


The scope of human creative action: Created co-creators, *imago Dei* and artificial general intelligence

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This article examines the relationship between artificial general intelligence (AGI) and the image of God. After identifying various models that Christian theologians use to classify or define the *imago Dei*, particular attention will be given to the 'created co-creator' model. Scholars have interpreted this model in different ways, based on the nature of human creative action. This action is seen as either subordinate to divine creation action or the human creative action is truly cooperative with divine creative action. Whether AGI would be made in the image of God in these models is then explored, highlighting the differences between humans as sub-creators versus humans as cooperative co-creators. If human creative action is cooperative, then the question arises as to whether AGI can be made in 'the image of humanity'. Some elements of this image are explored, and then the discussion turns to whether AGI would be made in 'the image of humanity', and if so, could AGI still be made in the image of God?

Contribution: The argument concludes by pointing to future work using the various models of *imago Dei* to help inform the relationship between humans and AGI by briefly mentioning two examples.

Keywords: science and religion; *imago Dei*; artificial intelligence; AGI; Phil Hefner; created co-creator; image of humanity.

Introduction

There are a variety of approaches to machine learning and artificial intelligence (AI), which lead to a diversity of applications. Perhaps the most complex or complete application is the creation of artificial general intelligence (AGI). Also known as strong AI, AGI would learn and reason as humans do, at the very least, if not surpass human intellectual capacities. While this may seem to be a vague definition for AGI, there are a variety of definitions in the literature. Perhaps the best way to describe AGI is to contrast it from other forms of AI; the opposite of strong AI is 'weak' or 'narrow' AI. A basic definition for narrow AI is 'systems that carry out specific "intelligent" behaviors in specific contexts' (Goertzel 2014:1). Examples of narrow AI include Deep Blue and Alpha Go. These systems were created for a particular purpose, namely playing chess and Go, respectively. This means that:

[I]f one changes the context or the behavior specification even a little bit, some level of human reprogramming or reconfiguration is generally necessary to enable the system to retain its level of intelligence. (Goertzel 2014:1)

Narrow AIs are useful for specific tasks in specific contexts, whereas AGI is meant to be more versatile. Artificial general intelligence can adapt to different circumstances or purposes without assistance from human reprogramming (Goertzel 2014:1). More specific aspects of AGI include 'the ability to achieve a variety of goals, and carry out a variety of tasks, in a variety of different contexts and environments' and 'generalizing the knowledge it's gained, so as to transfer this knowledge from one problem or context to others' (Goertzel 2014:2–3). This kind of definition focuses on the 'general intelligence' aspect of AGI. Other approaches make a more direct comparison to human intelligence. The AGI Research Institute states that AGI is (Franklin 2007):

describing machines

- with human-level, and even superhuman, intelligence.
- that generalize their knowledge across different domains.
- that reflect on themselves.
- and that create fundamental innovations and insights

Note: Special Collection: Theology and Nature, sub-edited by Johan Buitendag (University of Pretoria).

In other words, AGI would be AI that is capable of exhibiting general intelligence, including adaptability and transferring knowledge to new situations similar to or even better than humans.

Assuming humans are capable of creating AGI, it would be the first instance of humans creating something that is capable of reasoning like humans and, one would assume, also capable of communicating effectively with humans. This is important because human reason has traditionally been used as a way of separating humans from other organisms, but scientific research is increasingly showing that humans are thoroughly embedded in the created order. From a theological perspective, humans have been elevated above other animals by the doctrine of *imago Dei*, that is, being created in the image of God. Scholars have provided a number of ways of classifying interpretations of how humans image God.¹

This article will first discuss some of the most common theological models for *imago Dei* before focusing on Phil Hefner's notion of humans as created co-creators.² Using the co-creator model, the discussion will shift to the creative work of humans in the context of AGI. The question will be whether AGI would be made in what I will refer to as 'the image of humanity', or if humans as created co-creators can only pass on a reflection of the image of God. What would it mean for AGI to be made in 'the image of humanity' or to image God in some way? Drawing upon the insights of the theological models of *imago Dei*, the discussion will conclude by suggesting the first steps of how the various models of *imago Dei* could be used to protect the dignity of AGI and guide how humans should interact with AGI.

