3. Reading the Signs: The Biosecurity Individual, Biomedicalization, and Biomedical Salvation

> And in the Minutes of the Darkness wherein he lay thus feeble and sore broken, he sometimes let fall expressions of some Fear lest he might after all be Deceived in his Hope of the Future Blessedness.
> *Cotton Mather*

Cotton Mather's report on the dying of his father Increase Mather reveals the stark ambiguity of Puritan attitudes toward security. At the end of his life, which he led as a towering example of Puritan faith, Increase Mather seems to doubt. Salvation and sainthood, the most important pillars of Puritan striving in their pilgrimage through life, represented a never to be attained security that was *always* in doubt. Yet, only in this doubt might have rested the possibility of security as heavenly salvation. The perpetual insecurity represented in this example is not exceptional, but in line with the spiritual and ideological belief of the Puritan faith (Stannard 1316). Life and fate are given by God and preordained, to understand one's fate the individual had to be able to read the signs correctly, creating a hermeneutic reading for experiences of conversion. In the end, spiritual security remained unattainable and was often rather recognized by others, as in Cotton Mather's reading of Increase Mather's dying.[1] The belief in a preordained but unknowable future security created an obsessive focus on risks, and devilish temptations that dominated the Puritan understanding of their living surroundings as manifested for instance in Jeremiads or in Captivity Narratives. The hermeneutic insecurity and obsessive reading of signs that dominated Puritan culture indicates a sense of perpetual insecurity and threat. The reading of signs was for the Puritan faith thus a crucial and unavoidable tool of salvation. The relation to security that this example represents is a crucial analogy to the security produced in biomedical discourses.

Four centuries of medicalization and biomedicalization have changed the understanding of life and the relation to the body radically. Today, security is not to be found in

1 In contrast to the dying father, his observing son is sure of his salvation, understanding it as a didactic example for the aspired calm death (Mather 208).

the beyond but is fixed in the materiality of the body. But biomedical security narratives are anchored in the excessive reading of signs as a precondition to achieving security. Living in a biosecurity culture, individuals rely on hermeneutic reading of their own body, its surface as well as its biological make up. Also today people feel constantly at risk. The biologically predetermined fate has to be divined and tended to, and only through security practices can the fate and potential of an individual be achieved. But the reading is motivated by a fundamentally different understanding of security than that of the Puritans. The potential of ambiguity and uncertainty of knowing one's preordained fate has been replaced by scientifically provided "certainties." "To live well today is to live in the light of biomedicine" as Nicholas Rose puts it ("Human Sciences" 7). Salvation today is not granted and judged upon by a fierce God but by the possibilities of science, more specifically the field of biomedicine and biotechnology, which holds the normative power over (the understanding of) life, good life, and livability.

The promise of total security in the face of an always precarious normal also defines biomedical studies and research in non-contagious health contexts and makes logics of biosecurity crucial for understanding individual biological security. In this chapter I will focus on the growing complex of biomedicalization to emphasize the new relations it forges between individual and their body and the new biomedicalized identities that are based on professionalized readings and translations of bodily signs. I will explain how the progress of biomedicalization individualizes biosecurity practices giving shape to the imaginary of security as total control. I will then turn to the increasing responsibilization of the individual to emphasize how biological security appears as a question of choice, which makes individual biosecurity a deeply American matter. In a further argumentative step I will show how biomedical security narratives produce realities in *what if* scenarios that define not only bodily security and threat but also the understanding of good life and livability.

The Power of Translation: The Biosecurity Individual and the Vision of Total Control

Clarke et al. define the current developments as a process of biomedicalization – a further development of medicalization – which was facilitated by the rise of the "Biomedical TechnoService Complex, Inc." ("Biomedicalization" 162). The processes of biomedicalization exacerbate many developments already present in medicalization, but they also decisively change many relations between patient and doctor, present and future, and most importantly body and self. According to Clarke et al. biomedicalization is largely marked by technoscientific developments, which shift the focus to risk. They attempt to control as well as to transform the body itself creating new visions of bodily security and new biosecurity identities. Biomedicalization is driven by a further commodification of health and life itself, which has been analyzed as biovalue or biocapital (Cooper, Sunder Rajan). Furthermore, these developments are established through new forms of knowledge production and distribution. (Clarke et al., "Biomedicalization" 163)

