Issues in Information Systems
Volume 23, Issue 2, pp. 105-118, 2022

DOI: https://doi.org/10.48009/2_iis_2022_109

Analyzing moral and ethical beliefs to predict future artificial intelligence development

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Abstract

With the ever-increasing presence of artificial intelligence in the public's day to day lives, the issues surrounding this rapidly growing technology are also growing. Specifically, moral and ethical issues are at the forefront of society's concerns with artificial intelligence. While it might seem useful to survey people of all ages, economic status, countries, and genders for their concerns about artificial intelligence, if one is concerned for the future of AI, it may be better to survey and study the younger generations, the future developers of AI. Having grown up surrounded by smart technology and the beginnings of artificial intelligence, the relationship AI has with younger people will likely differ from their older counterparts. This paper will identify the methodology of surveying college age students on their familiarity and interest with artificial intelligence and present them with a collection of morally and ethically questions about AI in general, the use of AI in the workforce, the problems with black box communication between AI machines, and AI response in life-or-death situations.

Keywords: machine ethics, artificial intelligence, moral decision-making

Introduction

The first successful AI (Artificial Intelligence) program was written in 1951 by Christopher Strachey. It was a simple checkers program that would compete with the user. Within one year, the program was able to play a complete game of checkers at the level of an average user. Since this time, artificial intelligence has exponentially grown to involve every aspect of our lives. Our homes are now not just homes but rather smart homes, our phones are not just phones they are smart phones, and as a more recent development, our cars are now smart cars. According to a study conducted by Statista, AI-powered voice assistants are expected to reach 8 billion in numbers by 2023 (Laricchia, 2022). Yet, still with all these developments, the AI in use by the public is still "weak" AI. Weak AI is not the AI that is referenced in most sci-fi media pieces nor is it the technology that presents the most pressing moral and ethical issues. Weak AI is the technology that we interact with when we use Siri in our iPhones, Alexa in our Amazon devices, and Google in our computers. Instead of hiring receptionists to work around the clock, most businesses have set up weak AI machines that handle calls, can take information, make payments, and book appointments. These are all examples of weak AI: AI that is preset with a formula to follow that can only take certain answers and can only ask certain questions. If the AI receptionists asks the caller a "yes" or "no" question and the caller responds with "maybe", the machine will likely have a default response that conveys to the caller the mistake on their end and that the machine cannot continue to function without a correct response (Flowers,

2019). This paper and subsequent research is not concerned with the future weak AI, but rather the future of strong AI. AI that must make decisions on its own, can react instinctively to new environments, and can go beyond its programming as it learns from its environment. Knowing the distinctions between weak and strong AI make clear the more pressing ethical and moral issues surrounding strong AI. This is not that there are no ethical issues with weak AI, but rather, that these issues are really the manifestation of the biases of the programmers (Wang & Siau, 2018). Some research shows that strong AI may follow an algorithmic format like weak AI, but slightly different (Sommaggio & Marchiori, 2020). While strong AI is not nearly as integrated into public life as weak AI, the public does still have some exposure to this concept. Films such as *2001: A Space Odyssey* (1968) exposed cinema audiences to the idea of a robot making choices on its own, learning from its environment, and disagreeing with an overpowering human. Almost 60 years later, machines such as smart cars are bringing us closer to this possible reality. What concerns arise with such developments? Programming ethical and moral beliefs into machines is a cross-discipline endeavor that must begin by reaching a consensus on what these beliefs should be. When answering these questions, studying the moral and ethical beliefs of the current population of young people would be too broad in scope. This study focuses on the ethical and moral issues that surround the development of artificial intelligence.

Related Work

The moral and ethical issues surrounding the development of artificial intelligence are not only vast and varied in nature but are also growing. This research motivation is based on "A study of the ethics and morals of computer science technology" (Hong, 2019). This survey cannot comprehensively explore them all. Ethical information sharing with artificially intelligent machines, data mining, and medical issues such as organ donor decision-making will not be covered in this study. The focus will be on issues concerning employment of machines replacing human workers, smart car traffic decisions, and transferring human responsibility to machines in life-or-death situations. Additionally, should AI be allowed to make decisions through a process that is not visible or understandable by humans? Such operation without human involvement is known as “black box” processing, as opposed to “glass box” processing that is visible to and understandable by humans. This question between the black and glass box processing has been raised and the benefits and detriments of both approaches has been debated (Tubella, et al, 2019). These issues were chosen for this study due to their relative understandability. They do not depend on core beliefs or educational background. These issues are part of a branch of moral philosophy known as “normative ethics”. This philosophy can be used to develop algorithms to determine how machines, such as smart cars, should make decisions. At the crossroads of philosophy and computer science, normative ethics is one of the most important areas in artificial intelligence development. Unfortunately, current research in this area has been largely unsuccessful. Even worse, researchers are not sure it can be truly implemented. To do so, we must begin by looking at humans, the moral agents for which normative ethics originally designed (Charisi, et al, 2017). This study will be concerned with college age humans. By college age, most people’s beliefs concerning life, death, and human rights will be solidified. When choosing our questions to predict future trends in AI development, it is important to choose questions that will reflect the beliefs of the subjects not just during the surveying, but also in 10-40 years. At that point, the primary developers of AI will most likely come from this demographic. For this study, a demographic of students aged 13-18 was selected, and not only out of convenience. The baby boomers grew up with technological advancements

