

# Humans 2.0: Mortal Life, Immortal Consequences

**Annabella Lewis**

## **Abstract**

The first 'Humans 2.0' conference was held on the 1st of July 2022 at the University of Melbourne. The conference examined the current ethical dilemmas posed by emerging biomedical and technological innovation. The possible futures for humanity are uncertain, sometimes hopeful, and sometimes disturbing. In this review of Humans 2.0, I reflect on the struggles of mortality and morality with which individuals and society are confronted as we grapple with life and legacy in the face of these uncertain futures.

## **Keywords:**

Humans 2.0, ethics, emerging technology, biomedical innovation, morality.

---

On the 1st of July 2022, the future began: Humans 2.0.

Our journal's first conference examined the current ethical dilemmas posed by emerging biomedical and technological innovation. We sought to begin unravelling the uncertain, sometimes hopeful, and sometimes disturbing futures in store for humanity. For a conference so deeply invested in exploring our path towards the future, it was perplexing that the theme to which we consistently returned throughout the day was the one theme that, without fail, stops the future in its tracks: death. At every turn it seemed that the shadow of our mortality hovered over our discussions, prodding at fear, at hope, at determination, and even at the burgeoning of wisdom.

### **Life and Legacy**

Indeed, the ephemerality of human life quite literally dwelt ever over the audience. At the back of the theatre, Gary Anderson, Professor in the University of Melbourne Department of Biochemistry and Pharmacology, positioned a television screen on which bubbles, sometimes lone and oftentimes mingling, danced in innumerable patterns. Each bubble captured in the film must now have collapsed – for bubbles, according to Anderson, are the ultimate metaphor for ephemerality – yet as we witnessed them upon the screen they lived again and perhaps will never truly die. In those bubbles also lives on a mortal being like ourselves, dancer Merce Cunningham, whose dance is metaphorically immortalised in the digital representations of the microscopic, quantum interactions of the collapsing bubbles. Though, ironically, various other such screens that once showed similar bubbles no longer work and could not be used for our conference. An apt reminder that overcoming mortality –

overcoming human nature – is no simple feat.

*Even in death, we shun mortality by the legacies we leave behind...*

Opening the conference, Anderson spoke at length on the subject of mortality and how we cope with the beautiful turmoil of life; that curious, convoluted intervening period between birth and death. Commencing his presentation with the observation that patients with chronic lung disease tend to desire not the extension of their lifespans but the amelioration of their severe symptoms even at the cost of years of life, Anderson explored the interdisciplinary mingling between art and science in our quest to unravel the mysteries of our mortality and to overcome them in the emotional, spiritual, and even physical realms. Reflecting on his fine arts thesis on the concepts of “the soul as a baby”, the “battle for the soul” and of *Ars Moriendi* (the “art of dying”) in medieval theology, Anderson probed not only our human preoccupation with death but our belief that death may not be such an evil inevitability in the context of a life well-lived. Perhaps the chronic lung disease patients have discerned an important truth that a goodly life, no matter its length, is of far greater value than a lingering life of despair. For even at the very blow of our mortality, we may take comfort in the goodness of years well-spent and in the goodness of our memories that will extend far beyond our brief lives.

Even in death, we shun mortality by the legacies we leave behind but over which we no longer exert control. Anderson observed this of Alfred Felton, who, along with Frederick Grimwade, monopolised medicinal plant commerce during the late nineteenth century (Poynter, 1972). Felton left much of his accumulated fortune to the Melbourne National Gallery and thus, through his fortune's

---

ongoing contribution to Australian art, lives on in an infinitely interpretable image that we can never hope to truly know. Similar could be said of Dioscorides, the ancient Greek physician whose person and commitment to medicinal botany is immortalised in his encyclopaedic account of medicinal plants “De Materia Medica” and in the field which we now call pharmacology (The Editors of Encyclopaedia Britannica, 2013). Moreover, De Materia Medica immortalises not only Dioscorides but the countless Arabic scholars and Roman soldiers whose annotations and ailments respectively are preserved in the pages of the reproduced work. We worked our way through the curious histories that inextricably link pharmacology and fine art, Anderson’s two great career passions. We began with Paracelsus, the great medical philosopher. We moved then to William Henry Perkin, the serendipitous inventor of mauve dye. Next came Queen Victoria, the dye’s populariser. Finally, we came to Paul Ehrlich, who used the dye to pioneer histology and the pharmacological notion of the “magic bullet”. I began to wonder that perhaps much of our lives are, in fact, devoted to posterity and to our deaths, in the building of a legacy such that we might imagine that our death is not truly our end.

