Chapter 12
Developing a Workshop for Secondary School Students that Provides a Space to Explore Questions About Human Personhood Through the Context of Human-like Machines

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Introduction

This chapter introduces and explains a workshop designed to give secondary school students an opportunity to discuss the interactions between science and widely held beliefs about personhood, including beliefs about the soul.

The workshop was constructed as part of the *Being Human* project conducted by the LASAR (Learning about Science and Religion) Research Project. LASAR was established in 2009 to look at how questions and themes bridging science and religion are managed in schools.

As we explain further shortly the motivation for designing and running this workshop for secondary school students was a concern that some students hold back questions in their science lessons that they perceive to be 'off-topic' and/or to have a religious aspect. With this in mind we wanted to design a workshop that could provide students with opportunities to voice their questions and to explore a range of perspectives on the relationships between science and widely held beliefs about human personhood. We chose the theme of human-like machines for the workshop in part because we anticipated that it is a topic that engages this age group and also as a way to open up a space for discussion about human personhood that can address issues associated with religious belief without setting them up explicitly.

The idea that a person has a spiritual aspect or soul is central to the teachings of many faiths and is also an idea that is frequently endorsed by popular culture. Whether or not someone believes in the soul as a religious concept, there are attributes of personhood which are widely associated with the concept of a soul that are

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valued by people more generally. For example, in religious thinking and in popular perceptions of personhood more widely, it is believed that people have a capacity to choose how they behave and are sensitive to the moral consequences of their behaviour. Warren Brown (2004, p. 58) summarises the attributes of the soul in a way that illustrates its relevance to our area of interest in our research by saying:

> In many religious traditions, the concept of a soul has played a very important and meaningful role in the understanding of personhood. The soul has been thought to be the source of important aspects of human uniqueness, at various times including consciousness, intellect and free will. The soul is viewed as the point of interaction with God, and as necessary for maintaining belief in eternal life. It is the soul that is both corrupted by sin and the target of redemption. Most important the soul has come to encompass critical aspects of personhood. (Brown 2004, p. 58)

At the same time, scientific advances, particularly in evolutionary biology, genetics, neuroscience and artificial intelligence, present many challenges to religious and popular notions of human personhood. Common beliefs about human personhood have been challenged by Nobel Prize winner and biologist Frances Crick who argues that you, your joys and your sorrows, your memories and your ambitions, and your sense of personal identity and free will are in fact no more than the behaviour of a vast assembly of nerve cells and their associated molecules. As Lewis Carroll's Alice might have phrased it: 'you're nothing but a pack of neurons' (Crick 1994, p. 3).

While some commentators and some scholars argue that science is revealing a reductionist and, as such, atheistic picture of a person, this is only one of a range of positions that scholars today express.

We turn now to the context of human-like robots and explain why this became the focus we introduced for the workshop.

Alongside the question of what robots can do now and in the short term, there is also the question of what robots might do and one day become in the future. Ryan Dowell (2018, p. 305) is one of the many authors who are open to the possibility of thinking machines at some point claiming that:

> In the future, it is possible that humans will create machines that are thinking entities with faculties on par with humans. Computers are already more capable than humans at some tasks, but are not regarded as truly intelligent or able to think. Yet since the early days of computing, humans have contemplated the possibility of intelligent machines—those which reach some level of sentience. Intelligent machines could result from highly active and rapidly advancing fields of research, such as attempts to emulate the human brain, or to develop generalized artificial intelligence (AGI).

If, one day, there will be sentient, thinking robots, then what indicative steps might be expected over the coming years? A second prompt for the workshop was a headline by Yale News that is 'the first self-aware robot created' (Suterwala 2012). The body of the report states that 'A robot developed by computer science experts at the Social Robotics Lab may pass a landmark test by recognizing itself changing in a mirror'. The mirror test has become a widely used method to test for self-awareness in an animal which is usually selected as an example of its species. The same report then critiques its own headline by including a comment from a principal scientist at Honda Research Institute in California. The scientist gives a view that a robot could never be self-aware in the same way an animal can be. Instead, the kind of limited self-awareness for which the researchers plan to test is ‘purely an image-processing program’. Other reports of the same advance also anticipate self-aware robots and attempt to varying extents to discuss the significance of this achievement in relation to the goal (see, e.g. ‘Robot learns to recognise itself in mirror’, BBC 2012).