The developments of biomedicalization started in the mid 1980s and have increased significantly since the turn of the century. They describe a "shift to highly inventive

technoscientific biomedicalization" (Clarke et al., "Charting" 88), which has facilitated, among many other things, the development and proliferation of diagnostic technology. In fact, medical screening technologies have become so common that diagnostic techniques are closely associated with certain conditions, such as ultrasound and pregnancy, or MRI for cancerous tumors (van Dijck, *Transparent* 12). The biotechnological possibilities of visualizing further change the understanding of the body and security shifting the perspective from "clinical gaze" to "molecular gaze" (Clarke et al., "Biomedicalization" 164) as mentioned before. The technologies have not only facilitated the definition of more disease categories but have allowed detecting them earlier and earlier. Today, biomedical technology and research focus on the increasingly early detection and prevention of disease or deviation, such as cancer, diabetes, obesity, depression, or autism, in most cases by focusing on risk markers in the molecular stages of the disease.

Risks rather than diseases themselves have become the focus of research as it is paramount to detect them at "their earliest molecular stages" (NIH "Future" n.p.). This relatively new focus is described as a form of "surveillance biomedicine" (Clarke et al., "Biomedicalization" 166), which comprises securitizing practices originally targeting the population. But it no longer aims at interventions on the level of the population only. Rather, surveillance medicine has extended its reach to individualized practices defining risk groups as well as individuals at risk and their future. Risk analysis geared toward estimating emergent risks on the basis of a population are applied to the analysis of diagnostic assessment (Fosket; Clarke et al.). This means that the individual body has become "a world in which everything is normal and at the same time precariously abnormal" (Armstrong 400). It represents the body as a world that is harboring is own future demise.

> This new Surveillance Medicine involves a fundamental remapping of the spaces of illness. Not only is the relationship between symptom, sign and illness redrawn but the very nature of illness is reconstructed. And illness begins to leave the three dimensional confine of the volume of the human body to inhabit a novel extracorporeal space. (Armstrong 395)

The extracorporeal space that Armstrong emphasizes is the "space of risk." It is extracorporeal because the understanding of risks is produced outside of the body in technoscientifically facilitated risk assessments. It describes a potential for a disease, which itself is not present in the body. Instead of defining and treating disease the biomedical security narrative focuses increasingly on defining, diagnosing, and treating risks. This new form of "clinical gaze" adopted in "surveillance medicine" strives for an ideal of total security.

Health risks therefore no longer designate the difference between healthy and sick, between security and insecurity. This distinction has been blurred and largely suspended by technoscientific developments. The state of insecurity no longer coincides with the traditional status change of a healthy person becoming a patient. It no longer describes a difference between "being healthy" and "being sick," but rather the potential for either. The new medical gaze of surveillance medicine therefore shifts the logics and dynamics of the experience of biological security. Health becomes an ambivalent experiential sit-

uation, a "precarious state" (Armstrong 397) which is described in risk categories, most commonly "high risk," "medium risk," and "low risk" (Lupton, *Imperative* 92). Even the healthiest individual is thus still considered "at risk."

These descriptions might seem abstract and remote from everyday life at first sight, reserved for extreme medical cases. However, practices of surveillance biomedicine are a normal and standard procedure in many parts of life from childhood to adolescence, ageing and dying. Notions of biological security have become increasingly important for cultural conceptions of life and livability most explicitly in the example of pregnancy and prenatal testing. I will therefore use this example to illustrate new relations forged by the regimen of "total control." "[I]n the United States alone, more than 80 million ultrasound examinations are performed on women every year and many women have more than one ultrasound during their pregnancy" (Nash 5). This might not be surprising as the use of biosecurity practices seems so natural and intuitive. Why shouldn't one "control" biology and make sure everything is all right if it is so easily accessible? However, Deborah Lupton points out that "[t]here is no evidence that routine ultrasound screening is beneficial to the health of the infant" (*Imperative* 96). Nonetheless, the tests are presented as imperative to secure the health of mother and child and as a prerequisite for a good life – meaning a life free of disabilities.[2]

Pregnancy, childbirth and childhood are early and prime examples of the medicalization and biomedicalization of life (Ariès, *Centuries*; Conrad, *Medicalization*; Elliott). Prenatal testing has existed since the 1970s and became a crucial practice giving information about the development of the fetus.[3] Based on the accumulated data over the decades the different fetal biometric exams yield different calculations in the different trimesters. Their proclaimed beneficial effect is the predictive translation of signs to facilitate informed choice for potential necessary interventions. These security practices are the point where individual and national discourses of biosecurity intersect in the most obvious manner, allowing for biopolitical rule over processes such as population growth.[4] They describe practices of "surveillance medicine" on an individualized level. Prenatal testing assesses the possible future risk indicated in the individual fetus and maternal body. The possibilities of biotechnological interventions have fostered the belief that life should not only be controlled and managed in the present but in its future potential. Security does therefore not describe a present state but a future one, shifting the temporal relation from reaction to anticipation.