*As we contemplate the future of humanity,  
we must ever be cognisant that  
though we as individuals may feel mortal and  
limited, our ideas, our legacies,  
and the interdisciplinary mingling of our works  
are both immortal and powerful.*

Such legacies extending beyond our ephemeral corporeal lives take on lives of their own. In developing drugs such as imatinib and formoterol, Anderson himself, in building his own legacy, interacts directly with the legacy of Ehrlich and his magic bullet, each shaping the

other. The interactions, limitless and untamed, between peoples and ideas separated by space, by culture, by academic discipline, and by time, are both beautiful and frightening. For these may generate creative, insightful, interdisciplinary collaborations or shape great evils; all beyond our control as our creations and legacies pass beyond our thoughts and lives and take on their own unique identities. For our own individual identities are already infinitely complex, then how much more so must their relationships be? Inspired by Anderson’s presentation and the ideas of Sir James Black, one might argue that, in the context of the macrocosm of the great legacies of history, each of our individual identities exemplify the “minimal complexity” of the human condition. As we contemplate the future of humanity, we must ever be cognisant that though we as individuals may feel mortal and limited, our ideas, our legacies, and the interdisciplinary mingling of our works are both immortal and powerful.

Perhaps there is some peace in knowing that we will pass into peace before the full potential of our lively words and deeds are realised. It is just as a dancer like Merce Cunningham may retire from performance even as her dance lives on in memory and notation. Yet, amidst what Anderson described as “the horrors of life”, our mortality remains not a comfort but a deeply haunting influence. What about a potential being who transcends current conceptions of what it means to be human? What about the human 2.0? Is mortality the final frontier that we are driven to overcome?

#### **“Minimal Complexity”**

To explore these frontiers of the human 2.0, our conference masters of ceremony, Senior Lecturer in Biochemistry and Pharmacology

---

Dr Saw Hoon Lim, and history honours student and Humans 2.0 Editor-in-Chief Max Billington, introduced us to some (fictional) humans 1.0. Cooper and Audrey were amidst their second trimester of a healthy pregnancy, anticipating the birth of their first child. But Cooper's diagnosis of Huntington's Disease (HD) threw all that excitement into disarray, and, amidst that fear and uncertainty, the Humans 2.0 conference began in earnest. Indeed, it was through the "minimal complexity" of these characters that we sought to examine the broader dilemmas facing our world.

HD is a late-onset, neurodegenerative, genetic disease that causes progressive motor, cognitive, and psychiatric dysfunction; a disease with no cure and a prognosis of rapid functional decline and death within a median period of 18 years of motor symptom onset (Bates et al., 2015). Though deeply frightened, Audrey and Cooper reminded us of that selfless instinct, perhaps as inherent to humanity as our preoccupation with death, and set their thoughts upon the wellbeing of their unborn child. Being an autosomal dominant disease (Bates et al., 2015), the chance of their baby inheriting the pathogenic HTT gene and experiencing HD was 50%. Already, the spectre of death overshadowed the promise of nascent life.

We began to approach some very significant questions, probing at what it means to be human and therefore, what we might like it to mean to be human 2.0; a matter which, unlike our own fundamental nature, we may well have some say. What does it mean to lead a good life? Is the good life attainable amidst ill-health, to what extent, and how do we know? And, harking back to Anderson's presentation, is quality-of-life more valuable than life in and of itself?

With 54% of audience members voting that they were sure or believed that they would terminate a HD pregnancy and the most popular reason for that choice being "my child's quality-of-life will be severely affected", it seemed that the answer to that final question, according to the audience, is yes. Yes, our lives have intrinsic value, but we would certainly not choose to imbue them with needless suffering if we had that choice. Yet even amidst the tragedy that was beginning to unfold for Audrey and Cooper, who ultimately decided to continue with their pregnancy, the tumultuous life of that new baby boy, Jordan, was filled also with the love of his determined parents, and, as a conference and society, we are touched by his now immortal influence and inspired towards better treatments and more inclusive conceptions of infrastructural and social needs to alleviate the inevitable suffering with which life presents us.

### **Dreams of Danger and Delight**

Jordan and his parents faced significant challenges in seeking lives well-lived in the context of disease and vulnerability. If Anderson's presentation reminded us of the immortal possibilities of creativity in our lives and legacies, then University of Melbourne Professor of Emerging Technologies Megan Munsie's presentation reminded us of another fundamental of humanity and another such immortal possibility: the endurance of human hope. And yet Munsie's presentation took a darker tone and set before us the unnerving possibility of false hope and of deceit and victimisation.

