


# AMARTYA SEN'S CAPABILITIES APPROACH: RESISTANCE AND TRANSFORMATIVE POWER IN THE AGE OF TRANSHUMANISM

by I Sil Yoon 

*Abstract.* Although the development of transhuman technologies has the potential to radically improve the quality of human life, transhumanism risks widening existing socio-economic disparity. A side effect of innovative advance in AI (artificial intelligence) and IA (intelligence amplification) would be a society with a large underclass dominated by a techno-elite. For my analysis, I will draw on Amartya Sen's Capabilities Approach, which focuses on opportunities that make possible an individuals' capabilities of choosing to pursue their life values and well-being. This article explores how Sen's approach can serve as a foundational framework to critique capitalism-driven technological development and consequent social inequality. It further examines how it can serve as guidance for a democratic and just transhumanist society by necessitating the establishment of social conditions where all persons can flourish.

*Keywords:* Capabilities Approach; Amartya Sen; social inequality; transhumanism

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## INTRODUCTION

East Asia, Europe, and North America are accelerating their pace of innovation. What was a short time ago was only science fiction is becoming an everyday actuality. The digitized global society anxiously awaits the next leap forward in AI (artificial intelligence) and IA (intelligence amplification).

Among the innovators we find the transhumanists who plan to employ technology to take control of the next stage of evolution. Transhumanism or H+ is the ideology that envisions an enhanced humanity, even a state of humanity that surpasses many aspects of our current state. It is based on the belief that the human species can overcome its current form and continue to develop with technological advancements (Bostrom 2003). The next stage of evolution will see superintelligence, a posthuman species.

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Although the development of transhuman technologies has the potential to radically improve the quality of human life, possible dangers lurk on the other side of the merits. The belief in and movement toward “technological singularity”—where the current limitations of the human condition can be overcome through technological enhancements—can lead to a significant ethical challenge. Among the various possible ethical issues one could address, I will focus on that of a widening socio-economic disparity due to unemployment and the unequal distribution of technologies. This deleterious likelihood could push the transhumanist movement in the opposite direction from an enhancement of the human race to that of benefitting only certain individuals who are socially privileged. A byproduct of the giant technological leap forward for the techno-privileged could be baby steps backward for those excluded from the upper techno-class. In short, H+ could exacerbate existing social and economic injustices.

How might we structure the transhumanist plan to incorporate justice right into its envisioned new world? I recommend that we turn to economist and philosopher Amartya Sen who has developed economic and social theories that draw from political and moral philosophy. Sen presented his idea of justice in the Capabilities Approach, focusing on his concern for human development and flourishing. Through this focus, he points to the problem of global inequality and the need to pursue social justice for all.

Sen, particularly in the *Idea of Justice* (2010) and the *Handbook of Income Distribution* (2000), diverges from and enriches several dominant theories of justice. He places an emphasis on the opportunities provided to everyone in order to achieve human flourishing. Sen’s Capabilities Approach focuses on individuals’ capabilities of choosing to pursue their life values and well-being, and the opportunities that make that choice available. I will explore how Sen’s approach can serve as a moral framework to critique capitalist-driven technological enhancements in transhumanism. I will focus on its ability to promote a more democratic society by mitigating socio-economic inequality and the divisions that are expected to become exacerbated in a transhumanist society. Further, I will show how his approach can serve as practical guidance for a democratic and just transhumanist society by necessitating the establishment of the social conditions where all persons, in their diversity, can function well with freedom and agency. In accomplishing this purpose, I will take an interdisciplinary approach. I will focus on the socio-economic challenges that can be aggravated in the age of transhumanism from a moral philosophical lens, based on the framework of Sen’s Capabilities Approach.

This article consists of three major sections. First, I will address the major goals and characteristics of transhumanism and their social and ethical implications. I will explore potential socio-economic challenges in a transhumanist society, and the elements that exacerbate such problems. Next,

I will examine Amartya Sen's Capabilities Approach as a moral framework that necessitates not only personal but also institutional levels of assistance to promote the well-being of every individual in society. I will analyze and assert Sen's idea of justice as an alternative to that of John Rawls. Inasmuch as it has been historically considered one of the most influential theories in addressing fairness and equality, Rawlsian justice has been susceptible to numerous criticisms. These include failing to address individuals' actual lives and overlooking the unique needs of the least advantaged. Sen's Capabilities Approach, as a theory that address social justice issues, is a framework that is more relevant than the other references that have been widely used in this context as it rectifies the drawbacks of traditional theories. Sen's approach is strengthened by modern Catholic Social Teaching that recognizes the diversity of all of the members of a society and supports ensuring their freedom and agency. Finally, I will explore the potential of Sen's theory for critiquing the socio-economic injustice that exists in transhumanism. I will further examine how it can be used to call for societal transformation to support socially-disadvantaged people. I will make recommendations for possible practical social support for these people as a way to establish a more just and democratic transhumanist society.

#### DEFINITION AND GOALS OF TRANSHUMANISM

On a basic level, transhumanism is a philosophical movement. Its advocates affirm the development and use of technologies to improve human capacities and human lives. Such improvement involves transcending the limitations of the human body and brain (Hughes 2004, 155). The word "transhumanism" was coined by Julian Huxley, an eminent biologist, who, in *New Bottles for New Wine*, wrote:

The human species can, if it wishes, transcend itself—not just sporadically, an individual here in one way, an individual in another way—but in its entirety, as humanity. We need a name for this new belief. Perhaps *transhumanism* will serve: man remaining man, but transcending himself, by realizing new possibilities of and for his human nature. (Huxley 1957, 17)

Nick Bostrom, a philosopher and the co-founder of the World Transhumanist Association, describes transhumanism as a movement that pursues an interdisciplinary approach to comprehend and evaluate opportunities for fundamentally enhancing the human condition and the human organism through the advancement of technology (Bostrom 2005).

The central theoretical framework that underlies transhumanism is evolution. More specifically, it is the notion of a non-static and evolving human nature, as well the idea that technology enables this transformation. Bostrom addresses this point by stating that:

Transhumanists view human nature as a work-in-progress, a half-baked beginning that we can learn to remold in desirable ways. Current humanity need not be the endpoint of evolution. Transhumanists hope that by responsible use of science, technology, and other rational means, we shall eventually manage to become posthuman, beings with vastly greater capacities than present human beings have. (Bostrom 2005, 4)

This idea is reflected in Huxley's emphasis on evolution. The theory implies "man's destiny in the world process," as well as mankind's responsibility for its future revolution (Huxley 1992, 79). If humans have a fixed and unchanging nature, technology will not be able to modify it. However, transhumanism is based on the viewpoint that human nature is malleable and thus has been and can be constructed, deconstructed, and reconstructed by external forces—technology being the most important (Garreau 2005, 235).

