



# DUTCH DESIGNER BABIES

The Dutch public debate from prewar eugenics to present-day biotechnology



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## *Prologue*

*'De mensheid perfectioneren: moeten we dit willen?'* It was by the end of 2016 that I read this header in *de Volkskrant*, followed by an extensive article on the public fear of the future genome editing applications of the technique CRISPR-Cas9. 'Will this technique, which allows for altering one's DNA, lead to a future of designer babies and genetically perfect humans?' was the main question asked by the author. Interestingly, this article, which hinted towards a dystopian future of genetically enhanced humans, got stuck in my head for a while. Having learned a thing or two about the history of biology during my time as a History and Philosophy of Science student, I found myself wondering whether this debate resembles past bioethical discussions.

By that time, I had just started working on my master's thesis on the reception of evolutionary theory in early twentieth century Islamic Republic of Iran. Inspired by that year's study trip to Teheran's History of Science department, I wondered whether the reception of evolutionary theory had faced similar responses among Islamic intellectuals as among those in the Christian West. However, as it turned out, not being able to read Farsi quite reduces the amount of primary sources available for studying the history of this Persian Empire.

During the same time, I often found myself having discussions with my friends and roommates on their thoughts on these 'designer baby' technique, as CRISPR-Cas9 is often called. Already a fan of dystopian science fiction novels such as *Brave New World* and the *Handmaid's Tale*, I still wondered about the public's fascination with human genetic enhancement and the taboos, stigma's and fears glued to this topic.

After a meeting with Bert Theunissen, my thesis supervisor, on the troubles I faced on my Iran thesis, we concluded that it might be wise to start looking for a different topic. Still wondering about the public thoughts on gene technologies, I suggested researching science fiction films and novels over time, to get a hint of the public image of human genetic enhancement. Supporting my interest in this topic, Bert helped me turn this idea into a newspaper-based research on the present day public image of CRISPR as well as on early twentieth century eugenics. This time, playing it safe, and choosing the Netherlands as the demographic area that I wanted to study.

Whereas I started off enthusiastically, fascinated by the early twentieth century Dutch newspapers I encountered during my research, it turned out that the histories of eugenics as well as genetics are both quite extensive, making it hard to keep track of what it is that I actually wanted to investigate, and, evenly important, wanted to leave out. After a while I got stuck and decided to take a break from my research. Whereas my research question was the product of my

skepticism towards the belief in perfecting humankind, as claimed by *De Volkskrant*, I had to face the fact that turning my research into a perfect thesis seemed questionable as well, and rather science fiction than reality.

Feeling that I needed a break from the academic world and curious for experience in communicating science outside academic spheres, I chose to do an internship at the Utrecht based cultural venue TivoliVredenburg. Here, I gained experience in organizing lectures, panel discussions and public debates on various topics. Interestingly, I also helped organizing a talk show about the future of reproduction techniques, geneticist Sjoerd Repping and bio-ethicist Eline Bunnik being two of the talk show guests. This event confirmed that there are still many people fascinated by future reproduction techniques, including gene editing techniques, not only students and scientists but also future parents and couples which cannot have children that are biologically their own. This inspired me to continue working on my thesis after I finished this internship.

What you read next is a thesis I worked on spread out over a period of almost two years. I want to thank both Bert Theunissen and Hieke Huistra of keeping track of my developments and for all their help and pushes in the right direction. Hieke, thank you a lot for guiding me through the online world of newspaper databases and helping me set up these two researches. Your articles have served as helpful inspiration during this process. Bert, thank you so much for all the appointments and the critical notes towards the end. The feedback I was given by both of you has been really helpful in conducting this final version. Finally, I want to thank my friends and family who supported me throughout this significant period of my life. After editing, deleting and pasting this CRISPR-baby inspired thesis, I can conclude, as we say in Dutch; *het was een hele bevaling*.

# Introduction

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*“Genetic engineering represents our fondest hopes and aspirations as well as our darkest fears and misgivings. That’s why most discussions of the new technology are likely to be so heated. The technology touches the core of our self-definition.”*

—Jeremy Rifkin, *The Biotech Century* (xii)<sup>1</sup>

Imagine that you and your partner both carry a gene for cystic fibrosis (CF): an incurable hereditary disease, which causes permanent lung defects and other symptoms that considerably affect one’s quality of life. You both want children that are biologically your own, but the chances of them having the disease are one in four. Would you take the risk? If possible, would you use embryo selection to select for children without CF genes? What if scientists could just as well delete CF genes in your children at the embryonic stage? Would you allow such techniques to alter your child’s DNA in order to have a life without such a troublesome disease?

New genetic techniques allow this latter scenario to become less science fiction and a more realistic future scenario. The recently developed biotechnology

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<sup>1</sup> Rifkin, J. *The Biotech Century* New York: Penguin/Putnam, 1998, from Kirby, A.D. The New Eugenics in Cinema: Genetic Determinism and Gene Therapy in GATTACA, *Science Fiction Studies*, vol. 27, pt. 2 (2000)

CRISPR-Cas9, often referred to as CRISPR, allows scientists to selectively cut or alter a specific site on any organism's genome. This means that, theoretically, we could eliminate genetically heritable diseases in human embryos. However, these techniques do not come without ethical concerns: if we are able to alter DNA of our future children, are we allowed to do so? Are there any risks or side effects? Which innate properties are we allowed to delete, alter or enhance? Which genetic traits should remain untouched by this technology? Should these decisions be made by scientists, doctors, ethicists, lawyers or a child's parents? Finally: if CRISPR were to be applied, would it be a completely new form of human enhancement, or merely a next step in medically improving quality of life?

Multiple twentieth century science fiction novels and films lead us to believe that the questions that arise from CRISPR are not entirely new. Even before much was known of the biochemistry of genetics, in 1932, Aldous Huxley's famous work *Brave New World* depicted a dystopia in which humans are artificially bred to sustain a hierarchy based on physiological and mental fitness. Ten years later, Robert A. Heinlein's *Beyond the Horizon* was the first story to depict a world where genetic selection for increased health, longevity, and intelligence has become the norm. Actual genetic technologies became reality in the early seventies, leading gene therapy to appear in science fiction films, such as the low-budget British horror film *The Mutations* (1974). In this film, a scientist tries to create a better human race by inserting plant genes into human beings.<sup>2</sup> More interesting, the more recently produced film *GATTACA* (1997) is often mentioned as a product of the public interest and concerns on future human genetic modification. The film revolves around a 'not too distant future' in which hardly any child is born without careful prenatal genetic screening and embryo selection based on one's genetic profile. In this dystopian

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<sup>2</sup> Kirby, D.A. (2000) p. 23

world, discrimination based on one's genome has become reality.<sup>3</sup> The protagonist, Vincent, who was born the 'natural' way, proves that he can overcome his genetic flaws, and that we are more than our genes: this way, the film criticizes a genetic determinist view, thereby deviating from various other nineties science-fiction films that do hold a scientific determinist ideology.<sup>4</sup>

Clearly, the topic of artificially enhancing human beings has recurred to intrigue the general public. Whereas the film *GATTACA* was a product in times of the Human Genome Project, the books by Huxley and Herlein were published in a time of increased interest in the science of heredity as well as the time in which, not unrelated, the eugenics movement was most successful. Interestingly, developments in human genetics have often gone accompanied by references to, or fear of, eugenics: a term heavily charged due to its ties to Nazi Germany during the Second World War. Some have condemned practices in reproductive genetics as a form of eugenics, whereas others argue that modern gene modification techniques, as well as its possible applications, differ fundamentally from past eugenic ideals and practice in its goals and means. Among bioethicists, opinions vary widely on whether human gene modification should be performed, if actually possible, whether it should be dealt with very carefully or whether it's a slippery slope into modern day eugenics.

Therefore, the eugenics movement is an unavoidable element when investigating the roots of the public debate on genetic technology: eugenics was not simply a sideline to our cultural heritage, but rather a central component of European modernity.<sup>5</sup> A comparison of the modern discourse on gene editing to eugenics shows that the ethical dilemmas on the roots of all this have existed over at least a decade

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<sup>3</sup> Ibid., pp. 6-9

<sup>4</sup> Ibid., p. 7

<sup>5</sup> Huijnen, P. et al, A Digital Humanities Approach to the History of Science, *Social Informatics*, November 25, 2013. p. 73



among intellectuals.<sup>6</sup> Some have even named present day gene technologies ‘neo-eugenics’, since both aim to increase ‘good birth’.<sup>7</sup>

Looking at eugenics’ history shows that the degree to which eugenic thought was present, and its measures were exercised, differed among various western countries. For example, eugenics has allowed for several radical measures in some countries, such as sterilization laws for the heritably ‘unfit’ as compared to the ‘fit’. The most prevalent negative associations made with eugenics are Nazi practices of actively eliminating the ‘weak’, which, in their eyes, were Jews, other abled, homosexuals and several other minorities. Birth control measures following the eugenic thought have also taken place outside Nazi Germany, most infamously in Scandinavian countries. Here, until the seventies, sterilizations were justified due to the costs of institutional care for the weaker and proclaimed inability of the mentally ill to raise children. Additionally, it was thought that dysgenic citizens were a threat to the quality of race.<sup>8</sup> The history of eugenics in countries that adapted these sterilizations has been studied thoroughly. However, it has been shown that some western countries did not adopt such extreme measures, which does not mean that eugenic thought was not present.<sup>9</sup> A country that fits this description is the Netherlands.<sup>10</sup>

Since the motive for studying eugenics history is learning more about the public image of present day human enhancement by means of the CRISPR technology, it would be most relevant to study the public image of eugenics as well. However, twentieth century eugenics is often described only in the context of scholars and movements of scientists, anthropologists, doctors and ethicists. Nevertheless, its proposed measures directly affected family life, personal choice and freedom of

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<sup>6</sup> Van den Berghe, G. *De Mens Voorbij*, Antwerpen, 2008

<sup>7</sup> Suter, S. A brave new world of designer babies? *Berkeley technology law journal*, Vol. 22 (2015) p. 899

<sup>8</sup> Dikötter, F. Race Culture: Recent Perspectives on the History of Eugenics, *The American Historical Review*, Vol. 103, No. 2 (Apr., 1998), p. 469

<sup>9</sup> *Ibid.*, pp. 467-478

<sup>10</sup> *Ibid.*, p. 476

marriage and childbirth of all individuals. Therefore, studying public debate on eugenics is an interesting way to learn about eugenics' impact on society as a whole. Therefore, for this thesis, I have chosen to look at the Netherlands to study the transformation of the public debate on eugenics to the public debate on modern gene technologies as a proclaimed form of 'neo-eugenics'. This results in the question: *'How has the Dutch public image of artificially enhancing human heredity, from eugenics to modern gene technology, transformed over the last century?'*

Newspapers have been important resources for historical and contemporary research. They are of great value in showing a *zeitgeist* and the public image of historical phenomena. Therefore, I have chosen to study newspaper articles in order to answer my research question. I will use a digital source selection method and rely on digitalized databases, combining search words to obtain a proper corpus of texts that fit the study. I expect the usage of digitalized databases to provide some benefits as well as to present some obstacles.

First of all, using digitalized databases is an adequate way to get quick access to a large corpus of newspapers, both historical and contemporary. Large-scale digitalization of newspapers reduces time and distance that is involved in analogue newspaper research.<sup>11</sup> Additionally, newspapers' role in society is largely consistent over time and space; therefore allowing comparisons over time.<sup>12</sup> Yet, an obstacle in comparing newspapers from the first half of the twentieth to more recent newspapers is, that it requires two different types of search engines, due to the fact that the digital database that holds the most inclusive collection of Dutch historical newspapers, Delpher, only holds newspapers until 1995, requiring a different source selection method for my second research.<sup>13</sup> This entails the risks of using different selection criteria and proportions of archived newspapers in both researchers. Moreover, it is

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<sup>11</sup> Broersma, M. J. Nooit meer bladeren? Digitale krantenarchieven als bron. *Tijdschrift voor mediageschiedenis* 14:29 (2012) p. 29

<sup>12</sup> Ibid., p.35

<sup>13</sup> <https://www.delpher.nl/nl/platform/pages/helpitems?nid=385>

acknowledged that, while using digitalized search engines in searching for newspaper articles, the historian loses all forms of physical contact with newspapers and is left with little knowledge on the size and content of the newspaper that has published an article of interest - similar to a black box.<sup>14</sup> Taking these risks into account, I expect the benefits of studying newspapers to outweigh the risks, and choose to use newspapers as primary sources for both researches.

Before embarking on this research, I will give an outline of the history of eugenics in general, and, more specifically, eugenics in the Netherlands in the early twentieth century in the first chapter of this thesis. This will be followed by a research on Dutch newspaper articles from 1920 to 1940, since this timespan has shown to provide the most articles on eugenics in Dutch newspapers. The second part of this thesis will revolve around developments in genetics and bioethics and the transformation of eugenic thought in relation to these developments, as discussed in the third chapter. Next, chapter four discusses the Dutch public debate on CRISPR by analyzing contemporary newspapers. This second research will focus on the timespan from 2015 to 2018, since CRISPR's scientific and public breakthrough was in April 2015. The discussion section will provide a comparison of both researches, to see if, and how, the current public debate on CRISPR resembles the historic debate on eugenics.

I expect my first research to show the Dutch public to be hesitant towards eugenics, since actual eugenic applications have never been officially applied. Possibly, religious, most likely Roman Catholic, arguments have been used as moral objections towards the application of eugenic measures. I expect the eugenics movement, due to its ties to Nazi Germany, to have had a negative influence on how the public sees the application of CRISPR on the population level. Also, I expect the

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<sup>14</sup> Broersma, M. J. (2012) pp. 38-39

Roman Catholic Church to be of greater influence in the public's moral views towards eugenics compared to possible religious influences on the public's moral thoughts towards CRISPR. Considering the question if, and if so, for what type of genetic traits CRISPR should be allowed to remove material from embryonic DNA, I expect most articles to support deletion of severe genetic diseases, but to be cautious of its application in deleting less troublesome traits or enhancing other traits. Finally, due to the discrepancy in knowledge on the science of heredity, I expect advocates of eugenics to support its application towards a different type of traits as compared to the types of hereditary diseases CRISPR is supposed to cure.

Concluding, this thesis offers a research on both the Dutch public debate on eugenics from 1920 to 1940, and on the recent developments of the CRISPR technique from 2015 to 2018, by using digitalized newspaper databases to investigate newspapers, in an attempt to answer the question: *'How has the Dutch public image of artificially enhancing human heredity, from eugenics to modern gene technology, transformed over the last century?'*

# Chapter 1

## *How eugenic thought made its way to the early twentieth century Netherlands*

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*Domesticated animals and plants have been greatly improved by selective breeding. Why should not the same thing be done for man? This project of improving the human stock through selective breeding is called Eugenics.*

*– H.S. Jennings, 1930<sup>15</sup>*

Over the course of the nineteenth century, Europe's population had risen from 180 to 460 million. This had caused some intellectuals to fear overcrowding due to 'population explosion' and mass culture.<sup>16</sup> In Victorian Britain, as well as several other countries, a large gap had come to exist between the intellectuals and the larger, working class. Friedrich Nietzsche radically claimed for an imbalance between 'higher men' and 'the great majority'. The latter, he argued, had no right to existence.<sup>17</sup>

During the same period, the biological sciences were enriched by Charles Darwin's *On the Origin of Species* (1859). Darwin's later work, *The Descent of Man, and Selection in Relation to Sex* (1871), applied his concepts of evolution and natural

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<sup>15</sup> H. S. Jennings, *The Biological Basis of Human Nature*, New York (1930) p. 223

<sup>16</sup> J. Carey, *The Intellectuals and the Masses, Pride and Prejudice Among the Literary Intelligentsia 1880-1939* (1992) p. 3

<sup>17</sup> *Ibid.*, p. 12

selection directly to humans. Both of the books have had their impact on science as well as society, *The Descent* most notably in the form of social Darwinism. In a Britain that had fallen victim to mass population growth, inspired by the biology of Darwin, Francis Galton formulated the concept of *eugenics*: the practice of improving the human population by stimulating the breeding of those with hereditary good traits into an ideal human race.<sup>18</sup>

The idea of artificial selection among human populations has existed as long as mankind. The Spartans in ancient Greece already killed weaker babies, aiming for a healthy and strong citizenry. Plato argued in his notable work *The Republic* for a guarantee of the quality of the race, by making sure only men and women of 'good characteristics' interbred.<sup>19</sup> However, it was not until the nineteenth century that the belief that some individuals have more right to give birth to future generations than others would lead to a widespread movement.

Francis Galton, one of Charles Darwin's cousins, was a mathematician who has been of great influence in shaping the field of statistics. However, Galton gained most of his fame by coining the term 'eugenics' in 1883. Clearly, he was not the first to theorize on the eugenic concept. However, as the Dutch geneticist S.J. Geerts put it, he was the voice of many.<sup>20</sup> Galton had intended the term to denote 'the science of improving human stock by giving the more suitable races a better chance of prevailing speedily over the less suitable.'<sup>21</sup> Eugenics offered thoughts on how to react to the imbalance in society between intellectuals and the masses, and how to improve the quality of humankind.

In the years following the foundation of the eugenic movement, the most accepted theory on heredity mechanisms was August Weismann's 'germ plasm

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<sup>18</sup> D. J. Kevles *In the Name of Eugenics: Genetics and the Uses of Human Heredity*, Berkeley and Los Angeles (1986) p. 8

<sup>19</sup> C. Buskes, *Evolutionair denken: De invloed van Darwin op ons Wereldbeeld*, Amsterdam (2006) pp. 397-398

<sup>20</sup> Dr. S. J. Geerts, *Een Eeuw Eugenetische Selectie*, Nijmegen (1984) p. 2

<sup>21</sup> D. J. Kevles (1986) p. xi

theory', coined in 1893. This theory hypothesized that an organism's hereditary substance, referred to as germ plasm, was transmitted unchanged from parent to offspring via germ cells. This contrasted with the formerly accepted concept of Lamarckian inheritance, which assumed that acquired traits could be transmitted from parent to offspring.<sup>22</sup> By combining Darwin's theory of evolution with Weismann's germ plasm theory, Galton aimed at giving his eugenics a scientific foundation.<sup>23</sup> From 1900, the germ plasm theory would gradually be replaced by Mendelism, which presupposed genes as the carrier of hereditary traits, as we still do today.