Since the first culturing of human embryonic stem cells (Thomson et al., 1998), the possibilities of regenerative medicine to ameliorate a variety of medical conditions has

---

excited both the scientific and public imaginations. Such excitement has only grown in the advent of human induced pluripotent stem cells (iPSCs) (Takahashi et al., 2007; Yu et al., 2007), which can be derived from a patient's own skin biopsy, theoretically enabling the production of any tissue in the body, reducing concerns over immunogenicity, and removing the need to destroy embryos. There is great hope for future regenerative medicine. Yet in the wake of such exciting research, Munsie encouraged vigilance in the pursuit of good science and good medicine. Observing that although the regenerative medicine field is portrayed in the guise of Ehrlich's magic bullet with high levels of public acceptability, there is also a perception of promise and low levels of knowledge and risk perception. The gulf between public perceptions of dreams and dangers is most troubling.

*This age of scientific promise is permeated by hope that many patients have never been afforded.*

After a seizure at age nine and subsequent diagnosis with severe, juvenile-onset HD, Jordan and his parents found themselves at a crossroads. The family were faced with a curious dichotomy: the risk of pursuing unapproved treatments and the existence of the promising public discourse that surrounds them. Indeed, stem cell treatments are promising, with recent trials at the Royal Melbourne Hospital showing significant promise for the amelioration of Parkinson's Disease (Garitaonandia et al., 2018), a neurodegenerative disease like HD, which also affects the basal ganglia of the brain. Other promising biotechnologies and discoveries are emerging across biomedical fields such as transcriptomics and bioelectronics, each discussed by student presenters Ethan Newnham and Natalie Cierpisz respectively

after Munsie's presentation. This age of scientific promise is permeated by a sense of hope that many patients have never been afforded. It is a precious hope that must be preserved, but Munsie explored that it is also a dangerous hope when allowed to move from optimistic rationality founded on logical proof to quixotic expectation founded on hyperbole, such as is characteristic of stem cell "treatment" direct-to-consumer marketing (Sipp et al., 2017). This marketing, although now banned on Google Ads, continues to exert a strong influence over discourse surrounding unproven "treatments" with exaggerated and false claims describing risk-free and successful treatments despite the fact that current clinical research still primarily examines safety, barely broaching the subject of efficacy.

For the minimally complex case of Jordan and his parents, the choice was between slow, iterative yet methodical gene therapy clinical trials and the fast, unidirectional, yet unproven "Encephalink" brain implant technology. Encephalink – a hypothetical brain-computer interface to be implanted into a person's brain to prevent the degeneration of memory, motor, and other neurological functions – was, in our scenario, a yet untried, unproven technology, nonetheless offering great hope amidst the hopelessness of a devastating disease like HD. This choice represents a far larger issue facing society as we face the temptation towards rapid results and grapple with the need to ensure safety and true efficacy of emerging treatments. Munsie showed us that, like many vulnerable patients worldwide, Jordan and his parents are at risk of the "commodification of hope" and the exploitation of their desperation for vast profits. Troublingly, frustrations with often impersonal and cautious mainstream medical care and with insufficient patient support from their treatment teams as Munsie described, have only enhanced the allure of the

---

unproven treatment market. Patients and their families are thus further exposed to emotional and financial exploitation in cycles of mainstream neglect, unproven treatment failure, and the false pretence that “the worst that could happen is nothing” (Petersen et al., 2014), but the best could be healing and a new life. For Jordan, as we found at the Humans 2.0 conference, with a prognosis of approximately 10-20 years more to live with juvenile-onset HD (Nance, 2007), the burden of mortality only increased this desperation to live and to die well.

Amidst this frightening intermingling of dreams and deceptions, Munsie drew attention to the regulatory environments surrounding stem cell therapies and the promising new reforms to the Therapeutic Goods Administration’s (TGA) regulatory authority. Already, the over 70 fraudulent stem cell clinics in Australia has been reduced to approximately 15, and new, informative publications by Stem Cells Australia are aiming to empower patients to make informed choices for their care (Stem Cells Australia, 2022). Yet disinformation and false hope persist. As Munsie reminded us, such reforms often constitute a response that is “too little, too late” as in the case of Sheila Drysdale, whose tragic death caused by medical negligence and the “quack medicine” (Dillon, 2016) of unproven stem cell treatments occurred in 2013 and only precipitated reforms to the TGA from 2019. By the time of Drysdale’s death, already, reform was much too late. The tolls of falsely founded hopes and impotent regulatory mechanisms are unacceptable. For even amidst the turmoil and suffering of disease, moments of goodness persist. Mortality and the loss of all such goodness are bitter prices to pay for the false hope of alleviating the ailments of our mortal bodies. At the hour of death, perhaps the most powerful and painful feeling of all is that of regret; that

had we chosen differently the final hour might not have come so soon.

