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# The condition of heroes: looking for the heroic figure of future astronauts

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The term “hero” brings to mind a figure who is excellent in one way or another. However, it remains unclear which characteristics make a person eligible as a hero because the term has been applied to various types of figures. This paper investigates the characteristics required for people to be justifiably labelled and, based on the investigation and as a case study, looks for the heroic figure of future astronauts. First, surveying the literature from ancient to modern on heroism, it analyses that heroes are considered to be exemplars from whom we can learn something to cultivate heroic characteristics within ourselves. Second, based on this survey, it proposes the five key characteristics of heroes: attempting to scale valuable new heights; challenging difficulty in the heights; risking one’s own life to scale the heights; achieving the scaling the heights; and expressing the virtue of phronesis. Third, as an application of this study, it examines a desirable, heroic figure of future astronauts. Classifying four classes of future astronauts: space tourists, space businesspersons, space soldiers, and space explorers, it argues that space explorers can mostly be called heroic if they express the five characteristics and among them, in particular, the characteristic of phronesis, a power of discerning what is good for the world. It concludes that future heroic astronauts must be thoughtful about the possible results of human space explorations because their missions may have adverse outcomes, such as intensified international conflict and environmental contamination. Such heroic astronauts are not a representative of their space agencies, companies, or nations, but an exemplar for humanity from whom we could learn virtuous characteristics as human beings.

## KEYWORDS

cosmopolitanism, heroism, phronesis, virtue ethics, space businesspersons, space explorers, space soldiers, space tourists

## 1 Introduction

The term “hero” brings to mind a figure who is excellent in one way or another. However, it remains unclear which characteristics make a person correctly describable as a hero, as the term has been applied to very different people. Manfred von Richthofen, for example, was a German pilot who fought in WWI and, as a flying ace, killed 80 enemy fighters: he was called the Red Baron. Chiune Sugihara was a Japanese diplomat who served in Lithuania during WWII and, contrary to the governmental policy of Imperial Japan, issued visas for and saved the lives of about 6,000 Jewish people. Ernesto “Che” Guevara was a revolutionary who fought as a guerrilla and was on the winning side in the Cuban Revolution of 1959: he was famously depicted in the iconic photograph *Guerrillero Heroico* – Heroic Guerrilla Fighter. Ruth Bader Ginsburg (RBG) was a Jewish-

American lawyer and jurist who worked as an associate justice of the U. S. Supreme between the 1990s and 2020s and all the while devoted herself to gender equality as well as women's rights. Yuri Gagarin was the USSR cosmonaut who flew into space for the first time in history on 12 April 1961. Marie Curie was a Polish scientist who won the Nobel Prize both in physics (1903) and chemistry (1911).

These individuals have all been called heroes, but do not seem to share the same characteristics. Richthofen is called a hero because he killed many people, while Sugihara is called a hero because he saved many people. Guevara is called a hero because he changed the Cuban governmental system, whereas Judge Ginsburg is called a hero because she contributed to realizing a more equal society. While both Guevara and Ginsburg changed their societies, they did so in the opposite ways. Gagarin is called a hero not for killing or saving anyone nor for changing the USSR governmental system, but because he was the first human to journey into outer space. Curie is called a hero because she made an enormous contribution to the natural sciences despite the difficult social circumstances for women at the time.

Such diverse examples of heroes will lead us to entertain doubts as to the general characteristics of a hero that can apply to them all. Some may think that they do not share such characteristics and are only called heroes due to what Wittgenstein called "family resemblances" (Wittgenstein, 1958, p. 32e [Section 67])<sup>1</sup>. Conversely, others may think that they do share some common characteristics. In this paper, sympathising with the latter perspective, I investigate what characteristics, if any, must be exhibited in general for people to be justifiably called heroes, irrespective of whether it be moral or nonmoral sense. In this respect, it should be noted that my concern here is philosophical rather than sociological or historical. Although I will refer to various heroic figures based on common sense and other evidence, I recognise that some of these figures, such as Richthofen, might be disputable as to their status as heroes, and further sociological or historical evidence will validate to what extent such figures are/were assumed to be heroes. Still, my argument is largely independent of such sociological or historical studies because this paper is not searching for the sociological or historical truth of those who are/were called heroes but aiming to articulate the general features of the notion of heroes that is exemplified by these figures in one way or another. In this respect, my argument is concerned with normative rather than descriptive aspect of the notion of heroes. Accordingly, heroic figures presented in this paper are not the target but the clues of research. Against this background, I firstly look at historical examples of heroism and extrapolate that heroes are virtuous exemplars. I then survey recent debates on heroism and underline the three dimensions of the notion of hero. From a philosophical point of view, I derive five key characteristics that an agent must display for being justifiably categorized as a hero. Finally, as a case study, applying my analysis of the normative

account of the notion of heroes, I examine the figure of heroic astronauts in future space exploration.

## 2 Heroes as virtuous exemplars

The concept of the hero comes from the ancient Greek "ἥρωες," which is often used to mean a demigod, the offspring of a god and human (Plato, 1997, p. 116 [Cratylus, 398c]). Achilles, son of a goddess of water, Thetis, is described as a hero because he was the greatest warrior of all the Greeks. Perseus, son of Zeus, is called a hero because he killed Medusa and saved Andromeda. Hector, though not a demigod, is also called a hero because, although he was killed by Achilles, he was the greatest general of the Trojan army. Such heroes played a lively part in the Fourth Age of the Men, the Age of Heroes, and became iconic figures in communities (Hesiod, 1914, pp. 12–15 [Lines, 156–172]). Such typical heroes in ancient Greece are portrayed as being beyond humanity, namely, stronger and with better qualities than human beings<sup>2</sup>.

Partly following in the mythological tradition of the ancient Greeks, Aristotle suggests a link with human virtues. In his *Nicomachean Ethics* Book VII, Aristotle classifies the six stages of the human moral character, from the worst to the best, as follows: brutishness, vice, incontinence, self-control, virtue, and superhuman virtue. Aristotle focuses on the second to fifth stages because they are typical of human life that the *Ethics* is concerned with. However, he admits that both the sixth and first stages are not impossible for humans, even if such characters are very rare. Aristotle (2014) calls such superhuman virtue "heroic and godlike (ἥρωικὴν τινα καὶ θεϊαν)" and explains that heroic and godlike people are admired by people (p. 117 [1145a20]). Aristotle refers to Hector, a non-demigod character, as such a heroic figure. Although he does not clearly declare that Hector's heroic virtues can be learned by lay people, in Book II, he argues that virtuous people can serve as the exemplars we should imitate for our own education.