Grounded in this notion of human nature, transhumanism promotes exceeding the limitations that define the "less desirable" aspects of the human condition (e.g. lifespan, intellectual capacity, bodily functionality, sensory modalities, mood, energy, self-control, etc.) through enhancement provided by technologies (More 2013, 4). Transhumanists hope that their utopian vision of the future—of extended human life and the eradication of pain and suffering—can be accomplished by various technologies. In this utopian future, people will have enhanced intellectual faculties, emotional experiences trained from genetic breeding, an increased subjective sense of well-being, and a greater degree of control over their lives (Bostrom 2005, 3).

Futuristic transhumanist plans aim toward the final goal or outcome of the technological modification of human nature to then become "posthuman" (Shatzer 2019, 41). Based on the presupposition that human nature is not static but exists in an ever-changing process of development, transhumanism is directed toward the evolutionary growth that can be reached by transcending what we would currently call "human" (41). Posthumans will possess greater physical, cognitive, and emotional capabilities, along with the freedom to choose the form and capabilities they desire. They, with their capabilities, will be able to overcome disease, aging, and, eventually, death (42).

Such a posthuman ideal has the danger of supporting human supremacy based on anthropocentrism. It stresses the absolute systemic power and privilege of humans, and consequently, human control of other creatures. It can justify the ideology of human oppression and exploitation of non-human creatures, including animals and nature (Estrada 2019). Moreover, human supremacy concerns inter-human relationships as well. The theory is rooted in the human tendency or will to dominate whenever they find themselves "better," "superior," "above," or "separate" from others, either humans or non-humans (De Jonge 2011, 309). Human supremacy

involves the structural and institutional realities where certain social groups (those with power) choose to exercise socio-economic oppression, exclusion, and elitism over others (310–11).

In fact, the transhumanist ideal makes the assumption that the blessing of technological advancements will benefit the whole human race, if not the entire ecosphere. The foundation of transhumanism's radical movement toward human enhancement reflects a fundamental human desire for improvement—improvement not only of one's own life, but also of the lives and conditions of others (Young 2006, 51). Likewise, as Huxley addresses, the aim to become posthuman is based on the human aspiration to transcend oneself. Transhumanists argue that this is not unique to just some individuals, but is present in the entirety of humanity (Hughes 2004, 158). Nevertheless, in considering the potential risks of posthuman modifications, we need to further explore the possible socio-economic challenges that can deepen in a transhumanist society and their ethical implications—the focus of this article.

#### TRANSHUMANIST BELIEFS

Emerging from the notion of a malleable human nature that is open to continual enhancements through technology, several beliefs or assumptions that ground the transhumanist vision of the future have developed. First, transhumanists stress perpetual progress. Transhumanists continually desire “more”—more intelligence, more life, and more experience (Shatzer 2019, 43). This aspiration occurs, on the individual level, through a second belief which is that of human potential and self-transformation. Transhumanism assumes that since human nature holds a progressive orientation, the human condition can continue to change and develop through “critical and creative thinking, perpetual learning, personal responsibility, proactivity, and experimentation” (More 2013, 5).

Second, transhumanists believe in technological enhancement as a means to achieve such progress. The period of technological advancement is often referred as the technological “singularity”—a time with an explosion of breakthroughs through the emergence of “true AI” that possesses radically increased or “superhuman” biological and intellectual changes (Vinge 2013, 365). With this belief, transhumanists are committed to promoting research and development in a wide variety of biological and engineering technologies. These include not only present technologies, such as genetic engineering and information technology, but also future ones including molecular nanotechnology and artificial intelligence (Bostrom 2005, 3).

Finally, human autonomy is highly valued by transhumanists. They insist that individuals have the freedom and capacity for self-determination and self-governance. Such freedom includes morphological freedom or the

freedom of bodily change. Since humans own their own bodies, they can pursue their body's potential via modification, including modifications for technological advancement (Shatzer 2019, 58). Many, although not all, of the leading figures in the transhumanist movement are atheists and agnostics, which reinforces the transhumanist emphasis on human autonomy. This upholding of freedom and choice implies that humans are not only capable of determining their fates but are also responsible for their own actions (Rano and Samples 2019, 194–95).

#### A POSSIBLE ETHICAL CHALLENGE IN THE AGE OF TRANSHUMANISM: SOCIAL INEQUALITY

The developments that transhumanism will bring could have, ethically speaking, both positive and negative implications. Transhumanism might contribute to the advent of a world with lessened suffering, for example, through physical healing or enhanced intelligence. This is to be affirmed. Nevertheless, it also has the possible danger of causing socio-economic problems that could cause intensified suffering in the world.

#### Machines' Replacement of Human Labor

One of the possible socio-economic challenges is the exponential increase of humans' displacement by machines. The losses of jobs due to technological advancements is not a new phenomenon and concerns about this have been raised continually since the eighteenth century (Keynes [1930] 1963, 360). Nevertheless, the speed and range of displacement will be unparalleled in the age of transhumanism. This particularly the case due to the unprecedented development of artificial intelligence that is better than that of humans in consciousness, cognition, and even emotions. Whereas the narrow sense of AI refers to intelligence that is exercised by machines to carry out specific tasks, AI includes artificial general intelligence (AGI) that is a more developed version of robots that are capable of "coping with unpredictable situations in intelligent and creative ways" through judgment and decision-making (Goertzel 2013, 128). Distinctive from the AI that has already been transforming our world through various programs, AGI—designed to involve a connection between human minds and artificial "minds"—is of special focus for transhumanists (Bostrom 2014, 22). Jerry Kaplan explains that AGI programs are synthetic intellects, exceeding human minds that are limited in scope and in the degree of intelligence they can utilize, and represent more complicated forms of information that flow through computers and networks (Kaplan 2015, 7). In this context, technological unemployment is not limited to those with jobs that require manual labor. Examples of AGI replacing the work of so-called professional workers, including that of surgeons, lawyers,

and educators, demonstrates that no occupation is “safe” from being substituted by machines (Marturano and Vizmuller-Zocco 2019).

The development of AI programs may contribute to increased convenience in task management and problem solving through automation. However, radical innovations will cause a rise in unemployment that is greater in both speed and scope in the age of transhumanism, compared to previous periods. Additionally, the drastic automation of production and distribution systems from enhanced AGI will cause the removal of second-tier producers and distributors. As a consequence, it will lead to the rise of monolithic individuals or groups that can serve a high number of customers and produce great revenue, with fewer employees (Keen 2015, 49). The growth of unemployment will significantly impact the socio-economic and political life of humans in a negative way. It will do so not only by reinforcing financial inequality but also by taking away human agency and social participation (Goertzel 2013, 131).

#### “Technological Unemployment”

The consequence of technology’s replacement of human labor is the increase of unemployment. Austrian economist Joseph Schumpeter views technological unemployment as a byproduct of economic growth that is brought by new technologies. Schumpeter introduced the term “creative destruction.” This refers to the process by which existing firms are destroyed by newly invented technologies. The continuous friction that occurs in the matching of firms and workers, as a result of creative destruction, leads to what he calls technological unemployment (Schumpeter 1939). As technological changes that involve labor-saving “mechanical-muscle” machines or even more efficient “mechanical-mind” processes, or automation, machines replace human labor (Chuang and Graham 2018). As human labor is minimized, or at least significantly lessened, humans, particularly workers with blue-collar jobs or those who lack technical training or skill, experience a loss of jobs in various fields. Jobs with repetitive and routine processes and jobs that require manual labor can be easily replaced by machines (Chuang and Graham 2018).