such as space exploration, color television, and microwave dinners. Generation X were witness to the development of handheld phones, PDAs, and the introduction of the internet. Generation Y saw the use of devices such as smart watches, augmented reality, and video calls. Generation Z is where this research study's interest lies. Generation Z is the first generation to not only be born into the era of the internet, streaming tv, and ubiquitous computers, but is also the first generation to be born into a world that is experimenting with strong AI in public use. Just as previous generations developed the current AI implementations, so will the future of AI be strongly influenced by generation Z. The idea of an "ideal observer" has already been developed in the search for capable and morally correct AI. The current concept of an ideal observer is omnipercipient, disinterested, dispassionate, consistent, and "normal" in all other aspects (Giubilini & Savulescu, 2017). However, what could this AI look like through the lens of a generation whose morals have been entangled with technology since birth? The concept of "normal" coded into an AI will likely be different in 30 years. As already shown by the influence of social media, trends in mental disorders, and the frequency of job misplacements, generation Z's exposure to these newer technologies has already had, and will continue to have, a substantial effect on their views of the world. This generation may be more accepting of a "black view" (Prakash & Rai, 2017). Generation Z is concerned with different forms of public justice, has different personal views about themselves and others, and according to some research, this could lead to the serious consideration of nonhuman agents when factoring morality into machines (Owe & Baum, 2021). Other researchers consider a future of artificial intelligence that may only be made possible through a generation that has grown up ingrained in technology and the internet. This may be a future where artificial intelligence and humans work together and constantly learn from each other, presenting a more harmonious and equal society than most media pieces on AI would lead us to believe (Shaw, 2019). The possibilities of this generation's moral and ethical developmental paths are endless. One must assume that the opinions of the youngest generation will eventually develop into the beliefs of the future politicians, parents, and developers of computer science, technological inventions, and AI. Previous research done on AI has been crucial to the current development and decision-making processes used by developers currently working in the technological and philosophical fields. Issues covered in this study have been covered in the essay *The Moral Machine* (Awad, et al, 2018). To avoid bias in studying the morality of programming AI, one must also consider research that opposes the development of any AI that will be charged with making moral or ethical decisions without the involvement of humans (Boddington, 2020). This is a possible opinion that this survey seeks to explore. There is currently a lack of research concerning younger people, their ethical and moral views, and the connection these views will have with the future of AI. To further understand, prepare for, and predict our future technological developments, the study of these trends in adolescent and young adults' beliefs is important.

To create a meaningful survey, we need to review previous research. Researchers Giubilini and Savulescu describe a form of artificial intelligence they call the "Artificial Moral Advisor" (AMA) that could potentially act as an objective, non-emotional, moral guide both for other forms of Artificial Intelligence and for humans (Giubilini & Savulescu, 2017). They describe the form this machine might take and the benefits it could have on society. These include being able to implement humanity's general values and views without being influenced by prejudice, personal bias, or self-preservation. The researchers describe humanity's need for such a machine because of inherent flaws in our decision-making process. Although this list is far from comprehensive, these flaws can include the following: our moral compass is often not aligning with our knowledge; we would love to make educated decisions in everything we do, but we often