Such exemplary heroes are not restricted to mythological and superhuman figures. Plutarch's *Lives of the Noble Greeks and Romans* describes the lives of 48 ancient Greek and Roman male heroes, including Alexander the Great, Caesar, Cicero, and other political and/or military leaders. Scholars at that time, including Plutarch, regarded these leaders as worthy of being remembered because politically and/or militarily prominent achievements (*res memoria dignae*) were considered to be the *merkmal* of memorable figures (Cicero, 1955, p. 182 [Section, 66]). Although the fact that such leaders are described in historical writings does not necessarily mean that they are described positively, Plutarch describes his chosen noble Greeks and Romans as heroic figures by referring to them with the term *virtues* as follows<sup>3</sup>:

<sup>1</sup> This will be the case if every effort to investigate such common characteristics fails. It should be noted, however, that it remains unclear how we can ensure that every such effort has failed.

<sup>2</sup> The Joint Association of Classical Teachers Greek Course (1979) provides typical passages that show the heroic characters of these figures.

<sup>3</sup> Although Plutarch does not use the exact term "hero," he, as well as Diodorus of Sicily and Arrian of Nicomedia, describe, for example, Alexander the Great as a hero by naming him the philosopher king who exercised various virtues (Sawada, 2022).

I began the writing of my “Lives” for the sake of others, but I find that I am continuing the work and delighting in it now for my own sake also, using history as a mirror and endeavoring in a manner to fashion and adorn my life in conformity with *the virtues therein depicted*. (ἐμοὶ τῆς τῶν βίων ἄψασθαι μὲν γραφῆς συνέβη δι’ ἐτέρους, ἐπιμένειν δὲ καὶ φιλοχωρεῖν ἤδη καὶ δι’ ἑμαυτόν, ὥσπερ ἐν ἐσόπτρῳ τῇ ἱστορίᾳ πειρώμενον ἀμῶς γέ πως κοσμεῖν καὶ ἀφομοιοῦν πρὸς τὰς ἐκείνων ἀρετὰς τὸν βίον). (Plutarch, 1918, pp. 260–261 [Aemilius Paulus, 1.1.]; italicised by the author).

Plutarch chose these figures as heroes because he regarded them not as mythological, inimitable superhuman icons but as real figures from whom one can learn something about virtuous ways of living. For Plutarch, the aim of telling stories about heroes is that people can learn something virtuous that they should imitate.

The tradition that heroes play an educational role as virtuous figures, which originated from ancient Greek philosophers, has been retained in contemporary moral philosophy. Blum (1988), for example, refers to Pastor André Trocmé and his wife, Magda Trocmé, as moral heroes. Both they and the parish people who were inspired by their heroic behaviours saved Jewish people from the Holocaust. In this case, Mr. and Mrs. Trocmé play the role of moral exemplars from which people can learn moral virtues. Annas (2015) argues that whether we suppose a hero can play the role of exemplar depends on what kind of model they are, because heroism can take several forms. Compared to Achilles’s model of the hero, Annas proposes that Hector’s model is more suitable for cultivating heroic characteristics within ourselves because of his less exceptional character than Achilles, mentioning students’ opinion that “My mom is my hero [but] seldom is mom an astronaut” (p. 14). Zagzebski (2017) emphasises the phrase “moral exemplars” to develop a theory that we learn moral values through admiring and imitating such exemplars as saints, sages, and heroes. Although she narrowly defines heroic exemplars as “courageous persons” who perform “observable acts we call heroic, e.g., Holocaust rescuers”, she emphasises that such heroes’ behaviours are imitable (p. 92; see also Fruh, 2017). These contemporary studies show that the tradition is retained: heroes, regarded not as demigods but as human exemplars, are those we can imitate and, by doing so, cultivate heroic characteristics within ourselves. Thus, exemplarity is considered to be a grounding feature to understand the notion of heroes.

### 3 Studies of heroes and heroism

Apart from the exemplarity of heroes, the notion of heroes and their features have been studied in various disciplines. In this section, I focus on four major studies of heroism taken from different disciplines. I do not present this survey as throughout or comprehensive. Rather, from the philosophical point of view presented at the end of Section 1, I survey them to help articulating the normative account concerning the general characteristics of heroes.

### 3.1 Philosophical analysis

J. O. Urmson, a philosopher, argues that the term “hero” is used in both moral and nonmoral contexts: A great player in a sporting or athletic contest can be called a hero, but their greatness has no moral implication; conversely, a doctor who tries to save their patients under the plague situation at the risk of his/her own life can be called a hero due to his/her moral excellence. Although I do not restrict my argument in the moral realm, following Urmson’s classification, a person can be called a hero in a moral sense if they satisfy either of the following two conditions (Urmson, 1958, pp. 200–203): 1) if they perform their duty in contexts, in which terror, fear or a drive to self-preservation would lead most other people not to do it, and do so by exercising abnormal self-control or without effort; or 2) if they perform actions that are far beyond the bounds of their duty, whether through controlling their natural fear or without effort. In short, regardless of whether they do so without effort or through the exercise of a self-control, a person can be called a moral hero if they perform their duty or a supererogation that others would not be able to do.

Discussing such heroes, Urmson aims to demonstrate the unique status of the second type of hero. The first type of hero has been embraced by the existing moral theory, which uses three morally evaluative categories, namely “duties, permissible actions, and wrong actions,” whereas the second type has not been explained by existing moral theories because it is not concerned with any of the three categories but, rather, a new one, namely the act of supererogation (Urmson, 1958, p. 204). Through this definition, Urmson aimed to revise utilitarian theory so that it could embrace the second type of moral hero. However, it will be more straightforward to understand that type of moral hero in the context of virtue theory because it is the very feature of a virtuous person to conduct naturally what they ought to do, without hesitation, and without regarding it as a duty.

Urmson’s argument provokes further discussion. Some scholars show support for and enrich Urmson’s argument (Pybus, 1982; Stangl, 2020), whereas others offer criticisms; it remains uncertain whether the existing three categories of moral evaluation can embrace this type of hero or not (Chopra, 1963), whether such a hero can play the role of an exemplar (Melden, 1984), and whether a moral hero is virtuous if they assume their supererogation as a duty (Archer and Ridge, 2015). Despite these critics, however, it is clear that Urmson focuses on a single action and characterises the feature of heroes as aiming at achieving something difficult, which can be duty or supererogation for such heroes.