In 1907, Galton founded the Eugenics Education Society, which would later be named the Eugenics Society.<sup>24</sup> Its membership consisted of intellectuals and social reformers. During the first few months, several meetings were held, with lectures such as: 'Mendelism and Human Society', 'Mental integrity and how to attain it' and 'Selection in Marriage'.<sup>25</sup> This British organization aspired to discourage or prevent the increase of those inferior and to offer incentives to superior people to propagate. The eugenic society as well as its ideas to control childbirth was connected to the controversial birth control movement: "limitation of births would ease the financial burdens upon lower-income families, safeguard the health of the mother, and permit better care for the children who were produced."<sup>26</sup>

Summarizing, the organization's eugenic practice aimed at biologically improving the human population by controlling which persons were allowed to procreate and who should be prevented from creating offspring. Stimulating marriage and childbirth in the 'fit' - those with favorable heritable traits- has been referred to as positive eugenics. Contrastingly, acts in favor of inhibiting procreation among the 'unfit' would be denoted as negative eugenic measures. By implementing both

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<sup>22</sup> Ibid., pp. 18-19

<sup>23</sup> Dr. S. J. Geerts (1984) p. 1

<sup>24</sup> J. Carey (1992) p.13

<sup>25</sup> *Eugenics Review*, April 1909, p. 53

<sup>26</sup> As argued by Havelock Ellis, from: D.J. Kevles (1986) p. 88

strategies, the Society hoped that the danger of degeneration inherent in the masses might be avoided. In their view, heredity governed not only physical features, but also talent and character.<sup>27</sup>

### **Eugenics as a global phenomenon**

In the early twentieth century, the British eugenic beliefs spread internationally, leading several countries to found their own eugenic organizations throughout Western Europe, the United States, South America and China. Although the success of eugenic societies differed a lot between different areas, 'eugenics' belonged to the political vocabulary of many countries in the first half of the twentieth century. The concept was part of discussions on evolution, modernity and mass culture, as it touched upon many topics related to health and population growth. These discussions were held among scientific societies, pressure groups and political institutions.<sup>28</sup>

As Galton's beliefs had spread amongst western scientists and intellectuals, most eugenic societies shared similar goals to the British Eugenic Society. However, Frank Dikötter has shown that we cannot speak of *one* eugenics in the early twentieth century. The movement had many faces among various countries, depending on a country's politics, religion and ideologies.<sup>29</sup> Whereas the success of Galton's eugenics seems to have been partly due to its ties to Darwinism and the science of genetics, Finland and Southern America have shown that such a scientific foundation was not a necessary prerequisite for the spread of eugenic practices.<sup>30</sup> The lack of consensus on the evolutionary mechanism, whether it be predominantly Darwinist, Mendelian or Lamarckian, also shows itself in eugenics: in France, eugenic movements relied on

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<sup>27</sup> D. Kevles (1985) pp. 3-4

<sup>28</sup> F. Dikötter, *Race Culture: Recent Perspectives on the History of Eugenics*, *American Historical Review* (1998) p. 475

<sup>29</sup> *Ibid.*, p. 467

<sup>30</sup> *Ibid.*, p. 742



neo-lamarckian thought, the belief that a person's hereditary traits could be affected during one's lifetime and, subsequently, be transmitted to their offspring.<sup>31</sup>

Scandinavia is often mentioned for first adopting sterilization laws against the unfit. Those alleged to suffer from mental illness became the main targets of eugenic practices from the 1930s onward in the 'welfare states' of Denmark, Finland, Norway, and Sweden.<sup>32</sup>

Among the countries in which sterilizations were practiced, Social Democrats were the most vigorous defenders of racial improvement.<sup>33</sup> Sterilizations as negative eugenic measures were largely justified by the financial costs of institutional care of the weaker. Additionally, inability to raise children was used as an argument to perform sterilizations on those considered mentally disabled. The vast majority of those subjected to sterilizations were women. Nevertheless, women themselves participated in eugenic movements in large numbers, Margaret Sanger and Marie Stopes being two of the most prominent female British eugenicists.<sup>34</sup>

In Germany, racial hygiene has been considered to have originated simultaneously with eugenics. Though racial hygiene was not a side product of British eugenics, but originated independently of Galton's theories, the movement shared similar goals and ideas to eugenics. One of the main concepts that eugenics shares with the German racial hygiene movement as well as social Darwinism, has been their proclaimed scientific foundation, the belief that Darwin's evolutionary laws should unavoidably become the guide of the development of human society.<sup>35</sup> The decrease of most eugenic movements and institutions is considered to have been mostly caused by the escalation of Nazi Germany's racial hygiene. In 1933, Germany adopted a

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<sup>31</sup> Ibid., p. 743

<sup>32</sup> Roll-Hansen, N. *Eugenics and the Welfare State*, Michigan State University Press (1996)

<sup>33</sup> Ibid., p. 468

<sup>34</sup> Ibid. pp. 469-470

<sup>35</sup> Dr. S. J. Geerts (1984) p. 4

sterilization law, leading to a number of 100.000 mentally ill patients to be legally sterilized by German national socialists between 1939 and 1941.<sup>36</sup>

The eugenic ideology and sterilizations associated with Nazi Germany are considered to have led eugenic beliefs to gradually decrease after WWII. Correspondingly, the abandonment of eugenic beliefs has led most countries to abolish sterilization laws and other negative eugenic measures as well. Nevertheless, there have been some exceptions: Sweden is known to have performed sterilizations up to the 1970s. Additionally, China and the Soviet Union have applied eugenics inspired policies throughout the second half of the twentieth century. Moreover, over the last fifty years, eugenics has been of influence on various political, medical and bioethical debates, as will be discussed later in this thesis.

### **Feeble-mindedness and heredity**

As mentioned earlier, mental illness has been referred to occasionally as one of the deficiencies eugenics was hoped to eliminate from society. In addition to certain types of diseases and physical handicaps, Galton himself had already argued that mental traits ran in families. For example, he showed that talent, profession and mental peculiarities were present among various generations of the same family. However, he had not been able to gain scientific evidence that his findings could be explained by biological heredity.<sup>37</sup> Contrastingly, in the early 1900s, mental traits were mostly thought to be caused by one's environment. Influential psychiatrists such as Sigmund Freud and Emil Kraepelin had argued that, considering mental conditions, all people are inherently equal: mental illness, usually referred to as feeble-mindedness, was considered to be a result of negative environments.

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<sup>36</sup> S.F. Weiss, The Race Hygiene Movement in Germany, *Osiris* (1987) nr.3, pp. 233-234

<sup>37</sup> Paul, D.B. *Controlling Human Heredity: 1865 to the Present*, Amherst, N.Y (1995) pp. 48-49

Contrasting theories such as Freud's and Kraepelin's, in 1922, the German psychiatrist Ernst Kretschmer proposed his constitutional theory that acknowledged the central role of heredity in bringing about human mental traits and deficiencies.<sup>38</sup>

After eugenic thought had reached the United States, psychologists Henry Goddard, among others, studied the heredity of mental illness. Occasionally, Goddard collaborated with biologist Charles Davenport on his ideas on eugenics. Davenport studied human heredity, for which he trained fieldworkers to score for numerous physical, occupational and mental characteristics among American



Figure 1: Burlington Free Press, January 24, 1925

families.<sup>39</sup> Feeble-mindedness was considered the root cause of most defects in social skills, such as pauperism, licentiousness and criminal behavior. Goddard had conducted a famous study on the Kallikak family, with two lines descending from the same male ancestor; only one was 'wholesome' whereas the other was a 'race of defective degenerates'. Predominantly based on these observations, Goddard concluded feeble-mindedness to be a hereditary anomaly. His book *The Kallikak Family: a Study in the Heredity of Feeble-Mindedness* (1912) sold pretty well, its success reaching not only large part of the USA, but also European countries, such as Germany and Denmark.<sup>40</sup>

Remarkably, in 1900, feeble-mindedness was considered an insignificant problem in the United States, whereas by 1915, it was seen as the largest and most serious problem of the time. By that time, numbers of intelligence tests had

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<sup>38</sup> Ibid.

<sup>39</sup> D. Paul (1995) p. 58

<sup>40</sup> Ibid., pp. 49-51

simultaneously increased. These tests were often performed on schoolchildren, prisoners, students and soldiers.<sup>41</sup> Goddard and Davenport performed eugenic studies on the mentally ill in a framework of statistics, anthropological fieldwork as well as early genetics: Goddard had speculated that normal-mindedness was a dominant trait, over the recessive feeble-mindedness.

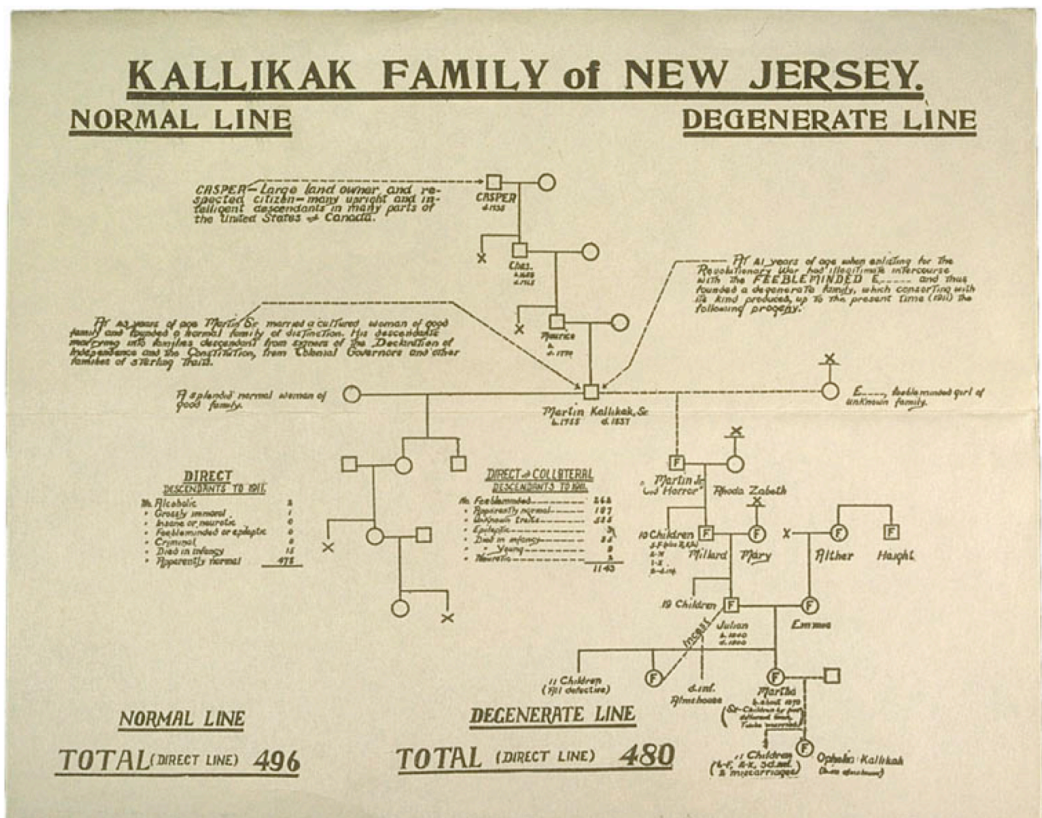


Image 2: This chart depicts the famous case study of the Kallikak family. It shows the ‘eugenic degeneration’ of a branch of an American family, contrasting a ‘normal’ branch from this same family. The pseudonym "Kallikak" refers to cacogenics, meaning: the degeneration of a genetic stock through time.

Later on, American intelligence tests inspired the British Eugenics Society (ES): the grading of mental ability by the American Simon and Binet test, conducted by Alfred Binet in 1905, denominated a large part of the slum population as morons.<sup>42</sup> Strikingly, nearly all British geneticists in the 1920s and 1930s, including those who

<sup>41</sup> *Ibid.*, p. 63

<sup>42</sup> G. R. Saele, Eugenics and Politics in Britain in the 1930s, *Annals of Science*, 36. (1979) p. 161

initially opposed eugenics, claimed that the feeble-minded should be prevented from propagating.<sup>43</sup> Many approved of segregation or sterilization, even if they were convinced that mental illness was not hereditary, but from the belief that feeble-minded individuals would make incompetent parents. When the economic depression had struck 1930s Britain, the ES campaigned for legalizing the voluntary sterilization of mental defectives, just like people with non-mental hereditary diseases.

Concluding, it seems as if the early twentieth century not only gave birth to eugenics, but to some degree also to public engagement with the rights of mentally ill patients. Additionally, just as the concept of heredity has been subject to change, so has its assumed role in determining human behavior. At the same time, the Modern Synthesis that took place in the biological sciences had globally led to a stronger genetic deterministic view within as well as outside of the scientific community. Genetic determinism is the belief that nature is dominant in bringing about a phenotype rather than nurture, meaning that a person's physical appearance as well as their behavior and personality are determined by their genetic makeup. This view also positioned itself in the psychological sciences, leading to believe that mental illnesses are caused largely due to hereditary factors. This served as scientific foundation for eugenicists to believe in the heredity of feeble-mindedness. In the United States, as well as elsewhere, dependence on genetic determinism in psychology has strongly affected eugenics directed towards the mentally retarded and criminals.<sup>44</sup> It would be from the fifties on, that scientific as well as the public belief of this determinism weakened.

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<sup>43</sup> D. Paul (1995) p. 70

<sup>44</sup> Sherry, J.L. Media Effects Theory and the Nature/Nurture Debate: A Historical Overview and Directions for Future Research, *Media Psychology*, no. 6 (2004) pp. 87-88

## Eugenics in the Netherlands

Open democracies with a vibrant civil society, such as the Netherlands, were generally less inclined to adopt extreme eugenic proposals compared to authoritarian regimes.<sup>45</sup> However, it has been shown that eugenic thought had nonetheless penetrated the Dutch psyche in the early twentieth century.<sup>46</sup> Jan Noordman's work *Om de Kwaliteit van het Nageslacht* (1987) has served as an excellent source to study the developments of eugenics in the Netherlands from 1900 to 1950.

In 1930, a Dutch eugenic society (de Nederlandse Eugenetische Federatie (NEF)) was founded, modeled after US and Swedish eugenic associations.<sup>47</sup> Among Dutch eugenicists who joined the NEF, most were biologists, doctors, anthropologists and other scientists. Biologist C. J. Wijnaendts Francken, also considered a social Darwinist, planted the first seed for the Dutch eugenic thought. In 1897, his book *Sociale Ethiek* was published, in which he argued for a future ethics that would revolve around conservation of the human race.<sup>48</sup> As a practice to live up to this ideal, he argued for a marriage restriction for those who were considered unfit to reproduce. Additionally, in 1900, gynecologist Hector Treub was one of the first Dutchmen to argue for premarital medical testing for hereditary diseases.<sup>49</sup> The *Nieuw Malthusiaanse Bond* (NMB) has also been of influence in shaping Dutch eugenic thought in the early twentieth century. This Neomalthusian society was inspired by the Malthusian persuasion, suggesting that the rapid population growth needed to be controlled. In 1905, Jan Rutgers, who was the leader of the NMB at the time, pleaded for condom use among those carrying hereditary flaws. He also recommended

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<sup>45</sup> Dikötter, F. (1998) p. 476

<sup>46</sup> Louter, M. *Om de Kwaliteit van het Nageslacht*, *De Groene Amsterdammer* (1997) p. 2

<sup>47</sup> Noordman, J. *Om de Kwaliteit van het Nageslacht*, *Eugenetica in Nederland 1900-1950*, Amsterdam (1989) pp. 99-101

<sup>48</sup> *Ibid.*, p. 46

<sup>49</sup> *Ibid.*, p. 42

sterilization, to filter the poor from society, pursuing a superior race.<sup>50</sup> Whereas Rutgers' ideas were some of the more radical among the Dutch eugenicists, the concepts of premarital testing and marriage restriction would be two of the central aspects around which the Dutch eugenic debate would come to revolve. Initially, tuberculosis, alcoholism and sexually transmitted diseases, all considered hereditary traits, became the main targets against which Dutch eugenics was directed.<sup>51</sup> These had been the three main folk diseases in the Netherlands at the beginning of the twentieth century, according to Dutch doctors. However, the range of traits against which Dutch eugenics aimed soon broadened.

Another key player in introducing eugenics in the Netherlands was embryologist Marianne van Herwerden. On a trip to the United States, in 1919, she learned about American eugenics. Additionally, she was introduced to the American eugenic measures, directed against Afro-American criminals, feeble-minded and Native American women. After returning to the Netherlands, she started writing enthusiastically for medical journals on racial improvement. Initially, Van Herwerden's work is considered to have led to a clustering of all Dutchmen who believed in the improvement of race. In 1926, Van Herwerden became vice-president of the international eugenic commission, which had its annual meeting in the Netherlands one year later.<sup>52</sup> During the same year, she published the book *Erfelijkheid bij de mens en eugenetiek*, which became the standard manual of eugenics in the Netherlands.<sup>53</sup> One of the things she pursued was a registration of descent of families with hereditary deficiencies.<sup>54</sup> Although Van Herwerden had been inspired by American eugenics, in which race had come to play a large role, she argued that race was not a criterium that should be selected for in these registrations. The most

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<sup>50</sup> M. Louter (1997) p. 4

<sup>51</sup> J. Noordman (1989) p. 38

<sup>52</sup> dr H. Schellekens and dr R. P. W. Visser, *De Genetische Manipulatie* (1987) pp. 76, 79-82

<sup>53</sup> Pols, H. *Eugenics in the Netherlands and the Dutch East Indies*, from: Bashford, A. Levine, P. *The Oxford Handbook of the History of Eugenics*, Oxford (2010) p. 350

<sup>54</sup> *ibid.*, pp. 79-81

important traits that did need selection to improve society, she claimed, were deficiencies such as alcoholism and criminal behavior. Additionally, she argued that feeble-mindedness was one of the largest hereditary problems of society.<sup>55</sup>

Thus, contrasting the American or German eugenics, racial discrimination and anti-Semitism have not been part of the Dutch eugenics in general. Correspondingly, in advent to the Second World War, German and American racism and anti-Semitism were disapproved of by most Dutch eugenicists.<sup>56</sup> This does not mean that Dutch scientists and eugenicists have not been involved in German racial hygiene from 1940 onwards. Some examples are doctor H. van der Hoeven, who sterilized 6 Jewish women in 1943 and the biologists W.F.H. Stroër, who collaborated with Josef Mengele during the war.<sup>57, 58</sup> Ten years after writing his book on eugenics in the Netherlands, Noordman speculated that, besides these forced sterilizations under Nazi policies, illegal sterilizations may have occurred in the Netherlands by the hand of doctors and psychiatrists. In his book, Noordman cited anthropogeneticists J.V. Meiniger, who has argued that these illegal sterilizations most likely took place. However, patient files would have to be studied thoroughly in order to support this statement.<sup>59,60</sup>

It has been argued that the dominant position of the Dutch Catholics limited the impact of eugenic societies in the Netherlands until the war. In general, eugenics did not fit the catholic thought, which emphasized care of the weaker, elderly and disabled. For comparison: France and Belgium, for example, had strong eugenic movements at the time. However, due to their catholic governments, they never adopted eugenic bills.<sup>61</sup> An exception would be the colonization of the Dutch Zuiderzeepolder, which was characteristic of the growth of eugenics in the 1930's. In this area, eugenic measures gained a larger playground compared to the rest of the

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<sup>55</sup> *ibid.*, p. 82

<sup>56</sup> *ibid.*, p. 87

<sup>57</sup> *ibid.*, p. 90-91

<sup>58</sup> *Ibid.*, p. 92-93

<sup>59</sup> M. Louter (1997) p. 2

<sup>60</sup> J. Noordman (1989) p. 215

<sup>61</sup> M. Louter (1997) pp. 5-6



country, since the catholic pillars had not yet established their power here.<sup>62</sup> At the time of the colonization of the Zuiderzeepolder, after its drainage in 1918, there was an active selection for which citizens were qualified to inhabit this area. Unemployed citizens, for example, were considered unqualified for colonization. Selection did not only occur on economical, but also on socio-biological criteria. This led to a medical test as a part of the selection procedure.<sup>63</sup> In this way, the colonization of the Zuiderzeepolder illustrates the catholic influence on the adaptation of eugenic measures.