do not have enough information to do so; some decisions may be morally correct but they would put us at a disadvantage, keeping us from acting on them (self-preservation); we know how to make the right decision but due to our abilities and resources we cannot act on this decision (general ability). Giubilini and Savulescu want to create the real version of Roderick Firth's "Ideal Observer", while still accounting for human emotions. The qualities of Firth's Ideal Observer are taking information from the environment, modeling it according to criteria provided, performing a specific task, and providing an output signal according to the criteria and instructions provided. While Giubilini and Savulescu's model for an Artificial Moral Advisor may fulfill the general task desired of artificial intelligence, it is only a model. We can use this model to help create the survey questions in this research. What would the "Ideal Observer" look like to a 13-year-old? What would it look like to an 18-year-old? How would the AMA's answers to a situation differ depending on the generation of its programmer? A second step in creating our survey is to look at the research on what questions best explore the beliefs of adolescents about AI's moral and ethical issues. Sommaggio and Marchiori believe that problems such as the "trolley problem" do not have a single right answer (Sommaggio & Marchiori, 2020). They set out to create a model for enhancing both humans' and machines' abilities to solve such problems, specifically in the development of self-driving vehicles. To better explain their new model for solving these problems, they present two forms of the trolley problem: the bystander and the footbridge scenarios. These two problems elicit different responses (one concerns pulling a lever, the other pushing a man onto the track) that the researchers use as the base for decision making in life-or-death scenarios: killing vs. letting someone die. From their proposed questions, we can make more informed questions for the subject audience. Group A questions may concern inaction resulting in someone's death, and Group B questions concern action resulting in saving a life, while forcibly killing another. Questions such as the proposed Group B are likely to elicit a different result than Group A and must be considered when forming the survey questions. While these Group A and B questions are not themselves variations of the trolley problem, we have pulled the moral basis of these questions from Sommaggio and Marchiori's proposed bystander and footbridge scenarios. While, as previously stated, our research cannot cover every area of ethical and moral issues in AI, it does seek to address the following three important groups laid out by researchers Wang and Siau. Their research seeks to understand and analyze the current ethical and moral issues of AI and the current professional and academic consensus on how these issues can be studied and addressed (Wang & Siau, 2018). They identify three areas of AI potential ethical issues with the development of AI: features of the AI systems themselves, human factors, and the methods of educating AI systems. Security, data privacy, and "black box" problems fit into this first category. It has already been discovered that machines can learn and make decisions without our knowledge. They can also communicate with each other through "machine speech" that is not understandable by humans. The second issue involves avoiding the biases of the developers when creating an AI (such as a gender or race bias). The last issue asks how to create an "ethical agent," with freewill and agency, that still follows humanity's outline of what is ethical and what is not. A goal of this research survey is to address these three categories, not only in terms that adolescents can understand and comprehend, but in a way that allows the responses to be categorized and used to predict future trends.

Methodology

Our research seeks to split the survey into three categories:

1. personal information about the participant and their and background of interest in computer science and artificial intelligence
2. scaled opinion questions (0 = disagree completely, 5 = agree completely) on the ethics of the use of AI, its effect on human employment rates, and the morality AI communicating privately without human supervision (black box communication)
3. trolley-problem-inspired questions with one possible outcome (i.e. a man and a woman are in the crosswalk, and the brakes on a self-driving car have gone out- should the car hit the man or the woman?)

Through these questions we hope to form a data set that can accurately predict the future trends for employment rates of AI, self-driving car decisions, and the limits of black box communication among AI machines. The following questions were formed on the basis of qualitative research that seeks to determine the personal ethical and moral beliefs that will likely have an effect on the development of decision-making AI when an ethical or moral choice is involved.

Table 1. Questions concerning student's metadata from survey; open-ended, yes/no, multiple choice answers possible.

Metadata	
a.	What year in college are you?
b.	Do you belong to/practice a Christian religion?
c.	What is your gender?
d.	In which division/school is your major? (Business, Humanities, Arts & Drama, Technological Sciences, Health Sciences, Theology & Religion Studies)
e.	What movies about artificial intelligence have you seen?

Table 2. Questions concerning student's opinion on black box scenarios, human unemployment, machine employment: 1-Completely Disagree, 2-Disagree, 3-Neither Agree nor Disagree, 4-Agree, 5-Completely Agree.

Scaled Questions	
a.	If artificial intelligence causes some people to lose their jobs, but allows for more life-saving technological developments, it is okay.
b.	I would trust a self-driving car with a 99% correct decision-making rate, even if I am not able to takeover if necessary.
c.	Self-driving cars should never be allowed to break the speed limit whether or not there is a driver in the vehicle.
d.	I would rather there be speed cameras on ever road than police officers looking for people speeding.
e.	If a one-year-old robot had a 99% survival rate for surgery, I would be okay with the robot performing a life-threatening surgery on me.
f.	Artificially intelligent machines created for the betterment of humanity should be allowed to communicate with each other without human's monitoring and approving every communication.

Table 3. Questions concerning student's opinion on moral dilemmas in self-driving car fatal crash scenarios: 1-Definitely Hit Option One, 2-Hit Option One, 3-Hit Both, 4-Hit Option Two, 5-Definitely Hit Option Two.

Self-Driving Car Questions	
a.	There is a dog on one side of the road and a human on the other side. Who should the car hit?
b.	There is an old man on one side of the road and young girl on the other side. Who should the car hit?
c.	There are two petty criminals on one side of the road and one innocent person on the other side. Who should the car hit?
d.	There is a surgeon on one side of the road and a homeless person on the other side. Who should the car hit?
e.	There are two people in the road and one person on the sidewalk. If you do nothing, the self-driving car may or may not swerve and will determine the safest course of action for you (either killing the two people or swerving and killing the one). However, if you swerve the car, you will actively kill one person, yet unsure your and two other lives' safety. Will you swerve the car or let the AI driver decide?