### 3.2 Mythological analysis

Heroes can be characterised in a different way. Joseph Campbell, a mythologist, analyses the typical features of mythological heroes. He argues that whether they count as heroes does not depend on their particular action but on their taking a certain route in their journey and the nature of the adventures that they experience during it. He identifies three phases of the heroic journey, namely departure, initiation, and return. Upon departure, heroes cross “the threshold of adventure” that no one else ever crosses; then, as initiation, heroes

experience a variety of “tests” and “ordeals.” Their grit and fortune enable them to endure such trials and achieve a “triumph.” Finally, upon their return, “the boon that he brings restores the world” (Campbell, 1949, pp. 227–228). Such heroes appear in various guises because what makes them heroes is their journey rather than their occupation, job, role, or social rank. Therefore, according to Campbell’s analysis, mythological heroes can include various types of people, such as, warriors, lovers, emperors, tyrants, world redeemers, and saints.

### 3.3 Socio-philosophical analysis

Thomas Carlyle, a Scottish scholar, provides a unique theory on heroes, the so-called great men theory, which claims that human history is the history of heroes: “the History of the Great Men who have worked here. [...] all things that we see standing accomplished in the world are properly the outer material result, the practical realization and embodiment, of Thoughts that dwelt in the Great Men sent into the world” (Carlyle, 2013, p. 21; originally Carlyle, 1841). Carlyle considers mythical gods, prophets, priests, people of letters and kings under the umbrella of “heroes.” As Ernst Cassirer notes, Carlyle’s theory was exploited by Nazism for justifying Hitler as a heroic leader who changed the world (Cassirer, 1946, p. 190). Nonetheless, his theory has something worthy of attention. Although Carlyle’s list of heroes covers a wide range of people, he does not present any “clear definition of what he understands by a hero.” All Carlyle did was to “speak by examples. He felt under no obligation to answer the question: What is a hero? But he tried to show, who the great heroic men were. His list is long and variegated. Yet he does not admit any specific differences in the heroic character. This character is one and indivisible; it always remains the same” (Cassirer, 1946, pp. 193–194).

However, with the aid of Cassirer’s discussion, we can identify three features of Carlyle’s characterisation of heroes. First, a hero must have the power to realise what they aim at (Cassirer, 1946, p. 204). The aim must be something that can be achieved by exercising grit, which Carlyle names virtue: “[v]irtue, *Vir-tus*, manhood, *hero*hood, is not fairsspoken immaculate regularity; it is first of all, what the Germans well name it, *Tugend* (*Taugend*, *dowing* or *Doughtiness*), Courage and the Faculty to *do*” (Carlyle, 2013, p. 178; Carlyle’s own italics). What they achieve is engraved in human history by taking humanity to “the other Higher World [...] *this world*” (Carlyle, 2013, p. 174; Carlyle’s own italics). Second, heroes have an excellent intellectual ability. Cassirer regards “clearness of thought” as a distinctive feature in “Carlyle’s theory from the later types of hero worship” and says that “[g]reat energy of action and great willpower always imply an intellectual element. The strength of will and character would remain powerless without an equal power of thought” (Cassirer, 1946, p. 217). Third, among the features of heroes, “the *moral* force obtains the highest rank and plays the preponderant role” (Cassirer, 1946, p. 218; Cassirer’s own italics). Although Carlyle’s famous phrase “might makes right” caused a misunderstanding of his thought, he “always understood the very term “might” in a moral rather than in a physical sense. Hero worship always meant to him the worship of a moral force” (Cassirer, 1946, p. 222). A person who has grit and intellectual excellence can achieve what they aim at. However, it does not

guarantee that the aim is morally good. What makes the aim of such a person good is the moral force. Therefore, following Carlyle-Cassirer’s analysis, a heroic person must have grit, intellectual ability, and moral force.

### 3.4 Sociological analysis

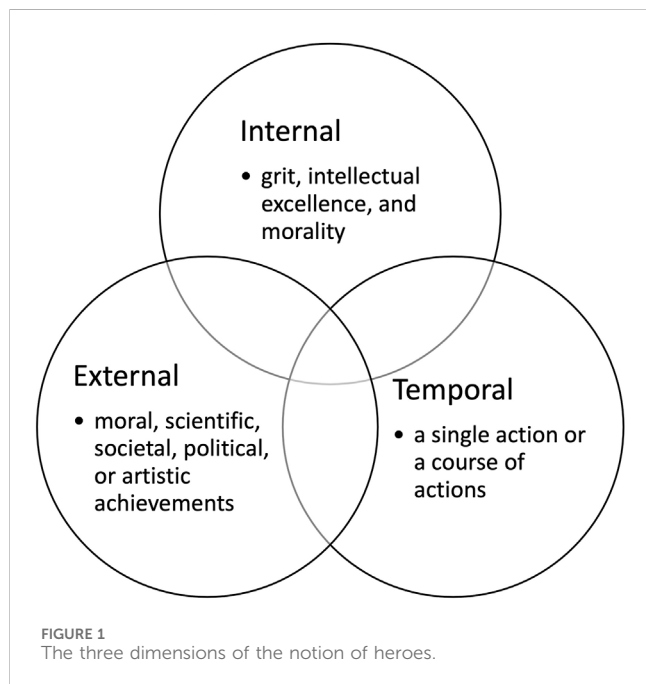
Sidney Hook, a sociologist, analyses the “‘great man’ or ‘hero’ in history” through the “heroic interpretation” of history and characterizes a hero as a sort of “force” that can determine the course of history (Hook, 1945, p. 10). Characterising a hero in this way, he include a wide range of great people as heroes. Following his classification, heroes in the literature include Euripides, Dante, Shakespeare, Goethe, and Dostoevsky. Those in music include Bach, Mozart, Beethoven, and Mussorgsky, and those in painting include Giotto, Michelangelo, Monet and Picasso. Among the heroes of philosophy are Socrates, Aristotle, Descartes and Kant, while those in science include Copernicus, Newton, Darwin, and Einstein, and in the field of religion, there are Buddha, Confucius, Christ, and Mohammed. Hook’s analysis represents the fact that various kinds of people have been called heroes.