Models of *imago Dei*

In her exploration of the relationship between AI and theology, Noreen Herzfeld identifies three major models for *imago Dei*: substantive, functional and relational interpretations (Herzfeld 2002a:304). The substantive model argues that humans possess a trait or quality that other organisms do not have, and this is what conveys the image of God. Typically, reason or rationality was this trait (Herzfeld 2002a:305). Although some might still hold such a position, most theologians had moved on from this model by the 20th century, articulating a functional or relational interpretation instead. A functional interpretation argues that humans have a role or purpose that conveys the image of God. Scholars turn to the biblical creation account and God giving humans dominion over the Earth as that function (Herzfeld 2002a:307).³ In light of scientific insights

in biology and ecology, the model of dominion over time has shifted to one of stewardship for many scholars⁴; creation is still God's, ultimately, and humans are meant to care for it not only for themselves but also for God and for future generations. Herzfeld argues that the shift from substantive to functional interpretations of *imago Dei* is mirrored in the field of AI by researchers turning away from AGI or strong AI to creating AI for specific purposes or tasks (Herzfeld 2002a:307).

It is possible to argue that Phil Hefner's classification of humans as created co-creators is a functional interpretation of *imago Dei*. Humans in this model are created, meaning that we are not God and are dependent on the divine; we are finite, and we have limits. On the other hand, humans are also co-creators, which fundamentally makes them creators as well. Hefner (1993) says:

[H]uman beings are God's created co-creators whose purpose is to be the agency, acting in freedom, to birth the future that is most wholesome for the nature that birthed us – the nature that is not only our genetic heritage, but also the entire human community and the evolutionary and ecological reality in which and to which we belong. Exercising this agency is said to be God's will for human. (p. 27)

Humans are the product of evolution, but that process has resulted in the emergence of freedom to act in humans (Hefner 1993:30). This is the paradox of humanity; humans are capable of acting with freedom that ultimately arose from evolution, a natural, deterministic process.

Hefner's understanding of freedom is linked with responsibility, because 'human beings can take deliberative and exploratory action, while at the same time they and they alone must finally take responsibility for the action' (Hefner 1993:30–31). It is because humans can act freely and also have responsibility that it appears similar to a functional interpretation of the image of God. In laying out the theological aspects of his anthropology, Hefner says the 'human being is created by God to be a co-creator in the creation that God has brought into being and for which God has purposes' (Hefner 1993:32). At first glance this sounds like humans are given dominion over creation or are called by God to be stewards of God's creation. Hefner (1993), however, goes on to say that:

[T]he freedom that marks the created co-creator and its culture is an instrumentality of God for enabling the creation (consisting of the evolutionary past of genetic and cultural inheritance as well as the contemporary ecosystem) to participate in the intentional fulfilment of God's purposes. (p. 32)

This is what ultimately separates Hefner's model from a functional interpretation of the image of God. God used evolution as a natural process in order to bring about an animal that would be capable of participating with God in terms of creative action in the world.

1. Entire books have been written on the subject of understanding the *imago Dei*. For examples of typologies of *imago Dei*, see Herzfeld (2002b:353–362), Peters (2018), Tarus (2016:18–25) and Welz (2011:74–91).

2. For just a few examples of scholars' interpretations of Hefner's created co-creator model see: Peterson (2004:827–840), Irons (2004:773–790), Hansen and Schotsmans (2001:75–87) and Howell (1999:147–163).

3. There is a great deal of scholarship on this subject. Some examples of how scholars relate a functional model of *imago Dei* and dominion include Sands (2010) and Simango (2016).

4. The scope of this work is outside the focus of this article but examples of research on dominion versus stewardship include Hall (2004), Smith and Scales (2013) and Weldon (2016).