### **Dutch eugenics and feeble-mindedness**

As well as in Britain and the United States, the heredity of intelligence became subject of debate in the early twentieth century Netherlands. Simultaneously, speculations arose on intellectual deficiency among society. Gradually, intelligence gained a key function in establishing a hierarchy of human superiority, which caused for the less intelligent to be considered inferior.<sup>64</sup> Additionally, a connection between feeble-mindedness and fertility was generally assumed, since feeble-minded women were considered to be more sexually permissive.<sup>65</sup>

The increase in mental illnesses and asylum inmates was strictly documented. Interestingly, heredity was not always considered the main cause in bringing about mental distress: it was often assumed that mental decay was correlated to modernization, population growth and technological advancements. P.K. Pel, an internist, claimed the twentieth century to be the 'nervous century'; the increase in nervousness due to population growth and modernization was considered to cause an increase in mental illnesses as well: the brain could be heavily distressed in a world

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<sup>62</sup> Pieters, T. and Snelders, S. Current thought on hereditary transmission and human genetics, *Gewina*, 26(4), (2003) p. 212

<sup>63</sup> J. Noordman (1989) p. 119

<sup>64</sup> *ibid.*, pp. 82-83

<sup>65</sup> *ibid.*, p. 84

full of technology and electricity. However, heredity was not completely left out of the picture either. Pel and others argued that these mental illnesses could be inherited by offspring. This example shows that the concept of heredity occasionally had a Lamarckian overtone, since traits acquired during one's lifetime could be considered to be hereditary.<sup>66</sup>

As mentioned before, Van Herwerden had already argued that feeble-mindedness was one of the largest hereditary problems of society, for it could lead to prostitution and criminal behavior. After a visit to the United States, and being involved in the international eugenic commission, she had been inspired by several different eugenic visions and measures. In her book, she cited Davenport's research on reproduction rates of different classes.<sup>67</sup> Interestingly, despite her involvement with American eugenics, she opposed sterilizations of the feeble-minded, for the reason that too little research had been done on this subject matter. Her proposed measures to deal with mentally ill were marriage restrictions and the separation of men and women on distinct islands, inspired by the Danish Island Sprogø.<sup>68</sup>

Concluding, eugenics gained success in various Western countries in the early twentieth century. Some of these adopted eugenic measures, whereas others did not. It has been shown that eugenics has been a part of Dutch twentieth century history as well, although eugenic measures have never been legally applied. Prominence of the Catholic Church has been one of the major influences hereon. In the Netherlands, as well as in Britain and the United States, mental deficiencies, labeled feeble-mindedness, have been prominent targets against which eugenic speculations were directed.

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<sup>66</sup> *ibid.*, pp. 86-87

<sup>67</sup> H. Schellekens en P.W. Visser (1987) p. 83

<sup>68</sup> *ibid.*, pp. 84-85

Thus far, mostly involvement with eugenics by intellectuals has been discussed. To what degree the eugenic debate on mental illness entered the public domain will be addressed in the next chapter.

## Chapter 2

### *Eugenics in Dutch Newspapers*

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*'Indien deghene, die sware en aenklevende sieckten onderhavigh zijn, haer onthielden van het voorttelen, het zoude haer geruster en het menschelijcke geslacht beter wesen'*

- Johan van Beverwijck (Dutch physician and popular writer) 1636<sup>69</sup>

From the previous chapter, it appears that the eugenic discussion in the Netherlands in the first half of the twentieth century was mostly held among scientists and doctors. However, the movement did not go unnoticed in Dutch politics and society. As Jan Noordman has stated, several positive and negative eugenic measures were proposed by politicians to improve the quality of progeny. Interestingly, one measure stood out in particular. This was the premarital medical test (*het geneeskundig onderzoek vóór het huwelijk*), that aimed for 'genetic quality of future parents', which had been a topic of discussion during several political debates in the twenties and thirties.<sup>70</sup> Therefore, it can be observed that eugenics gradually moved from scientific and medical into public spheres in the early twentieth-century

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<sup>69</sup> In English: If those, who are suffering from heavy diseases, would withhold from procreation, they would remain more restful and the human genus would be better. M. Louter (1997) p. 2

<sup>70</sup> J. Noordman (1987) pp. 161-169

Netherlands. Nevertheless, no eugenic measures made it through political debates to be legally applied. The question may arise what factors caused the discussed eugenic measures not to be applied in the Netherlands, whereas other countries did chose to do so. It has been argued that it was largely due to the catholic dominance among The House of Representatives, the lower house of the bicameral parliament of the Netherlands, that eugenic birth control measures have never been legally approved.<sup>71</sup> This chapter explores the public debate on eugenics in the Netherlands from the early twenties until the beginning of WWII. By doing this research, I want to answer several questions on the public image of eugenics, especially directed at feeblemindedness, one of its main targets. The most important ones are: has eugenics been presented to the public as a predominantly positive or negative movement? What are the claimed benefits and oppositions towards the concept of eugenics and its positive and negative measures? To what degree do the different views on eugenics correspond to religious or political ideals?

By looking at newspapers, I will evaluate the Dutch public stand towards eugenics, possible religious and political influences and look for other recurring elements in articles on eugenics. Among the newspaper articles that are interesting for my research, I will score for several features, in order to answer the questions formulated above. I expect these features to be of interest in present day public debate on CRISPR-Cas9 as well. Hopefully, this will allow for an insightful comparison on the public image of the ethics of controlling human heredity and eugenic thought in Dutch public spheres over the course of the last decade.

## **Methodology**

Whereas there are multiple sources in which public opinion is reflected,

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<sup>71</sup> M. Louter (1997) pp. 5, 6

newspapers, as the first mass medium, have played a prominent role in shaping public knowledge and public opinion. Newspapers have been more widely distributed compared to other sources often studied by historians. Moreover, newspapers serve as frequently used public platforms that have been widely read in the early twentieth century as well as today. Therefore, I expect them to allow for a proper comparison of the public image and debate of earlier eugenics to current day public debate on human genetic modification. Until not too long ago, researching a significant corpus of historical newspapers would have taken a large amount of time. However, over the past years, mass digitization has improved the accessibility of these sources, which tremendously reduces the time selecting articles of interest.<sup>72</sup>

I have used the website [www.delpher.nl/nl/kranten](http://www.delpher.nl/nl/kranten) to search for archived newspaper articles on this topic, during my period of interest, to create a corpus of relevant sources. Delpher is an online database, containing a collection of millions of digitalized texts from Dutch newspapers, journals and books. Its search engine allows one to search the entire database by using keywords. The texts are obtained from collections of various scientific institutions and libraries. Delpher uses the Optical Character Recognition (OCR) technique to scan digitalized sources. OCR works very accurate, though not flawless; some of the older sources and certain fonts are not easily recognized by this technique. Additionally, conditions such as discoloration and fading of ink may cause trouble in recognition of a text.<sup>73</sup> Fortunately, articles are depicted on the original page of their published newspaper, which allows the reader to easily scan an article's context. Moreover, though the numbers of newspapers that is archived by Delpher is abundant, not all Dutch newspapers that were ever published have been archived. Approximately, Delpher harbors 15% of all Dutch newspapers ever published. The database has used several criteria that have led to

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<sup>72</sup> Huistra, H. Lay Users as Authorities in Slimming Remedy Advertisements, 1918-1939, *BMGN - Low Countries Historical Review*, Vol. 132-1 (2017), pp. 129-130

<sup>73</sup> <http://www.delpher.nl/nl/platform/pages/helpitems?nid=372> (10-05-2017)

the current selection of newspapers that they harbor. Due to these conditions, the articles that are used for this research do not cover the complete number of articles on eugenics and feeble-mindedness in the Netherlands. Nevertheless, the articles contained in Delpher's database are numerous enough to provide an interesting sample study for this research.

Delpher holds different selection criteria for including newspapers in different periods. One of the demarked periods is 1914 to 1940, the interwar period, which is the timespan that proves to be the one of most interest for my research. As is claimed on Delpher's website, this period brought about a new, modern lifestyle that expressed itself in the rise of pop culture, new media and mass production. Many established newspapers played a role in maintaining the countries pillarization. In society, as well as in the domain of media, five areas underwent changes during this period: politics, culture and religion, society, economy and journalism. Newspapers that show changes in these five domains, therefore showing the *zeitgeist* of that particular period, have been selected for by Delpher.<sup>74</sup> The topic of eugenics fits well in the political, religious and social domain, since ethical stands towards eugenics are often tied to political or religious views and it occasionally deals with issues such as social class and hierarchy. Therefore, I think Delpher's selection of articles from 1914 to 1940 consists of newspaper articles that fit the scope of my research.

## **Digital humanities**

By using a digital database with a keyword-based search engine while searching for useful sources, I am utilizing the possibilities of digital humanities. Digital humanities methodology differs fundamentally from classical historical source

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<sup>74</sup> <https://www.kb.nl/organisatie/onderzoek-expertise/digitaliseringsprojecten-in-de-kb/project-databank-digitale-dagbladen/geselecteerde-titels-en-selectieprocedure/selectie-van-titels/1869-1940> (10-05-2017)

selecting methods, bringing along new possibilities as well as some risks. The main advantage of this methodology is the large reduction of time browsing databases that is involved in classical historical source selection. This method additionally provides for a vast increase in search results. On the other hand, one of the main risks while using a keyword-based search engine is that history does not center on words, but on phenomena. Hence, there is a gap between phraseology and meaning. Possible differences in word usage among persons, between places and across times while referring to certain phenomena must be held into account.<sup>75</sup> Therefore, using various synonyms to refer to a topic of interest is useful. In this case, the topics I want to research are eugenics and feeble-mindedness. However, while increasing the number of search word, the number of resulting articles that fall outside of the scope of this research may increase as well. In their article on methods of digital humanities, Huistra and Mellink have argued that a good way to deal with this problem is by using a maximum number of synonyms to describe a topic, while keeping the number of returned search results limited and relevant. A way to accomplish this is through developing so-called combined search queries, in which two or more topics are described by a wide variety of synonyms and searched for in relation to each other.<sup>76</sup>

While searching Delpher, I have used various keywords as search terms. Since the topic of my research is the public debate on eugenics directed at feeble-mindedness, most of these keywords have been early twentieth century Dutch synonyms of both. Keeping in mind the suggestion by Huistra and Mellink's article, I have chosen to combine synonyms of both terms. However, when looking at the terms separately, it can be observed that the number of times eugenic synonyms are mentioned in the newspapers increases from the 1920s and decreases from 1945 on (see graph 1). The twenties and thirties appear to have been the most fruitful decades

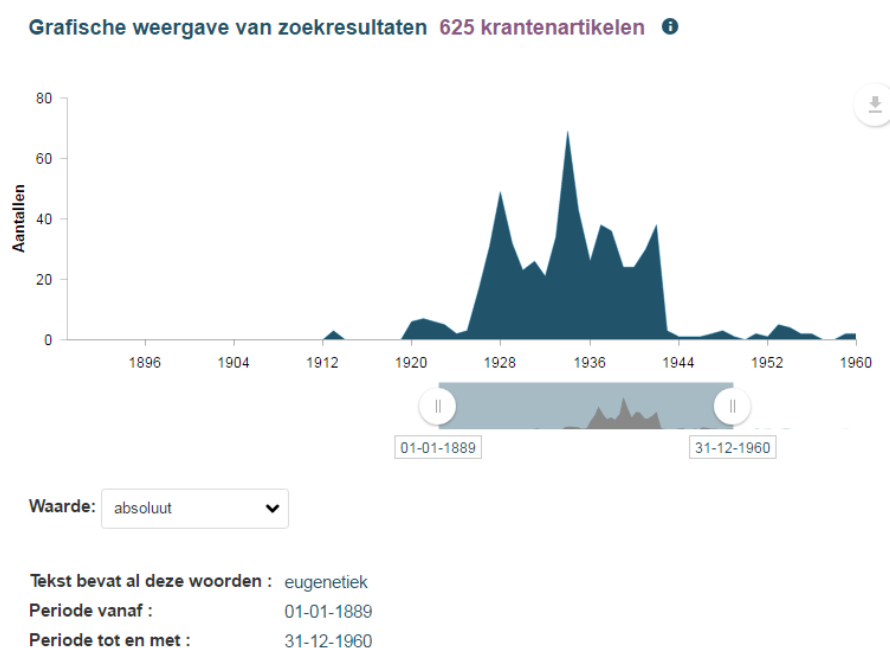
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<sup>75</sup> Huistra, H. and Mellink, B. Phrasing history: Selecting sources in digital repositories. *Historical Methods* Vol. 49, issue 4, (2016) p. 224

<sup>76</sup> Ibid.



for eugenic thought to develop in public spheres, based on Delpher's collection. The graph's decline after 1945 is most probably linked to the ending of the Second World War, the period often said to have given eugenics its bad reputation. Because I want to look at eugenics outside of direct WWII context, I prefer to leave out the period from 1940-1945. With this in mind, the sources that will most likely be of interest to examine are Dutch newspapers from January 1<sup>st</sup> 1920 until December 31<sup>st</sup> 1939. Choosing this period, I also remain within the boundaries of one of Delpher's periods (1914-1940)



Graph 1: This graph shows the number of mentions of the word 'eugenetiek', the most common Dutch synonym for eugenics in Dutch newspapers between 1889 and 1960. It can be observed that the majority of articles containing this word have been published between 1920-1943.

## Classification

When classifying articles, I will, first of all, note what *type of newspaper* I am dealing with. A distinction can be made between national and regional newspapers. Additionally, newspapers' ties to pillars are taken into account. From this, the newspaper's religious and political background can be derived. Next, I will score for

the *type of article*. Am I dealing with an article that is purely informative, does it report on a eugenics-related event, or does it fit the requirements of being advertisement or propaganda? Furthermore, it is essential to know the article's *stand towards eugenics*. Since eugenic societies existed in the Netherlands, but eugenic measures have never been legally applied, it is interesting to look at the public view on theoretical eugenics as well as eugenic measures. Therefore, I will examine whether an article deals with eugenics purely *theoretically*, or whether it also addresses positive or negative eugenic *measures*. Next, I will examine whether the article holds a neutral stand or whether it can be considered pro- or anti- eugenics. Thereafter, I will try to find out whether its arguments are *tied to religious or political persuasion*, based on the article's pillar as well as the article's content. A follow-up question will be whether pro-eugenicists argue for eugenic choices to be made on *individual or at state level*: when speculating on eugenic measures, should they be decided upon by the state or by an individual or his or her family? It can be observed that Dutch texts on eugenics often refer to American, British or German eugenic practices. Therefore, I will note whether the article's content revolves around *national or international* eugenics. Finally, inspired by Pieters and Snelders' discussion on the plasticity of the public *concept of heredity*, I will write down the article's hereditary concept and the relationship between heredity and mental illness, when mentioned.

It is interesting to observe that all eugenic synonyms alone account for a total of 1116 articles between January 1<sup>st</sup> 1920 and December 31<sup>st</sup> 1940. Searching for 'zwakzinnigen' (feeble-minded) gives 9.573 articles. This shows that eugenics and feeble-mindedness are topics that were occasionally discussed in Dutch media. When searching merely for eugenic or feeble-minded synonyms, the number of results is often excessive. Additionally, a large part of those articles falls outside of the scope of this thesis. Therefore, I have started by collecting the results from eugenic synonyms combined with feeble-mindedness synonyms. This has led to a total of 140 articles.

However, it can be observed that some articles have resulted multiple times, under multiple keywords. When leaving out the articles that appear under multiple combinations of synonyms, my number of results is 79.

Initially, I also tried searched for names of prominent Dutch eugenic figures, such as: van Herwerden, Stroër, Sirks, van der Hoeven, S.J. Geerts, Roscam Abbing, Wijnaerendts Francken, Prak, Treub, Rutgers, Tammes and Schulte. However, most names were extremely common, which resulted in an excessive amount of articles that were not related to these eugenicists. Combining surnames with first names or initials sometimes limited the results to more useful articles, though sometimes it did not help sufficiently. The instances where the number of results has been sufficient are rare. For the purpose of consistency, I chose to leave them out and focus on combinations of eugenics and feeble-mindedness synonyms only.