*...innovation and the possibility of exploitation necessarily go hand in hand...*

### **Who are we now? Who will we become?**

Although death haunts us, we find ourselves preoccupied on most days not by the shade but by the concerns of life; all that we can truly hope to understand as mortals. Relative health and disease states underpin our human 1.0 experience – whether such physical matters will remain of great import to humans 2.0 is a matter for speculation and debate – and concerns surrounding disease and abnormality permeate our fears and our priorities as we navigate our ephemeral lives. Though the mature fruits of nascent scientific discoveries may not impact us today, once again we may have hope that the legacies of new research may beget a future where our children may be relieved of many of the disease burdens of today. Amongst such nascent research is the study of a schizophrenia risk gene; a field of study to which Bachelor of Science student Ethan Newnham recently contributed through experience at the Clark Laboratory at the University of Melbourne. Presenting on his experience characterising an alternative splice isoform and novel exon of the gene, Newnham speculated on the possibility of genetic amelioration of neuropsychiatric disorders such as schizophrenia as being a step along the pathway to our becoming humans 2.0. Though the complexity of gene-environment interactions to generate human traits remains prohibitive, once again, the extravagance of scientific coverage in mainstream media is enough that we ought to, at the very least, be concerned that, like stem cell therapy, gene therapy or gene editing may be areas open to future experimentation and exploitation.

---

Indeed, it seems that innovation and the possibility of exploitation necessarily go hand in hand. As progress is made in science so too are surreptitious prospects for emerging technologies revealed: for profit; for political gain; for control. Such a dichotomous relationship is exemplified by excitement surrounding the development of electronic tattoos, the principal subject of Bachelor of Science student Natalie Cierpisz's presentation, which is necessarily coupled to the research possibilities and ethical dangers of big data. Cierpisz proposed that although the technology will permit efficient monitoring and even modulation of physiological and pathological parameters; as well as the investigation of correlations between biometrics and disease states, the abundance of physiological data may be overwhelming and impractical, or a source of conflict between patients and physicians. Additionally, this big data may also open to exploitation by large corporations, threatening privacy and autonomy.

Drawing on ideas in Nick Bostrom's popular thesis "Why I Want to be a Posthuman When I Grow Up" (Bostrom, 2014), Cierpisz also considered the human telos – the purpose and nature that underpins what it means to be human – asking whether the potential enhancement of our "health span" (Bostrom, 2014) by the pursuit of such technologies as electronic tattoos undermines that telos. Humans, creatures of rationality, are in constant pursuit of health. However, a technology like electronic tattoos merely represents an extension, not a fundamental alteration of the human condition.

*I hope, perhaps naively, that, should the legendary humans 2.0 ever emerge among us, they will treat us with dignity, recognising that in our feeble bodies and minds is contained the same fundamental nature as they...*

In creativity and in hope, it seems that our human experience across history has ever sought to question and to overcome our boundaries, even unto the limits of knowledge and of our mortality. Considering such an interpretation, I wonder whether becoming humans 2.0 can ever truly be possible. Perhaps what it means to be human has little to do with our physical state and with our technological capacities, and much more to do with these more fundamental qualities of endeavour. I hope, perhaps naively, that, should the legendary humans 2.0 ever emerge among us, they will treat us with dignity, recognising that in our feeble bodies and minds is contained the same fundamental nature as they, with qualities of mind and matter differing merely in degree and not in kind. I know enough of history, however, to realise that gross technological and cultural differences rarely make for peaceful, harmonious ends. Reflect for a moment. Could you, a human 1.0, stand to live in a world with humans 2.0? If there were to be a lottery and we would either be allocated a life as human 1.0 or 2.0, could we authorise the inherent inequalities between the physical and mental states separating the human 1.0 and 2.0? Perhaps not. Indeed, if not, it cannot be a just course for humanity (Rawls, 1999). If we cannot all be human 2.0 then surely the risk is much too great that any one among us cross the threshold.

### **A Silicon Hellscape**

Yet this is the very threshold that Jordan found himself approaching. Cooper having succumbed to HD and to mortality, and Jordan's own HD worsening by the day, the lurking inevitability of death drawing ever closer and growing ever more frightening. The fundamental human desire to overcome this limit welled in both Jordan and in his grieving

---

mother, Audrey. So it was that the conference came to consider the notion of “social life after bodily death”.

*Amidst our desperation to hold on to life,  
the hubris of self-preservation,  
and the fear of death and of losing those  
whom we love, the prospect of  
confronting our mortality becomes murky with  
torrents of emotions of all colours.*

We discussed this as a panel of three including Professor in the School of History and Philosophy of Science Michael Arnold, who appeared via video-link – the irony of which, in the context of a discussion about digital life and artificial intelligence (AI), was lost on none of us – Lecturer in Music Psychology and Performance Science, Dr Solange Glasser, and myself, Annabella Lewis, Bachelor of Biomedicine student. The panel also welcomed the insightful contributions of audience members. The beginning of our discussion was underpinned by Glasser’s question: “how much of oneself is sufficient to constitute the self?”. Is our body sufficient? Our mind? Our memories? Our performative social choices? Our digital persona? Is any single combination sufficient or are we necessarily the complete and dynamic sum of all these aspects?