#### Unequal Distribution and Social Divisions

A relevant but distinct challenge that can emerge with transhumanism is the inequitable accessibility and distribution of technological innovations. That is to say, not everyone will benefit from them. As the process of invention and the development of goods and services has been expensive and this is expected to continue, economists assume that production costs will be reflected in the market price. Costly market prices, at least initially, means that this technology cannot be accessible to those who do not have the means to obtain these products (Chuang and Graham 2018). In

addition, such technological developments will require professionals who are highly competent and trained to use and invest in further enhancements. People who lack relevant skills, will not have the means to access and use them (Rano and Samples 2019, 162). Although prices will be reduced over time, the leap to an advanced humanity or even a posthuman existence will be limited to those who are sufficiently wealthy to continue to afford new products. Eventually, the society in the period of transhumanism will operate with the principle of “survival of the fittest,” as Ted Peters (2011) argued. As in the case of technological unemployment, the problem of asymmetric access and distribution already exists in various fields of contemporary society including biotechnology, healthcare, agriculture, and manufacturing. However, in transhumanism, with the pursuit of morphological transformation at its center, technologies will become more sophisticated at a faster rate, which consequently aggravates socio-economic problems (Rano and Samples 2019, 145).

The problem of unequal distribution entails social divisions characterized by an increased gap between the lives of the wealthy and those of the poor. The wealthy, who have access to enhanced technology, will not only enjoy the efficiency that comes from the innovations, but also have further social advantages beyond access to the technology. The technology can enable them to become smarter, wealthier, and higher in social status than those who cannot afford it (Rano and Samples 2019, 146). Furthermore, Jaron Lanier, a computer scientist and computer philosophy writer, predicts that the new economy will diminish the value of “ordinary people” who do not have specific skills that can be utilized to manage technological innovations, whereas the economy will overvalue those “closest to the top computers” (Lanier 2013, 7). The unequal accessibility, combined with enhanced intelligence and income, may cause the wealthy to have more power to control the disadvantaged. Countries that are industrially advanced societies, despite their overall economic development, will experience a deep social problem arising from increased divergence between economic growth and employment, as well as between different social groups.<sup>1</sup>

In this society of deepened social divisions, there would most likely be individuals and groups whose basic human needs cannot be fulfilled. The free market, while allowing any person in society to hold social resources and exchange them, at the same time, does not address those who do not have resources and therefore cannot become participants in the society. In other words, a right to basic sustenance is not inherent in the capitalist system (Van Til 2003, 60).

Another possible injustice is socially disadvantaged people’s loss of autonomy and freedom. As transhumanism promotes morphological transformation—modifying the human body by editing or removing its limitations, genome editing technologies are continually developed and



may be broadly used to remove genetic disorders. In this context, there may be cases where parents are forced to undergo genetic screening prior to pregnancy, and to edit and select embryos, as a way to avoid flawed or “undesirable” genes (Rano and Samples 2019, 145). Parents may not be able to receive medical care during pregnancy if they refuse the gene editing. As the technology costs are unprecedentedly high, socially powerless people may not be able to afford them. This demonstrates a situation when unequal distribution of technology leads to the loss of freedom and privacy in decision-making, along with rights to healthcare (Rano and Samples 2019, 145).

The vulnerability of the underprivileged and the social inequality that comes from both technological unemployment and the asymmetric distribution of access would impact the overall quality of life of humans and cause disparity between the privileged and the underprivileged. Lanier insists that unlike the transhumanist assumption that the increased economic growth and automation will liberate people in various fields including science, philosophy, art, and travel, such privileges might apply only to those who possess and/or manage the technology (Lanier 2013, 7). Ultimately, the transhumanist vision that technological advancement will be the means to achieve a better, happier, and more stable “society” cannot be realized. Society will rather move toward the opposite direction.

#### FACTORS THAT DRIVE INEQUALITY

The potential ethical challenges reveal that the transhumanist ideal of the enhancement of all humanity might not be possible and could cause society to fall in the opposite direction—toward deep social division and inequality. In this section, I will discuss the fundamental values that drive transhumanism, serve as the catalyst of the ethical challenges, and distort the original intentions of transhumanism.

##### Belief in the Technological Singularity

The first transhumanist value that is a driving force that accelerates socio-economic inequality is its fundamental belief in the “technological singularity” where machines become more intelligent than humans. Therefore, humans achieve progress through technological advancement. Michael Burdett asserts that the “myth of progress” grounds this belief. According to Burdett, the myth of progress reveals the human utopian thinking that insists that “history/society/humanity has advanced, and will advance in the future,” and the present is the imperfect and diminished form of the perfect future (Burdett 2015, 132). It conveys the conviction that continual progress will bring humanity toward better conditions as well as the realization of advanced economies, social justice, improved health, and even immortality. Transhumanists present a radical

techno-faith by expressing higher respect for the social contribution of the “impending” techno-science and the pursuit of a posthuman future (Rano and Samples 2019, 194, 231).

### Capitalist Ideology

Another value that is deeply ingrained in transhumanism is the ideology of laissez-faire capitalism. Rana and Samples point out that capitalism is required to promote the transhumanist vision. Transhumanists recognize that their grand plans—that involve the development of technologies including biotechnology and bioengineering—will require money, and lots of it. Affluent investors will offer capital, the financial assets that are necessary to fund such technological developments. They then need to have a return that is equivalent to their investment in order to acquire the resources needed for future funding for the next technological development (Rano and Samples 2019, 215). This capital, manifest in commodities (technological inventions), is placed in the free market at a higher price than was spent creating them, with the purpose of purchasing or inventing more commodities. This process is repeated as the capital investors pursue a path of generating greater value from their capital, motivated by greed and stimulating competition for profits (Heilbroner 1997). To this end, H+ includes within its strategy support for the capitalist economy.

Within capitalism, transhumanism defends the free market economy where individual freedom is guaranteed to promote technological advances, with minimal state intervention. It argues that only when the state stays non-interfering will individuals’ potential be fully developed. This is said to lead to the advance of society as a whole (Adán 2017).

We observe how all along the primary driving force behind modern technology has been capitalism, where money becomes the token through which one calculates, stores, and transmits value. It has become a vehicle through which people exchange relationships and preserve power and security (Gay 2018). Despite its efficacy, the modern capitalist system has rendered money as an object of awe and even worship, and produced societies where human beings’ experiences of the world and individual qualities are neglected (Simmel 1950, 414). It further allowed opportunities for exchange to be made primarily for future financial profits, and caused the problem of social inequality. In the free market, one must contribute to it in order to be rewarded, and in order to contribute, one needs to have resources that are valued by the market (Van Til 2003, 58). In addition, sellers of commodities will accept the highest bids. Those who have the greatest amount of money can offer a higher bid than those with little financial backing. As a consequence, capitalism enables those who already have resources, who are wealthier, and who can use money more productively, to become the dominant users of resources in society (Van Til 2003, 137).