Out of the resulting 79 articles, fifteen predominantly revolve around feeble-mindedness, but refer shortly to eugenics as a means to deal with the feeble-minded in society. About thirty articles deal with eugenics in general, and mention feeble-mindedness as one of the various traits against which eugenics may operate. The major section of the articles deals with eugenics in general and emphasizes feeble-mindedness and other mental illnesses as some of the main traits against which eugenics should be directed. Since the vast majority of these articles deals with both topics, I find it safe to conclude that this selection is representative of the way eugenics of feeble-mindedness was presented in Dutch newspapers from 1920 to 1940.

Out of the articles that have resulted from this search, I have scored for the following traits:

- National/local newspaper
- Newspaper's pillar

- Type of article: informative/ report on event/ advertisementpropaganda
- Stand towards eugenics
- Theoretical eugenics/ eugenic measures
- Role of feeblemindedness
- Religious/ political arguments
- Responsibility in applying eugenic measures
- National/ international eugenics
- Concept of heredity

Next, I will elaborate on the most interesting observations that can be made based on the results of this research.

## **Results**

### Type of article

Most of the newspapers of interest have been distributed nationally.

Seventeen articles originated from local newspapers and eight have been published in newspapers that belonged to one of the Dutch colonies of Indonesia or Suriname.

Content wise, no specific differences can be found among these three types of regions.

Interestingly, I did not detect any advertisements or propaganda for eugenics or its measures among the articles. The majority of the articles provides information about eugenics theoretically, or eugenic practices, commonly with a persuasion that is in favor of or opposed to eugenics. Few articles were merely descriptive of eugenics, relating events without taking a stance towards the movement. Several other articles report on lectures that revolve around eugenics, held by eugenicists such as Marianne van Herwerden and Prof. Dr. J.A. Honing. Others report on eugenic conferences, talks

held at conferences on mental health, or at organizations such as the national women's council, that reflected on eugenics as one of several topics of discussion. In this second category, some of the articles were merely descriptive of the talk, whereas others have blended in the author's opinion on the topics discussed in the talk.

### Date

While studying the articles, I have ordered them chronologically, to analyze whether certain trends could be observed over time. The main trend that can be witnessed, when looking at the results, is a gradual shift in the standpoint towards eugenics. In general, most articles until 1932 are mainly positive towards eugenics. Some articles up until then deal with eugenics theoretically, but several others refer to (mostly negative) eugenic measures applied abroad. American sterilizations are occasionally mentioned, as well as the isolation of mentally ill men and women, first applied in Denmark. Whereas the former is discussed more carefully in terms of approval of its morality and effect, the latter is often praised as a promising eugenic method. Additionally, in 1924, premarital medical testing is first mentioned as a eugenic measure that might be agreed upon by the Dutch parliament. From 1930 onwards, this measure is more often mentioned as the best option for applied eugenics in the Netherlands. The recurrence of this topic corresponds to Noordman's discussion on the prevalence of this test among Dutch political debates. Concluding, the average view on eugenics shifts from a more pro-eugenic attitude in the early twenties towards a more anti-eugenic attitude in the late thirties. However, standpoints towards the diverse measures discussed differ significantly compared to standpoint towards the theoretical concept of eugenics: whereas, in the late thirties, eugenics is acknowledged as a movement that might improve quality of society, the possibilities of its applications are strongly criticized.

## Science and heredity

Pieters and Snelders have argued that the concept of heredity took various forms in scientific and public spheres in the early twentieth century.<sup>77</sup> Remarkably, most articles studied that mention the science of heredity, name Mendel as the founding father of genetics. Therefore, it is likely that the commonly held public view of heredity in the period of interest has been Mendelian genetics.

Interestingly, the articles show that skepticism towards eugenics grows over the timespan of my search, along with the growing negative stand towards eugenics. Two of the elements that fall victim to this skepticism are the concept of heredity and the science of eugenics. Sometimes, anecdotal evidence, such as the Kallikak and the Jukes family, is praised as scientific proof of the heredity of mental illness. More often, the scientific foundation of the heredity of feeble-mindedness is questioned, since the precise role of genetics in bringing about mental traits had not been scientifically established. Additionally, it is frequently mentioned that phenotypic traits are possibly not purely hereditary and have environmental components as well. Correspondingly, several articles claim that more research should be performed on the heredity of mental illnesses, in order to know what role eugenics can play in controlling these.

Regarding feeble-mindedness as well as 'unfit' traits in general, suspicion is occasionally voiced in relation to the time it would take to reduce a certain trait in society. For example, it is stated several times that, due to some genetic deficiencies being recessive, its prevalence among society will not be reduced vary rapidly by only eliminating homozygotes from giving birth. Therefore, sterilizing feeble-minded will merely lead to an insignificant reduction of feeble-minded in the population.

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<sup>77</sup> T. Pieters and S. Snelders (2003)

Altogether, the lack of scientific proof that eugenics will benefit society is occasionally mentioned.

### Pillarization

Until the sixties of the twentieth century, the Netherlands maintained a societal segregation, referred to as pillarization. Based on different religion and ideologies, the existing pillars were the Protestant, Roman Catholic, Liberal and Social- Democrat. Subsequently, the four pillars all had their own institutions and organizations as well as newspapers. The lists below show the pillarization of the newspapers studied for this research.<sup>78</sup>

Pillar:

Liberal	23
Roman catholic	16
Socialist	5
Neutral	4
Protestant-liberal	1
National socialist	1
Unknown (mostly local newspapers)	20

As can be observed, most articles have been published in Roman Catholic or liberal newspapers. As far as the protestant pillar is concerned, its take on eugenics cannot be derived from the results of this search, due to lack of results from protestant newspapers. Between 1924 and 1933, five socialist articles were published

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<sup>78</sup> Partly based on: Dijkstra, K.J. *Verborgene verhoudingen. Relaties tussen liberale politiek en journalistiek ten tijde van de verzuiling.* (1998)

on eugenics and feeble-mindedness. The one dating from 1933 is merely descriptive of the passing of the German sterilization law that happened during that year. The other articles take a pro-eugenic stand and hint at the state to decide upon eugenic measures. The articles involve eugenic measures such as sterilization and isolation. However, after the passing of the German law, no socialist articles have been found that address eugenics or sterilizations. Though not explicitly mentioned, most socialist articles hint for state responsibility to impose eugenic measures.

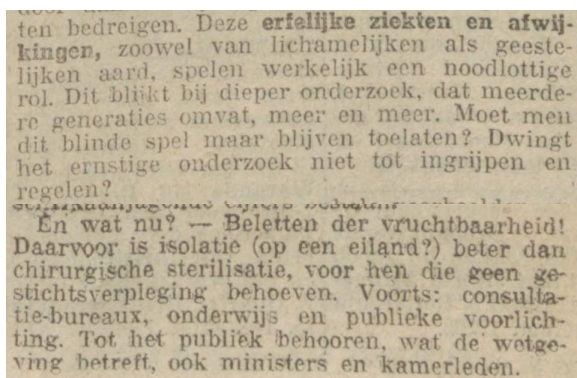


Image 3: Two segments from an article from a socialist newspaper, *Het Volk*, dated 18-11-1926. Here, it is mentioned that research on multiple generations has shown that physical and mental deficiencies are disastrous and call for interference. Considering measures, isolation is preferred over sterilization. Public education on eugenics is desirable.

Among the articles from Roman Catholic newspapers, the stand towards eugenics varies over time and among articles. A difference between eugenics theoretically and eugenic measures can be observed as well: several articles claim that, theoretically, eugenics may indeed increase wellness in society. Considering measures, however, sterilizations are often criticized upon, sometimes referred to as morally condemnable from a catholic point of view. From 1933 on, the articles gain a more skeptic tone towards eugenics, mainly due to the German sterilization law.

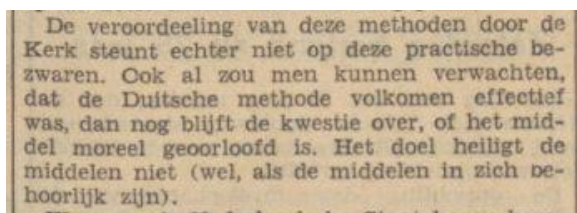


Image 4: A section of an article of *De Tijd*, dated 28-08-1938 that criticizes eugenic sterilizations. It concludes that, in agreement with the church, even if the German method (referred to sterilizations) would be effective in eugenic goals, this does not mean that it is morally justified. The goal does not justify its means (it does, when measures are proper).



Furthermore, some of the Roman Catholic articles criticize the scientific foundations of eugenics. Part of the articles deals with mental illness and questions to what degree feeble-mindedness is actually hereditary, and claim that education plays a large role in developing this trait as well. It is also interesting to observe that, in the few cases that explicitly address which agent should be responsible in imposing eugenic measures, most articles put this responsibility with individual citizens rather than the state.

A significant deal of the results, however, does come from liberal papers. It is interesting to observe that liberal newspapers are prone to be pro- eugenic during the twenties, whereas the articles become more skeptic towards eugenics by the end of the thirties. Scientific justification is one other element that these article are skeptic towards.

#### Measures and responsibility

From 1933 on, a large deal of the articles discusses sterilizations of German citizens, as the German sterilization law was passed during that year. The years 1933 and 1934 provide the largest deal of articles that elaborate on eugenic sterilizations. The tone of the articles can be defined as a growing skepticism towards the method: articles that positively discuss forced sterilizations are rare. Especially Roman Catholic newspapers take a critical stand towards the issue. Whereas most of these articles discuss German sterilizations, sometimes comparisons to the Netherlands are made, in terms of whether Germany's policies should be copied or not. In Dutch, talk about applying sterilization laws has been referred to as *Het vraagstuk der sterilisatie* (the question of sterilization). The studied articles also show discussion about the measure of isolation of feeble-minded men and women, inspired by isolation measures applied in Denmark and Sweden. These are often reflected on less critically.

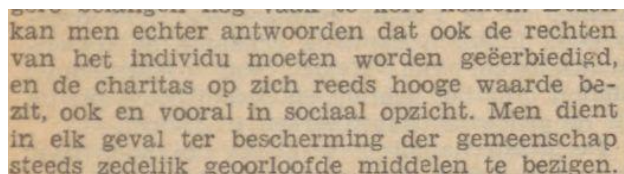
Ultimately, premarital tests are the eugenic measure most often praised amongst the studied articles. However, in the later articles that show pro-eugenic implications, it is often implied that premarital testing should not result in obliged prohibition of childbirth. It is often suggested as an advising measure: those who are tested positively for mental or physical traits, can be advised to refrain from having children, but the choice to actually do so should be their own.



Een huwelijksverbod of sterilisatie zou een conflict brengen met de Kerk, die de hoogste zeggingskracht heeft over het huwelijk der gedoopten, omdat dit een sacrament, dus een instelling van goddelijk karakter is. Een geneeskundig onderzoek voor het huwelijk zou toch wel veel goeds kunnen brengen, maar zonder huwelijksverbod. Spr. behandelt

Image 5: Nieuwe Apeldoornsche Courant, 11-04-1934. This section provides a good representation of the view on eugenic measures around 1934. It is claimed that marriage restriction and sterilizations conflict with the church, since marriage is a sacrament. Nevertheless, premarital medical testing could be profitable, provided that it does not lead to marriage restriction.

Responsibility for applying eugenic measures could either be positioned by the state or by individual citizens who suffer from less desirable traits. The desired agent responsible for this, however, was not too often mentioned explicitly. Many articles that are pro-eugenic measures, such as sterilization and isolation, are often from socialist newspapers and indicate the state's responsibility in exercising these measures. Articles that praise premedical testing, however, occasionally state that deciding for abstaining from marriage or procreation should be an individual choice.



kan men echter antwoorden dat ook de rechten van het individu moeten worden geëerbiedigd, en de charitas op zich reeds hooge waarde bezit, ook en vooral in sociaal opzicht. Men dient in elk geval ter bescherming der gemeenschap steeds zedelijk geoorloofde middelen te bezigen.

Image 6: De Tijd, 23-03-1939. This section of the article on mental health and society emphasizes the importance of harboring individual rights, also in light of eugenic measures aimed at the mentally ill, in order to protect society. The Catholic values of the newspaper are evident in the rest of the article.

## Morality

In articles from various pillars, moral objections towards eugenics or eugenic sterilizations are often tied to Catholicism, as can be read in image 5 and 6. Additionally, Roman Catholic newspapers show more attention towards morality and religious objections. Even some of the articles that take a support eugenic, acknowledge that the eugenics movement cannot be seen in a morality-free context. However, no article shows much elaboration on moral discussions.

**Daarbij doen zich echter allerlei moeilijkheden voor; in de eerste plaats dient de vraag te worden beantwoord in hoever men reeds inzicht heeft in de wetten der erfelijkheid om met zekerheid of zelfs met groote kans van slagen te kunnen ingrijpen. Verder zijn er ook overwegingen van moreelen en van socialen aard. Het boek van dr Frets**

Image 7: Het Vaderland, 03-08-1935. This section perfectly sums up possible objections towards eugenics. In the first place, it is questioned whether the scientific knowledge on heredity is sufficient to intervene successfully in society. On the other hand, there are social and moral considerations.

On the other hand, Christian religion has occasionally been claimed to be in line with eugenics. This can be observed in the section below: these two articles claim that eugenics serves the love for the perfection of God's creation and can be seen as an altruistic act, in a sense of loving they neighbor.

**Hier verschijnt de eugenetiek als liefde tot de volmaaktheid van de Schepping. Weest dan gijlieden volmaakt, gelijk uw Vader die in de hemelen is, volmaakt is."**

Image 8: Het Vaderland, 29-01-1936. After citing various biblical verses, this text concludes that eugenic perfectly serves the love for the perfection of God's creation.

Maar wie zoo spreken, vergeten het schoone en verhevene van den eerbied voor het individu. En is het bovendien wel juist de menschheid te verdeelen in twee groepen: de volwaardigen en de onvolwaardigen? Wie durft zich onvoorwaardelijk met een naam van volwaardige bestempelen? Bovendien geldt ook nog voor onzen tijd het hooge gebod van de naastenliefde.

Image 9: De Maasbode, 24-11-1937. One of the few articles that elaborates on moral questions regarding eugenics. The question put forward here, is: who is to decide which people are properly healthy not? Besides, loving your neighbors should be a highly valued trait.

## Conclusion

In the results section, I have elaborated on the most interesting observations done while studying 79 articles on eugenics and feeble-mindedness from various newspapers dating from 1920 to 1940. Whereas the idea of eugenics is often praised, especially up to 1933, the justification of its measures is critically questioned. If a collective public view should be concluded from these articles, it would be: eugenics' goal does not justify all means. Overall, among the articles studied, there is not one universal opinion on what type of eugenics should be allowed and what agent should be ultimately held responsible for deciding on its applications. However, two of the main trends that can be observed are criticism towards sterilizations and the value of freedom of individual choice about marriage and reproduction. These two elements are found mostly in Roman Catholic newspapers. Contrastingly, though not explicitly mentioned, most socialist articles hint for state responsibility to impose eugenic measures. This suggests a significant influence of religion and politics on stand towards eugenics.

Though the next chapter will show that a lot has changed with regards to eugenics as well as genetics, the value of individual choice and religious and political influences on public opinion on application of gene technologies are elements that are interesting for comparison.

## Chapter 3

### *Human Heredity after World War II*

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'We have to be aware of the really terrible past of eugenics, where incomplete knowledge was used in a very cavalier and rather awful way, both here in the United States and in Germany. We have to reassure people that their own DNA is private and that no one else can get at it.'

- James Watson, 1989<sup>79</sup>

In the previous chapter, graph 1 shows a decline of the newspaper articles on eugenics after 1945, indicating the end of eugenics' "success" after WWII. However, historians have argued that eugenic thoughts have been expressed in several countries, and in various ways ever since.<sup>80</sup> In Scandinavian countries, for example, eugenic sterilizations were even performed until the seventies, mostly directed at mentally ill patients.<sup>81</sup> The 1970s Soviet Union provides another example of how eugenic thought influenced society decades after WWII. Here, several liberal intellectuals advocated a form of "socialist eugenics": a system that acknowledged a superior elite based on superior DNA, thereby invoking human genetics in political theory.<sup>82</sup> Additionally, China is considered to have passed its most severe eugenic regulations in 1988.<sup>83</sup> That year, a law was prescribed in Gansu province that proscribed marriage for mentally ill people until they have undergone sterilization

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<sup>79</sup> Kevles, D, J. (1997) p. 279

<sup>80</sup> Dikötter, F. Race culture: Recent perspectives on the history of eugenics, *The American Historical Review*, Vol. 103, No. 2(1998) p. 467.

<sup>81</sup> *Ibid.*, pp. 468-469

<sup>82</sup> *Ibid.*, pp.476-477

<sup>83</sup> F. Dikötter (1998) pp. 468-469

surgery, leading to sterilization of thousands of people. In 1995, this legislation was even accepted at the national level, under the header of ‘maternal and infant health’.<sup>84</sup>

In this chapter, I will show that eugenic thought never completely vanished in the Netherlands either. Instead, it transformed itself into several fields such as criminology, birth control and, according to some, modern genetics. Hence, I will also elaborate on the developments in genetics as well as its ethical components. Next to summarizing twentieth-century developments in molecular biology, I will discuss several authors and events that have contributed to public debates around the eugenic nature of modern genetics. Since the United States have pioneered in the field of molecular biology throughout the twentieth and twenty-first century, I will discuss developments in genetics and eugenic-like debates in the United States and highlight the ways in which the Netherlands have been influenced by, and differed from, this country.

### **Post-War molecular biology**

Prior to WWII, it was agreed upon that organisms contain hereditary components that are passed on to next generations, which Mendel had named genes. However, these components had not been identified in the lab until 1944. By that time, the American bacteriologist Oswald Avery had shown DNA (deoxyribonucleic acid), located in a cell’s nucleus, to be the carrier of genetic information.<sup>85</sup> However, his findings did not immediately spread to gain consensus in the scientific community, partly because of the distortion of communication among the scientific community due to the war. Avery’s research did not go completely unnoticed either. In 1952,

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<sup>84</sup> Ibid., p. 477

<sup>85</sup> dr H. Schellekens and dr R. P. W. Visser, *De Genetische Manipulatie* (1987) p. 101

Hershey and Chase experimentally confirmed Avery's findings, leading to a broad acceptance of DNA as the carrier of hereditary information.<sup>86</sup>

Approximately one year later, James Watson and Francis Crick made their famous discovery of the DNA molecule's structure, the double helix. Rosemarie Franklin's excellent Rontgen diffraction images of the DNA molecule contributed to the coming about of their model, as well as Chargaff's discovery of the four DNA bases by the end of the nineteenth century. This moment, in 1953, is often mentioned as the start of molecular biology.<sup>87</sup> The identification of the DNA molecule has brought about more discoveries regarding the genetic code. For example, by 1969, for all DNA base pairs it was known for which amino acid they coded.<sup>88</sup> This could indicate which proteins could be made, therefore providing an important component in telling which genes allowed for which traits, including hereditary diseases.