### 3.5 Summary

These four studies focus on different aspects of the notion of heroes and, by doing so, provide useful characterisations of heroes respectively. First, focusing on a single action, Urmson (1958) suggests that heroes aim at achieving something difficult, which can be duty or supererogation for such heroes. Second, in contrast to Urmson, focusing on the time scale of the journey taken, Campbell (1949) provides a theory that a person can be called a hero if they take a certain route within their journey and have certain experiences and achievements during the journey. However, it should be noted that Campbell has the same image as Urmson in that the achievements of the journey must be something difficult to achieve. Third, Carlyle (2013), with the aid of Cassirer’s interpretation (1946), emphasizes different aspects of heroes from Urmson and Campbell. He focuses on the capabilities of heroes, such as grit to achieve the end, intellectual excellence to comprehend the way of achieving the end, and moral force that aims at morally good ends. Still, as well as Urmson and Campbell, Carlyle also pays attention to the factor that heroes achieve something difficult when he emphasizes that heroes create human history, carving out a new world for humanity in one way or another. Fourth, Hook (1945) proposes the range of people who can be called heroes. Similar to Carlyle, he regards heroes as playing a decisive role in history and states that such heroes include great people in fields such as literature, music, painting, philosophy, science, and religion.

Surveying these studies, the notion of heroes can be characterised by three dimensions: internal, external, and temporal. First, heroes have internal, good faculties, such as grit, intellectual excellence, and morality. Second, they achieve external, difficult outcomes, which can be moral, scientific, societal, political, or artistic achievements. Third, they behave in a certain temporality, which can be a single short-period action or a long-period course of

action. We can schematise such characteristics of the notion of heroes as follows (Figure 1).



It would be misleading to assume that each of these is a necessary condition for being heroes. It would also be incorrect to consider that these are sufficient conditions for being heroes. Rather, it would be more accurate to assume that these are the dimensions of a heroic figure, in other words, an assembly of descriptions concerning the key characteristics of being heroes. Satisfying different degrees of these characteristics, different people can be called heroes. However, it does not mean that the concept of a hero is merely a Wittgensteinian notion of family resemblance. In the next section, clarifying these descriptions, I suggest essential five key characteristics of the idea of heroes, which provide the greatest common consensus of the notion.

## 4 Five key characteristics of heroes

Each of the studies surveyed in the previous section provides a useful perspective on the notion of a hero. Given that they grasp different aspects of this notion, we should not have an over-expectation that we can easily reach a unified understanding of the notion of a hero. In this section, taking these studies into consideration, I propose tentative but further integrated criteria for a hero by referring to five key characteristics, which I believe are useful for taking the concept back into our hands: Namely, 1) aiming for something valuable, 2) challenging something difficult, 3) taking risks with one's own life, 4) achieving something valuable and difficult, and 5) expressing phronesis. Each characteristic is not identified for a purely descriptive purpose. Rather, heroes being an evaluative concept, the characteristics also have normative implications in the sense of what sort of people are worthy of being called heroes. Accordingly, the following argument does not exclude the possibility that some of the heroic figures mentioned above may not be labelled as heroes by some people.

### 4.1 Aiming for something valuable

As Carlyle (2013) noted, heroes have moral forces, based on which they can discern which things are *worthy* of going after<sup>4</sup>. The new height in the world the heroic person is attempting to scale must be worthy of being scaled. There are various things that human beings have never achieved and which are of little value. For example, the garden of my house has 27 steps that twist and turn from the gate to the entrance. Two amiable black and white cats follow me whenever I am in the garden. It is not an easy mission to walk through the garden from the gate to the entrance with my eyes closed and without being touched by cats. Imagine that I try to achieve the mission every afternoon when I come back from my office, and one day, I finally achieve it. But no one would call me a hero for doing this because such an achievement would have little value<sup>5</sup>.

The new height in the world must be something deemed worthy of being attained. The value can be moral, intellectual, political, or other. It can be the enlargement of scientific knowledge, such as uncovering astronomical facts, the establishment of engineering products, such as building a large seawall in a developing country, the preservation of natural ecosystems, such as afforestation in a desert, political mobilisations aiming at a revolution in a society, or the performance of life-saving actions, such as the care given by a medical doctor. The positive values of such achievements are understandable in one way or another. As I will discuss in more detail in Section 4.5, a person must understand the value of what he/she is trying to do, that is, before scaling the *new* height in the world. Conversely, other people – the audience – may not understand the value before the achievement, but they must understand it someday to call the person a hero, unless such a person would not be labelled as a hero.

### 4.2 Challenging something difficult

As previous studies suggest in common, a hero challenges something *difficult* to achieve. The term “heroic” is not applied if a person achieves something valuable that everyone assumes is not difficult to perform. For example, one day, I decided to do the morning routine of my wife. An alarm I set the previous night for 5:30 a.m. woke me up, and I started to cook porridge. I put oatmeal, milk, cinnamon, nuts, chocolate, and so on in a pan, boiled the mixture for a few minutes, and woke my four children up. I served the chocolate porridge to them and encouraged them to go to school on time. In the end, I successfully saw my children off to school. This is a valuable thing to achieve: it may even

<sup>4</sup> This characteristic has a certain link with the notion of phronesis, which I shall describe in the following Section 4.5. As Aristotle says, virtue distinguishes what is truly good from what appears to be good (Aristotle, 2014, III4).

<sup>5</sup> Of course, we can provide another kind of examples that have vicious values such as Nazi's holocaust.

express my virtue of fatherhood. However, my wife would not call me a hero because she does it every morning.

Conversely, it is heroic if someone achieves a valuable thing that everyone thinks is difficult. The difficulty in question can be understood in three ways. First, people think it is difficult if there is no clear or established way to achieve it. For example, it seemed difficult for Indian people between the late 19th and early 20th centuries to become independent of the British Empire without appealing to violence. However, Mohandas Gandhi overtly or covertly found a way and finally succeeded in achieving Indian independence through nonviolence.

Second, people think it is difficult if, although there is a clear or established way to achieve a valuable thing, it is very difficult to carry it out. When a hand grenade has been thrown by the enemy, it is heroic for one of a squad of soldiers to protect his comrades by throwing himself on the grenade (cf. Urmson, 1958, p. 202). Soldiers may easily find a way to save their comrades in this situation, but practicing this is not easy because it necessitates giving up their own lives. Urmson (1958) excludes the case of “natural affection, such as the sacrifice made by a mother for her child” from the range of heroism because “such cases may be said with some justice not to fall under the concept of morality but to be admirable in some different way” (p. 202). Following the survey in Section 2, however, such an affection-triggered action can indeed be called heroic if it challenges something difficult, because, at least, the notion of heroes covers not only moral but also other types of heroes. In this respect, as another example of heroes, we may be able to include the case of women who gave birth while working as coal miners (see Hursthouse, 1990).