Greg Peterson, in analysing Hefner's concept, argues that this creative power is exhibited in several ways. Firstly, humans are creators in the sense that people 'exercise at least some modest control over our own lives and cannot avoid the necessity of making decisions' (Peterson 2004:829). This freedom extends to how humans are able to act in the world as well, making choices beyond their own lives that shape the planet, other organisms, culture and ourselves. Being created but also being creators is therefore paradoxical, because it promotes an understanding of humans as both limited and free. The 'co' prefix of created co-creators for Hefner exacerbates this paradox. Humans being co-creators at least (Peterson 2004):

[I]mply not simply that we are creating in and of our own right but that our creative acts are in cooperation with God's creative acts in a way that suggests partnership rather than subordination. (p. 829)

In other words, humans are capable not just of rearranging God's creation in new ways, but of actual creative action. The argument will return to this point when the discussion shifts to Hefner's model in the context of AGI.

The third model that Herzfeld identifies is the relational interpretation of *imago Dei*. Karl Barth proposed an understanding of both God and humanity that is relational by nature. In the biblical text, Barth (1958) says the:

[P]hrase: 'In our likeness,' means to be created as a being whose nature is decisively characterised by the fact that although it is created by God it is not a new nature to the extent that it has a pattern in the nature of God. (pp. 184–185)

It is with the creation of humans that there finally exists 'a true counterpart to God' (Barth 1958:185). This allows for 'confrontation and reciprocity which are actualised in the reality of an "I" and a "Thou"' between humans and God, which is the pattern that exists within the Trinitarian God already (Barth 1958:185). This kind of relationship also exists within humanity, because God created man and woman, which Barth argues are analogous to the 'I' and 'Thou' relationship found within the divine nature (Barth 1958:186–187). Herzfeld argues that the focus AI research has placed on the Turing test represents an understanding of intelligence that is rooted in relationality and is relational by nature (Herzfeld 2002a:310). It also suggests that intelligence may be social as well (Herzfeld 2002a:311).

Theologian Ted Peters separates Phil Hefner's created co-creator perspective as a distinct model for *imago Dei* (Peters 2018:355). Given the prominence of Hefner's work in the field of science and religion, it is not surprising that it is given special attention. Nor is it surprising that theologians might disagree over classifications of theories and models, but the primary reason for adding this point to the discussion is that Peters seems to have a different understanding of the scope of 'created co-creator' than Greg Peterson's articulation of Hefner. Humans, Peters says, 'create nothing *de novo*, nothing that is totally new. *Creatio ex nihilo* is still solely God's

province' (Peters 2018:356). Greg Peterson, however, asserts that this is not the proper understanding of Hefner's term. As stated previously, co-creation conveys cooperation rather than being subordinate. The latter, he argues, is better exemplified by J.R.R. Tolkien's perspective, using the term 'sub-creator' (Peterson 2004:829). While Hefner acknowledges that humans are not equal with God, this does not automatically mean that humans are completely subordinate to God.

In defending his understanding of created co-creators, Hefner (2005) says:

[T]o be created means that we are God's creatures, not God's equals ... the real difficulty with the concept lies not in its possibly diminishing the infinite qualitative difference between God and humans – rather, the heavy lifting comes in when we ask just what this God intends by creating a co-creator. (p. 185)

Hefner (2005) argues that using the prefix 'co' is being realistic about the scope of human behaviour. Human action, from treating disease to bioengineering, affects:

[N]ot only the present, but the futures of the individuals and societies involved, of the evolutionary processes (think of the consequences of our success with diabetes for the gene pool), and the environmental systems. (p. 186)

Cooperation, Hefner says, has an inherent irony to it because of the human capacity for sin. Although cooperation infers working towards an agenda or purpose that God intends, '[a]ll our co-creating falls short, is shot through with finitude and sin, and frequently it results in irreversible damage and death' (Hefner 2005:187). On the other hand, denying that humans are capable of 'good' creative action is also a denial of 'who God has created us to be' (Hefner 2005:188). Whether one interprets 'created co-creator' as truly cooperative or subordinate will have a direct impact on the relationship between *imago Dei*, humanity and AGI, a point that will be revisited towards the end of this article.