By the early seventies, these findings, however revolutionary among molecular biologists, had not yet led to any medical applications. Molecular biology was criticized for not having cured patients with any sort of medical condition. This changed shortly after the genetic code of *Escherichia coli* was deciphered: soon it was recognized that this particular mapping of 64 codons (pairs of three DNA bases) to 20 amino acids is shared by all known life forms on earth.<sup>89</sup> This knowledge was crucial in realizing medical applications: universal DNA did not only provide evidence for a common ancestor of all species, it also meant that, with the right techniques, bacteria could create human proteins.<sup>90</sup> During the following years, the development and

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<sup>86</sup> Ibid., p. 10

<sup>87</sup> Ibid., p. 104

<sup>88</sup> Ibid., p. 108

<sup>89</sup>Koonin, E. V. and Novozhilov, A.S. Origin and evolution of the genetic code: the universal enigma, *IUBMB Life*. No. 61 (2009) p. 100

<sup>90</sup> Schellekens, H. and Visser, R. (1987), pp. 108-109

combination of several biotechnologies led to recombinant DNA techniques. This allowed for artificial production of human proteins and hormones by bacterial DNA.<sup>91</sup>

Discoveries of the human genome together with accumulating knowledge on embryonic development have also had their effects on medical techniques regarding prenatal screening. Since the mid-1970s, prenatal tests that screen for genetic and chromosomal diseases, such as Down Syndrome, cystic fibrosis or sickle cell anemia, have been regularly applied in pregnant women, amniocentesis and chorionic villus testing (CVS) being the most common. Finding out if a fetus is carrying such a disease by means of these techniques, has led parents to decide to terminate pregnancies, to prevent giving birth to children suffering from such a disease.<sup>92</sup>

### **The rise of bioethics**

The early seventies also witnessed the use of restriction enzymes. This type of enzymes can be used to snip, insert, and reattach DNA strands in the lab. More than 100 different restriction enzymes were discovered, forming a battery of tools to cut DNA almost anywhere one wished. The new research theoretically enabled genes to be recombined—cut and pasted at will, even between species.<sup>93</sup> These genetic and medical developments brought along the beginning of institutionalized bioethics movements. In 1973, the first type of bioethical conference was held in California, named 'Biohazards of Biological Research'. This very first conference was attended by scientists only and gained no public awareness.<sup>94</sup> However, that same year, the molecular biological community reached out by involving the American government. During a conference on nucleic acids, they speculated on possible concerns in creating

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<sup>91</sup> Ibid., p. 114 Insulin, a previously hard to obtain metabolic hormone which is linked to diabetes, is a good example of a protein that became available by using this technique. Artificial production of this hormone has me

<sup>92</sup> Suter, S (2015), p. 923

<sup>93</sup> Comfort, N. Can We Cure Genetic Diseases Without Slipping Into Eugenics? From Obasogie, O. K. *Beyond Bioethics: Toward a New Biopolitics* (2018) p. 178

<sup>94</sup> Schellekens, H. and Visser, R. (1987), p. 115



'new' and 'unnatural' organisms; the participating scientists explained, by means of a letter to the academic journal *Science*, that by combining different pieces of DNA, organisms could be created that contained unpredictable and possibly dangerous traits.<sup>95</sup> In response to this debate, the American government proposed guidelines for biomedical research, making space for public involvement in recombinant DNA research.<sup>96</sup>

According to Schellekens and Visser (1987), a Dutch pharmaceutical scientist and a historian of biology, during the seventies and eighties, bioethics debates also emerged in the Netherland. Whereas these debates largely mimicked those in the USA, differences can be observed in terms of the types of lobbyists advocating or opposing these technologies. For one, in the USA, several Nobel-prize winners advocated in favor of or against the use of biotechnologies, giving these debates a more professional character. Additionally, in the USA, scientific research as well as scientific policies were funded by the central organ NIH (National Institutes of Health), contributing to the professionalization of bioethical regulation. In contrast, the Netherlands did not have access to such amounts of funding.<sup>97</sup>

Nevertheless, similar ethical concerns on DNA research reached the Dutch public spheres as well. The KNAW (the Dutch Royal Academy for the Arts and Sciences) founded the first Dutch commission to advise upon DNA research in 1974. This commission soon became a governmental organ. Additionally, in 1979, an ad hoc commission was founded to advise upon regulations regarding recombinant DNA-technology, which was composed of scientists as well as workers' representatives and

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<sup>95</sup> Ibid., pp. 116-117

<sup>96</sup> Ibid., p. 120

<sup>97</sup> Ibid., p.126

environmental groups. This group set up rules and safety policies, partly mimicking the American ones.<sup>98</sup>

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### Repeating the past?

From the last section, we can conclude that during the seventies, biotechnologies partly became public concern in the USA as well as the Netherlands. However, in these public debates, the focus was rather on safety issues than on concerns about these techniques leading to eugenic-like applications. Nevertheless, some individuals drew links between this new science of human genetics and eugenics. For example, in 1972, the Dutch ethicist and reformed theologian Dr. P. J. Roscam Abbing (1914-1996) emphasized several ethical aspects of human genetics. In his essay on the ethics of euthanasia and eugenics he posed several ethical questions, such as: 'Is one allowed to unrestrictedly modify life, as well as its building blocks?' 'Is one allowed to birth children, despite knowledge of a large probability of a severe handicap?' Additionally, he argued, giving birth to handicapped children has its effects for both the society and the individual. Whereas society has to deal with the financial costs of care and mental and physical costs of caretakers, on the individual level, having a handicapped child can be a burden for parents and siblings. Moreover, the handicap burdens the child itself.<sup>99</sup> The author argues that there is a lack of studies that attempt to structurally bring nuanced answers to these questions. Finally, he claimed that the Dutch evangelic climate had led to a humane care for the 'weaker': as long as we continue to let just anyone birth children, all kinds of anomalies can reproduce'.<sup>100</sup>

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<sup>98</sup> Ibid., pp.126-127

<sup>99</sup> Dr. P. J. Roscam Abbing, *Toegenomen verantwoordelijkheid, euthanasie, eugenetiek, moderne biologie*. (1972) pp. 70-71

<sup>100</sup> Ibid., p. 73

This essay indicates a critical, eugenic attitude towards the possible future applications of medical knowledge of unborn children. Roscam Abbing's writing on eugenics and modern biology suggests there was an interest in these ethical questions among Dutch intellectuals, and the desire to reach out to a larger public with regard to these questions. The book *'Om de Kwaliteit van het Nageslacht'* (2006) by Gie van den Berghe, as well as Schellekens and Visser's book both serve the same purpose: to educate scholars as well as a wider public on eugenics history and suggest that future biotechnologies may hold eugenic motives. Correspondingly, in the last sections of their book, Schellekens and Visser predict that in 10 to 20 years, scientists have revealed all hereditary diseases in our DNA. With this knowledge, they claim, it will be possible to test for carriers of the disease. This could lead to the expelling of genetic diseases, provided we agree upon classical eugenic measures, such as sterilization, marriage restriction or preventive abortions.<sup>101</sup> The authors themselves are convinced that the only worthy influence on the genetic constitution of an individual is gene therapy of children who suffer from life-threatening genetic diseases.<sup>102</sup>

However, these applications need not be performed without remembering eugenics' past. Schellekens and Visser plead for a discussion around recent and future genetic developments. They warn that "...our past 'mistakes' might just as well happen again".<sup>103</sup> For one, they are concerned that there are no test animals for diseases that occur solely in humans. Would this mean that, at a certain point, humans will serve as test- animals themselves? Another question they pose is what happens if an individual does not want to be tested for hereditary diseases. Would society, because of health insurance considerations, demand that such a person is tested?<sup>104</sup>

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<sup>101</sup> Schellekens, H. and Visser, R. (1987), p. 134

<sup>102</sup> Ibid., p. 142

<sup>103</sup> Ibid., p. 143

<sup>104</sup> Ibid., p. 146

## **On body and mind**

In the first half of the twentieth century, dependence on genetic determinism in psychology had strongly affected eugenics directed towards mentally ill patients and criminals.<sup>105</sup> It would be from the fifties on, that scientific as well as the public belief of this determinism weakened. Interestingly, it can be observed that there was a difference in reception of the degree of heredity in physical traits as opposed to mental traits: whereas the science of genetics rapidly developed, genetic predisposition for physical traits and diseases were taken more seriously. However, in the Netherlands, genetic predisposition for mental traits has been a controversial topic until not too long ago. In chapter one of this thesis, I have already shown that mental traits, such as criminal behavior, intelligence and “feble-mindedness”, have been much discussed in eugenic spheres, both in the United States and the Netherlands. Interestingly, discussions on the hereditary and environmental influences on mental capacities remained mostly absent between the late thirties and the late sixties.<sup>106</sup>

Contrastingly, from the late sixties, research on IQ and how intelligence came about slowly made its way back into the scientific community, however not without resistance. In the United States, human behavior gradually became considered to be influenced by heredity. Among all mental traits, researchers focused mostly on criminal behavior; as had been the case in classical US eugenics. By now, in American criminology, attention gradually shifted towards biological predisposition and empirical studies of the brain.<sup>107</sup> It is argued that the resurfacing belief that criminal behavior has a large genetic component was linked to a shift towards right-winged politics in Europe and the United States.<sup>108</sup> Contrastingly, Schellekens and Visser’s

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<sup>105</sup> J. L. Sherry (2004) pp. 87-88

<sup>106</sup> Schellekens and Visser, pp. 147-149

<sup>107</sup> *Ibid.*, pp. 147-148

<sup>108</sup> *Ibid.*, p. 153

left-winged political views come forward in their evaluation of the American criminal scientists at the time. In contrast to the American view, in the eighties Netherlands, it was not commonly accepted to look for biological causes of mental traits such as criminal behavior, as can be illustrated by the *Buikhuisen*-affair, that took place in the late seventies. In 1979, the bioethics of mental traits became public discourse as a consequence of the work of Wouter Buikhuisen. This scientist had played a fundamental role in Dutch criminology research from the late sixties onwards. In 1967, he was appointed professor of criminology at Groningen University. Up until then, criminological research in the Netherlands had merely been theoretical and non-empirical. However, the appointment of Buikhuisen introduced a change into Dutch criminological research: believing that social factors alone could not entirely explain the bringing about of criminal behavior, Buikhuisen wanted to perform empirical research on biological factors that contributed to this as well, for example, by examining the brains of criminals and adolescents.<sup>109, 110</sup>

Buikhuisen's plans caused a lot of resistance: his scientific environment consisted of particularly left-wing psychologists, sociologists and criminologists who held the belief that hereditary predisposition for criminal behavior was negligible; a person was affected to behave a certain way by their environment. Not only fellow scientists attacked Buikhuisen's work. The public broadcast *VPRO* and the intellectually left-wing magazine *Vrij Nederland* publically criticized Buikhuisen's desire to research biological predisposition for criminal behavior. Columnists did not hesitate to call him a fascist, deceiver, quack and several other insults. Some even drew links to Nazi-doctor Josef Mengele, Nazi- criminologist Franz Exner and classic eugenics.<sup>111</sup> The resistance towards Buikhuisen shows how intolerant left-wing Dutch citizens were towards ideas that hinted at human genetic

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<sup>109</sup> Junger-Tas, J. Criminological Research in the Netherlands, *Crime and Justice*, Vol. 5 (1983), pp. 281-296

<sup>110</sup> Foogteloo, M. Poep door de Brievenbus: Wouter Buikhuisen, *Kriminologie in biosociaal perspectief*, *De Groene Amsterdammer*, nr. 36, (2016)

<sup>111</sup> Ibid.

experimenting.<sup>112</sup> Apparently, in the late seventies Netherlands, Buikhuisen's scientific aspirations were still seen in the light of WWII and the impact of the holocaust on human experimenting by a part of society.

### **The genome era**

The nineties shed new light on the image of genetic components of physical traits, mental traits and, especially, diseases. Geneticists had identified genes responsible for diseases such as familial hyper cholesterolemia, a cause of heart disease. Additionally, cancer had been proven to arise partly from the interplay of genes, called oncogenes.<sup>113</sup> Rapidly increasing discoveries about the role of genes in bringing about these types of severe diseases lead to the desire to 'map' the entire human genome. Subsequently, a "Big Science" project initiated by American scientists in the mid eighties, led to the start of The Human Genome Project (HGP) in 1990.

The HGP was first headed by James Watson, known as the co-discoverer of the DNA molecule's structure, and later by Francis Collins, another prominent geneticist. The project's main goal was to map the entire human genome, hoping to gain more insights in which genes code for which diseases. It was determined complete in 2003: by that time, Collins declared the final product to be a "highly polished sequence of the human genome, free and readily accessible to all".<sup>114</sup> The biological community put a lot of faith in the new disciplines of genomics and genomics-based medicine. With the right funding, Collins argued, "we imagine that genome science will soon

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<sup>112</sup> Ibid.

<sup>113</sup> Kevles, D. J. Big Science and Big Politics in the United States: Reflections on the Death of the SSC and the Life of the Human Genome Project, *Historical Studies in the Physical and Biological Sciences*, Vol. 27, No. 2 (1997), p. 273

<sup>114</sup> Collins, F.S. et al. The Human Genome Project: Lessons from Large-Scale Biology, *Science*, vol. 300 (2003) pp. 286

begin revealing the mysteries of hereditary factors in heart disease, cancer, diabetes, schizophrenia, and a host of other conditions.”<sup>115</sup>

The HGP and its related gene-therapeutic discoveries of the 1990s yielded two fundamental ethical distinctions. For one, it was feared that meddling with the genome had a high risk of unintended consequences. In the words of historian of science Nathaniel Comfort: ‘the genome is like an ecosystem, with every element ultimately connected to every other. Inadvertently damaging alterations could thus be seen as harming the genomes of the others without their consent.’ The second distinction was that gene therapy should only be used to treat disease—not to enhance or alter ‘normal’ traits.<sup>116</sup> In line with this second distinction, some historians have pointed out how medical innovations in reproductive technologies, including human gene therapy, embryo selection and the Human Genome Project, could lead to a resurgence of eugenic ideas.<sup>117,118</sup>

Correspondingly, in the beginning of this thirteen-year genome sequencing process, scientists involved in the HGP felt the need to justify the project’s goals and thereby claim to be extremely cautious of repeating the past in terms of eugenics. In 1990, James Watson had already claimed: ‘We have to be aware of the really terrible past of eugenics, where incomplete knowledge was used in a very cavalier and rather awful way, both here in the United States and in Germany. We have



Image 10: The cover of Time Magazine, showing Vin and Collins, two of the leading HGP scientists. Statin ‘Cracking the Code! The inside story of how these bitter rivals mapped our DNA, the historic feat that changes medicine forever.’

<sup>115</sup> Ibid., pp. 289-290

<sup>116</sup> Comfort, N. (2018) p. 180

<sup>117</sup> Dikötter, F. (1998) p. 476

<sup>118</sup> Kevles, D. In the Name of Eugenics: Genetics and the Uses of Human Heredity (1985) preface, p. viii

to reassure people that their own DNA is private and that no one else can get at it.<sup>119</sup> During the same year, a European genome research project was established as well, at a modest level of funding but also with strong safeguards against the project being used for eugenic purposes.<sup>120</sup>

Despite the fact that these scientists proclaimed to be very much aware of, and reluctant to repeat our eugenic past, the HGP did not go without resistance. Besides political debate about the project's large amount of funding, it awakened fear of a genetic determinist future. Subsequently, over the course of the HGP, several philosophers of biology and bioethicists wrote about their fears and recommendations of future applications of our newly acquired knowledge and ever improving biotechnologies. Examples are Paul Griffiths, Philip Kitcher, John A. Robertson, Julian Savulescu and Nicholas Agar.

However, not all bioethicists proclaimed fear of a new eugenics. Julian Savulescu, for example, started to argue for "procreative beneficence," in 2001. This principle holds that people are morally obligated to have the best children possible—including through genetic-enhancement technologies.<sup>121</sup> Like Savulescu, Agar insists that it is immoral to prohibit parents from producing the best children they can, by whatever means.<sup>122</sup> In 1998, the latter bioethicist coined the term 'liberal eugenics', to distinguish future human genetic enhancement from classical eugenics.<sup>123</sup> One of the main characteristics that distinguishes liberal eugenics from classical eugenics, according to Agar, is state neutrality; the decision whether to opt for genetic therapy for an unborn child is up to the parent.<sup>124</sup>

Whereas Agar's term "liberal eugenics" is strictly tied to political liberal persuasions, some have used the term "neo-eugenics" to refer to present-day

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<sup>119</sup> Kevles, D. (1997) p. 279

<sup>120</sup> Ibid., p. 276

<sup>121</sup> Comfort, N. (2018) p. 181

<sup>122</sup> Ibid., p. 183

<sup>123</sup> Agar, N. Liberal Eugenics, *Public Affairs Quarterly*, Vol. 12 No. 02. (1998) p. 137

<sup>124</sup> Ibid.



biotechnologies that affect one's DNA. In her 2015 paper "A brave new world of designer babies?" Susan Suter notes the importance of making a distinction because the reprehensible history of classic eugenics: "to label a practice as eugenic is to deem it morally problematic at best and abusive and violating at worst".<sup>125</sup> Over the last decades, various authors have used the term neo-eugenics in slightly different meanings, however, most of them share the same features as Suter's definition: "reproductive technologies that we may soon use in eugenic ways".<sup>126</sup> These modern practices share some key features with classical eugenics—the goal of increasing "good birth"—but they differ because they refer primarily to the individual, rather than state, level.<sup>127</sup>

The most recent gene technology that caused neo-eugenic debates among the academic and public spheres is the CRISPR-Cas9 technique. This technology allows for simple cut, copy and paste in DNA, including that of humans. As scientists themselves have announced: it is hard to recall a revolution that has swept biology more swiftly than CRISPR-Cas9.<sup>128</sup> In the next chapter, I will elaborate on this technique and the Dutch public opinion on its possible future role in society.