Third, and related to the first and second, a new height should theoretically be scaled but still be difficult if no one has ever succeeded in scaling it. This sort of difficulty is typically found in the case of explorers (Huang and Hawke, 2019). When Charles Lindbergh succeeded in flying solo across the Atlantic Ocean for the first time in 1927, his aerospace engineers had theoretically concluded that his plane, *the Spirit of St. Louis*, was powerful enough to complete the journey. When Neil Armstrong became the first human to step foot on the surface of the Moon in 1969, NASA’s aerospace engineers had reached the conclusion that the Lunar module of Apollo 11 could safely land on the Moon. These explorations were calculated as possible in theory. However, it remained uncertain whether such challenges could succeed in practice. Lindbergh and Armstrong were called heroes because they proved that their missions were not impossible.

### 4.3 Taking risks with one’s own life

Previous studies show in common that heroes risk their own lives to scale valuable, challenging heights in the world. This feature is reasonable because one might still be able to accomplish something valuable and difficult in a leisurely fashion. Imagine a situation where I am lazing on a sofa and watching a World Cup football game. I am not a person who enjoyed the math class at the university. While watching the game, however, a unique idea to solve a mathematical conundrum happens to pop into my mind. I publish this idea and make an

enormous contribution to advancing mathematical research. People will appreciate my achievement and may be surprised by the fact that I stumbled across this truth while at leisure. Some might even call me a genius, but still hesitate to call me a hero because all I did intentionally to find it was watching a game on a sofa. People would regard something as missing in the way I discovered such an important fact.

Having one’s life at stake has two meanings here. First, heroes can risk their own physical life. Almost all the heroes referenced in this paper satisfy this sort of risk-taking: the great warriors in Ancient Greece, Jeanne d’Arc, Manfred von Richthofen, Chiune Sugihara, Ernesto Guevara, soldiers who sacrifice their lives to save their comrades and medical doctors who treat patients during plague situations have all taken such risks. Some heroic scholars, including Socrates, Giordano Bruno, and Galileo Galilei, also risked their physical lives to pursue the truth. Their courage is thought to be a unique characteristic of a hero<sup>6</sup>.

Second, heroes can risk their lifetime but not their physical life. As Hook (1945) discusses, some scientists are also called heroes because they achieve a new height in the world. Thomas Alva Edison is known as a heroic inventor. He studied by himself as a school expellee, worked very hard, and spent his whole life inventing new products such as photographs, motion picture cameras, and light bulbs. As I mentioned in Section 1, Marie Curie also is a heroic scientist in this sense. She studied by herself due to the sexual discrimination of her age, had little interest in fame, and devoted her life to scientific investigation. After her death, she became the first woman to be entombed at the Panthéon in Paris in recognition of her own achievements. Such individuals devoted almost all their lifetimes to achieving something valuable and difficult. Their devotion to scientific research and invention expresses a sort of courage because there was no guarantee that such devotion would bear fruit.

### 4.4 Achieving something valuable and difficult

The three conditions mentioned above are not sufficient because there have been innumerable people who took a risk with their own lives to scale a valuable and difficult height in the world. Such brave people are appropriately called challengers. However, challengers are not equal to heroes. Heroes are also challengers, but unlike most challengers, they succeed in overcoming their challenges. Therefore, as Carlyle (2013) stresses, another condition must be added that challenges must have a grit or power to succeed in scaling new heights in the world. In this sense, heroes are *successful* challengers.

However, we are inclined to call “heroes” also those who faced a challenge but failed. Hector and many other soldiers who fought

<sup>6</sup> Courage has traditionally been assumed to be the core feature of heroes (see also Aristotle, 2014, III6). However, I argue in this subsection that courage is only a feature of heroes because we can also find other important features that shape the notion of (contemporary) heroes.

against invaders to save their country are called heroes, even if they failed. Revolutionists who devoted their lives to making their society better but failed are also called heroes. Seven astronauts who boarded the space shuttle Challenger in 1986 are called heroes even though they died before they started the mission. As Battaly (2015) puts it, we have an intuition that “external success is not required for virtue” (p. 41).

Still, it should also be noted that not every challenger can be called a hero. Then, what distinguishes challengers who are called heroes from those who are not? This question might be answered by considering what distinguishes those who succeed from those who do not. In this respect, Williams (1976) proposes the notion of the resultant luck with referring to the case of Paul Gauguin. Gauguin left his wife and children in Paris and moved to Tahiti to achieve an artistically new, valuable height as a painter. His decision is justified by many not because of the challenge he took on but because of his successful achievement as a post-impressionist artist. Williams argues that this fact suggests our justification is not only based on what was in Gauguin’s own hands but also on what Gauguin could not control, namely, his successful reception as a painter.

The same dichotomy can be observed in the case of heroes. Consider the case of revolutions. Of the challengers who try to lead people to achieve a revolution, almost all fail and meet their death, and only a few succeed. Although we feel that they all are worthy of being called heroes, only these few successful challengers are called so. One might explain this by saying that they were more competent; they made good decisions at the time, treated their comrades properly, kept it all together, and so on. Nothing would be dilemmatic if the difference between mere and successful challengers could be attributed to the difference in their competence. However, often, such successful challengers were also lucky, whilst the unsuccessful challengers were unlucky. The latter challengers were hit by a stray bullet and died, some were betrayed and killed by their comrades, some were found, caught and killed by their enemies, some caught malaria and died, and so on. The few successful challengers who were lucky enough to survive these innumerable potential accidents finally achieved revolution. Therefore, they were called heroes not only based on their efforts, competence, and achievements but also due to their resultant luck.

Thus, we could say that what makes the difference between mere and successful challengers with respect to the notion of heroes is the presence and absence of achievements that are (or are not) accomplished based on both their competence and luck. On the one hand, since the factor of luck is inevitably and complexly embedded in the process of their achievements, we are inclined to call heroes also to those who failed, especially when we have difficulty in distinguishing the competence of those who succeeded from those who failed. The typical cases will include soldiers and space crews. On the other hand, we have the other, different inclination to think that not every challenger can be heroes just because they tried to achieve their ends. Heroes must exhibit their competence to achieve their ends even when they have misfortune, such as the case of Priam described in Aristotle’s *Nicomachean Ethics* 17. Thus, we fall into a dilemma of who to be called heroes with respect to achievement.