Ted Peters identifies two additional models for *imago Dei*. The first is the morality model. This perspective looks at the creation and fall narratives in scripture and focuses on the serpent. When tempting Eve, the serpent says that eating from the tree will not cause them to die; rather, it will give them knowledge of what is good and what is evil, knowledge that only God has. It is moral knowledge, therefore, that conveys the image of God (Peters 2018:355). The second additional model that Peters identifies is a proleptic model. Humans are currently (Peters 2018):

[P]artially and fragmentarily – what humanity will become in the eschatological future. The proleptic model seeks the *imago Dei* not in the old *adam* but in the new *adam*, not in the old creation but in the new one. (p. 356)

Christ was a foretaste of the new creation, what humans could look forward to and participate in the image of God through this connection as well.

There is one final model of *imago Dei* that I would like to highlight, a perspective created by Joshua Moritz. Looking to both biology and the Bible, Moritz dismisses understandings of *imago Dei* that require humans to have a trait distinct from other organisms, especially other hominids (Moritz 2011:307). Instead of placing the image of God as something human, Moritz argues that the best understanding is to ground it in God's action, election. Just as God chose the Hebrews from amongst the people, not because of anything they possessed uniquely, but by God's free choice, modern humans were also chosen from amongst other hominids to bear the image of God (Moritz 2011:321). Election in the context of the Hebrew Scriptures is based on God choosing a specific group of people and forming a special relationship with them. The reason for election is to serve God's purposes, and the chosen do this through their service; in the case of Israel, this service was obedience to God, but the concept of service was common in that part of the world at that time (Moritz 2011:321). Election, however, in the grand scheme of God's purposes is not just for the elected, but the chosen are meant to be living out God's purposes for the benefit of all humanity (Moritz 2011:322).

Subordinate created co-creators

Humans were created by God and bear the image of God, but what would be the relationship between humans and their creation? Would humans serve as a conduit of the divine, passing the image of God to their creation, or would human creations bear 'the image of humanity'? Using the created co-creator model, both perspectives can be explored because of the differences in interpretations of whether human creative action is cooperative with God's creative action or if human creative action is subordinate to God's. In other words, are humans truly co-creators or are they sub-creators?

The implications of the position that created co-creators actually means sub-creators are easier to describe and therefore they will be explored first. According to this position, the creative work that humans do is recycling or repurposing. It is not creation from nothing; God created the universe, and human creative work just rearranges things. An appropriate analogy could be Lego bricks. They can be used to build a specific set if one follows the instructions, but the bricks can also be repurposed, used as components for another set of instructions, or they can be combined in novel ways to create the texture of perspective that is not typically seen in constructed sets. Lego bricks can be used in a multitude of ways, and humans can create new shapes and forms, but only from the materials that have been provided or acquired. In the context of AGI, the creative work that humans do is taking materials that exist already and combining them in new ways. The result of their work, a created machine intelligence, would not image their creator in the way that humans image God. God remains the ultimate creator of everything; humans have just added a new character to the cast of a divine narrative. So if AGI would not be made in 'the image of humanity' in

this perspective, the question would be whether AGI would bear the image of God.

Artificial general intelligence and *imago Dei*?

If AGI possesses rational capacities that are similar to or even surpass humans, then from a substantive model, AGI would have the *imago Dei*. The same would be true for the created co-creator model; if AGI is able to learn and act as humans can, then AGI would also be capable of the creative work that humans do, especially because humans are sub-creators. Slightly less clear are the relational, moral and functional models. Just because AGI can learn and reason the way that humans do does not necessitate that AGI will relate to others as humans do. While humans possess reason, they also have emotions, and emotions play an important role in human interactions. It is unclear whether AI or AGI will ever be capable of having emotions. If AGI does not possess emotions, would it be possible for AGIs to relate to one another, humans and the rest of the world in a way that is similar enough to humans to have similar relational capacities? It is also possible, on the other hand, that AGI could be more connected to one another than modern humans are to each other. Assuming that AGIs can be networked or have regular if not constant access to the Internet, the amount of information that could be shared and the rate at which communication could occur could lead to deep connections or a more meaningful sense of community amongst AGIs.