The logic of money and the free market can become even more intensified in the age of transhumanism. Again, due to their expensive cost, technological innovations, such as genetics, nanotechnology, and robotics, require the investments of sufficiently wealthy people. As Peters identifies, a challenge arises as the investors expect a return on their investment, and reinvest in the newest versions of innovations with another expectation of a return. As a return on their investment, the wealthy investors will have dominant access to the technologies that are the latest and highest in quality (Peters 2011, 156).

As a response to this problem of unequal distribution, ethicists have been arguing for the necessity of enacted legislation that grants broader access to human enhancement technologies. In addition, transhumanists have been insisting that although technological advances may initially benefit the upper class of society, they will eventually become widespread and increase the health and happiness of everyone (Devlin 2014, 68). Nevertheless, these approaches are not convincing as developing human enhancement technologies “requires” a capitalist system where the investment of entities functions as a major source of the development (Rano and Samples 2019, 146).

### The Problem of Greed

Central to the driving force of social inequality caused by techno-faith and capitalism is greed as a component of human nature. Philosopher Patrick Hopkins argues that what causes social problems is not technology itself but the relationship between humans and technology that is furthered by human greed—the unsatiable desire of humans to continue to acquire and achieve more. Combined with the belief in progress, this perpetual craving forces humans to be blind to the side effects of technological enhancement. Hopkins insists that due to their perpetual cravings, humans will never feel satiated or fulfilled regardless of how much safety, health, and wealth they have, as they always desire more (Hopkins 2015). Peters elaborates this point by arguing that as capital investors continue to rely on private capital and value capitalism, the techno-scientific advancements that benefit them will cause greater detriments to the broader society. Ultimately, humans will not be able to reach the utopian future that transhumanism envisions but will rather move toward the opposite direction (Hopkins 2015, 72–76).

The problem of greed reveals a clarifying point is: what is to be critiqued is not progress nor capitalism itself and consequent economic growth. The benefits of techno-science are to be affirmed. In addition, technological development requires money—private money—and it can possibly be pursued within a society that is willing to provide funds. Nevertheless, the possible social challenges I have explored call for the awareness that

improvement through technology will deepen and create further unintended problems (Rano and Samples 2019, 235). Capitalist ideology's emphasis on individual humans' own economic desires cannot bring forth a society where all members care for each other and pursue the ultimate well-being of everyone. It rather directs them to the opposite. Considering this possibility, progress based on the free market should be promoted in a way that overcomes its abuses and that establishes a social structure that ensures democratic regulations and equal availability of technologies (Huges 2004, xii).

#### AMARTYA SEN'S CAPABILITIES APPROACH AS A FOUNDATIONAL THEORY TO CRITIQUE CAPITALISM-DRIVEN TRANSHUMANISM

In critiquing the negative socio-economic impacts of techno-faith and capitalism and to provide a direction toward a just and equitable transhumanist society, Amartya Sen's idea of justice, presented through his Capabilities Approach, can function as a powerful moral framework. It can be used to call for the establishment of society that respects the diversity of individuals, including those who may be excluded in a transhumanist society, and that ensures social policies to provide them with opportunities to exercise agency.

#### Critique of Rawls' Theory of Justice

Sen presents the Capabilities Approach as an alternative to the existing economic, ethical, and political theories that he found inadequate to assess the well-being of human beings, and thus cannot support the welfare of all individuals and cannot contribute to actual social justice (Daka 2008, 72). Though John Rawls' idea of justice had been one of the most influential theories for dealing with socio-economic inequality, this traditional approach has failed to address the actual lives of people and human well-being (Filice 2013). Although heavily influenced by it, Sen diverges from and complements Rawls' theory of justice through his Capabilities Approach, with its major focus on recognizing and enhancing people's capabilities, as well as individuals' quality of life. Sen, in his book *The Idea of Justice*, specifically examines the link between the Capabilities Approach and justice in a more explicit manner.

With regard to the question of what a just society should be, Sen raises the critique that, for Rawls, justice is primarily about institutions, deriving that the specific distributions of goods are just if they are generated by just institutions. Sen then articulates the combination of just institutions and corresponding actual behaviors that are necessary to make a society just (Maffettone 2011). To be specific, Rawls, in his theory of justice as fairness, argues that the object of justice is the establishment of a society that promotes the interactions of citizens who are free and

equal in a democratic “cooperative venture for mutual advantage” (Rawls 1999, 3). He insists that citizens themselves should be the subject of a just allocation of resources, existing in an original position of fairness, but situated in a political conception of justice to which all approve (4). Based on these presumptions, Rawls argues that the principles of justice are bound by the design and functioning of a society’s laws, and such an institutionalized scheme applies equally to all members of the society, regardless of their preferences, histories, or individual contingencies. This argument undergirds the prohibition of discriminating against society members for unfair reasons (Rawls 2001, 18–24). Sen argues that Rawls aims to draw upon principles of justice for a “well-ordered society,” meaning, a society of “strict compliance” where all individuals must act fairly and justly in order to create a perfectly just society (Rawls 1999, 128). Sen asserts that Rawls’ “transcendental institutionalism” neglects the significance of how the institutions affect the capability and real lives of individuals, and it cannot incorporate the plurality of multifaceted, diverse, and conflicting dimensions of a society and its members (Sen 2010, 128). He argues that Rawls’ theory is superficial and significantly limited in recognizing the actual lives of people and in fulfilling the demands of their plurality (128). Sen further objects to Rawls’ argument for sufficient moral personhood as a requirement to be guaranteed equal protection and entitlement, raising the issue of the meaning of justice as fairness to those who are mentally or physically disabled and thus lack “sufficient” moral personhood (Sen 1976).

Correcting these defects, Sen’s Capabilities Approach, as a framework that fundamentally explores justice issues, takes a balanced approach. On the one hand, it pays attention to individuals’ capabilities that enable the well-being of all, and, on the other hand, it necessitates the role of society to provide people with opportunities to nurture and exercise their capacities. As a response to the ethical problems that arise in transhumanism related to social inequality, Sen’s approach raises the need to establish a society that supports the actual quality life of diverse peoples, including the socially marginalized, by ensuring their agency and the just distribution of resources. This contribution will be addressed in more detail later in the article.

### Major Arguments of Sen’s Capabilities Approach

In contrast with Rawls’ approach, Sen’s Capabilities Approach focuses on the capacity of each individual to fully utilize opportunities or resources, and therefore to function fully in society. Sen argues that the proper allocation of resources can have a significant impact on facilitating capabilities to achieve basic human needs or entitlements. Although our moral vision must go beyond meeting basic needs and toward human flourishing, functioning well is the starting point to live a good life (Sen 1992).