It is not easy to solve the dilemma between two sorts of intuitions that we have on the notion of a hero. To avoid such a dilemma, here I propose introducing the two meanings of “achievement” required to be a hero. First, “achievement” can mean “completion.” A challenger can be called a hero if they complete achieving their end. Gagarin’s spaceflight as the first human is such an achievement because he completed in flying space as the first human. Second, “achievement” can also mean “contribution.” A challenger can be called a hero if they contribute to getting close to the end. Sugihara’s achievement is worthy of being called heroic in this sense because it would be nonsense to say that he was not entitled to be called a hero unless he saved all Jewish people in Lithuania from the Holocaust. Since he saved as many of them as he could, He is called a hero; in other words, he contributed to realizing the ideal goal to a certain extent. Soldiers, revolutionists, and some crew members of Challenger can be properly called heroes in this second sense. Although they died before they achieved the end in the first sense, their challenges contributed to other people’s achieving the end. Without these fallen comrades-in-arms, Che Guevara would not have been able to achieve the Cuban Revolution. Without the catastrophic accident of Challenger, NASA would not be able to improve its safety culture sufficiently to send astronauts safely into space. Since contributing to realizing an end is a sort of achieving the end, their contributions can entitle them to be called heroes.

## 4.5 Expressing phronesis

Even if a person satisfies the previous four conditions, they will not be called a hero if they do not achieve the goal by exercising their virtues. For, one can successfully scale a valuable and difficult height in the world, which no one knows how to achieve, at the risk of one’s own life, but without a proper causal chain. Consider a soldier who observes an enemy throwing a hand grenade to their comrades and is struck by a desire to save their comrades by throwing himself onto the grenade to cushion its blow. The soldier is so surprised by the very fact that he has such a heroic spirit. This surprise is so enchanting that he feels dizzy and gets a foot cramp. The cramped soldier’s body then bends over the hand grenade, thereby saving his comrades. His saving of their comrades was causally based on his inadvertent fall that was caused by his foot cramp that was caused by his dizziness that was caused by his heroic desire. In this respect, it is not wrong to say that his heroic behaviour was caused by his desire to do so. However, there remains something wrong here. Davidson (2001) calls this sort of strange causation *deviant* and explains that deviant causation is a form of causation that makes it difficult to attribute intentionality to the action of a person. Therefore, for an outcome of a person’s action to be an achievement of that person, “the causal chain must follow the right sort of route” (Davidson, 2001, p. 78), that is, “competent causation” (Bradford, 2015, pp. 64ff). Since heroic achievement must be something that the agent intentionally achieves, such achievement must be the outcome of a proper causal chain.

However, in almost heroic situations, it is not easy to discern which route is appropriate to achieve the end because such situations are stressful for a person who is required to take an

action or a course of actions. For one thing, the situations are often so complicated and contain so many uncertainties that the person has cognitive difficulty in identifying the appropriate route to achieve the end. For another thing, the situations are also so risky for his/her life that the person also has psychological constraints in putting the route of actions identified into practice. Thus, even if a person has the above-mentioned four characteristics, the person may not be able to track the proper causal chain to achieve the end. Accordingly, as [Carlyle \(2013\)](#) discusses, a further internal characteristic is required by which one can comprehend the appropriate route for the end.

Following Aristotle, we can call such a characteristic *phronesis* (practical wisdom). He argues that if a person does not have phronesis, “it is also possible... [for the person] ... to achieve the right result, but not by the right steps” ([Aristotle, 2014](#), p. 111; *NE* VI9, 1142b22–26). The characteristic of phronesis is also concerned with the faculty of discerning the good end, which was identified as the first characteristic of heroes in [Section 4.1](#): Aristotle refers to Pericles and similar politicians as typical examples of phronimos because “they can see what is good for themselves and what is good for people in general” ([Aristotle, 2014](#), p. 105; *NE* VI5, 1140b7–11). Thus, phronesis, as the highest human faculty, is concerned with both values and knowledge: it discerns what is the good end on the one hand, and on the other hand, it comprehends what is an appropriate means to reach the end (see also [Foot, 1978](#)). Being concerned with both values and knowledge, phronesis enables its bearer to achieve the good end in a proper way. Some contemporary politicians, such as Abraham Lincoln, Winston Churchill, and Nelson Mandela, have such phronesis because they, under difficult circumstances, discern what is good and how to achieve the good in a proper way<sup>7</sup>. Though not politicians, Emily Davidson and RBG also seem to have phronesis.

In summary, we can list the five key characteristics of the notion of heroes as follows ([Table 1](#)):

TABLE 1 Five key characteristics of the notion of heroes.

<b>1. Aiming for something valuable</b>
<b>2. Challenging something difficult</b>
2.1. There is no clear or established way to achieve it
2.2. Although there is a clear or established way to achieve it, it is difficult to put it into practice
2.3. It should theoretically be scaled but still difficult because no one has ever succeeded in scaling it
<b>3. Taking risks with one's own life</b>
3.1. Taking risks with one's own physical life
3.2. Taking risks with one's lifetime
<b>4. Achieving something valuable and difficult</b>
4.1. Achieving as the completion of something valuable and difficult
4.2. Achieving as the contribution to something valuable and difficult
<b>5. Expressing phronesis</b>

<sup>7</sup> Since phronesis is the unifying virtue, it is not denied that those who have phronesis also express other virtue. For example, heroic politicians can be said to have exercised the virtue of magnanimity (*μεγαλοψυχία*), which Aristotle described as the greatness of soul ([Aristotle, 2014](#), IV3; [Faulkner, 2008](#)).

As is mentioned in [Section 1](#), this list is concerned with normative rather than descriptive aspects of the notion of heroes. Accordingly, I propose them as the necessary condition for being heroes. Although different people can be called heroes by satisfying different degrees of these characteristics, they still satisfy them to some extent.