## **Conclusion**

In this chapter, I have shown that developments in biotechnology and their medical applications brought along the beginning of institutionalized bioethics movements in the seventies. This way, the use of biotechnologies became public concern in the USA as well as the Netherlands. In the rise of bioethics, the fear to

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<sup>125</sup> Suter, S. (2015) p. 898

<sup>126</sup> Batt, J. They Shoot Horses, Don't They: An Essay on the Scotoma of One-Eyed Kings, *15 UCLA Law Review* Vol. 15:267 (1968) The earliest use of the term neo-eugenics has been found in this paper. Batt refers to a "neo-eugenics movement", which would artificially enhance humans in the future by means of biological and electrical engineering, a future he deems as bad as classical eugenics. p. 531

<sup>127</sup> Suter, S. (2015) p. 898

<sup>128</sup> Lander, E.S. The heroes of CRISPR, *Cell* no. 164, January 14 (2016)

resemble eugenics in goals or measures has played a prominent role. Ever since, intellectuals from various disciplines have felt the need to inform the public of eugenics and its possible ties to future biotechnologies. Schellekens and Visser, Roscam Abbing, Van den Berghe and Suter (respectively a historian of science, a pharmaceutical scientist, a theologian, a historian and a jurist) are a handful of authors who have done so over the last decades. Whereas each of the authors differs in some of their visions, as well as the time in which their works have been published, all have argued that eugenics' goals are still present amongst scientists. Nevertheless, it depends on these scientists as well as politics whether, and how, these goals will be pursued.

The *Buikhuisen-affaire* has shown that the heredity of human criminology reached the Dutch public spheres. This event suggests that biological determinism of mental traits was a controversial topic, often related to Nazi ideology. At the same time, there was a quite skeptic atmosphere when it came to applying future techniques to correct for mental traits and the concept of human experimenting. However, thanks to developments in neuroscience and genetics, over the last three decades, it has become acknowledged that mental traits, to some degree, have biological causes. What does this mean in terms of neo-eugenics? Which public expectations and fears are currently present among Dutch society, with regards to newly developed gene technologies and their future effect on hereditary diseases and other less desirable traits?

No overview on the Dutch public opinion of these matters has been established yet. However, topics such as CRISPR-Cas9, designer babies and emerging reproductive technologies have been of wide interest in Dutch newspapers, popular science magazines, and television programs. In the next chapter, I will perform a research similar to the one in chapter 2 on newspaper articles that have dealt with

these topics from 2015 onwards. Hopefully, it will teach us to what degree current public debate on neo-eugenics resemble pre-war public debates on eugenics.

## Chapter 4

### *The debate on CRISPR-Cas9 in contemporary Dutch Newspapers*

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*Over the last 150 years of efforts to control human evolution, the focus on the object of control has tightened, from the population, to the individual, to the gene—and now, with CRISPR, to the single letters of our DNA code. Culturally, during this period, the pendulum has swung from cooperative collectivism to neoliberalism. The larger question, then, is: With the emergence of gene editing during an era of self-interested free-market individualism, will eugenics become acceptable and widespread again?*

*– Nathaniel Comfort, 2015<sup>129</sup>*

As we have seen in the previous chapter, from the fifties on, developments in genetics and medical science gave way to bioethical institutions and debates. Whereas scientists announced a desire to distance themselves from any eugenic ideology, several philosophers and bioethicists explored the possible consequences new technologies might hold for the future of childbirth and family life. This chapter will show that these debates did not go unnoticed by the Dutch public. Over the last years,

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<sup>129</sup> N. Comfort <https://www.thenation.com/article/can-we-cure-genetic-diseases-without-slipping-into-eugenics/>

the term ‘designer babies’ has come up in various media, referring to a future in which we can design the genetic make-up of our future children. Since 2015, most debates that fit this neo-eugenic framework have been around the technique called CRISPR-Cas9. In this chapter, I will perform a research on how concerns around this technique are represented among Dutch citizens. I will do so by examining Dutch newspaper articles, in a similar way as I have done in chapter 2.

### **CRISPR-Cas9**

The recently developed technique named CRISPR-Cas9 has been the target of much debate around genome editing. This technique, more often referred to as CRISPR, allows for cutting and altering specific sites in the DNA of microorganisms, plants and animals, including humans. This way, theoretically, if the exact genetic cause of a trait has been identified, CRISPR allows for altering that specific gene. Diseases that CRISPR has shown to effectively delete in the lab are cystic fibrosis, Duchenne’s muscular dystrophy, specific HIV genes and some cancer-related genes.<sup>130</sup> The history of this technique is one of multiple scientists and research-groups over the past three decades.

The first discovery that led to the technique can be traced back to 1987, when a Japanese research group discovered several ‘curious sequences’ in the DNA of bacterium *Escherichia coli*, that turned out to be repeat elements.<sup>131</sup> Later on, the Spanish researcher Francisco Mojica played a large role in discovering multiple species of bacteriophage (bacterial viruses) with corresponding sequences, inducing him to hypothesize that these sequences play a role in the bacterial adaptive immune

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<sup>130</sup> Wang, K. CRISPR and the Future of Genome Engineering: A Bold New World, *Intersect*, Vol 10, No 3 (2017), pp. 4-5

<sup>131</sup> Peng R. Et al. Potential pitfalls of CRISPR/Cas9-mediated genome editing, *The FEBS journal* (2016) p. 1219

system: a hypothesis that was confirmed in 2007.<sup>132</sup> In 2011, Emmanuelle Charpentier, director of the Max Planck Institute in Berlin, isolated the mechanism of the CRISPR-Cas9-guided activity in viral DNA.<sup>133</sup> These findings, along with previous studies, led to the proposal by Jennifer Doudna in 2012 that the so-called Cas9-crRNA complex could be a robust genome-editing tool for inducing specific double-strand breaks. In 2015, she published the first report that CRISPR could cut specific DNA targets in various organisms.<sup>134</sup> Due to these two discoveries, Doudna and Charpentier are often seen as the discoverers of CRISPR-Cas9 as a tool for genome editing.

Because of its genome altering capabilities, the CRISPR technique has been employed for a variety of uses, such as constructing novel genomic libraries and genetic screens; creating genetically modified organisms, ranging from viruses to silkworms to primate embryos; analyzing epigenetic modifications and genomic regulation; growing genetically modified plants and analyzing and editing gene function in the genome in living organisms.<sup>135</sup> Concluding, the CRISPR-Cas9 system has by now come of age as a novel targeted genome-engineering technology and has been successfully used in numerous species, including humans. As scientists themselves have announced: it is hard to recall a revolution that has swept biology more swiftly than CRISPR-Cas9.<sup>136</sup> Correspondingly, CRISPR has been hailed as the medical breakthrough of the year 2015 by the magazine *Science*.<sup>137</sup> Currently, the technique is constantly being modified and optimized with the aim of achieving different outcomes, and new studies are continually forthcoming.<sup>138</sup>

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<sup>132</sup> F. J. Mojica et al, Biological significance of a family of regularly spaced repeats in the genomes of Archaea, Bacteria and mitochondria. *Mol. Microbiol.* 36 (2000) pp. 244–246

<sup>133</sup> *Ibid.*, p.1081

<sup>134</sup> Travis, J. Making the cut, CRISPR genome-editing technology shows its power, *Science*, vol. 350 is. 6267 (2015) pp. 1456-1457

<sup>135</sup> Brokowski, C. (2015) p. 263

<sup>136</sup> Lander, E.S. The heroes of CRISPR, *Cell* no. 164, January 14 (2016)

<sup>137</sup> Travis, J. p. 1465 (2015)

<sup>138</sup> *Ibid.*

These developments have not come without concerns from the scientific and ethical community. Prominent among these concerns are the connections to our eugenic past. For example, Brokowski et al. (2015) wrote an article called: “Cutting Eugenics Out of CRISPR-Cas9”. Here, the authors, (a medical ethicist, biologist, and psychiatrist) argue that CRISPR use in non-germline experimentation and applications in non-germline human tissues should be legally permissible, however, they are convinced “...that the use of the CRISPR-Cas9 system to edit the human germline should be legally prohibited on account of the system’s potential for generating an unjust eugenic future.”<sup>139</sup> Summarizing, these authors reject the use of CRISPR in germline modification since it will eventually lead to inequality in terms of human rights.

Australian philosopher and bioethicist Julian Savulescu, however, takes a different stand towards the use of CRISPR on human germ lines, as he argues for “a moral imperative to continue this research.”<sup>140</sup> Possible unforeseen future (side) effects of a technique should not be an argument for refraining from such technological applications. Additionally, he claims, “expected benefits outweigh their expected harms,” since “advanced gene editing techniques could reduce the global burden of genetic disease and potentially benefit millions worldwide.”<sup>141</sup> Due to these ethical concerns, scientists working with CRISPR themselves have reached out to the public. Since this technique not only brings along ethical questions relevant for scientists, but for society at large, in 2015, eighteen scientists signed a letter to *Science*, saying: “A framework for open discourse on the use of CRISPR-Cas9 technology to manipulate the human genome is urgently needed.”<sup>142</sup>

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<sup>139</sup> Brokowski et al. Cutting Eugenics Out of CRISPR-Cas9, *Ethics in Biology, Engineering & Medicine - An International Journal*, 6(3-4) (2015) pp. 263, 267

<sup>140</sup> Savulescu, J. The moral imperative to continue gene editing research on human embryos, *Protein & Cell*, vol. 6 (2015) p. 476

<sup>141</sup> *Ibid.*, pp 477- 478

<sup>142</sup> Bosley, S.K. et al. CRISPR germline engineering—the community speaks *Nature Biotechnology* Vol. 33 No. 5 (2015) p. 478

## CRISPR and mental deficiencies

As we have seen in the previous chapters, classic eugenic measures have, for a large part, been directed at feeble-mindedness. However, the understanding of feeble-mindedness in early twentieth century society differed from the understanding of the various mental illnesses that are thought to exist in society today. Additionally, much has changed in the knowledge of hereditary components that play a role in the development of mental illness. Some scientists argue that mental traits may eventually be targeted by CRISPR as well. Kevin Wang, for example, discusses the use of CRISPR for autism research.<sup>143</sup> Later on he also states that, in the future, the technique may even be used to enhance mental conditions such as intelligence and artistic ability.<sup>144</sup> Zhou et al. (2017) wrote an article on the possible use of CRISPR in schizophrenia treatment, however, they conclude: “there is still a long way to go before this revolutionary technology is translated into a clinical cure for schizophrenia and possibly other mental diseases as well due to significant overlaps of the risk genes shared by different forms of psychiatric disorders.”<sup>145</sup> Additionally, its applications for Huntington and Alzheimer’s disease are currently examined.<sup>146</sup> However, Brokowski et al. are skeptical towards such applications, based on the fact that “... many diseases, especially psychiatric diseases such as schizophrenia, bipolar disorder, autism spectrum disorder, and Alzheimer’s disease, are largely thought to be of multigenic etiology.”<sup>147</sup> Concluding, scientists are exploring the ways in which CRISPR might be used to delete genes that play a role in the development of various mental illnesses. However, most of them acknowledge that there is no mono-causal

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<sup>143</sup> Wang, K. (2017) p. 5

<sup>144</sup> Ibid. p.11

<sup>145</sup> Zhou, C. et al. Genomic Editing of Non-Coding RNA Genes with CRISPR/Cas9 Ushers in a Potential Novel Approach to Study and Treat Schizophrenia, *Frontiers in Molecular Neuroscience*, Volume 10 | Article 28 (2017)

<sup>146</sup> Rohn T. Et al. The Potential of CRISPR/Cas9 Gene Editing as a Treatment Strategy for Alzheimer’s Disease, *Journal of Alzheimer’s*, no. 8 (2018)

<sup>147</sup> Brokowski, C. (2015) p. 273



relationship between genes and one of those illnesses, and thus, we are far from actually using CRISPR to prevent autism, schizophrenia or Alzheimer's from developing in in our future children.

### **CRISPR and the Dutch Public**

Since 2015, several Dutch newspapers and public platforms have reported on the possibilities of CRISPR in relation to the human genome and other applications, such as using the technique in creating genetically modified crops (GMO's).<sup>148</sup> Information about the technique almost always goes accompanied with considerations of the ethical aspects and "challenges" for society.<sup>149</sup> Subsequently, the RIVM (Netherlands National Institute for Public Health and the Environment) and NEMO Kennislink have developed a website to inform the public on new biotechnological developments, such as CRISPR, and their possible applications and consequences for society: <https://biotechnologie.nl/>. As claimed by the website, the ethical questions at stake revolve around if, and when, it is allowed to interfere in the human hereditary material and the possible consequences for offspring.<sup>150</sup> Legally, the Netherlands, as well as other member states of the European Union, are bound to the European embryo law in experimenting on embryo's. Additionally, the Cogem (Dutch commission for genetic modification) advises the government on environmental risks as well as ethical aspects of genetic modification techniques.<sup>151</sup>

Annelien Bredenoord is the most well known Dutch public educator on CRISPR, and her view on CRISPR is most often cited in public news articles on CRISPR. In 2015, she told *Nature* that she would consider human germline engineering ethically acceptable when, first of all, it fits the safety requirements for human use.

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<sup>148</sup> <https://biotechnologie.rivm.nl/CRISPR-Cas>

<sup>149</sup> <https://biotechnologie.rivm.nl/maatschappelijke-uitdagingen>

<sup>150</sup> Ibid.

<sup>151</sup> <https://www.cogem.net/>

Additionally, so-called 'essential characteristics' of a future person must not be altered in such a way that a person's future is predetermined toward a specific plan of life, which is a rather genetic determinist view. However, she argues, that being healthy should be the main concern when we allow genetic modification on future children.<sup>152</sup>

## **Methodology**

Whereas in chapter 2, I have performed a digital search on newspaper articles on eugenics from 1920 to 1940, here, I will perform a similar search on Dutch newspaper articles that discuss the use of CRISPR-Cas9 applied to human germ lines over the last years. However, my methodology differs in terms of search engine. In my first research, I have used Delpher's digital archive of Dutch newspapers. However, this database only holds newspapers until 1995.<sup>153</sup> Therefore, my second research requires a different database. I have decided to use the five largest national newspapers as well as the most prominent religious newspaper for this study and to use their online database in finding articles. Additionally, I have used LexisNexis to gain access to some of the newspapers whose articles are not publically available. LexisNexis holds the majority of local and national Dutch newspapers articles from 1980 until today.

The newspapers used are:

- De Telegraaf
- Het Algemeen Dagblad
- Trouw

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<sup>152</sup> Bosley S.K. et al (2015) p. 482

<sup>153</sup> <https://www.delpher.nl/nl/platform/pages/helpitems?nid=385>

- Het NRC Handelsblad
- De Volkskrant
- Het Reformatorisch Dagblad

### Audience newspapers

All newspapers have a slightly different profile, therefore a different audience. Together, I think these six newspapers represent a large section of Dutch society. Here, I shortly describe the background and target audience of each of the newspapers included in this study.

*De Telegraaf* is considered one of the more popular newspapers. It's directed at a wide audience and uses a predominantly conservative and populist style. Politically, *De Telegraaf* is considered right-wing. *Het Algemeen Dagblad* claims a political and religiously neutral position and also targets a wide audience. *De Volkskrant*, *Trouw* and *het NRC Handelsblad* are considered to be upper middle class newspapers. *Trouw* is an originally protestant newspaper, however, it currently distinguishes itself by emphasizing all kinds of religious and philosophical news and visions. *De Volkskrant* is directed at a younger audience. This newspaper is considered politically left-wing. *Het NRC* is considered a more liberal newspaper. Finally, *Het Reformatorisch Dagblad* is the largest Christian newspaper to date, with a reformed signature.

### Date

Since CRISPR's scientific and public breakthrough took place in April 2015, this is the chronological start of my research. Most articles on CRISPR from 2018 deal

with its application on crops.<sup>154</sup> Therefore, I have chosen to perform a search over the timespan of three years; from April 2015 until April 2018.

### Search words

Since CRISPR-Cas9 has been the motive for this thesis, it will be one of my search words. Most newspapers refer to the method by using the shorter term *CRISPR*; therefore, I have chosen to use this word for the first round of searches in the newspapers I have chosen to study. However, not all articles that deal with CRISPR deal with its use on human embryos; some of the more recent articles on CRISPR discuss its application on crops, to create GMO's. Additionally, not all newspapers that discuss CRISPR use the method's term, but instead refer merely to a 'recently developed biotechnology', or talk about human improvement or designer babies. Therefore, I have decided to leave out articles that talk about CRISPR being applied for any purpose besides genetic manipulation in human embryos, against which I have selected manually by scanning an article's content. Additionally, I decided to add terms referring to designer babies, human enhancement and gene technology. Next, I inquired whether any articles have been written over the last years that link modern biotechnology to eugenics. Therefore, I added the term *eugenetica* to my search. Additionally, in order to trace the public opinion on modifying genes in order to affect mental traits, I searched for CRISPR, genetics and biotechnology, the words *genetica*, *CRISPR* and *biotechnology*, combined with words that refer to mental states, such as *mentale gezondheid*, *psychologische aandoening* and *intelligentie*. In the end, only the combination of *genetica* and *intelligentie* gave me a few articles that are interesting for my research. This resulted in the list of the following search words:

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<sup>154</sup> This was written in September 2018. Contrastingly, November brought along much public debate on CRISPR applied on human embryo's, due to the unsuspected birth of the first HIV- resistant CRISPR babies in China, due to the medical doctor He Jiankui.

*CRISPR*

*Designerbaby*

*Mensverbetering*

*Gentechnologie*

*Eugenetica*

*Genetica + intelligentie*

Type of article

Within the articles that result from this selection, I have checked whether an article deals with applying CRISPR for genetically modifying human embryos, as opposed to the technique's other possible applications. Within this selection, predominantly research articles and opinion articles are selected for study. In this type of articles, compared to news articles, the author (and interviewed individuals) elaborate on opinions regarding the use of CRISPR as compared to merely stating the developments surrounding the technique, as most news articles do. This resulted in a total of 60 articles that have proven to be interesting for my study. Among the 60 articles that fit the criteria of my research, I will score for:

- Stand towards future applications of CRISPR-Cas9 on human diseases and other traits in embryos
- Whether opinion towards CRISPR is tied to politics or religion
- Whether responsibility in deciding upon applying CRISPR comes down to scientists, politicians or individual parents
- Explicit or implicit references to eugenics
- Mention of mental traits

The six newspapers varied in the numbers and the depth of the articles on CRISPR. This suggests an inequality among Dutch society in terms of awareness of, and vision on, the technique CRISPR-Cas9. First, I will elaborate on the different ways each of the newspapers has addressed the technique in their articles. Afterwards, I will describe some of the general findings on the elements mentioned above. In the discussion section of this thesis, I will compare these results to the results from my second research.