Two primary concepts that become the building blocks of Sen's theory are "functionings" and "capabilities." Functionings, for Sen, consist not only of a person's "doings" but also the person's "beings." They include the states and activities that are constitutive of the person's being, ranging from elementary elements, such as being healthy and safe, to more intricate or complementary ones that are realized through achievements, such as being happy and acquiring self-respect (Sen 1992). Functionings enable people to discover meaning and value in their access to and use of social resources. They are essential when assessing people's well-being, particularly through their economic and political activities (Daka 2008, 73–74).

Sen clarifies that although functionings inform about "various things a person may value doing or being" (Sen 1997, 199), they are not considered individually and independently, separate from the relationships among the individuals' choices and actions as well as the contexts that have impacted their choices and actions. Rather, an evaluation of one's functionings is to consider her combined functionings and the interactions among them and with her peers' functionings, as well as the context where the choices were made and the actions were carried out (Daka 2008, 73–74).

Sen refers to capabilities as "combinations of functionings from which the person can choose" (Sen 2005, 154). In other words, as a set of functionings, capabilities are a "combination of things [she] is able to do or be" freely and reasonably (Davies 2014). Sen argues that in order to "be well," beyond converting their activities to functionings for their existence, individuals further need to be able to convert them to a state from which they can be assured of and enhance their capability to achieve what they consider good for their lives (Daka 2008, 73–74).

Capability is the word through which Sen forms the idea of freedom and its influence on people's well-being and development. Sen defines capability as the "substantive freedom to achieve alternative functioning combinations" (Sen 1985, 199). In relationship to functionings, a functioning (e.g. being well-nourished) should not be seen as a freedom of any kind. On the contrary, a freedom, in the form of a capability, refers to the scope in which individuals can freely choose specific functionings—that is distinct from what they actually decide to choose. In other words, capability focuses on the "opportunity" to be able to have combinations of functionings (e.g. the opportunity to be well-nourished) (Sen 2005, 154). The individuals have the freedom to use or not use the opportunity (154). Sen argues that individuals' functionings enable them to produce more functionings and equip themselves with a substantive quality of freedom, or capabilities (Daka 2008, 73).

Sen further addresses that having such freedom means going beyond having their basic needs (e.g. safety, nourishment, etc.) fulfilled, to being entitled to have access to the commodities or services necessary for the individual's flourishing (e.g. education, freedom of speech, etc.). They can

function well under this condition. Capabilities can be formulated when both the opportunity as well as the ability that a person has in order to produce valuable outcomes are served (Sen 1992). Here, the person has the agency to pursue the goals and values that he or she regards as important (Sen 1985, 204).

According to Sen, freedom is a multi-layered concept that goes beyond “negative freedom”—freedom from external restraints, such as freedom from poverty, from an oppressive domestic, religious, or political regime, and freedom from disease. Freedom further includes “positive freedom” that involves the ability to seek valuable things for one’s life and to possess the power and resources to fulfill one’s potential (Daka 2008, 76).

In addition, Sen articulates four roles of freedom: instrumental, constructive, constitutive, and substantive. The instrumental role of freedom secures socio-political rights, opportunities, and entitlements. It also guarantees transparency by promoting trust and openness toward others and thus preventing corruption and irresponsibility, and offers protective security (Davies 2014). The constructive role of freedom assists people in identifying their choices and the values necessary to assess their well-being in a given social context, along with their needs, including economic ones (Daka 2008, 95). Constitutive freedom enables people to recognize and enjoy “basic capabilities”—the elements constituting their existence and allowing them to survive (95).<sup>2</sup> Finally, substantive freedom combines the role of the other three freedoms and concerns the quality of life. It informs persons about what they existentially and practically value. It focuses more on the agency and ability of the individuals to achieve freedom, rather than on the means to gain it (95).

Sen stresses that such distinctions should be guaranteed through social policies and redistribution in order to facilitate effective human development. This claim reflects the nature of the Capabilities Approach that emphasizes individuals’ equality where their needs and ability are considered as well as the societal duties to ensure such equality. Criticizing systemic social deprivation, including poor economic opportunities, Sen emphasizes states’ establishment and implementation of policies with the aim of eliminating sources of constraint. He argues that the understanding of the subtlety in different roles of freedom will contribute to creating a more comprehensive vision of well-being in society (Davies 2014).

Along with the articulation of different types and roles of freedom, the Capabilities Approach argues for the significance of a “society of freedom.” To be specific, individuals are to have access to opportunities or an adequate set of resources from which they can think and act freely in their particular context. In this society, individuals can exercise the freedom of choice and make appropriate choices from the available range of options (Sen 1992).

Here, Sen clarifies the distinction between freedom of choice and freedom of capabilities, emphasizing the fundamental importance of the latter as a way to ensure the former. Having expanded choices may not necessarily lead to the increased well-being of a person. For example, if healthcare services are costly, socially vulnerable populations who cannot afford them, despite the variety of options, cannot improve their health through these services (Deneulin 2008). In this regard, Sen stresses the important role of society to provide opportunities or choices so that people can function well and thus live well in accordance with their values.

To this end, Sen is concerned with the social conditions that are necessary to well-being and social justice. Such environments are not limited to guaranteeing negative freedom but extend to ensuring that people have the resources needed to maximize their capabilities. The individuals do not only fulfill their basic needs but live lives of substantive quality (Daka 2008, 79).

Sen's approach is particularly suitable to addressing the diversity of individuals—the specific aspects of disadvantage, including socio-economic status, gender, race, or disability. These features need to be considered in social policies to ensure adequate resources for the operation of their full capacity, and consequently, so that they can fully contribute to society (Daka 2008, 79). In order for the societal and practical level of assistance to happen, the decision-making process of policies requires public deliberation as well as democratic discussion. The democratic process and outcomes will provide individuals the tools for empowerment—the constituent of their freedom (Rajapakse 2015).

### Amartya Sen and the Catholic Social Thought on Justice

Although Sen's language in the Capabilities Approach does not have a religious dimension, Sen's idea of justice and modern Catholic Social Thought—particularly that which developed in the late nineteenth century through the conciliar and other types of official documents, in Europe first and in the United States as well as non-Western parts of the world—have much in common. These converging points can strengthen the Capabilities Approach's contribution to empowering the socially marginalized and, consequently, to promoting social justice.

Both Sen and Catholic Social Thought articulate a hope for change from the current reality of injustice, through both moral reasoning and action for justice. In the Pastoral Constitution *Gaudium et Spes*, the Catholic Church presents its eschatological belief that we have “nurtured on earth the values of human dignity, brotherhood and freedom, and indeed all the good fruits of our nature and enterprise” that will be fully realized and “transfigured” in the eschaton (Paul VI 1950, 39). The belief that the justice, love, and peace of God are already present, and will be



brought into fullness, provides necessary motivation to be committed to this work in the present time (Verstraeten 2017, 216). Sen, particularly when he argues for a departure from Rawls' transcendental institutionalism, also expresses his conviction that "hope and history rhyme" and names engaging public discussion on justice in our own time (Sen 2010, 26). Catholic Social Thought values staying devoted to the present time, however imperfect, anticipating the ultimate fullness of justice. Similarly, Sen rejects expecting or aspiring toward complete/perfect institutions "as themselves manifestations of justice," but, rather, he argues for seeking "institutions that promote justice" reflected in concrete human behaviors and social achievements (82–83).