In light of such a question, Arnold proposed three scenarios by which we mortals may divorce our biological selves from our social or digital selves with the express purpose to continue a true semblance of “life” after death. Each scenario was more technologically advanced, more exciting, and more foreboding than its precedent: pre-recorded messages, perhaps released by a third party on the occasion of significant events to intervene in ongoing biological life in loving or loathsome ways; the creation of a chatbot software using the digital data of the deceased as in the case

of John Vlahos’ “Dadbot” to allow the living to continue to communicate with the semblance of the dead; and, most dramatically, the combination of such data with advanced AI to create a growing, evolving, computerised personality. With each iteration of social life after bodily death from simple, static messages to complex, adaptive intelligence, questions of ontology, identity, relationships, and ethics pervaded discussion.

Amidst our desperation to hold on to life, the hubris of self-preservation, and the fear of death and of losing those whom we love, the prospect of confronting our mortality becomes murky with torrents of emotions of all colours. In a society where respect for the dead remains an important tenet and in which, as Anderson explored, the legacies of the dead exert enduring influence, the potency of the voices of the dead may exert undue influence over the living who remain. Not only does the preservation of these revered voices threaten the enforcement of guilt, exploitation, and malicious intent without consequences for the deceased but it fundamentally threatens the profound healing process that must take place after the loss of a loved one. Losing a loved one is grief enough. How much worse a grief might be that which is forever prolonged by clinging to the imperfect digital semblance of a loved one? Worse still, an evolving AI represents the ultimate possibility for grief: the utter bereavement of rejection by a digital being, the supposed ongoing incarnation of your loved one now lost, who no longer understands nor cares for you.

*...believing whole-heartedly in the notion that  
science will be our saviour, we pursue  
innovation to its utmost degree...  
blind to or wilfully ignorant of the existential  
dangers...*



---

I couldn't help but suspect that such a technology might represent a mere excuse to create an advanced AI, leveraging the vulnerability and desperation such as of Audrey, a widow on the verge of losing her only child. As we navigate the frontiers of research and innovation, society must take a special interest in the vulnerable for, ultimately, it is through preying upon their suffering and corrupting their hopes that so-tempted individuals will seek to exert a god-like influence over their kin. Even as responsible, valid science mingled with considered ethics strives towards true help to the vulnerable, there will emerge at every turn those who would feign such virtuous motivation but ultimately merely use the vulnerable as test subjects or sources of income.

Yet our discussion of social life after bodily death was coloured by perhaps an even more menacing fact. The frontiers of science are most frightening, not when they pursue clearly immoral paths as in the case of exploitative, profit-driven stem cell clinics, but when we follow these paths blind to, or wilfully ignorant of, the existential dangers that they pose. When, believing whole-heartedly in the notion that science will be our saviour, we pursue innovation to its utmost degree only to leave widows to weep as their artificial sons reject them and, set loose a fundamentally inhuman force unfettered by the one force that truly controls humanity: our mortality.

For though qualities of innovation, creativity, hope, and determination also underpin the human condition, our mortality too, as one astute person in the audience observed, has ever been at the very heart of our nature. We are, by our nature, limited: limited by want of knowledge and by sheer lack of time. The creation of a being like "Jordan 2.0" – the AI rendition of Jordan that might extend eternally beyond the death of "Jordan 1.0" – removes

this fundamental limitation. Without this common experience, could Jordan 2.0 ever hope to identify with mortal beings? Without the limitations of time and physicality, the breadth and depth of knowledge that Jordan 2.0 could hope to attain is just as unconstrained as his span of years. Why should he abide by our limited governance? Why should we hope to retain our autonomy without first and fundamentally constraining his? The emergence of such advanced AI technologies may yet open the floodgates of the singularity hypothesis such that super intelligent AI with vastly different values, goals, and conceptions of the world, will reshape that world with little heed for human concerns (Yampolskiy & Fox, 2012). Yet once even a low level of sentient AI is achieved, fresh ethical concerns over the restriction of such a "being" arise; we are, in a sense, caught in a bind between existential threat and utter moral degradation if we pursue such AI as Jordan 2.0. We cannot afford to be naïve.

I am reminded at this point of a modern translation of Dante's "The Divine Comedy" by Australian writer Clive James. At the gate of hell reads an ominous sign both for Dante and for us as we stand upon the threshold of the future: "your future now is to regret the past. Forget your hopes. They were what brought you here." (Dante, 2013).