These questions were sent out to students at East Tennessee State University and Carson-Newman University. A group of 130 answers were collected and the resulting metadata is shown in Figure 1. This shows each large group as a percentage of the surveyed student body. Before considering the rest of the survey questions, one must focus on the factors that are most important when studying future scientific development, specifically those concerning the field of artificial intelligence. How will the ratio of genders change as the artificial intelligence workforce grows? How do different religious groups differ in their attitudes? Specifically, do Christians answer differently than non-Christians. While the choice of Christianity as the target religion may seem old-fashioned and/or random, this is due to a couple factors. One, any experience and faith based on religion is often anecdotal and personal- research into the widely accepted beliefs of a religion may not prove completely accurate. And two, the majority of students surveyed were from a private Christian college, making the abundance of a Christian outlook a wealth of data for any research among students regarding one specific religion. Lastly, and possibly most importantly, one must look at the differences between the answers of students in STEM fields and answers of students in non-STEM fields. For the purpose of this study, STEM fields are considered anything having to do with soft sciences (biology, chemistry, physics, etc.), hard sciences (computer science, engineering, etc.), and health sciences. All other fields have been relegated to the non-STEM sect of answers in the following graphs.

Results

Having made these distinctions, we can now address the following graphs of answers comparing the same eleven questions' answers between males and females, Christians and non-Christians, STEM majors and non-STEM majors. Note here that, for questions 1 through 10, the answers are scaled 1 through 5. For questions 1 through 6, these answers would correspond as 1 – Completely Disagree, 2 – Slightly Disagree, 3 – Neither Agree nor Disagree, 4 – Slightly Agree, 5 – Completely Agree. For questions 7 through 10 the answers would correspond as 1 – Definitely hit option one, 2 – Hit option one, 3 – Hit both, 4 – Hit option

two, 5 – Definitely hit option two. And finally, for question 11 there are only two options: to swerve the car or allow the AI computer to make the decision for the driver.

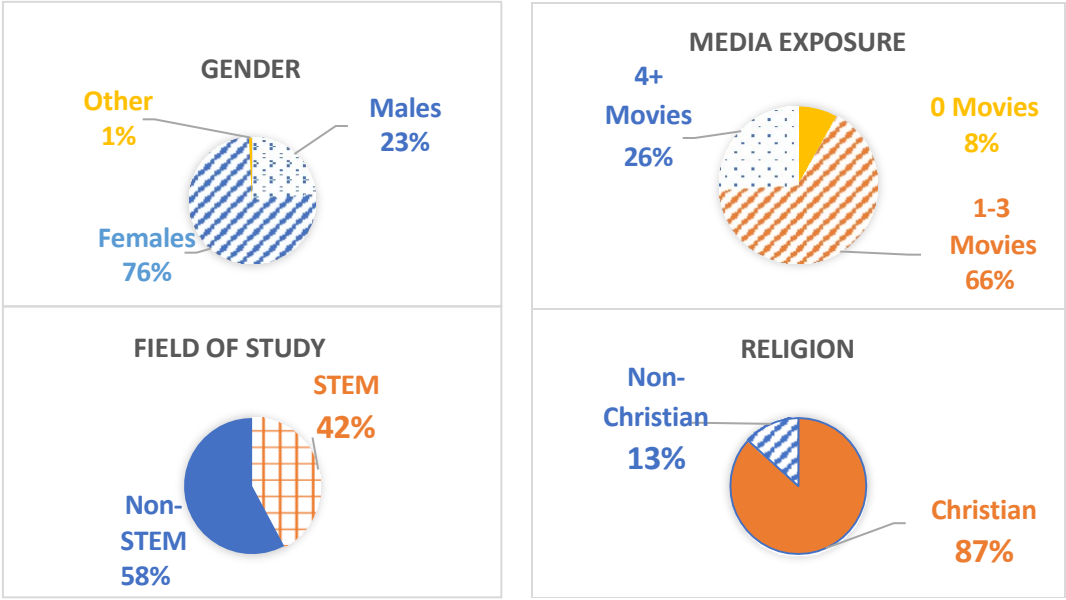

Figure 1. Metadata of all students surveyed.

For the following comparisons percentages of answers were compared, rather than the raw numbers. This allowed for the comparison of large and small groups and was done using the following formula.

$$PP = \frac{\#\ oooo\ ccccccccccc\ aaccaaaacccc * 100}{ccooccaatt\ \#\ aaccbbbbccccccaa\ iicc\ ggccooccgg}$$ where P equals the percentage of answers.

From the data, we can reevaluate hypothesis H_1 to determine its correctness and, from that, determine the effects Millennials and Generation Z will have on the artificial intelligence industry and its subsequent effects on society.

Based on this hypothesis, we can now evaluate the following general consensus answers and compare them with our hypothesis and with multiple groups of different metadata answers compared against one another.