Moreover, both Sen and Catholic Social Thought assert the universality of justice, meaning, justice for all. Thus, both pay attention to the injustice that is faced by the socially vulnerable. Catholic Social Thought emphasizes that this is a moral obligation by stating that "we incarnate the duty of hearing the cry of the poor when we are deeply moved by the suffering of others" (Francis 2013). Sen also shows a strong belief in the "catholicity" of human rights as a moral claim grounded in "our shared humanity" (Sen 2010, 143, 364). His emphasis on catholicity is expanded in his argument for an "open impartiality" that necessitates attention to the interests, needs, and perspectives of even the "distant" or "insignificant other" (199). Sen stresses that "different voices from diverse sections of the people," including those on the more marginalized side, should be "actually heard" (xiii).

The vision of justice implied in Sen's approach and Catholic Social Thought goes beyond the fulfillment of the basic needs of each individual toward creating a society where everyone can contribute and participate. As described in the Capabilities Approach, all individuals can exercise their potential with freedom, and have the agency for social participation. Sen's vision can be strengthened by Catholic Social Thought's pursuit of the common good in light of the preferential option for the poor. This necessitates the special protection of the marginalized as a way to promote justice. Support of the poor must allow them to be "subjects of their history" rather than merely an "object of care" (Verstraeten 2017, 219). In Sen's language, such support should be an empowering process for people that allows them to have the freedom to choose and live the life they desire to live (Sen 2010, 249).

Given the socio-economic inequality that can deepen in the age of transhumanism, Sen's convergence with Catholic Social Thought on the topic of justice can provide insights for ethics in transhumanism. Christianity is not the only religious tradition that Sen utilizes. He employs a variety of religious sources, including Hindu, Buddhist, and Islamic teachings. Nevertheless, modern Catholic Social Teaching is the tradition that provides profound justification for the concept of human dignity that is expressed

in various aspects of life along with the significance of human development based on such dignity (Hollenbach 2005, 280). Furthermore, with its emphasis on human beings as social beings and the common good, Catholic Social Teaching addresses that human dignity is realized in social and communal solidarity. It calls for solidarity amongst humanity that will respond to the suffering of the socially disadvantaged whose dignity has been deprived and will empower each individual agency (Hollenbach 2005, 280). Modern Catholic Social Teaching's recognition of each person as an "end" and emphasis on diversity, interconnectedness, and communal responsibilities to support such dignity, not only provide the motivation to support those who are limited in their exercise of functionings in a transhumanist society. It can also help to call for the advancement of institutions as a way to ensure the freedom and agency of all in society and, ultimately, to promote social justice. Details of this will be illustrated in the following section.

#### THE IMPACT OF SEN'S CAPABILITIES APPROACH ON CRITIQUING THE LIMITATIONS OF CAPITALISM IN THE AGE OF TRANSHUMANISM

The ideas presented and implied in Sen's Capabilities Approach, enriched by Catholic Social Thought's vision of justice, can contribute to critiquing the transhumanist spirit that can cause socio-economic inequality and to providing a path toward a more democratic and just transhumanist society.

Sen's theory can critique capitalism-driven transhumanism where individuals' substantive freedom that enables their functionings is significantly restricted. As socially disadvantaged people lose their jobs and are limited in their access to technological advancements, they lose opportunities not only to fulfil their basic needs and to not be exposed to external interference (negative freedom), but also to exercise their potential and consequently to pursue a meaningful life (positive freedom). Sen's approach can criticize the reality where the vulnerable lose their agency in socio-economic and political life by valuing individuals' capabilities and their freedom to have the agency.

The Capabilities Approach can further suggest a direction to support human autonomy to establish a just transhumanist society. Both transhumanism and Sen's theory advocate for the significance of upholding human freedom, the former focusing on individuals' autonomy to govern themselves and their lives with their use of technology, and the latter on their freedom to fully exercise their functionings. Despite their overlapping emphasis on freedom as a condition to achieve one's well-being, capitalism-driven transhumanism provides a narrow approach to autonomy. Transhumanism asserts that human autonomy can bring boundless progress through technological enhancement that can overcome humans'

current natural states and limitations. Such an ideal has been rooted in and supported by a belief in progress and in the capitalist economy to produce advancements and benefits, deeply influenced by humans' insatiable greed. It does not consider how one's acquisition of profits requires others' sacrifice and experiences of loss, but rather instigates continuous competition and a selfish pursuit of profits. Transhumanism consequently neglects unequal distribution and the social inequality faced by socially powerless and impoverished people who cannot afford technological enhancements. Unlike the transhumanist ideal where all individuals possess autonomy with a sense of responsibility, the exercise of human autonomy and potential applies to the socially privileged, while the marginalized suffer from a loss or restriction of autonomy, remaining limited in their access to technology, unskilled, and unemployed. The development of drastically transformative technologies remains as a destructive and dystopian force, rather than a Utopian dream.

Sen's approach can critique the self-centered capitalism and elitism that threaten the freedom of socially disadvantaged populations. By supporting all human persons' agency to function well, his Capabilities Approach provides an inclusive moral framework that cuts across social, cultural, and national boundaries. It can critique the economic injustice and unbalanced social structure that results from the misuse of freedom by limiting others' social participation. Sen's theory then can provide direction toward enhancement that pays attention to the value of all groups of people in today's diverse society and supports the specific interests and needs of particular groups. Maximizing human autonomy as an ideal of transhumanism implies not only the freedom to make one's own choices but also of being responsible for these choices. Exercising freedom should entail an awareness of the worth of others and a respect for others. This emphasis can motivate both the developers and users of technology to move toward the true transhumanist ideal that is characterized by a sense of responsibility, cooperation, and social harmony.

Furthermore, the distinctions of freedom in Sen's theory can illuminate the significance of establishing social conditions that assist all persons to exercise such potential and autonomy and can contribute to the pursuit of sustainable capitalism in the age of transhumanism. The role of government or other state agencies becomes essential as an increasing number of people in more diverse fields are facing unemployment and consequent social inequality. In order to achieve the flourishing of everyone, the systemic inequality faced by socially disadvantaged people needs not only to be recognized but prioritized on institutional levels. Sen's categorization of freedom implies that such institutional levels of assistance go beyond removing primary sources of un-freedom, such as poverty and oppression, to then provide basic needs and entitlements. States are to further provide practical support by providing all individuals with substantive

opportunities to exercise their capabilities so that everyone's quality of life can be ensured (Daka 2008, 79). Only when the two levels of aid are guaranteed, everyone, including socially disadvantaged people, can realize a more comprehensive vision of development.