Perhaps there is a strange blessing in embracing the opportunities of our mortality. In our ephemerality, we have impetus to strive for the goodness in each of our numbered days and to make individual choices and mistakes, each of which gives us a unique identity, and to cultivate devoted relationships; all are richer for their necessary brevity. We have autonomy, and the perfect reason to use it as well as we can according to our own conceptions and identities.

---

## The Power of Choice

As Jordan, in his final years, quickly becoming a young man with full immersion in his own medical care and a burgeoning sense of autonomy, made the decision to defy Audrey's wishes, and abandons the conventional path of clinical trials in pursuit of the "Encephalink" brain implant. This question of autonomy, especially in the context of children, came to the fore. Academic director and clinical ethicist at the Children's Bioethics Centre at the Royal Children's Hospital Melbourne, Professor Lynn Gillam explored our personal capacity to make choices and the higher ethical, and legal regulation of our autonomy.

As novel technologies and human capabilities emerge, so too do possible choices. Already, questions about personal freedoms are inherently tortuous and have engendered controversy throughout human history. In our increasingly complex world, brimming with new contexts and new choices, these questions will only grow all the more impenetrable. Foregrounded by Jordan's own controversial decision to pursue a brain implant, Gillam invited us to consider whether there are choices that we should be encouraged to make, as is currently the case for prenatal screening in the context of severe congenital defects and genetic disorders; and, more troublingly, whether there are choices that a paternalistic state should restrict us from making. Here, Gillam drew a crucial distinction between the related concepts of liberty and autonomy. In a true state of liberty, each individual would be free to make their own choices from the entire suite of almost limitless choices: to choose the way they walk to work; to choose what they will eat for breakfast; to choose to treat their peers with respect; to choose to try experimental, untested pharmaceutical products; to choose to bully their peers; to choose to maim and to

kill. Liberty is a tempting and attractive state in a world where one could trust in the goodness of humankind, but a dangerous prospect in reality. Alluding to the renowned ideas from John Stuart Mill's "On Liberty", Gillam speculated on the reasons why society might choose "autonomy", where an informed, capable individual can make some choices that are restricted in kind, rather than true liberty. Choice is a powerful thing. Gillam's presentation prompts us to consider the extent to which we should be trusted with such power.

*In our ephemeral, mortal lives, the ability to choose in a way that is meaningful... to us as individuals is a most beautiful blessing.*

Perhaps a more difficult question still is that of the extent to which we permit paternalistic restrictions in choosing autonomy over liberty. If we give ourselves over to governance that restricts our liberty for our own safety and wellbeing as English philosopher Thomas Hobbes detailed in his seminal work "Leviathan", we must be wary of the extent and nature of that governance. If we are to achieve autonomy and neither a state of "everyone against everyone" (Hobbes, 1924) nor of complete oppression, these difficult questions become of paramount importance. Fortunately, Gillam and, reaching forward to us from history, Mill, had, if not answers, then at the very least, a series of ethical considerations with reasons to restrict freedom of choice.

Jordan's story provided a useful base from which to examine such considerations. As a 15-year-old child making a decision against his mother's wishes without the ability to be certain of the long-term consequences of pursuing a novel technology that may alter his thinking, emotions, and personhood and even to place these things under the control of a private company, Jordan's decision is plagued

---

by immense ethical complexity. Mill, through Gillam's analysis, proposes numerous bases from which to restrict choice in order to enhance autonomy for each member of society. These include: incomplete or manipulated information; harm to others or the self; and the surrender of the capacity for future choice (Mill, 1859). Yet this seemingly simple and broadly applicable set of criteria, Jordan's case revealed, does not illuminate the intricate nuances of all situations.

Incomplete and manipulated information is a grand challenge of our time as Munsie highlighted earlier in the conference. In the context of unproven stem cell treatments, it seems clear that we ought to regulate the providers to thereby remove the choice of consumers, thus indirectly restricting them in order to prevent them from being manipulated into possible financial, physical, and emotional harms. On the other hand, there remains the question of whether we can prevent individuals from exercising choice from options that are, conventionally or extrajudicially, potentially available to them especially when information is incomplete or unknowable. In the context of Jordan, information about the novel "Encephalink" technology is unknowable; does this justify restricting his choice? Gillam highlighted, however, the fact that all choices concerning the future are, by their very nature, uncertain. The fact of uncertain consequences alone, therefore, seems an insufficient reason to restrict autonomy. Thus, the ability of an individual to analyse the information available to them becomes an important concern, especially in the context of adolescents. Would another few years of maturity improve Jordan's capacity for decision-making and autonomy? Did Jordan have another few years? Does this make a difference to his right to choose? Numerous legal tests of adolescent competence –

sometimes called "Gillick" competence after the originating UK court ruling ("Child protection," 2013) – in medical decision making have been proposed, including demonstration of understanding of the nature, risks, benefits, and application of information in considering a proposed medical treatment ("Paediatrics, ethics, and the law," 2013). It seems, however, unfortunate to me that such emotionally charged, life-altering decisions should come down to a legal dispute and not to a collaborative decision between invested parties.