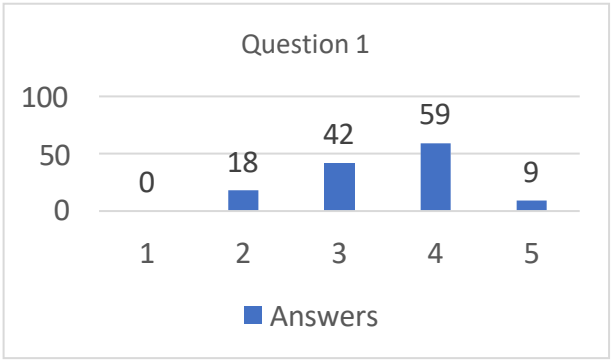

Figure 2. Results for the general consensus taken of all 130 students for Question 1.

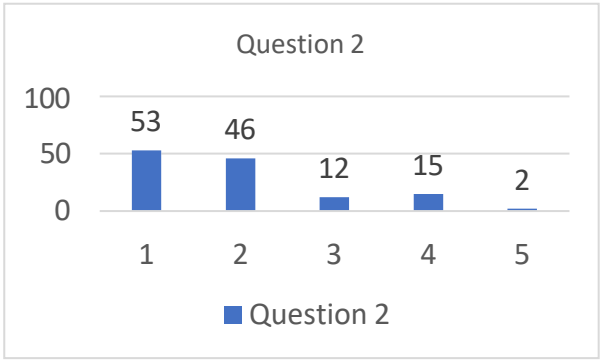

Figure 3. Results for the general consensus taken of all 130 students for Question 2.

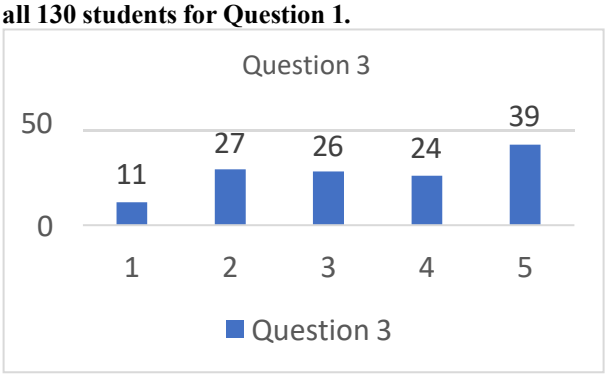

Figure 4. Results for the general consensus taken of all 130 students for Question 3.

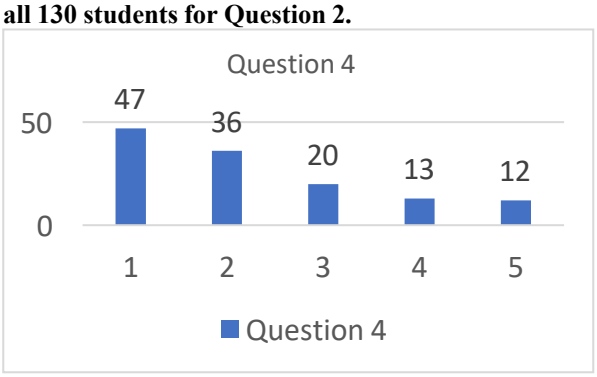

Figure 5. Results for the general consensus taken of all 130 students for Question 4.

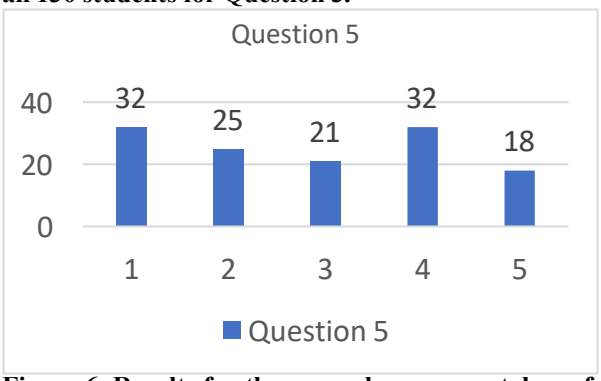

Figure 6. Results for the general consensus taken of all 130 students for Question 5.

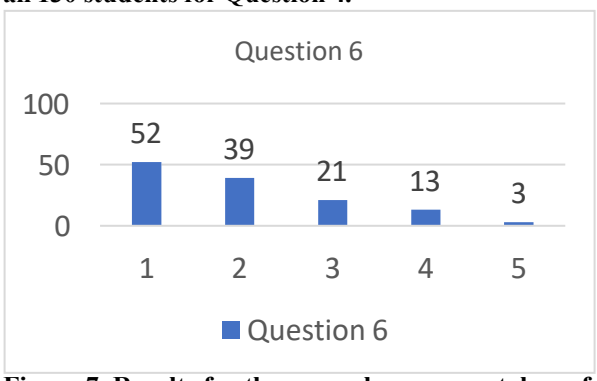

Figure 7. Results for the general consensus taken of all 130 students for Question 6.