The Yale article has a sensationalist headline and then critiques its own claim by quoting a scientist who calls into question whether a robot that can identify its own reflection in a mirror is self-aware in the human sense. In our view this makes it an interesting article to discuss with a class. Is a machine that can produce signs of self-consciousness necessarily conscious of itself? Philosopher Joel Feinberg (1994, p. 52) sees these signs as merely outward indicators of an inner mental life that is essential to what makes us conscious selves:

> It is because people are conscious; have a sense of their personal identities; have plans, goals, and projects; experience emotions; are liable to pains, anxieties, and frustrations; can reason and bargain, and so on—it is because of these attributes that people have values and interests, desires and expectations of their own, including a stake in their own futures, and a personal well-being of a sort we cannot ascribe to unconscious or nonrational beings.

School students are encountering news of advances in evolutionary biology, neuroscience and genetics both in formal lessons and via the media which may seem to challenge the notion of the person as an agent with moral responsibilities and a capacity for making choices. Headlines like ‘it’s all in your genes’ or ‘we’re just a bundle of neurons’ are not uncommon in media reports and suggest that human thought and behaviour can potentially be fully explained scientifically. Consider, for example, a media article which says that scientists have discovered the parts of the brain which become active when someone falls in love (see, e.g. Spencer 2015). How might reports that emphasise a biology of emotions be interpreted by a school student who believes each person has love that is associated with a core or soul which is distinct from the material body? An analysis of media reports of advances in neuroscience by Racine et al. (2010) concluded that neuroessentialism is an emerging trend in media interpretations of neuroimaging. The authors explain that neuroessentialism refers to depictions of the brain as the essence of a person, with the brain a synonym for soul. It seems reasonable to suppose that school students’ perceptions of what it means to be human are influenced by such reports and also that some students may experience some of the puzzles and conundrums that scholarly literature discusses.

One of our central motivations for constructing the workshop was the possibility that secondary school students may not have access to the epistemic insight which enables scholars to articulate different positions on whether and why scientific and nonreductive (including religious) accounts of personhood may be compatible. This circumspection was in part prompted by the findings of a small-scale survey with students in upper secondary school which sought to discover students’ positions on the power of science to explain aspects of human personhood relating to behaviour, thinking and personality. This found that there are some teenagers who believe that science has revealed a necessarily materialistic and deterministic picture of human personhood, yet were uncomfortable about accepting these ideas for themselves (Billingsley et al. 2016b). The survey included the statement, 'the brain is what makes you "you"', and invited students to add comments as well as show their level of agreement. Students' comments revealed the ways that some are struggling to make sense of the ideas that they had encountered as these examples illustrate:

> I'm unsure about this one. I suppose everything you do is a result of the brain, but I feel uneasy saying that I'm not a person – I'm just a brain in a shell.
>
> I am unsure whether humans have a soul and whether that affects you rather than your brain.
>
> I suppose so, if the brain is really where all decisions and thoughts come from but the ability to weigh out pros and cons and emotion I don't think comes from the brain.

How secondary school students reason about the relationships between scientific and religious ideas has been a concern within educational research for some time. Studies exploring students' perceptions of what science and religion say about the origins of life has shown that school students frequently hold narrow and even misconstrued perceptions of science and religion and as such are blocked from appreciating the range of positions that scholars take (Billingsley 2010; Billingsley et al. 2016a; Konnemann et al. 2016). Arguably, one of the reasons for this is the way that teaching is organised in secondary schools – which is mostly into single subject sessions.

Immersing students in the questions, methods and norms of thought of a single discipline at a time is important to help students get a feeling for how each discipline works and there is no intention here to suggest a move away from teaching disciplines through subject compartments. When, however, compartmentalisation becomes entrenched, it means that organisational, social and pedagogical practices have become habits and dictate students' and teachers' expectations about what happens in the classroom (Tyack and Tobin 1994).

Compartmentalisation affects students' opportunities to develop cross-disciplinary epistemic insight (Billingsley et al. 2018). In a strictly compartmentalised education system such as in England, children may have few opportunities to compare the questions, methods and norms of thought that characterise different disciplines. Our own research shows that interest in 'Big Questions' (i.e. questions about the nature of reality and human personhood) such as why there is a universe at all, what it means to be a person and the extent to which a person can freely direct the choices they make in life is widespread among young people but also that children typically have few opportunities to ask questions and engage in discussion (Taber et al. 2011). Our previous work found that that in science lessons teachers try to avoid questions and discussion that link with religion. We also found that children pick up on their teachers' resistance and hold back their questions believing them to be 'unwelcome' (Billingsley et al. 2013). Fourteen-year-old David (not his real name) was one of the many students who explained that students resist asking questions they perceive as 'off-topic': 'We don't ask science teachers questions any more at the moment, because we don't think that they'd answer them … they won't answer that because it's not on their topic'. Brenda (also aged 14) used the abbreviation RS to refer to religious studies/education when she told us:

> We don't really talk about RS in science, I don't think the teacher really brings it up, and no-one ever asks about it, so there's no need for her to bring it up. And the same with RS, no-one really asks the science questions because you'd really more ask your science teacher about that instead of asking your RE teacher. (Billingsley et al. 2013, p. 1726)

What we drew from this preliminary work was that many young people are wrestling with the implications of contemporary science when thinking about what it means to be human, and there is a tendency among upper secondary school students ages 14–17 to articulate scientific ideas about human personhood and character in reductionist and deterministic terms. We also concluded that school students are unlikely to have opportunities in school to raise and discuss any questions and concerns that they have.

Having indicated the motivation for developing the workshop, we will now explain the activities that were provided for students participating in the workshop.

Workshop Activities

Workshop Activity 1: Can a Robot Be an Electronic Person?

The facilitator asks participants to imagine that it is the year 2100 and that the field of robotics has made significant advances. Participants have an array of technologies to choose from at their local computing and robotics shop. They are asked to imagine that they are a keen amateur technician entering the annual 'artificial life' championships. With a £1000 budget, the objective is to build the machine that has what it needs to have the status of electronic person. The facilitator asks them to discuss how they will choose to spend their budget and why and to be ready to explain and defend their decisions. The figure below is a worksheet for this activity (Fig. 12.1).

Workshop Activity 2: Can a Robot Hear?

The facilitator asks students to give their opinions about whether we can design and build a robot that can hear. There is a work sheet with these two questions:

1. Suppose you were designing a robot that can hear – how would you address that challenge?
2. How would the robot demonstrate that it can hear (if it can hear)?

Then the facilitator demonstrates a robot that starts and stops moving on the sound of a clap and again asks the question, 'Can this robot hear?' The aim is to help

Fig. 12.1 Handout sheet for workshop activity 1

students consider whether there is a distinction between 'hearing' and 'responding to sound'. Students are asked whether there is a difference between a person hearing and a robot hearing. Pupils may suggest that 'understanding' or 'emotions' are involved in the person hearing. The list of differences between a robot hearing and a person hearing is written on the board by the facilitator. (Participants may suggest that hearing for a person is more complicated than just a responding to a clap. In that case, the facilitator may ask what about Siri (the voice recognition and response system on iPhones): Does Siri hear what the user says, and if this is hearing, how is this different from a person hearing?) During the discussion among students, the facilitator should try to highlight two different answers that students may give to the question of whether hearing is the same as responding to sound. One view is that 'hearing and responding to sound are the same', and the other is that 'a robot responding to sound is different from a human being hearing' (the facilitator refers back to this distinction later).

Workshop Activity 3: Comparing the Visible Behaviour of a Humanoid Robot and a Human Being

The facilitator explains what a humanoid robot is (perhaps showing some interesting photos or video clips). She/he asks the group of students to do a simple task (such as raising their hands a couple of times). Then the facilitator asks the students to imagine that there is a group of humanoid robots in one room and a group of students in another room and that both groups have been asked to follow the same instruction (raising their hand). The facilitator asks students to think about the similarities and differences between these groups in what they are doing. The point is to discuss the difference of 'rule following' between programmed humanoid robots and the human beings. These are the questions for thinking and discussion:

- Would the robot get tired if we asked them to do this many, many times? Would that be a difference between a humanoid robot and a human being? (If students say robots never get tired in the way that a human being gets tired, the facilitator may ask them to list the signs of tiredness in humans and say, 'How about if I give this list to an engineer and ask for a group of robots that show all these signs after repeating the job for a certain number of times? Does this reduce or even fill in the gap between the robots and the human beings?)
- Do you think that any of the humans or robots or both would start to get cross if they were asked to do this several times? (The facilitator can then say that the engineers will be asked to address this gap in their design.)
- Do you think that any of the humans or robots or both would refuse to follow the instruction after a while? (The facilitator can again say that this will be addressed in the design of the robots.)
- Does the robot group understand what they are doing?

The facilitator broadens the question and asks whether, in general, engineers can fill the gap between humanoid robots and human beings – by honing the robots' visible behaviour until they match the behaviour exhibited by people?

Workshop Activity 4: Ordering Questions from Amenable to Science to More Metaphysically Sensitive

The facilitator gives eight cards which each present a question and ask students to use the graphic below to categorise them into (a) very amenable to science; (b) partly amenable to science; (c) not very amenable to science – but there may be smaller scientific questions that we can usefully explore (see Fig. 12.2).