In regard to practical levels of support, several suggestions have been presented from scholarly work in the realm of governmental assistance. A long-debated one is that of governmental provision of universal basic income (UBI) as a response to massive unemployment in order to prevent the status quo from ignoring the suffering of others. Historically, from the sixteenth through the twenty-first century, the idea of guaranteed income from the government ranged from securing a subsistence minimum unconditionally to every citizen to assisting those who are unable to meet their basic needs (Rajapakse 2015). Either conditional or unconditional, governmental financial support that is sufficient for necessities may help socially powerless people and may also reduce inequality, insecurity, and poverty (Paine 2010). As numerous questions remain regarding a universal income, for example, concerning the recipients, the source of the money, the length of assistance, its taxability, and so on, dialogue and experimentation need to be conducted by nation states (Marturano and Vizmuller-Zocco 2019).

Along with universal income, professionals from diverse fields have suggested other types of governmental financial support. For example, governments can remunerate so-called "implicit work" conducted particularly by socially vulnerable populations (Bellucci 2005). It has been argued that users' access to social and other media can be seen as implicit work, as the data they provide or create helps companies make profits, and thus the data should be regarded as the product of labor, rather than the product of leisure. Governments may provide remuneration to users in recognition of this contribution (Bellucci 2005). Another possibility is to provide certain types of replacement income to those who have lost their job to a machine (Marturano and Vizmuller-Zocco 2019). While the conditions for a free wage should be carefully negotiated, such financial assistance can alleviate the economic disparity between different social groups, and, consequently, relieve the unequal distribution by providing socially marginalized people with more opportunities to access technology.

In addition to financial assistance, education, training and re-training services will be crucial to reduce unemployment as well as the unequal distribution of technology. As stated earlier, a lack of skills to utilize technological innovations is a significant reason for unequal access and distribution. Various elements including financial affordability, social status, and age can affect skill-lessness. Moreover, those who have lost their jobs need technical skills to find a new job or profession. Even after they acquire new skills, their skills need to be updated on a regular basis, as technological advances will continue to increase at a faster rate in a transhumanist

society (Marturano and Vizmuller-Zocco 2019). Due to this circumstance, education should be a necessary component of programs provided by governments and private enterprises in order to assist people to adapt to and be equipped in the society of every-expanding technology (Marturano and Vizmuller-Zocco 2019).

The establishment of social conditions supportive of socially disadvantaged people can play a significant role for individuals to realize the different functions of their freedom as articulated by Sen. Being equipped with higher adaptability to the society through increased financial stability, knowledge, and skills, they can have socio-political and economic rights and opportunities that will offer them security (instrumental freedom); they can more easily exercise freedom to make choices that will meet their needs—not only in search for a job but also in daily activities (constructive freedom)—as a consequence, they can not only survive in the waves of technological development (constitutive freedom), but also pursue their life values (substantive freedom). On the whole, such social structures will help them possess not only negative freedom with reduced poverty and social oppression, but also exercise positive freedom, being empowered as an agent to pursue values and happiness in life and exercise their competence and potential in the process.

### CONCLUSION

As transhumanism pursues the limitless development of technology, impelled by capitalism, the problem of socio-economic divide and socially marginalized people's suffering from inequality will deepen. The potential problems of capitalism in the transhumanist age do not require the necessity of its demise, nor the termination of technological development. The advantages that technology provides to humans are to be appreciated and further cultivated.

Moreover, halting or reversing the current trend of capitalism-driven technological advancement will be impossible. Rather, technological enhancement should take a proper direction that promotes establishing a democratic and just society. Sen's Capabilities Approach can serve as a foundational framework in discerning that direction. Its emphasis on individuals' functionings and opportunities for freedom to exercise the functionings calls for social responsibility to ensure such freedom for everyone in society. It can demonstrate that while pursuing profits through hard work and progress through technology, supporting the status quo related to who can benefit from technological advancements should be restrained. Rather, the interests, needs, and suffering of the socially powerless—who are excluded in the age when technology continues to replace humans and innovative technologies are not only encouraged but even coerced—should be prioritized. It necessitates the pursuit of solidarity and mutual

support, along with institutional levels of assistance that can promote equal distribution of technology and the well-being of the socially vulnerable. Under such social conditions, each individual can exercise freedom not only to have their basic subsistence but also to pursue their life values. When this direction is taken in every step of technological development, it will move us toward the ultimate purpose and ideal of transhumanism, that is, the enhancement and well-being—not only of bodily and cognitive processes but also the psychological and emotional life—of all humans.

## NOTES

1. The social division between different social groups would not be limited to the domestic level. The life quality of underdeveloped countries that have less technological development would be significantly lower than that of advanced countries. However, this challenge will not be discussed in this paper, as the focus here is the socio-economic ethical issues that can be exacerbated in a transhumanist society.
2. Sen does not specify a set of basic capabilities, unlike Martha Nussbaum who, with a list of specific basic capabilities, presented the Capabilities Approach as a way to analyze quality of life. Sen argues that the list may vary from person to person and between cultures, and the deliberation about constitutive freedom helps one to identify which capabilities are necessary for survival in a given context.

## REFERENCES

- Adán, Expósito Serrano. 2017. "Transhumanism: Biological and Epistemological Implications." (February 1, 2017). Available at SSRN: <https://ssrn.com/abstract=2913576> or <http://doi.org/10.2139/ssrn.2913576>
- Bellucci, Sergio. 2005. *E-Work, Lavoro, Rete, Innovazione*. Rome: DeriveApprodi.
- Bostrom, Nick. 2003. *The Transhumanist FAQ: A General Introduction*. Version 2.1. The World Transhumanist Association. [www.nickbostrom.com](http://www.nickbostrom.com)
- . 2005. "Transhumanist Values." *Journal of Philosophical Research* 30:3–14.
- . 2014. *Superintelligence: Paths, Dangers, Strategies*. Oxford: Oxford University Press.
- Burdett, Michael S. 2015. "The Religion of Technology: Transhumanism and the Myth of Progress." In *Religion and Transhumanism: The Unknown Future of Human Enhancement*, edited by Calvin R. Mercer and Tracy J. Trothen, 131–47. Santa Barbara, CA: Praeger.
- Chuang, Szufang, and Carroll Marion Graham, 2018. "Embracing the Sobering Reality of Technological Influences on Jobs, Employment and Human Resource Development: A Systematic Literature Review." *European Journal of Training and Development* 42 (7/8): 400–16.
- Daka, Lawrence. 2008. *A Human Empowerment Approach to Economic and Social Justice: An Appropriation of Sen's Capability Approach*. Saarbrücken, Germany: Verlag Dr. Muller.
- Davies, Augusto Zampini. 2014. "Amartya Sen's Capability Approach and Catholic Social Teaching in Dialogue: An Alliance for Freedom and Justice?" PhD dissertation, Department of Humanities, Roehampton University, London.
- De Jonge, Eccy. 2011. "An Alternative to Anthropocentrism: Deep Ecology and the Metaphysical Turn." In *Anthropocentrism: Humans, Animals, Environments*, edited by Rob Boddice, 307–91. Boston, MA: Brill.
- Deneulin, Séverine. 2008. "Beyond Individual Freedom and Agency: Structures of Living Together in the Capability Approach." In *The Capability Approach: Concepts, Measures and Applications*, edited by Flavio Comin, Mozaffar Qizilbash and Sabina Alkire. 105–24. Cambridge: Cambridge University Press.
- Devlin, Matthew. 2014. "Cultivating Better Brains: Transhumanism and Its Critics on the Ethics of Enhancement Via Brain-Computer Interfacing." Master's thesis, The University of Western Ontario.