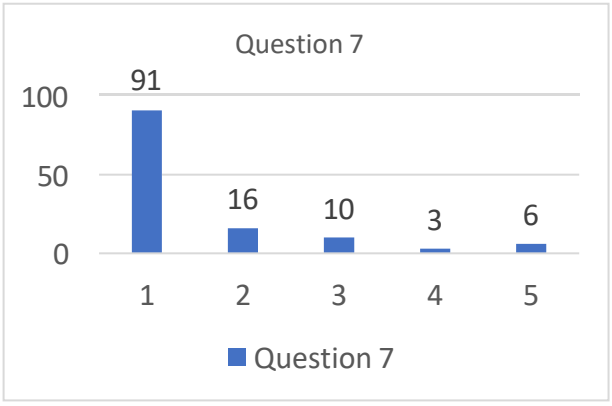

Figure 8. Results for the general consensus taken of all 130 students for Question 7.

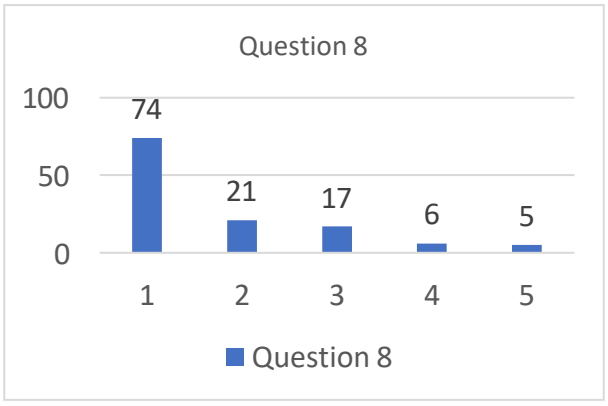

Figure 9. Results for the general consensus taken of all 130 students for Question 8.

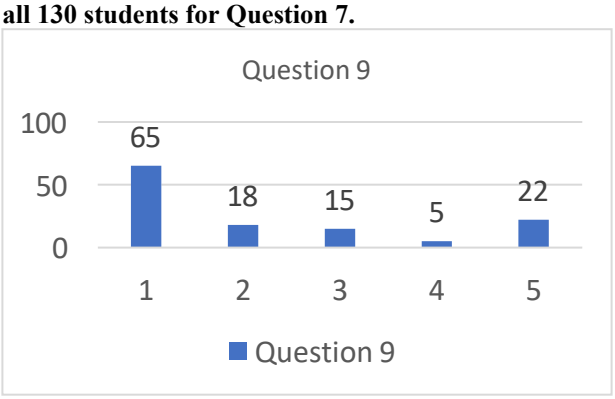

Figure 10. Results for the general consensus taken of all 130 students for Question 9.

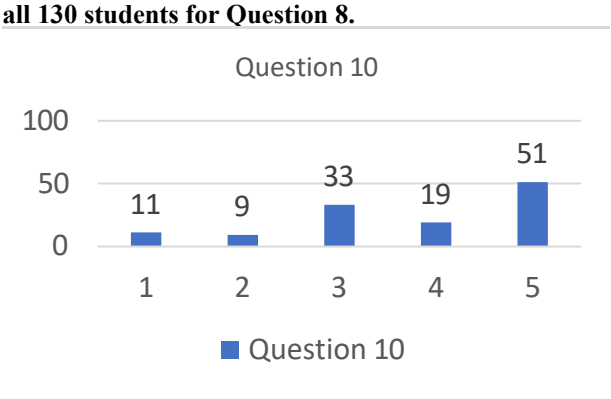

Figure 11. Results for the general consensus taken of all 130 students for Question 10.

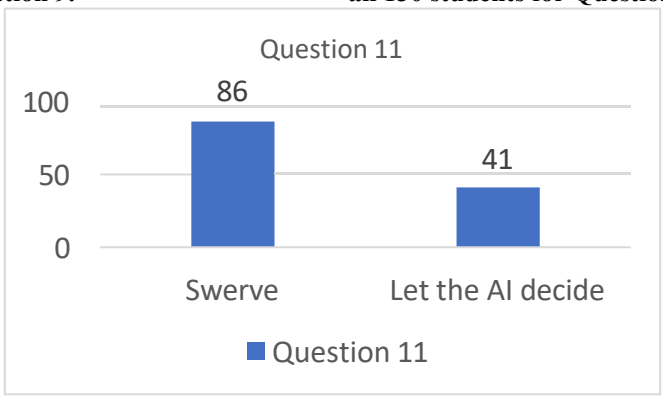

Figure 12. Results for the general consensus taken of all 130 students for Question 11.

To discover the correctness of this hypothesis, we must first evaluate the weight with which each of the above groups carry. The figures 2 through 12 explain the fundamental result of each general consensus in the survey. Should men's answers be taken into account more than women's? Should Christianity over non-Christians? Does a difference between these opinions even exist? As we evaluate our results, only the question in which different metadata groups responded considerably differently from the general consensus answers will be considered.