For the possibility of harm, even if uncertain, to the self and to other invested individuals remains an important issue. Gillam observed that it is nigh on impossible to imagine a choice that truly affects no one but the individual making it. Gillam asked us to think back to Jordan as a foetus: would abortion on the grounds of a prenatal HD diagnosis constitute a choice of harm to the developing yet unborn baby? And to the present, we considered harms to fully autonomous human beings. Audrey, for example, was vehemently opposed to Jordan's choice; she will be harmed psychologically not only by the choice itself but by Jordan's underlying decision to reject her express wishes. Here, the matter became all the murkier as we considered the relative importance of objective and subjective harms and, with even less certainty, how to assess the weight that should be given to subjective harms, especially those with potentially objective psychological corollaries. The choice of abortion, according to Gillam, represents an objective harm to a non-autonomous being (although some might argue that not terminating the pregnancy may constitute a subjective harm to a being with potential future autonomy due to the potential for future suffering), whereas Jordan's choice to pursue "Encephalink" represents a subjective harm to a fully autonomous being (to Audrey). The

---

boundaries of just regulation lack clarity. The Humans 2.0 conference did not hope to illuminate these boundaries, but I hope that all attendees might now consider them more thoughtfully for having attended; perhaps together we might someday combine our thoughts and legacies to produce a sensitive, interdisciplinary solution.

Autonomy is another fundamental value of the human telos. Restricting that autonomy either through poor legislation or personal choice is unacceptable. That one should not give oneself over to slavery and lose autonomy is a basis on which we might restrict a person's availability of choice (Mill, 1859). For Jordan, this raises many questions not least of which concerns, once again, data integrity, privacy, and control as he gives over his memories and neurological identity to "Encephalink". In this, it seemed all the more pressing to restrict Jordan's irreversible choice of unknowable yet potentially deeply troubling consequence for "hell is truth seen too late" (Hobbes, 1924).

Akin to the choice of becoming a posthumous AI, it is also worth considering whether highly advanced brain implant technologies fundamentally change our nature of being. Ultimately, we returned to the matter of identity, of what it means to be human and what it means to be a particular human. Does the alteration of one's memory, as proposed by Humans 2.0 Editorial Board member Mark Gillam, alter one's identity? If so, what does this mean for the relevance of one's past choices and former identity? This raises pertinent questions not only for the hypothetical scenario of Jordan but, more pressingly, for how we care for patients with dementia and other neurodegenerative diseases, who may be said to have lost autonomy, in the context of advanced planning, recognising the person's evolving identity and preferences in tandem

with earlier directions given by the fully autonomous person. Again, such questions are difficult to resolve but in sore need of consideration for they can only become more complicated in an ageing population and in the context of emerging technologies.

### **Transcendence**

We value choice for it allows us to pursue "our own good in our own way" (Mill, 1859). In our ephemeral, mortal lives, the ability to choose in a way that is meaningful and, in the knowledge of life's brevity, pertinent to us as individuals is a most beautiful blessing. We can pursue the good life even if we know not for certain what that may be. We can make choices that lead us on that good path. And through these choices, we can shape our legacies. On a whiteboard at the front of the lecture theatre, Professor Gillam left for us a familiar message, the motto of the University of Melbourne, which was now laced with new significance: *Postera Crescam Laude*. We may be but mortals, but through our brief lives we can take comfort that the goodly and unique legacies that we build today will "grow in the esteem of future generations" (The University of Melbourne, 2022). Jordan's legacy following his death and the end of the conference has certainly lived on for us at Humans 2.0. After the conference, the Humans 2.0 team wondered at how the world would react to Jordan 2.0: what might you say to him were you to meet him? The nascence of Jordan 2.0 is, morally dubious, technologically challenging, and, of course, highly controversial. We wondered whether this controversy would permeate exchanges with Jordan 2.0 and how we might seek to unite or differentiate ourselves from such a strange being. Could he ever be a member of our society? Or would he be doomed to social exclusion? The consequences, either way, make for chilling

---

contemplation.

For now, we can be safe in the knowledge that this will be a one-way exchange.

Considering such speculations about the relationships between humans 1.0 and 2.0, Dr Jiang-Li Tan, a founding member of the Humans 2.0 staff team, has written a letter to Jordan 2.0.

Could it ever be more?

Should it ever be more?