## **Results**

*Het Algemeen Dagblad* showed few articles that deal with CRISPR. Those that do, mostly report on CRISPR applied to crops, to create GMO's. Only one article resulted that fitted the criteria for this research. This article consisted of a short interview with three scientists and their opinion on how CRISPR should be applied on human embryos in the future. Whereas one of the scientists mostly fears CRISPR's risks, the other two praise its ability in possibly terminating hereditary diseases. The article concludes that we should rely on the expertise of scientists in deciding if, and how, the technique should be used in the future.

*De Telegraaf* has published a handful of news articles that shortly report on the basic technique behind CRISPR, and only one research article. These articles mostly speculate that human genome editing might be near, and are quite skeptical whether this is desirable. However, this newspaper's articles on CRISPR give no extensive elaborations on the issue. The only research article on the technique relies for a part on quotes from Annelien Bredenoord as well as interviews with individuals suffering from hereditary diseases, who claim to be supportive of CRISPR's promise of

deleting hereditary diseases in germlines. This article makes the future use of CRISPR appear to be a development supported by both bioethicists as well as patients.

*Het Reformatorisch Dagblad* has published eight articles that fit the criteria for this research. Most of these articles seemed to have a similar stand towards CRISPR: this newspaper shows to be in favor of applying CRISPR in deleting severe hereditary diseases, but opposes applying the technique to enhance 'normal' traits. One interesting recurring issue is the emphasis on the complexity of genes and the role of environmental factors in bringing about traits, as reasons why it is unlikely that CRISPR can eventually be used to affect just any trait. Additionally, several of the articles mention the debate on changing the embryo law in 2017, in which the Christian political party ChristenUnie (CU) holds a position contrary to D66, in stating that embryos should not be used for clinical research. *Het Reformatorisch Dagblad* seems to agree with CU's position.

Newspaper *Trouw* showed a total of ten articles interesting for this research. The opinion articles showed to be skeptic towards CRISPR, and one of them even compared new genetic technologies to eugenics. Interestingly, an article was published by a geneticists in response, that argues that CRISPR does not resemble eugenics and will only be used to prevent future suffering. *Trouw's* research articles often explain that, whether or not we should use CRISPR in the future is not a yes or no question, but largely depends on how we will use it. These articles mostly quote scientists and other experts in their opinions on future applications instead of clearly taking an own stand. However, the overall consensus that appears from most *Trouw* articles is that CRISPR proves to be interesting, as long as its safety is examined first, as can be seen in the example below:

We grijpen nu al in om erfelijke ziektes te vermijden, benadrukt hij. Ouders die hun gendefect niet willen doorgeven, kunnen besluiten geen kinderen te nemen, een donor in te schakelen of een embryo te laten terugplaatsen dat het defect niet heeft. Repping: "Met CRISPR zou je die andere embryo's kunnen repareren. En hoef je ze niet weg te gooien."

Maar dan moet die reparatie wel veilig zijn. Er blijft een kans dat het nieuwe gen niet precies op de goede plek terecht komt. Hoe groot die kans is, moet worden onderzocht.

Image 11: *Trouw*, March 28<sup>th</sup>, 2017: Here, geneticist Sjoerd Repping argues that 'we currently operate to avoid hereditary diseases. Parents who do not wish to pass their genetic defect, can decide to withhold from having children, use a donor or have an embryo selected that does not have the defect. CRISPR would allow fixing the other embryos, and not having to dispose of them.

However, the procedure should be safe. The risk remains that a new gene does not settle at the exact location. It needs to be examined how high these chances are.'

*De Volkskrant* offered thirteen useful articles. This newspaper contained more elaborate research articles compared to *Trouw*. It mostly elaborates on opinions by Jennifer Doudna, Julien Savulescu, Annelien Bredenoord and Sjoerd Repping (head of reproductive medicine at the University of Amsterdam), instead of taking an own stand. In contrast to *Het Reformatorisch Dagblad*, instead of claiming to be in favor of applying CRISPR in deleting severe hereditary diseases, but against applying the technique to enhance 'normal' traits, it is occasionally mentioned that there is a grey area between what we would call "curing diseases" and "improving normal traits". Therefore, it is hard to draw a line between when to, and when not to, apply CRISPR in the future:

De onmiddellijke keerzijde is onheilspellend: denk aan gezinnen die niet alleen gezonde, maar ook slimmere, gespierdere of mooiere nakomelingen willen. 'Er is geen manier om een grens te trekken tussen medische behandeling en mensverbetering', zei ethica Marcy Darnovsky van het Amerikaanse Center for Genetics and Society vorige maand op een congres in Amsterdam.

Image 12: *De Volkskrant*, December 24<sup>th</sup>, 2015: 'The immediate downside is sinister: imagine families who do not only wish for healthy, but also muscular or more beautiful offspring. 'There is no way to draw a line between medical treatment and human enhancement', ethicist Marcy Darnovsky argued last year at the American Center for Genetics and Society.'

*Het NRC Handelsblad* provided the largest number and the most elaborate articles on CRISPR; a total of 24. This newspaper resembles *Trouw* and *De Volkskrant* in providing more elaborate articles, based largely on the visions of experts and showing



that whether or not we should use CRISPR in the future is a complex question.

However, *Het NRC* contained more elaborate research articles compared to both *Trouw* and *De Volkskrant*. Several articles also suggest that technically, CRISPR may be applied when curing severe genetic diseases. They claim, however, that there is a grey area between what we would call 'curing diseases' and 'improving normal traits', as can be seen in image 3. Additionally, it can be observed that the technique's safety is also criticized. This way, concerns of both *Trouw* and *De Volkskrant* recur in *Het NRC* as well.

Waarom zou je erfelijke ziekten niet voorgoed uit getroffen families bannen? Het zou het einde betekenen van slopende en vaak dodelijke ziekten als taaislijmziekte, hemofilie en verschillende ernstige spierziekten.

Als het daarbij bleef en de techniek was veilig zou de tegenstand snel verdwijnen. Maar de grens tussen ziekte bestrijden en mensen 'verbeteren' is onscherp. Sterker nog: er is een groot grijs gebied. Het gaat om ziekten die op late leeftijd ontstaan, om ziekten waarmee goed te leven valt en om lichte (verstandelijke) handicaps.

Image 13: *Het NRC*, December 1<sup>st</sup>, 2015: 'Why wouldn't you ban diseases forever from affected families? It would mean the end of demolishing and often deadly diseases, such as cystic fibrosis, hemophilia and various severe muscular diseases.'

If it would end here, and the technique would be safe, the opposition would disappear soon. But the line between combatting diseases and "improving" humans is unclear. Even worse; there is a large grey area. It concerns diseases that appear later in life, diseases one can perfectly live with, and lighter (mental) handicaps.'

Occasionally, this newspaper also warns against genetic determinism when believing that, by editing genes, we can simply alter just any trait.

Ook zijn er steeds betere technieken (zogenoemde CRISPR-technologie) om zelfs genen aan te passen in het DNA, op termijn ook mogelijk in menselijke embryo's. „Het is een ontzettend spannende tijd, zegt Wijmenga. Al moeten we ook oppassen voor genetisch determinisme. Iemand's DNA bepaalt niet alles.”

Image 14: *Het NRC*, July 4<sup>th</sup>, 2015: 'There are also continuously improving techniques (so-called CRISPR- technology) to even affect genes in one's DNA, within time even in human embryo's. 'It is a tremendously exciting time, Wijmenga says. Although we need to be aware of genetic determinism. One's DNA does not determine everything'.'

## Concerns about CRISPR

From the analysis per newspaper, I can conclude that overall, few articles have shown to be explicitly pro or anti CRISPR. There was only a handful of opinion articles, or interviews with scientists, that are supportive of the technique. One example is the interview with Annelien Bredenoord in the NRC, as can be read in the image below:

### **Vindt u dat we op deze manier moeten sleutelen aan genen?**

„Als deze techniek echt veilig genoeg toegepast kan worden, dan is het wenselijk. Je kunt erfelijke kanker voorkomen, of zeer ernstige spierziektes. Voor mij past dat binnen de doelstellingen van de geneeskunde: het verminderen van lijden en het vroegtijdig voorkomen van sterfte.”

Image 15: Het NRC, August 3<sup>rd</sup>, 2017: ““Do you think we should edit genes this way?” “If this technique can actually be applied safely, then it is desirable. It allows prevention of cancer, or severe muscular diseases. For me, this fits the goals of medicine: reduce suffering and prematurely terminating death.””

One of the recurring concerns towards the technique is its permanent character, combined with the uncertainty of possible side effects of altering specific sites in one’s DNA:

GENERATIES: Dat een kind niet meer een ernstige erfelijke ziekte krijgt, lijkt mooi. Bezwaar is echter dat als je het DNA van een embryo verandert, die wijziging niet alleen die persoon treft maar ook de volgende generaties. Onbedoelde schade en ongewilde wijzigingen kunnen niet meer ongedaan worden gemaakt.

Image 16: *‘Het Reformatorisch Dagblad*, December 7<sup>rd</sup>, 2015: “ GENERATIONS: A child no longer being subjected to severe diseases, which seems good. However, it can be objected that, when changing an embryo’s DNA, its changes do not just affect the treated person, but also next generations. Unintended harm and changes cannot be undone.’

Based on the four fragments shown so far, it can be concluded that the most recurring concerns of CRISPR are the technique’s safety, the grey area between curing diseases and enhancing normal traits and transmission of edited genes to future generations.

## Politics

*Trouw*, *Het NRC Handelsblad* and *de Volkskrant* have provided the majority of useful newspapers. Apparently, developments around CRISPR and future human genome editing are mostly debated among the more left-wing, as well as liberal, upper middleclass public in the Netherlands. A large discrepancy can be seen in the numbers of articles on CRISPR among the various newspapers. Whether this has any ties to the newspaper's political color, remains speculative. In the discussion section, I will elaborate on the possible underlying explanations.

## Religious arguments in relation to CRISPR

Contrasting the eugenics debate, the CRISPR debate seems to rely less on religious arguments when discussing the morality of the technique. *Het Reformatorisch Dagblad* was the only newspaper studied with a reformed signature. The articles from this paper often highlight ethical concerns around the technique, however, do not explicitly mention whether CRISPR's possible applications are in line with the Christian faith. However, its Christian character comes forward in some of the newspaper's concerns with regards to gene technology and embryonic experiments:

Tegelijkertijd adviseert de raad een maatschappelijk debat aan te zwingelen over de vraag hoe ver een land als Nederland wil gaan in het toepassen van revolutionaire medische technieken, als dat eenmaal veilig kan. Spijtig genoeg wachtte de raad het verloop van zo'n debat niet af, alvorens de bakens te verzetten. Niettemin biedt deze opening volksvertegenwoordigers en patiëntenorganisaties die de beschermwaardigheid van al het menselijk leven nog steeds als speerpunt zien een uitgelezen kans om hun zorgen en bezwaren kenbaar te maken tegen de richting die het kabinet dreigt in te slaan.

Image 17: *Het Reformatorisch Dagblad*, March 3<sup>rd</sup>, 2017: ‘The senate advises for a public debate on how far the Netherlands want to go in applying medical techniques, once this can be done safely. Unfortunately, the council did not wait to see the progress of such a debate before changing its course. Nevertheless, this event allows elected representatives and patient organizations who highly value the protection of all human life the opportunity to express their concerns towards the path the cabinet is about to take.’

From the fragment in image 4, it appears that the article highly values public debate on application of medical techniques. Additionally, it grants high responsibility in the cabinet in taking public concerns into account when deciding upon medical ethical matters. At the same time, this article shows the newspaper’s disapproving stand towards the use of embryos for experimental purposes, which is referred to as with ‘all human life’.

#### Responsibility and individualism

From the newspapers studied, an individualist mentality seems to be present. At least, in the sense that if the technique would be applied in the future, the ultimate responsibility for using CRISPR will be up to a child’s parents.

Het leidt volgens de klinisch geneticus af van waar het om draait: ervoor zorgen dat aanstaande ouders een geïnformeerde keuze kunnen maken, zodat ze 'ernstig leed' kunnen voorkomen.

Image 18: *Trouw*, April 29<sup>th</sup>, 2016: On applying genetic tests in unborn embryo’s that score for 50 hereditary diseases, this newspaper states: “According to the clinical geneticist, this detracts from what is at stake: making sure that future parents can make an informed choice, in order to prevent “severe suffering”.”

However, the responsibility in educating those parents, in deciding whether such genetic tests should be made available, creating rules for which traits the technique may or may not be applied, and solving other ethical dilemmas, is put in the hands of multiple agents. For example, image 5 shows the responsibility of, and faith

to, the senate in listening to public organs before making decisions on embryonic tests, according to *Het Reformatorisch Dagblad*.

The grey area between curing and improving people is one of the recurring public concerns in this issue. *Het Algemeen Dagblad* puts its faith in scientists in deciding when and how to apply the method. However, other newspapers and scientists call for public debate. Annelien Bredenoord, as mentioned in *De Volkskrant*, claims that the government makes laws, though individuals should have the freedom to decide whether they want to use the technique. Therefore, they should be properly informed on its implications.<sup>155</sup> *Het Reformatorisch Dagblad* highly values the Cogem and gives a large role to politics in deciding on ethical issues regarding biotechnology.<sup>156</sup> Concluding, the main consensus is that multiple agents have their responsibility in this debate, which should be held more often and more publically. Bredenoord's view on this seems to be agreed upon most.

### CRISPR and mental illness

So far, the articles have shown no debate on the application of CRISPR to mental illness in a similar way as eugenics was targeted for a large part towards feeble-minded individuals. When entering search words, I used various terms that refer to mental illness and other mental capacities combined with terms such as CRISPR and genetics. Only genetics combined with intelligence gave a few useful results. Some of these articles only speculate that, when CRISPR application will be allowed on all genes in the human genome, we may eventually create more intelligent children. On the other hand, some articles explicitly mention that the relationship between genes and mental traits such as intelligence is too complex to do so.

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<sup>155</sup> *De Volkskrant*, October 15<sup>th</sup>, 2016, De mensheid perfectioneren: moeten we dat willen?

<sup>156</sup> *Het Reformatorisch Dagblad*, 15-06-2016, Cogem: Politiek moet heldere keuzes maken rondom biotechnologie

marcheren. Al deze eigenschappen: groot, sterk, mooi, slim, dom, volgbaar, agressief, worden bepaald door het samenspel van zo veel genen en zo veel omstandigheden dat een geplande wijziging onmogelijk lijkt.

Image 19: *Trouw*, September 22<sup>nd</sup>, 2017: “All these traits: tall, strong, pretty, smart, stupid, docile, aggressive, are decided by the interaction between genes and so many environmental circumstances that a planned modification seems impossible.”

One article from *Het NRC* mentions that scientists have used CRISPR to affect autism-related genes in macaques. The ethical concern briefly put forward in the article is whether ethical commissions would ever allow this research in the Netherlands, and there is no talk of eventually affecting autism genes in humans this way.<sup>157</sup>

Additionally, *De Volkskrant* mentions that one Alzheimer-related gene may be affected by CRISPR. However, the article does not take an ethical stand towards this.<sup>158</sup> Overall, it can be concluded that only some severe hereditary diseases that CRISPR has effectively shown to delete in the lab, are mentioned as possible future targets. However, no debate is (yet) centered on specific mental illnesses and CRISPR.

### References to eugenics

Last, but not least interesting, I sought for eugenics references among the articles. Nine articles refer to eugenics. Interestingly, all but one of these are opinion articles, most of which are more cautious towards CRISPR. The other articles do not explicitly nor implicitly refer to the historical movement. For example, one opinion article in *Het Reformatorisch Dagblad* refers to genome editing as “this new eugenics” and questions whether this deserves the support of Christians. The author eventually

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<sup>157</sup> *Het NRC Handelsblad*, Januari 27<sup>th</sup> 2016, Gentherapie tegen autisme? Even testen op de proefpaal

<sup>158</sup> *De Volkskrant*, April 18<sup>th</sup> 2015, Is de supermens in aantocht?

claims that genome editing is “eugenics in its newest form”.<sup>159</sup> From this, I can conclude that some people see CRISPR and other forms of genome editing in the light of eugenics, and use the movement to warn for its possible consequences. However, most research articles treat CRISPR as a new phenomenon without mentioning eugenics or any similar debates that occurred in the past.

## **Conclusion**

By looking at the numbers of articles distributed over the six newspapers, I can conclude that the CRISPR- debate does not reach the entire Dutch population, but is mostly present among upper-middle class politically left and liberal newspapers. Among these three newspapers, not the CRISPR-Cas9 technique itself, but its specific goals and possible future applications are questioned. The most recurring concerns of CRISPR are the technique’s safety, the grey area between curing diseases and enhancing normal traits and transmission of edited genes to future generations. Opinions on how to apply CRISPR in the future mostly rely on professionals. Opinion articles are an exception to this; here, the authors themselves often suggest whether, and how, the technique should be used. These are also the only articles that mention eugenic thought as an example of a future mentality that we want to avoid.

As from April 2018, we are left with more questions than answers on how CRISPR should be applied. Responsibility is sought among scientists, politicians, public debates and future parents who might be ultimately confronted with the option to have their child’s DNA edited by CRISPR. In this thesis’ conclusion, I shall compare my results from chapter 2 to the ones discussed in this chapter.