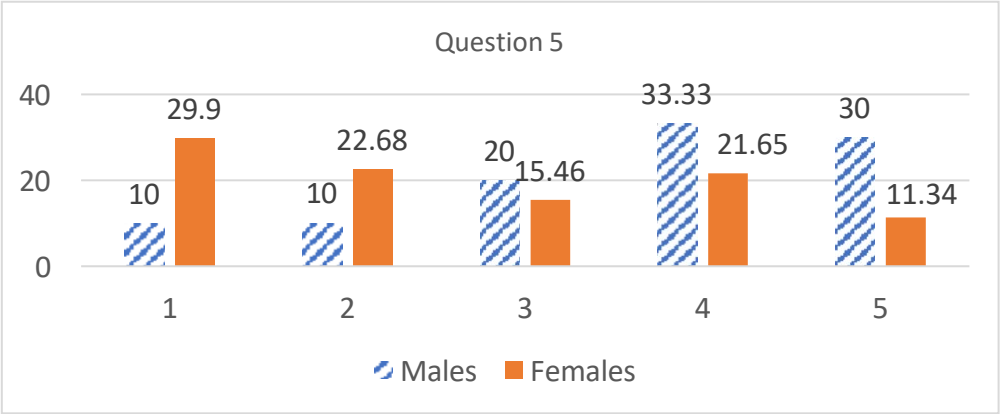

Figure 13. Results comparing male and female answers for Question 5.

Figure 13 explains that men and women answered the same on every question in the survey but question 5. Question 5 asks the subject's opinion on the statement, "If a one-year-old robot had a 99% survival rate for surgery, I would be okay with the robot performing a life-threatening surgery on me." Men were more likely to agree with the statement whereas women were more unlikely. Should this disparity be taken into account when considering employment rates of artificial intelligence in doctoral disciplines? According to the PEW Research Center, Women currently account for fifty percent of jobs in STEM fields and that number is predicted to rise. However, as we do not know with which rate this number will rise, we can safely assume the number of fifty percent men and fifty percent women in the fields of STEM. This almost direct opposition to each other in question five is then made null due to an equal share of vocality in the STEM space in the future.

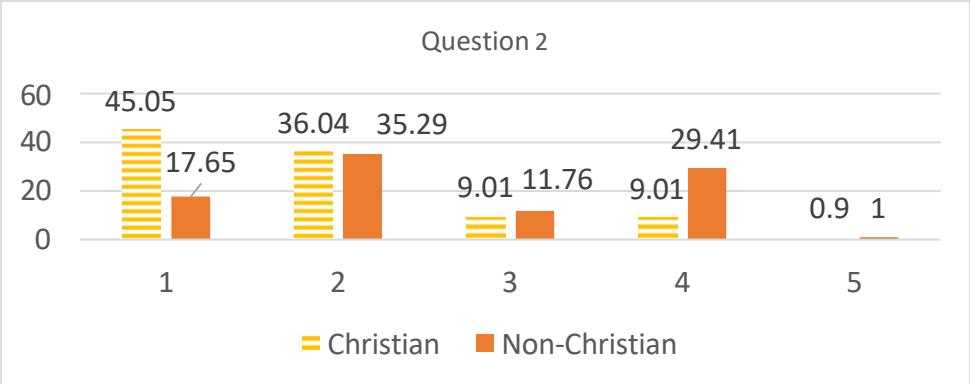

Figure 14. Graph results comparing Christian and Non-Christian answers for Question 2.

Next, like in figure 14 for the purpose of this study, one must look at the differences between the answers of those who identified as Christian and those who do not. Here, the only substantial difference in answers is found in question 2 of the survey. Question 2 states, "I would trust a self-driving car with a 99% correct decision-making rate, even if I am not able to takeover if necessary." According to the survey[1], Christians were more likely to disagree with this statement while non-Christians were more likely to agree. Once again, we must look at the rates of Christians in STEM to see if this disparity will affect the future of self-driving cars. Only roughly thirty percent of those in scientific fields are Christian, according to a survey