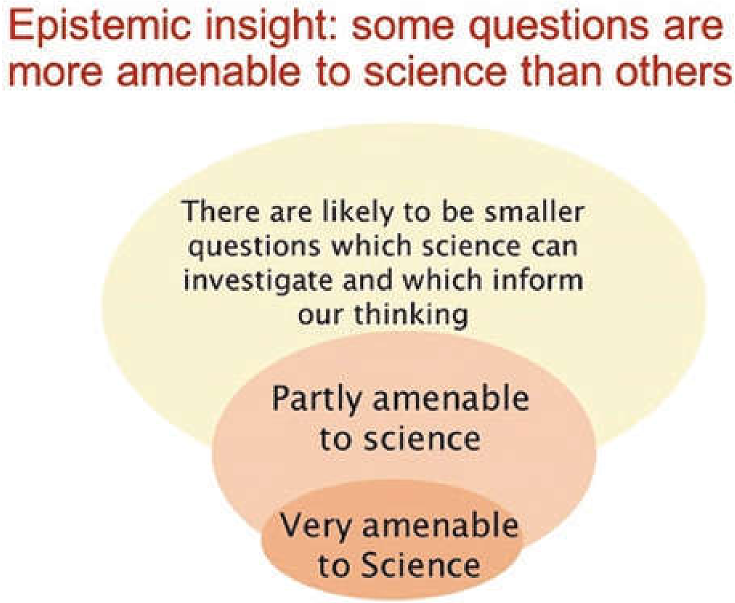

Fig. 12.2 Graphic to sort questions

Data Collection and Findings

We have run various versions of the workshop as pilot studies with different year groups, from Year 8 to Year 12 (12- to 17-year-olds) on different occasions. Here we highlight some of our findings drawn from this mostly exploratory work.

Many students commented on the impact of the workshop on their ideas about robots, being human and science. In explaining how her thinking had changed, Tara commented that 'I have realised the scientific potential … [of] advanced robots and have distinguished the difference between scientific and non-scientific questions'. Reyhaneh stated that although her thinking had not changed and she still believes that robots will not advance the level of humans, now she has 'a deeper understanding into some of the reasons for this'.

A version of the workshop was presented to 32 Year 8 students in a school in South England with a survey before and after the workshop. Analysis of the survey indicated that students had become more critical about the meaning of the terms that are commonly used for robots and human beings. For instance, before the workshop, nearly 70% of the students agreed or strongly agreed with the statement that 'One day there will be robots that are as intelligent as humans'; the level of agreement with this statement after the workshop fell to just over 40%. Similarly, while one in three of the students initially agreed or strongly agreed with the statement that 'One day there will be robots that have minds', this level of agreement reduced to less than 15% after the workshop.

We also found evidence that the workshop was an effective way to draw students' attention to the need to consider the power and limitations of science, and in some cases this consideration led some students to change their expressed positions on this statement. In response to the statement 'One day science will be able to tell us how our personalities are formed', nearly 50% of students agreed or strongly agreed before the workshop, while less than 10% agreed or strongly agreed with the same statement after the workshop.

At the end of each workshop, we also asked students how their thinking had changed; below is a sample of comments students who attended these workshops:

- I have questioned the difference between hearing and responding which is particularly significant in terms of understanding of robot.
- It has made me think more about what makes me a human – and what does/doesn't do the same for a robot.
- I can appreciate the difference between hearing and responding and it has developed my ethical views about robots.
- I am thinking more metaphysical. Science is not all about grades.
- Now I think there is a way bigger question and meaning to think about with robots and humans.
- It has enabled me to think about the source of our mental thoughts and if it is possible to implement senses and the power of thoughts into machinery/robots.

Conclusion

In this chapter we report on the design and delivery of a workshop that aimed to address some of the issues raised by research that explores how secondary school students make sense of the ideas they encounter about human personhood in the light of their understanding of science. Previous research indicated that there are some students in this age group who articulate scientific ideas in reductionist and deterministic terms and are troubled by what these ideas mean in relation to common beliefs such as that people have souls. Based on these findings, we designed a workshop designed to give school students an opportunity to make comparisons between human-like machines and human beings and to explore questions and issues around personhood. Comments and survey data gathered from participants suggested that the workshop engaged secondary school students. We also noted that the workshop helped to develop participants' epistemic insight and encouraged students to examine their own and other stances on the power and limitations of science.

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