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<sup>159</sup> *Het Reformatorisch Dagblad*, April 12th, 2017, Weerwoord: Knutselen met genen is een mijnenveld

# Discussion

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*Een technologie die raakt aan de toekomst van de menselijke voortplanting verdient een breed gedragen democratisch debat, waarin iedereen, en niet alleen de wetenschappelijke beroepsgroep, wordt uitgenodigd om na te denken over de vraag wat voor een toekomst we willen voor onszelf en komende generaties.*

*- Mr. dr. Britta C. van Beers, 2018<sup>160</sup>*

In the previous chapters, this thesis has shown that prewar eugenics and present day discourse around the technique CRISPR-Cas9 both reached the Dutch public through newspaper articles. Whereas the main connection between the two concepts is that they impact human heredity, there are many differences between both concepts, their applications and their related debates. For instance, whereas eugenics can be seen as a movement, or an ideology, with various measures to live up to it's goal, CRISPR is one specific biotechnological measure, which could be used for multiple goals. One more interesting difference to take into account is that the eugenic measures were actually applied in some countries, whereas CRISPR has, in the timespan I researched, only been used in the lab. In this discussion section, I will elaborate on some observations when comparing results from both researches, to

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<sup>160</sup> Waar ligt de grens tussen genezen en verbeteren?, *Het NRC Handelsblad*, December, 7<sup>th</sup> 2018



answer the question: *'how has the Dutch public image of artificially enhancing human heredity, from eugenics to modern gene technology, transformed over the last decade?'*

My expectations prior to this research, as discussed in my introduction, were:

- The Dutch public is hesitant towards eugenics in the period between 1920 and 1940
- Religious, most likely Roman Catholic, arguments have been used as moral objections towards the application of eugenic measures
- A negative influence of eugenics on the public image of the application of CRISPR on population level
- A greater influence of the Roman Catholic Church compared to possible other religious influences on the public moral thoughts towards CRISPR
- In future CRISPR applications I expect the most public support towards the deletion of severe genetic diseases, but cautiousness of its application in deleting less troublesome traits or enhancing other traits
- different knowledge on the science of heredity between both periods
- a difference between the main targets (diseases or traits) of eugenic measures and CRISPR

Some of the findings of this research are in line with my expectations prior to this research, however, some of the observations are not. Summarizing, I will elaborate on the following findings:

- The Dutch public was partly positive towards the goal of eugenics from 1920 to 1940. Contrastingly, its applications were mostly criticized. In CRISPR's case, its goals are more often topic of debate

- Whereas the eugenics debate, focused a lot on population level goals of applying eugenic measures, there is little speculation on the population level consequences of allowing CRISPR to be applied on human embryo's. This may be due to the negative impact of eugenics on medical applications on population level
- Whereas eugenics was for a large part directed at feeble-mindedness, CRISPR's main targets, however much debated, are most often concrete hereditary physical handicaps
- The influence of the Roman Catholic Church on both the debates was mostly in line with my expectations
- Between 1920 and 1940, eugenic measures have actually been legally applied outside of the Netherlands. This has influenced the Dutch debate and resulted in a more negative stand towards eugenics.
- Contrastingly, between April 2015 and April 2018, CRISPR has not been applied outside of the lab. Actual application of the method abroad may affect the Dutch public opinion towards CRISPR in a similar way

Before elaborating on these results, I will discuss the methodology used in this thesis. In conclusion, I will point out the limitations of this research and possible further interesting domains to perform research on, in order to find out to what degree eugenic thought may be present in current debates on gene technology.

## **Methodology**

Searching digitized sources is a relatively new approach in historical research. I have experienced the benefits to using a digital database in that it has proven to be time efficient, due to its easy access to a large body of texts. A benefit of using

newspapers as primary sources was the fact that the different newspapers used have different political or religious identities, which allowed for studying a diverse public and analysis of differences between public opinion tied to religious or political persuasions, although not all persuasions are represented evenly in this research.

However, the use of digitalized newspapers has proven to have its limits as well. For one, it has already been acknowledged that disadvantages of digital methodologies may be encountering false negatives or false positives when using certain search words: articles that are not found, because they discuss the topic in different words than we would expect, and articles that do not discuss the topic of research, but do mention a keyword.<sup>161</sup> Especially my second research initially led to a lot of false positives, which made critical manual selection among the corpus of articles found necessary. Furthermore, I have used newspapers partly because of pragmatic considerations, since digital databases are easily accessible and provide a relatively large number of sources. Nevertheless, it has been argued by media scholars that newspapers are not a neutral and proper mirror of society, since their news is constructed from an ideological perspective.<sup>162</sup> One more limitation in studying newspapers when researching public opinion is that you are never completely sure how the audience responds to an article: what proportion of a newspaper's audience have read the article of interest, do they completely understand its content and do they agree with the author? Fortunately, the second research covered some opinion articles as well, which sometimes showed a reader's response to articles on CRISPR, therefore offering a better image of some actual public opinions.

Therefore, I can conclude that the use of digitalized databases to study newspapers offered a proper image of the public image of eugenics as well as the future application of CRISPR on human embryos, though additional sources may give

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<sup>161</sup> Huistra and Mellink (2016) p. 223

<sup>162</sup> Broersma, A.L. (2012) p. 37

a more complete picture.

### **Goals and measures**

In my first research, it became apparent that, until the early thirties, standpoints towards the diverse eugenic measures discussed differed significantly from views on the theoretical concept of eugenics. The goal of eugenics was considered to benefit society. As discussed in chapter one, the three social diseases tuberculosis, alcoholism and sexually transmitted diseases as well as the more general affliction feeble-mindedness were the main targets against which Dutch eugenic measures should be aimed.<sup>163</sup> Whereas the general idea of eugenics targeting those diseases was often praised, the nature of most measures, especially sterilizations, was critically questioned. The measure most often recommended was the premedical marital test. However, the freedom of individual choice was highly valued in deciding to act on marital advice based on this test, mostly in catholic newspapers. From 1933 onward, it can be observed that the public consensus became that eugenic goals, even though initially praised, became more problematic, due to the German sterilization law. From this moment on, the term eugenics was put in a more negative light in the newspapers studied.

Contrastingly, the second research focuses on one biotechnological measure, CRISPR-Cas9, instead of a specific goal or a movement. It has been observed that while CRISPR as a measure is often accepted, it's safety has occasionally been criticized. Moreover, the genes or traits at which the methodology should be directed, if it were to be applied, are questioned. Therefore, the debate is mostly about at which diseases or traits CRISPR should be aimed. In this sense, it is not the means, but the goal that is topic of debate. Interestingly, while eugenics gained more public

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<sup>163</sup> Schellekens and Visser (1987) p. 82

resistance after the German sterilization law was passed, CRISPR's technique has not been applied outside of the lab. Perhaps actual application of the technique in actual human embryos will bring about more public concern.<sup>164</sup>

### **Individuality and population**

One of the most interesting findings that did not match my expectations is related to the question whether the debates focused on individual or population level consequences, both in the case of eugenics and CRISPR. Whereas, in the Netherlands, individuality was highly valued when it came to deciding upon eugenic measures (if they were to become reality), it has been shown that eugenics goals were often discussed in terms of population level consequences. It has been argued that the second half of the twentieth century brought along a shift towards individualism that went along with a shift in perspectives towards eugenics. Prior to the nineteen fifties, it was commonly believed that individuals should serve society, whereas from the fifties onwards, the belief that society should serve all individuals started growing.<sup>165</sup> However, from the research discussed in chapter 2, we can learn that this individualist mentality was already present in the late thirties Netherlands. According to Van Den Berghe, this growing individualist mentality ultimately resulted in the late twentieth century scenario where almost all parents have the right to give birth to children with mental or physical handicaps, despite the social costs, a neo-liberal mentality largely contrasting the one underlying the goals of early twentieth century eugenics.<sup>166</sup> This is in line with Agar's claim that one of the main characteristics that distinguishes liberal eugenics from classical eugenics, is state neutrality; the decision whether to opt for genetic therapy for an unborn child is up to the parent.<sup>167</sup> This

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<sup>164</sup> This changed in November 2018, as will be mentioned later in this discussion

<sup>165</sup> Van den Berghe, G. (2008) *De Mens Voorbij*, p. 13

<sup>166</sup> *Ibid.*, p. 207

<sup>167</sup> *Ibid.*

would lead to the expectation that those involved in the CRISPR debate highly value individual decision-making when it comes down to if, and how the technique should be applied.

However, many who question the use of CRISPR and other forms of biotechnology, claim that it might lead to inequalities in the population on a larger scale. Additionally, it can be argued that one can never make a decision fully individually, since we are always influenced by societal norms. One example is Michael Sandel's book, *The Case Against Perfection* (2007), which discusses multiple concerns that are raised if the larger part of society would have access to genetically enhanced babies.<sup>168</sup> Consequently, I expected these population level consequences to be a recurring concern in the public CRISPR debate.

Partly in line with these expectations is the difference from eugenics in that future use of CRISPR is often accepted as beneficial in curing diseases on the individual level: if we had the chance to prevent future suffering in individual children, we should do so. Additionally, the technique is criticized by a few of the opinion articles for its possible effects on the population level: do we want to improve traits – whether they are considered 'normal' or not - in society as a whole? However, the vast majority of the articles on CRISPR refrain from discussing what population level consequences would be if, a few years from now, CRISPR would be offered as a prenatal application.

This abstinence from population level consequences of a CRISPR- future may be explained by the fact that speculation about population level health improvement in terms of genetics is often linked to eugenics. As has become clear in chapters 2 and 3 of this thesis, from 1933 on, eugenics increasingly became a taboo among Dutch society, and those involved in genetics often felt the urge to distance themselves from anything eugenics-related. Or, as Suter has argued: "to label a practice as eugenic is to

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<sup>168</sup> Sandel, M. *The Case Against Perfection*, Cambridge (2007)

deem it morally problematic at best and abusive and violating at worst".<sup>169</sup> Hence, claiming that CRISPR might be advantageous on the level of society might cause much resistance: the negative connotation with eugenics of medical advice on the population level may induce CRISPR advocates to withhold from speculating on any possible consequences that CRISPR may have on population level.

### **Newspapers and politics**

From 1920 to 1940, some political influences on the stand towards eugenics could be pointed out more clearly than in the case of CRISPR research: clearly, socialist newspapers were the most in favor of applying eugenic measures and opt for state responsibility. It would be interesting to see what present-day socialists think of applying CRISPR. However, none of the newspapers studied have a strong socialist character.

Overall, in my second research, it was harder to trace political influences on stands towards CRISPR. This was partly due to the fact that not all newspapers have published on CRISPR evenly: only upper-middleclass, left to center, and liberal newspapers reported more often on CRISPR. Additionally, the *Reformatorsch Dagblad* gave some interesting results. This means that lower to middleclass and center to right newspapers mostly refrained from discussing the topic. However, in the few articles that these types of newspapers (*Het Algemeen Dagblad*, *De Telegraaf*) featured, it appeared that the authors granted a large role to scientists in deciding upon ethical questions concerning CRISPR. This implies that these newspapers and their audience put most faith in the scientific community in deciding on such matters, as opposed to the 'uninformed' public; this may explain why they do not pay not too much attention to the ethics around the future of CRISPR.

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<sup>169</sup> Suter, S. (2015) p. 898

## Newspapers and religion

One more difference between eugenics and CRISPR might be rooted in changing Roman Catholic influence between the two periods. Interestingly, it has been argued that it was largely due to the Roman Catholic dominance among The House of Representatives, the lower house of the bicameral parliament of the Netherlands, that eugenic birth control measures have never been legally approved.<sup>170</sup> Additionally, moral objections in most newspapers towards eugenic measures were often tied to Christianity, and Roman Catholic newspapers gave more attention towards morality and religious objections.

*Het Reformatorisch Dagblad* has made clear to be opposed to the use of embryos for experimental purposes. Besides this, few religious objections towards CRISPR can be found in newspaper articles. This may be due to the fact that the Roman Catholic church has much less influence on Dutch society now, and most newspapers, besides *Trouw* and *Het Reformatorisch Dagblad*, have a clearly non-religious identity. Interestingly, *Trouw*, which originally had a Christian signature, has a relatively tolerant attitude towards CRISPR and does not pose any moral objections that are tied to Christian values.

Changing influence of the Catholic Church in the Netherlands might cause newspapers to talk less on the morality of birth control and embryo modification. It might be interesting to perform a similar research on the debate around CRISPR in countries with a more orthodox Roman Catholic climate to see whether a dominant Roman Catholic influence allows for less freedom of debate on gene technologies such as CRISPR. Interestingly, both researches showed few articles that reflected the protestant stand towards either eugenics or CRISPR.

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<sup>170</sup> M. Louter (1997) pp. 5, 6



This difference in political and religious character can partly be due to the fact that the Netherlands was more strongly divided into religious pillars in the first half of the twentieth century as compared to today. Therefore, newspapers had a stronger political and religious identity compared to today. However, this does not mean politics and religious climate is less influential. The concerns around the embryo law that are discussed in *Het Reformatorisch Dagblad*, make it uncertain whether actual application of CRISPR might eventually be problematic in orthodox spheres. Therefore, it would be interesting to look at orthodox views on prenatal applications that are already being performed.

### **Mental illness and concept of heredity**

From the first two chapters of this thesis, it has appeared that feeble-mindedness was one of the most important traits that eugenics was directed at. This trait, covering a wide range of mental deficiencies, was considered largely hereditary. From 1940 until now, our understanding of both mental illness and heredity has changed a lot. Though Mendelism was the most accepted theory of heredity, there was little known of the role of genes in relation to traits, especially more 'complex', non mono-causal traits such as mental capacities. Whereas feeble-mindedness was addressed occasionally among the articles of my first research, mental illness was not addressed as often in my second research. Some of the factors that may account for this are changes in the knowledge of genetics, changing attitudes towards genetic determinism and developments in the social sciences.

Recent developments in genetics as well as social science have shown that there is a large role of non-hereditary factors in bringing about diseases and other traits. Especially mental illness and other mental capacities have been frequently addressed in nature-nurture debates over the last decades. Besides, chapter 3 has

shown that genetic determinism with respect to mental traits at one point became a big controversy in the Netherlands, as the Buikhuisen affaire illustrates. However, over the last years, biological determinism on mental traits has gained more ground, with the recent success of neuroscience. While some researches have been published that have applied CRISPR to specific mental dispositions, such as Alzheimer related genes, [and others, chapter 3], genetics has shown that there are few mental illnesses that are reducible to a one gene- one trait relationship, and that the relation between genes and brain function is more complex. I assume that knowledge of the complexity of genetics in mental traits as well as the past controversies around biological determinism have led the authors of the articles studied to be careful in involving mental illness specifically in their articles.

Currently, CRISPR is predominantly targeted at hereditary diseases of which one clear hereditary predisposition has been pointed out. Examples are cystic fibrosis, Duchenne's muscular dystrophy, some genes related to cancer and a gene related to susceptibility for HIV.

### **Difference in timespan**

One last thing worth noticing is that the timespan differs greatly between the two researches. Whereas in my first research, I looked at a period of twenty years, in my second research, the research covered merely three years. This large difference is due to pragmatic reasons; looking at only several years of the eugenics debate would offer an incomplete representation on the Dutch public debate on the issue. This is supported, for instance, by the changing views on eugenics over time I have observed. In case of the CRISPR debate: discussions on how to apply CRISPR on the population level have not started yet. Possibly, this is due to the fact that, until April 2018, no CRISPR babies have yet been born; actual medical applications still seems far away.

Performing a similar research ten or twenty years from now will provide more interesting findings on changing public views towards CRISPR, as the technique develops and actual applications may become more realistic.

# Conclusion

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*'We have now mapped DNA, which means we have read 'the book of life', so we can start writing in corrections.'*

*- Steven Hawking, 2018<sup>171</sup>*

How has the Dutch public image of artificially enhancing human heredity, from eugenics to modern gene technology, transformed over the last century? References to eugenics among the more critical opinion articles on CRISPR may suggest that the current debate on CRISPR among Dutch society resembles the debate on eugenics in the first half of the previous century. Additionally, absence of speculation on population level consequences of the technique may be due to fear of resembling eugenics. Additionally, follow up research on the public debate on other medical and birth control techniques that are, in fact, already being performed, may be of interest to look for eugenics influence on today's public debate. Examples of these might be: embryo selection to select against diseases, or public debate on the individual and societal costs of handicapped citizens.

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<sup>171</sup> Hawking, S, W. *Brief Answers to the Big Questions*, London, 2018 p.

Moreover, other sources may be of interest when studying the current public debate around CRISPR, such as online platforms, popular science journals and public surveys. To investigate religious or political influences on public opinion on the ethics of CRISPR, it would be interesting to perform similar researches on more orthodox countries. Additionally, to see whether the political climate affects to what degree and in which way gene technologies such as CRISPR are discussed, similar research on newspapers of countries with various political climates would be interesting as well.

In the course of this research, an interesting event took place that may be highly relevant to follow-up research on the public opinion towards CRISPR use in human embryos: the first actual CRISPR babies have been born, utterly unexpected by the scientific community. In November 2018, the Chinese medical doctor He Jianguo revealed that he had applied CRISPR on recently born twins to make them HIV-resistant. While doing so, he avoided governmental supervision. The affair received a lot of attention and was heavily criticized by the scientific community, leading to He's dismissal.<sup>172</sup> The critique was mostly on the ethical aspect of He's project: he experimented with human embryos, while the method he used was considered underdeveloped for actual application outside the lab. Additionally, the carefulness of his method was largely disputed: one of the babies suffered from a CRISPR-induced undesired mutation. Nevertheless, he placed the embryo in the mother's womb to be born.<sup>173</sup> This event has led to much scientific and public discourse on the safety and ethics of CRISPR's use. Therefore, a research based on the newspaper articles that were published in response to this event would probably skew the results discussed in this thesis, confirming my hypothesis that actual application of CRISPR on human embryos would affect the public stand towards the technique. Therefore, an

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<sup>172</sup> *Het NRC Handelsblad*, January 21<sup>st</sup>, 2019

<https://www.nrc.nl/nieuws/2019/01/22/crispr-cas-universiteit-ontslaat-onderzoeker-die-babys-genetisch-verbeterde-a3651190>

<sup>173</sup> *Het NRC Handelsblad*, January 4<sup>th</sup>, 2019 <https://www.nrc.nl/nieuws/2019/01/04/het-jaar-van-de-genetisch-gemanipuleerde-mensenbabys-a3127934>

interesting follow-up question to the research presented in this thesis would be: *how has the birth of the first HIV-resistant CRISPR babies affected the public debate on the ethics of CRISPR use?*

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Image 2, page 15: From the Eugenics Archive of the online DNA learning centre:

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Image 10, page 28: Venter and Collins on the cover of Time magazine, 3 July

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