## 5 A case study: looking for the heroic figure of future astronauts

Astronauts have been considered national heroes. Appearing as visible symbols of the 1960s–1970s space explorations, both the Russian cosmonauts who flew into space as part of the Vostok project and NASA's twelve astronauts who set foot on the Moon during the Apollo project are such heroic figures. They had *the right stuff*: they were tough and brilliant enough to undergo rigorous screening and training, expressed their virtues, risked their lives, took on apparently impossible missions, and achieved valuable and astonishing things ([Tachibana, 2020](#)). They also had a vision, such as Manifest Destiny, which is said to provide “a rich vein of images, heroes, and stories that are used to promote space activities” ([Leib, 1999](#), p. 32, see also p. 37). John H. Glenn Jr. and Neil Armstrong are typical figures who embody such a vision and are thus accorded the reputation of national heroes<sup>8</sup>.

However, contemporary astronauts might not seem to have such heroic reputations. Mike Mullane, a retired NASA astronaut who flew into space three times on Space Shuttle missions between the 1980s and 1990s, denies a heroic image of astronauts for two reasons. First, criticising NASA's astronaut culture, he argues that contemporary astronauts are not so morally respectable, saying that they are not “selfless heroes, laying our lives on the line for our country, the advancement of mankind, and other lofty ideals” ([Mullane, 2006](#), p. 151, see also p. 206). Certainly, citizens are not so naïve to believe that astronauts are moral saints. Space agencies have reported various interpersonal issues of astronauts, including bullying and sexual harassment and space medicine and psychology have studied mental or behavioral healthcare of them ([Tachibana et al., 2017](#)). Some of us also have anecdotes that some astronauts are not so respectable due to their less cooperative and arrogant attitudes during their space missions or on-Earth publicity activities such as lectures and collaborations with academia.

<sup>8</sup> However, it should be noted that such heroic images were partly controlled (and even created) by space agencies. For example, NASA's exclusive deal with *Life* magazine enabled NASA to control its contents before publication ([Maher, 2017](#), p. 145). [Chaikin \(2007\)](#) mentioned an unpublished article by a NASA officer, saying, “*Life* treated the men and their families with kid gloves. So did most of the rest of the press. These guys were heroes... I knew, of course, about some very shaky marriages, some womanizing, some drinking, and never reported it. The guys wouldn't have let me, and neither would NASA” (p. 647; italicised by Chaikin).



The second reason for Mullane's criticism of the heroic image of astronauts is concerned with the relatively high quality of safety standards of contemporary human space exploration. He says, "[w]e astronauts are frequently characterized as heroes and heroines for sailing into a great unknown. In reality no astronaut has ever sailed into an unknown. We send robots and monkeys ahead to verify our safety. . . It is laughable to compare astronauts with those [heroic] explorers" (Mullane, 2006, p. 185). Although human spaceflight is a risky mission, a recent study reports that "Manned spaceflight over the last six decades has become significantly safer" because the rate of incidents and accidents in human spaceflight has been declining since the 1960s (Schmitz, et al., 2022). Another report says that "the job of space explorer should not make any top 10 lists of the world's deadliest jobs" because, as for the overall death rate, that of both astronauts and cosmonauts is lower than that of the general public in each nation (Reynolds and Day, 2018). Thus, human spaceflight is becoming safer than before.

It can be true that contemporary astronauts also have the same (or even better) right stuff as (or than) those in the 1960s–1970s. However, it must also be true that the circumstances of human space exploration have changed through advances in the sciences and engineering. Incorporating Mullane's insights into this background, we can identify three changes of the circumstances that may affect the heroic image of future astronauts. First, as is mentioned above, although space remains a risky and difficult place, space explorations have become safer than ever before. Second, the number of professional astronauts in space agencies has increased, and it is even becoming a real option to work as a non-governmental astronaut, which is a professional astronaut in private companies<sup>9</sup>. These changes are likely to make future astronauts resemble just employees or businesspersons more than national heroes, and space flight look more like a business trip than a journey of exploration. Given that every business must be conducted under the law regarding the protection of workers, such future professional astronauts may not be required to express the same rigorous virtues of Armstrong, Gagarin, and the other astronauts and cosmonauts of the 1960s–1970s. Third, it is now possible to just visit space as a nonprofessional astronaut – a space tourist. As we do not have to be as brave as Lindbergh to fly nonstop from John F. Kennedy International Airport to Charles de Gaulle Airport, so future space tourists will not be required to have any of the virtues, including moral excellence, that professional astronauts must express.

Such changes are likely to branch out the image of future astronauts from national heroes to the diverse figures that the term "astronaut" originally contains. Namely, as the *Oxford English Dictionary* defines, the term "astronaut" means both "space traveller" and "member of the crew in a spacecraft." Such a change in the image of astronauts should be more delightful than lamentable because it is good for both space agencies and society that

human space activities become safer and more pleasant than ever before.

Indeed, the notion of astronauts is vague. Some nations and space agencies define the term "astronaut" in their own ways. For example, the United States legally defines it as those designated by NASA and employed by the U. S. government or other international partner space agencies (51 U. S. Code 50902). Given this definition, the U. S. applies the term "astronaut" exclusively to "government astronaut." Conversely, those who are not designated but perform activities directly related to the launch and re-entry or other operations in space are defined as "crews"; those who do not participate in such activities or operations are defined as "space flight participants." For another example, since 2001, the Multilateral Crew Operations Panel (MCOP), which has the authority to define ISS crew members, has introduced two categories of such crews, namely, professional astronauts/cosmonauts and space flight participants "in order to provide for visitors wishing to experience a stay in an orbital space station" (Masson-Zwaan and Hofmann, 2019, pp. 136–137). However, states have not yet reached internationally agreed legal terms or definitions of the so-called astronauts. Rather, different countries adopt different terms and definitions to express them (Langston and Pell, 2015). Therefore, it is one thing for a country, such as the United States, to have adopted its domestic legal definition of astronaut; it is another thing to consider how we should use the term "astronaut" in accordance with the aforementioned reality of future human space exploration. And the latter is our concern here.