- Estrada, Daniel. 2019. "Human Supremacy as Posthuman Risk." *Computer Ethics–Philosophical Enquiry (CEPE) Proceedings*. 13:1–26.
- Filice, Mary E. 2013. "Catholic Social Teaching and the Capability Approach to Human Development: A Critical Analysis and Constructive Proposal." PhD dissertation, Duquesne University.
- Francis, Pope. 2013. *Evangelii Gaudium*, Vatican City: Libreria Editrice Vaticana.
- Garreau, Joel. 2005. *Radical Evolution*. New York: Broadway Books.
- Gay, Craig M. 2018. *Modern Technology and the Human Future: A Christian Appraisal*. Downers Grove, IL: IVP Academic Press.
- Goertzel, Ben. 2013. "Artificial General Intelligence and the Future of Humanity." In *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*. Max More and Natasha Vita-More, 128–37. Malden, MA: Wiley-Blackwell.
- Heilbroner, Robert. 1997. "Technology and Capitalism." *Social Research* 64 (3): 1321–25.
- Hollenbach, David. 2005. "Gaudium et Spes: Pastoral Constitution on the Church in the Modern World." *Modern Catholic Social Teaching: Commentaries and Interpretations*. Kenneth R. Himes, 266–91. Washington, DC.: Georgetown University Press.
- Hopkins, Patrick. 2015. "A Salvation Paradox for Transhumanism: Saving You versus Saving You." In *Religion and Transhumanism: The Unknown Future of Human Enhancement*, edited by Calvin Mercer and Tracy J. Trothen. 71–81. Santa Barbara, CA: Praeger.
- Hughes, James. 2004. *Citizen Cyborg: Why Democratic Societies Must Respond to the Redesigned Human of the Future*. Cambridge, MA: Westview Press.
- Huxley, Julian. 1957. *New Bottles for New Wine*. London: Chatto & Windus.
- . 1992. "The Humanist Frame." *Evolutionary Humanism*. New York: Prometheus Books.
- Kaplan, Jerry. 2015. *Humans Need Not Apply: A Guide to Wealth and Work in the Age of Artificial Intelligence*. New Haven, CT: Yale University Press.
- Keen, Andrew. 2015. *The Internet Is Not the Answer*. New York: Atlantic Monthly Press.
- Keynes, John Maynard. [1930] 1963. "Economic Possibilities for Our Grandchildren." *Essays in Persuasion*. 358–73. New York: W. W. Norton.
- Lanier, Jaron. 2013. *Who Owns the Future?* New York: Simon & Schuster.
- Maffettone, Sebastiano. 2011. "Sen's Idea of Justice Versus Rawls' Theory of Justice." *Indian Journal of Human Development* 5 (1): 119–32.
- Marturano, Antonio, and Jana Vizmuller-Zocco. 2019. "Introduction." *Technology-Driven Unemployment and Social Welfare* 13 (1): 1–17.
- More, Max. 2013. "The Philosophy of Transhumanism." In *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*. Max More and Natasha Vita-More, 3–17. Malden, MA: Wiley-Blackwell.
- Paine, Thomas. 2010. *Agrarian Justice: By the Author of "Common Sense" and "The Age of Reason"*. Rockville, MD: Wildside Press.
- Paul VI, Pope. 1950. *Pastoral Constitution on the Church in the Modern World: Gadium et Spes*. Vatican City.
- Peters, Ted. 2011. "Transhumanism and the Posthuman Future: Will Technological Progress Get Us There?" In *H±: Transhumanism and Its Critics*, edited by Gregory R. Hansell and William Grassie, 147–75. Philadelphia: Metanexus Institute.
- Rajapakse, Nadeera. 2015. "Bringing Ethics into the Capitalist Model: Amartya Sen's Approach to Economic Theory and Financial Capitalism." *Revue LISA*, 13 (2), <https://doi.org/10.4000/lisa.8233>
- Rano, Fazale, and Kenneth Samples. 2019. *Humans 2.0: Scientific, Philosophical, and Theological Perspectives on Transhumanism*. Covina, CA: RTB Press.
- Rawls, John. 1999. *A Theory of Justice*. Cambridge, MA: Harvard University Press.
- . 2001. *Justice As Fairness: A Restatement*. Cambridge, MA: Harvard University Press.
- Schumpeter, Joseph. 1939. *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process*. New York: McGraw-Hill.
- Sen, Amartya. 1976. "Welfare Inequalities and Rawlsian Axiomatics." *Theory and Decision* 7 (4): 243–62.
- . 1985. "Well-being, Agency and Freedom: The Dewey Lectures 1984." *Journal of Philosophy* 82 (4): 169–221.

- . 1992. *Inequality Reexamined*. New York and Oxford: Russell Sage Foundation Clarendon Press and Oxford University Press.
- . 1997. *On Economic Inequality*. Oxford: Clarendon Press.
- . 2000. *Handbook of Income Distribution*. Amsterdam: Elsevier.
- . 2005. "Human Rights and Capabilities." *Journal of Human Development* 6 (2): 151–66.
- . 2010. *The Idea of Justice*. New Delhi, India: Penguin.
- Shatzer, Jacob. 2019. *Transhumanism and the Image of God: Today's Technology and the Future of Christian Discipleship*. Downers Grove, IN: IVP Academic.
- Simmel, Georg. 1950. "The Metropolis and Mental Life." In *The Sociology of Georg Simmel*, translated by Kurt H. Wolff. 409–24. New York: Free Press.
- Van Til, Kent A. 2003. "Distributive Justice and the Free Market: Toward a Reformed Theological-Economic Approach." PhD dissertation, Graduate School of Marquette University.
- Verstraeten, Johan. 2017. "Catholic Social Thought and Amartya Sen on Justice." In *Economics as a Moral Science*, edited by Peter Rona and Laszlo Zsolnai. 215–23. Cham, Switzerland: Springer.
- Vinge, Vernor. 2013. "Technological Singularity." In *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*, edited by Max More and Natasha Vita-More, 365–75. Malden, MA: Wiley-Blackwell.
- Young, Simon. 2006. *Designer Evolution: A Transhumanist Manifesto*. Amherst, NY: Prometheus.