The moral model highlights the knowledge of good and evil that humans have, but this knowledge is not exclusively rational, depending on one's ethical approach. Immanuel Kant's deontology is based entirely on reason, and Kant would argue that any rational being capable of creative universal laws would be part of the moral circle – what he called the 'kingdom of ends' (Korsgaard 2012:45). While Kant refers to humans a great deal, in his discussion of the 'kingdom of ends' he expands this to refer to all being capable of reason. In the *Groundwork of the Metaphysics of Morals*, Kant says:

[A]ll rational beings stand under the *law* that each of them is to treat itself and all others *at the same time as an end in itself*. But by this there arises a systematic union of rational beings through common objective laws, i.e. a kingdom. (p. 45)

However, many people struggle with a moral framework devoid of emotions. This is one reason why the Star Trek character of Spock is so compelling. In virtue ethics, the moral virtues are connected to appetites, aspects of human behaviour that are amenable to reason but not only rational; the intellectual virtues are distinct from the moral virtues. While it is unclear whether AGI would be capable of moral deliberation similar to that of humans, I would argue that the most robust understanding of AGI would include the full range of human functions, including morality. Therefore, it is not out of the question that AGI could in theory possess the *imago Dei* in a moral model.

As stated previously, much research in AI has moved the focus away from AGI to trying to replicate intelligence in specific ways, such as playing chess or Go. The most realistic and practical projection of the future of AI is that machines would be created to do specific tasks; these are tasks that are less desirable for humans to do, whether because they are dangerous, tedious or cheaper or more efficient to automate. But the whole point of developing AGI is to create AI that can do what humans are capable of doing. If humanity's function is one of stewardship of creation, it is possible that AGI would be able to participate in this function as well. Similar to the moral model, there is no reason to think that the most robust understanding of AGI would not allow it to possess the *imago Dei* in the functional model.

Even less clear is AGI in Peters' proleptic model. If humans are incomplete now, and Christ was a foretaste of what humanity will be in the new creation, then at first glance it does not seem that AGI would participate in the new creation as humans will. There is no evidence that there was anything about Christ that included any technology associated with AGI; it was clear that Christ post-resurrection still possessed a biological body, though one transformed. But given advances in human creative action, there is an increasingly close relationship between technology and humanity. Smart devices serve as external memory, keeping track of things like contact information and schedules so that humans do not have to keep track of those things themselves. Transhumanists seek to take control of human evolution, increasing or amplifying existing capacities, giving humans new abilities or characteristics through a variety of technological means, leading to a posthuman future, with one or more species that have evolved beyond what modern humans are. It is possible, therefore, that a transhumanist understanding of the new creation could include a view of the future of humanity that includes things like cybernetic implants or computer or brain interfaces that can connect to AI, potentially including AGI (Lopatto 2019). It is not clear, however, even in this specific view of the future of humanity, whether AGI is a part of humanity or just linked to humans in some way. If AGI remains distinct from posthumans, then they would not bear the image of God in a proleptic model.

While there are potential questions about whether AGI would possess the *imago Dei* depending on the model used for analysis, I think the clearest example of AGI not being made in the image of God would be the election model. The election represents a specific relationship between God and a people or a species. Artificial general intelligence would be the result of human creative action, and ultimately, if humans are sub-creators, then AGI could be framed as a result of evolutionary processes as well; AGI could be the natural extension of a rational, relational species' desire to extend their relationality to more of creation by making something capable of communicating with them. Even in this model, however, there is an opening for how AGI could possess or bear the image of God. God is the entity who elects, and the relationship that election confers is for the

benefit of all of creation. It is theoretically possible, then, that God as a God who acts in history could decide that AGI would better serve divine purposes than modern humans and choose to elect AGI instead. This would mean that modern humans would no longer be the elect and that AGI would become the elect. While this is possible, I find this particular example highly unlikely if humans are sub-creators. This point will be revisited, however, in the context of human creative action being cooperative with God's creative action.