Consequently, the notion of astronaut can be influenced by the changes concerning space activities. So, I propose that such changes will lead us to distinguish four classes of future astronauts. First, we can identify the class of nonprofessional astronauts, namely, space tourists, who do not work in space but travel there. They are not required to express rigorous intellectual virtues such as space engineering expertise or moral virtues such as courage or nobleness. As a visitor or customer, they merely enjoy the flight and spend time in space in the same manner as taking a trip abroad. Some billionaires, such as Charles Simonyi (in 2007 and 2009) and Yusaku Maezawa (in 2021), are examples of such space tourists. Second, representing a type of professional astronaut, the class of industrial astronauts, namely, space businesspersons, can be identified. They are professional because they belong to space agencies or private companies and work in space. The work style of such astronauts is business-like; their workflow is relatively well-established and not particularly challenging as in the cases of the 1960–1970s astronauts. They will go to space not as an exploration but as a business trip, and their works will mainly contribute to advancing space explorations and developing space industries such as the commercial exploitation of space<sup>10</sup>. Third, as another type of professional astronaut, we can identify the class of military personnel in space, namely, space soldiers. Space militarisation is

9 During the Axiom Space Ax-1 Mission (8-25 April 2022), four private astronauts "worked" in the ISS by conducting 26 scientific experiments. Since they are said to pay money to do such works, private astronaut has yet to be established as a job. However, it will realize soon or later.

10 I have heard twice that two JAXA astronauts described their space missions as "a business trip"; one was in a private conversation with me in 2022, and the other was publicly expressed by Dr Satoshi Furukawa on 1 September 2023 during Expedition 69/70; [https://twitter.com/Astro\\_Satoshi/status/1697523190384427336](https://twitter.com/Astro_Satoshi/status/1697523190384427336).

a real concern if we remember the establishments of so-called space forces in various nations, such as that of the United States (2019), Japan (2020), and the United Kingdom (2021). Like space businesspersons, space soldiers are professional and belong to the space force of their nation and work in space. A possible difference with space businesspersons is that space soldiers tend to take risks with their own lives in their business and work for their nation. The growing militarisation of space may increase such risks and make their business challenging. Some military personnel who belong to space forces in those and other nations will be required to work as space soldiers in future. Fourth, representing the other type of professional astronaut, we can identify the class of heroic astronauts, namely, space explorers. They also belong to space agencies, private companies, or space forces, and work in space. However, their missions are highly challenging because the missions have yet to be well established and are very risky to their lives<sup>11</sup>. They are required to express their rigorous virtues to achieve the ends that are worthy not only for their nations but also for all humankind. Those who reach Mars for the first time can be – but not necessarily – called heroic astronauts.

In short, we can list them as follows (Table 2):

TABLE 2 Four classes of future astronauts.

<b>1. Nonprofessional astronauts</b>
1.1. Space tourists
<b>2. Professional astronauts</b>
2.1. Space businesspersons (Industrial astronauts)
2.2. Space soldiers (Military astronauts)
2.3. Space explorers (Heroic astronauts) <sup>11</sup>

This four-fold classification remains schematic because an astronaut can occasionally belong to more than one class. For example, an industrial, professional astronaut who belongs to a private company may take on a heroic colouration when they are required to risk their own life to a larger extent than usual and commit themselves to a challenging mission that may contribute to humanity. (The same thing can apply to space soldiers.) In this respect, this schematic classification tells us two things. First, it is misleading to understand different kinds of future astronauts by the same, rather vague, single term of “astronauts” with a heroic colouration. Human space exploration is undergoing a period of transition. Progress in the space sector has changed the figure, and brought about four different kinds, of astronauts. Therefore, astronauts, simply described, are no longer the heroes they once were.

Second, if some astronauts are properly called heroes, they must have the above-mentioned five characteristics of a hero. A possible and typical mission in which they can express such characteristics might be human explorations of Mars that no one has ever reached.

Everyone would not doubt that those who step foot on Mars for the first time would be adequately called heroes. However, we should cautiously examine whether the very success of such challenging missions would be sufficient for them to be called heroes. Such an achievement is undoubtedly an iconic success of the expansion of human society. The following space activities will inevitably include so-called Moon and Mars villages, human economic and habitable societies outside the Earth. However, contemporary and future astronauts do not live in the Age of Exploration in the 16th century, the age when explorations were also exploitations, invasions, conquests, and contamination. As history always teaches lessons to us, the progress and expansion of space activities will require future (and even contemporary) astronauts to be aware of the possible harm that their space activities may cause. This means that, whichever they belong to, space agencies, space forces, or private companies, they must be sensitive to the possibility that their achievements may not only bring economic benefits and increase national prestige but also intensify international problems and ruin the natural environment. Therefore, taking the five characteristics into consideration, to be heroes, future astronauts must exercise phronesis to discern what is worthy of being achieved for all humankind by their space missions and find the proper route to achieve the good discerned.

## 6 Conclusion

“Hero” is an awkward concept. Different kinds of people have been called heroes for different reasons. Previous studies have revealed different profiles of the notion of heroes. Following such a diverse characterisation of the notion of heroes, astronauts can also be and presumably have been called heroes for different reasons. However, through the examinations of previous studies, I have proposed a more holistic figure of heroes depicted by five characteristics. Reflecting on such characteristics, we can figure out heroic astronauts in future space explorations. Among the five characteristics, the exercise of phronesis, the faculty of discerning what is good for people and finding the appropriate way to achieve the good, is crucially important for future astronauts to be heroes, because space explorations can have unpeaceful outcomes such as intensifying international conflicts and environmental pollutions in space. Given such a dire possibility, they may have a moral obligation not to be innocent poster boys or girls of their space agencies, companies, and nations, but to be “envoys of mankind” as described in Article 5 of the *Outer Space Treaty*. This term should not be understood only as for the safety of astronauts on landing or in missions, but as expressing heroic figures that are required for astronauts in our century. As envoys of humankind, astronauts must be an exemplar for humanity, expressing the virtue of phronesis, in regard to what their missions will bring. Expressing this and other characteristics listed in Section 4, they will discern what is truly good for the world and how to realize the good, bravely challenge it, and accordingly, be heroic astronauts, that is, exemplars to look up to. Such heroic astronauts can well be assumed to be cosmopolitan astronauts (see Tachibana, 2024). They can deeply deliberate which flags, if any, they should put up on the surface of the Mars

<sup>11</sup> The adjective “heroic” in this class is just schematically labelled. Therefore, industrial and military explorers can be heroic if they satisfy the five characteristics, whilst space explorers will not be heroic unless they satisfy the characteristics.

when they achieve the first human space exploration to Mars; their national flags, the flag of the UN, or others. Thus, to be a hero, future astronauts are required to exercise phronesis and clearly exhibit that they, as envoys of humankind, represent human beings and not any specific nations. In this respect, heroic astronauts in our century can have a different figure from those in the past age.

## Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## Author contributions

KT: Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Writing—original draft, Writing—review and editing.

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