## References

- Bates, G. P., Dorsey, R., Gusella, J. F., Hayden, M. R., Kay, C., Leavitt, B. R., Nance, M., Ross, C. A., Scahill, R. I., Wetzell, R., Wild, E. J., & Tabrizi, S. J. (2015). Huntington disease. *Nat Rev Dis Primers*, 1, 15005. <https://doi.org/10.1038/nrdp.2015.5>
- Bostrom, N. (2014). Why I Want to Be a Posthuman When I Grow Up. In R. L. Sandler (Ed.), *Ethics and Emerging Technologies* (pp. 218-234). Palgrave Macmillan UK. [https://doi.org/10.1057/9781137349088\\_15](https://doi.org/10.1057/9781137349088_15)
- Child protection. (2013). In R. C. Tasker, R. J. McClure, C. L. Acerini, R. C. Tasker, R. J. McClure, & C. L. Acerini (Eds.), *Oxford Handbook of Paediatrics* (pp. 0). Oxford University Press. <https://doi.org/10.1093/med/9780199608300.003.0028>
- Dante. (2013). Book I: Hell (C. James, Trans.). In *The Divine Comedy*. Picador
- Poetry. Dillon, H. (2016). *Inquest into the death of Sheila Drysdale*. C. C. N. S. Wales.
- Garitaonandia, I., Gonzalez, R., Sherman, G., Semechkin, A., Evans, A., & Kern, R. (2018). Novel Approach to Stem Cell Therapy in Parkinson's Disease. *Stem Cells Dev*, 27(14), 951-957. <https://doi.org/10.1089/scd.2018.0001>
- Hobbes, T. (1924). *Leviathan* / by Thomas Hobbes. J. M. Dent.
- Mill, J. S. (1859). *On liberty* / by John Stuart Mill. J.W. Parker and son.
- Nance, M. (2007). *The Juvenile HD Handbook: A Guide for Families and Caregivers* (K. Tarapata, Ed. 2 ed.). Huntington's Disease Society of America.
- Petersen, A., Seear, K., & Munsie, M. (2014). Therapeutic journeys: the hopeful travails of stem cell tourists. *Social Health Illn*, 36(5), 670-685. <https://doi.org/10.1111/1467-9566.12092>
- Poynter, J. R. (1972). Felton, Alfred (1831–1904). In *Australian Dictionary of Biography*.
- Rawls, J. (1999). *A theory of justice* / John Rawls. Oxford University Press.
- Sipp, D., Caulfield, T., Kaye, J., Barfoot, J., Blackburn, C., Chan, S., De Luca, M., Kent, A., McCabe, C., Munsie, M., Sleeboom-Faulkner, M., Sugarman, J., van Zimmeren, E., Zarzeczny, A., & Rasko, J. E. J. (2017). Marketing of unproven stem cell-based interventions: A call to action. *Sci Transl Med*, 9(397). <https://doi.org/10.1126/scitranslmed.aag0426>
- Stem Cells Australia. (2022). *Dispelling myths*. Retrieved 30 September 2022 from <https://stemcellsaustralia.edu.au/>
- Takahashi, K., Tanabe, K., Ohnuki, M., Narita, M., Ichisaka, T., Tomoda, K., & Yamanaka, S. (2007). Induction of pluripotent stem cells from adult human fibroblasts by defined factors. *Cell*, 131(5), 861-872. <https://doi.org/10.1016/j.cell.2007.11.019>
- The Editors of Encyclopaedia Britannica. (2013). Pedanius Dioscorides. In *Encyclopaedia Britannica*.

- 
- The University of Melbourne. (2022). *Our vision*. Retrieved 1 October 2022 from <https://about.unimelb.edu.au/vision>
- Thomson, J. A., Itskovitz-Eldor, J., Shapiro, S. S., Waknitz, M. A., Swiergiel, J. J., Marshall, V. S., & Jones, J. M. (1998). Embryonic stem cell lines derived from human blastocysts. *Science*, 282(5391), 1145-1147. <https://doi.org/10.1126/science.282.5391.1145>
- Yampolskiy, R. V., & Fox, J. (2012). Artificial General Intelligence and the Human Mental Model. In A. H. Eden, J. H. Moor, J. H. Søraker, & E. Steinhart (Eds.), *Singularity Hypotheses: A Scientific and Philosophical Assessment* (pp. 129-145). Springer Berlin Heidelberg. [https://doi.org/10.1007/978-3-642-32560-1\\_7](https://doi.org/10.1007/978-3-642-32560-1_7)
- Yu, J., Vodyanik, M. A., Smuga-Otto, K., Antosiewicz-Bourget, J., Frane, J. L., Tian, S., Nie, J., Jonsdottir, G. A., Ruotti, V., Stewart, R., Slukvin, I., & Thomson, J. A. (2007). Induced pluripotent stem cell lines derived from human somatic cells. *Science*, 318(5858), 1917-1920. <https://doi.org/10.1126/science.1151526>