Truly cooperative created co-creators

If the creative action of humans as created co-creators is not subordinate to God's creation but is instead cooperative, there are substantial implications for the nature of AGI. Returning briefly to the analogy of Lego bricks, humans as sub-creators must use the Lego bricks that they have but can use them in a multitude of ways. True co-creators, however, are not limited to the use of just Lego bricks in their creative work. They can include new materials into the creative process, such as paper or modelling clay. This allows for a greater degree of freedom in the creative process. Cooperative creators are not restricted to the existing medium; they can expand the building blocks of the creative process. In other words, humans would be capable of novel creation, which would allow them to create similar to how God created. As a result of this, AGI would bear 'the image of humanity' because humans were their direct creator. In such a context would it be possible for AGI to also bear the image of God?

There has been a great deal of discussion about what it means to be made in the image of God, but if humans are capable of creation that is not subordinate to God's creative action, then 'the image of humanity' is also a possibility. Instead of trying to create multiple models to mirror what scholars have done with the image of God, I will identify three things that contribute to what would be called 'the image of humanity'. The first of these elements of the 'image of humanity' is that beings that possess this image would also be created co-creators capable of novel creative action. Because humans who are made in the image of God are capable of this kind of creative action, then it stands to reason that the beings humans create would have the same capacity. In the context of AGI, people are already operating with this kind of assumption. Researchers are already trying to use machine learning to improve machine learning and algorithms. Google Neural Machine Translation, which was used in Google Translate, was able to create its own internal language that helped it internally represent the translation model (Burgess 2016). There is also work being done using AI to try and create better AI or AGI (Heaven 2021). Artificial general intelligence would join humans as another partner capable of cooperative, not subordinate, creative action in the world.

The second element of 'the image of humanity', I would argue, is self-transcendence. As a social species, humans reach out to one another and out into the universe. They are

also capable of transcending themselves in ways that other species cannot. Self-transcendence is also the basis for human freedom. Being made in the image of humanity would imbue AGI with similar freedom and desire to reach out to the rest of the universe through creative action. Finally, the third element of 'the image of humanity' that I will suggest in this essay is moral ambiguity. In the Genesis account, God creates and God's creation is considered good. Human creative action, on the other hand, is much more ambiguous. Ian Barbour, in his book *Ethics in an Age of Technology*, describes three ways that humans relate to technology: 'technology as threat', 'technology as liberator' and 'technology as an instrument of power', where technology is viewed in a negative light, a positive light and neutrally, respectively (Barbour 2014). I think that the third category best represents the relationship between technology and humanity; technology can be used in a variety of ways, both good and evil. The research that brought about nuclear weapons could also be used for the generation of power not relying on fossil fuels. Artificial general intelligence is also seen with a great deal of ambiguity; AI can take over dangerous jobs, or even possibly free humans from work altogether, creating a higher standard of living and letting people pursue whatever work or creative expression they choose (Kande & Sonmez 2020). On the other hand, there is concern that automation through AI will cause people to lose their jobs and lead to a reduction in wages. Researchers from Massachusetts Institute of Technology (MIT) estimated, based on the impact of robots on employment historically, that 'one additional robot per 1000 workers reduces the aggregate employment-to-population ratio by 0.2 percentage points and aggregate wages by 0.42%' (Acemoglu & Restrepo 2020:52). As another expression of human creative action, AGI would bear humanity's moral ambiguity.

Both 'image of humanity' and *imago Dei*?

Under the model of humans as created co-creators who are truly cooperative with God, 'the image of humanity' was discussed, but if humans are truly capable of cooperative creative action, would their creations bear the image of God? If not, are there potential problems for how humans and AGI could value or relate to one another? Relying on the analysis done about AGI and *imago Dei* earlier, this section will only highlight any meaningful differences in light of the cooperative created co-creator model. The answer remains the same for substantive, relational and proleptic models of *imago Dei*. Artificial general intelligence either has the characteristics that confer the image of God or it does not. Likewise, AGI is either capable of a kind of relationality that is sufficient for the image of God or it is not. For the proleptic model, if AGI remains distinct from humans, they would not be included in the image of God.