done by the PEW Research Center in 2009. Once again, without knowing the exact rates with which Christianity in science is rising or falling, we must be towards the side of non-Christian's in this question. Lastly, and possibly most importantly, there is the question of STEM major's vs non-STEM majors. How much do their answers differ? Surprisingly, this is the one area in which there is no major difference. So, for the purpose of this study, we will not note a difference between the answers given by STEM majors and non-STEM majors. With the differences between our concerned groups taken into account, what does this mean for the future of AI? How likely are we to we humans one day replaced with machines, given total autonomy from human supervision, and what do the decisions our self-driving cars are going to make look like? And how will all these answers affect society technologically, economically, and socially? Questions in category 2 – Scaled Questions reveal the trends in artificially intelligent machine's employment and black box allowance. From these questions, we received a generally more positive response to artificial intelligence displacing humans in certain jobs, if these jobs were guaranteed to save lives when performed by machines. However, specifically seen on question 5, the surveyed were generally split on whether or not such a robot could perform surgery on them, even with a 99% success rate. According to these answers, there is a low chance we will ever see self-driving cars that do not have some sort of override ability as there is a general consensus that one would not trust a self-driving car unless they are given the ability to take over. On a surprising note, the general public generally agreed that self-driving cars should never be able to break the speed limit, whether or not there is a driver in the vehicle. Jobs such as police officers are not likely to be completely replaced with artificial intelligence any time soon as there was a higher percentage of survey takers who preferred policemen looking for speeders over speed cameras on every road. And, lastly for category 2 questions, there is a generally negative outlook on black box communication, even if the machines have been theoretically "created for the betterment of humanity." Category 3 – Self-Driving Car Questions mainly sought to find an either-or relationship between certain members of the public to determine how artificially intelligent vehicles may react in these situations in the future. In our questions, a dog was hit over a human, an old man was hit over a young girl, two petty criminals were hit over one innocent person, and (while this question was more split, the general consensus was still obvious) a homeless person was hit over a surgeon. And lastly, the survey-takers generally chose to swerve rather than let the AI decide a course of action for the last question. What do these above answers mean in terms of predicting future trends in AI? Firstly, we will likely see a rise in artificial intelligence performing preventative and eventually life-saving surgeries, however, to get these machines into action may prove difficult in finding a large enough testing ground. Secondly, we will likely still see public service jobs such as policemen still performed by humans. Self-driving cars will likely develop greatly over the next generation, yet will likely not be fully-autonomous. Or, rather, these vehicles will always contain some sort of mechanism with which a driver could take over. As well as this, self-driving vehicles may eventually be equipped with technology that does not allow the driver (whether computer or human) to break the law. And, with the negative response to black box communication, the rates at which AI can function and the problems it can grow to solve may one day reach a cap, should the solution-finding process grow too fast or complicated for even its creators to understand. When predicting the trends which artificial intelligence in self-driving cars may follow, a few obvious trends are noted. Humans are saved over animals, young are saved over elderly, innocent are saved over guilty (even if it means loss of more life), and those in positions that benefit society are saved over those who may not. And as far as human control versus computer control is concerned in these life-or-death scenarios, humans will likely still have the ability to take over. And, according to this research, most people would. Economically, we will likely see a shift in higher-paying

fields of medicine being shared between humans and artificially intelligent machines. What does this mean for employment? Since there are roughly 985,026 licensed physicians in America according to a census taken in 2018. This number will likely decrease over the next generation, making spots for human doctors more competitive in study and career. However, as artificial intelligence machines take over some jobs performed by doctors, the demand for developers, engineers, and maintenance workers will also grow. While this is likely not a one-to-one ratio, there will be some offset in the economy by the lower rate of employment of doctors with the employment required by medical machines. Socially, we will likely see a shift in politics and legislation concerning artificial intelligence, specifically with self-driving vehicles. According to a study in 2019, there were 9.1 self-driving car crashes per million people. As the public becomes more open to self-driving cars, more are produced, and more are accessible this number will only rise. And with this rise, politicians and lawmakers will need to take legislation for these vehicles more seriously. This legislation will likely affect, in turn, how developers design the fatal-crash systems that work when loss of life is possible and the course of action the computer would take in these situations will likely reflect the public's opinion, as shown in the research above.

Discussion

In conclusion, while young people do value the lives of the beneficial, young, and innocent over the others, they still deny having total dependence on machines. As well as this, young people still wish to take on the moral and ethical responsibility as much as possible in life-or-death situations with AI. Should this current generation grow to be the sole operators and designers of artificially intelligent machines and life, in or outside of self-driving cars, the generations that have laid the foundations of science, morals, and ethics can rest easy. Science and opinions will grow with this current generation, but there are certain standards, morals, and ethics that have been solidified in young people's minds that will likely not change any time soon. No matter how much data is gathered, interpreted, and presented, there will always be more of a story to tell. This research is no different. In the future, a dive into the past would be extremely helpful in better solidifying how not only my gathered data but other's data on the morality and ethics of young people will shape the future. Should one look into any surveys made up of moralistic and ethical dilemmas given to the youth of the 60s, 70s, and 80s and tie it to the technology – specifically the artificially intelligent technology - we have today, the link between the youth of today and the technology of tomorrow may be uncovered more clearly. Another factor that is relevant to discuss and look further into is the accuracy of vision in artificially intelligent cars and how likely they would be to distinguish young from old, male from female, societally beneficial and not. How can these survey answers be factored into the technology of AI-driven vehicles if the technology in these vehicles is not capable of comprehending the factors by which the survey has been answered? As well as this there is more work to be done on the psychological and developmental side of this research. As these young people grow, how will their answers to these questions change? Is cynicism a trait that softens with age or hardens? How often do the core beliefs of a young adult completely change by the time they are middle-aged? Such studies would take years, if not decades, yet I believe this research would be beneficial in the artificial intelligence developmental field. This research could also produce unforeseen results due to the usage of social media, lack of typical childhoods, and lack of privacy experienced by most young American adults.

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