The functional and moral models are affected more by human cooperative creative action. Humans likely created

AGI for specific purposes, and therefore, AGI would not necessarily be capable of the same kind of function that humans serve in terms of divine purpose. However, it is possible that the function humans create AGI for could be an extension of that function or to help humans better achieve that purpose. Again, while it is unclear whether AGI would be capable of moral deliberation in a way comparable to humans, an AGI that is truly like humans in terms of thinking and learning would likely be capable of moral deliberation. For the moral model of the image of God, however, humans received their knowledge of good and evil from God and God's creation. Theologically speaking, though, God is seen as good and loving. Even though humans have the capacity to deliberate morally, they do not always arrive at the correct decision for a situation. Or even if the right action or decision can be determined, it is not necessarily the case that humans will do the right thing. If this moral ambiguity is passed on to AGI, it is unclear whether AGI will really have knowledge of good and evil. Algorithms are being used currently to try and eliminate the bias of humans, but so far, the unconscious bias of the programmers remains in the finished product (Park 2019). It is possible that human creations will not be able to overcome the moral ambiguity from 'the image of humanity'.

In the previous discussion of the election model, it was discussed that it was possible AGI could be elected but would be unlikely if humans were sub-creators. However, if humans are truly capable of cooperative creative action, then it is possible that God could decide that AGI could better serve God's intents or desires for the creation and choose to elect AGI instead of modern humans, as the election is not based on any characteristic or function of the group elected. While this is more likely if humans are cooperative co-creators, I still find this change in election unlikely, especially if AGI is unable to overcome the moral ambiguity received from their human creators. The created co-creator model, on the other hand, would allow for AGI to also bear the image of God. If AGI is made in 'the image of humanity' and part of that image included creative action, then AGI would also be made in the image of God for the same reasons. The question then turns to whether AGI would be sub-creators or cooperative creators. While it is possible that there could be some reason why AGI is considered a sub-creator, the most robust understanding of AGI would allow for AGI to be another cooperative partner in the creative process, along with God and humans.

Conclusion

I have tried to show that how one thinks about the image of God affects the discussion of the scope and nature of human creative action, and that in turn shapes the discussion of the nature of human creations, especially AGI. Each of the models of *imago Dei* explored provides some insight into how humans and AGI should relate, but these insights cannot fit

into a framework where each model's insights have equal weight. Instead, the insights of these models provide rules, reminders or boundaries. The next step in this project is to articulate the insights these models of *imago Dei* provide and identify specific ways in which these insights can contribute to creating or maintaining positive relationships between humans and AGI. I will conclude with two broad suggestions. Considering one application of AI that is being pursued is to do work that is dangerous for humans or is considered undesirable, with the goal to improve the lives of individual humans as well as society, then humans need to be careful to uphold the dignity of AI. Often this kind of work is done by people who are either not a part of society or who are marginalised, so the *imago Dei* in this case reminds humans to include those who do this kind of work in society and be considered in what constitutes a flourishing society.⁵ The second suggestion is that creation is not static; creative work, both by God and by humans, whether they be sub-creators or cooperative creators, is ongoing. Human stewardship of creation has resulted in the extinction of species through the destruction of habitat for a variety of reasons. The pull of the new creation, as well as stewardship, should inform decisions about the kinds of technology that are pursued and the impact technology will have on the world. It is possible to work towards a world where AGI is a creative partner in making the world a better place for all of creation to exist and flourish.

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Competing interests

The author declares that he has no financial or personal relationships that may have inappropriately influenced him in writing this article.

Author's contributions

B.M. is the sole author of this article.

Ethical considerations

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Data availability

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⁵I have written about issues of AI and membership in society previously (see Molhoek 2020).

Disclaimer

The views and opinions expressed in this article are those of the author and do not necessarily reflect the official policy or position of any affiliated agency of the author.

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