The biomedical as well as cultural and social overemphasis on risk produces what Catherine Belling has called in a different context "hypochondriac hermeneutics," which describes an almost compulsive reading of our bodies: "we read our bodies, looking

2 This prerogative of prenatal screening, which is evidently researching and working for a future free of disabilities, is opposed by disability rights advocacy groups that critique this practice and discourse in a supposedly "post-eugenic" society.

3 "Besides ultrasound, women can opt for amniocentesis, serum alpha-feto-protein screening, triple tests, a genetic testing for single-gene disorders. Every new test, of course, yields new information, and every additional bit of information may confront the pregnant woman with more options" (van Dijck, *Transparent* 109).

4 Other examples are the availability, as well as structural and educational support of contraception, the question of abortion rights, or fertility treatments.

at them as if from outside ourselves at the same time as we feel them as from within" (Belling, "Hypochondriac" 376). People – caught between the dread of fear and the desire for security – take on a hermeneutic attitude, reading their bodies as if it was an assembly of signs: the hiccup could mean that the umbilical cord is wrapped around the neck, the placenta could move, iron levels could fall too low, one could eat the wrong food, consume too much caffeine, come into contact with chemicals, or bacteria such as toxoplasmosis or listeria. The security practices for pregnant women are rigid and start often with the pre-emptive consumption of supplements such as folic acid and Vitamin D, which is used by almost 80% of pregnant women in the U.S. either prescribed by a healthcare provider or as over-the-counter consumer good (Aronsson et al. 2).

But most risks remain experientially inaccessible and uncontrollable for pregnant women without professionalized help. The gaze of surveillance medicine implicates every individual, no matter of their own feeling of "well-being." Preventive diagnostic practices and treatments are thus represented as an increasingly important and normative part of pregnancy, necessary to know one's current state of security. If "neither health nor disease are stable but perpetual becoming" (Armstrong 402) security has to be constantly re-verified, reproduced, and checked for potentials that are fixed to the different stages of pregnancy, or the life course in general. Every check-up is thus a performative act producing "security." The performance of security temporally fixes the transient state of security, by presentifying it, offering above else "parental reassurance" (van Dijck, *Transparent* 107). The growing possibilities of technoscientific developments therefore also produce a growing insecurity about people reading their own bodies. Already discoveries such as "X-ray machines overruled patients' own experience of disease's symptoms. A patient's experience was inherently subjective, and hence unreliable" (van Dijck, *Transparent* 87). This trend is exacerbated by further technoscientific developments, which seem to eradicate the possibility to know one's own body. This means that the individual can never be sure of themself being in need of technoscientifically produced "certainty." Ultimately, the biomedical apparatus threatens to strip women of a certain sense of self and body which is constantly reproduced as at risk and in need of professionalized reading. Instead of an individual "unmediated" experience of conversion, the biosecurity individual relies on ritualized performances and translation by experts.

In pregnancy, security, thus, does not represent a stable condition, which is then threatened: in the discursive formation of pre-emption this "condition of security" appears to be always already precarious. The "tyrannies of nature" – laid out in the omnipresent biosecurity narratives targeting pregnant women – are hanging like a Damocles sword over their heads. Continuously medically observed, the pregnant body is marked by its risks, which start to increase for an otherwise healthy pregnant woman with her 35th birthday. And women are made acutely aware of this shift. Rachel Adams describes her first pregnancy with the definition of this "risk identity": "I was thirty-six, a year beyond the age when the chances of having a baby with Down syndrome and other genetic conditions start" (98).[5] This quote comes from Adams's book *Raising Henry* in which she reflects on her experience of becoming mother to a son with Down

5 And also her son Henry is predominantly defined by his risks from the biomedical discourses and services that ought to help the Adams's family (24,25,76).

syndrome. Her acute awareness of having assumed a risk identity by being pregnant at 36 makes the option of screening and testing an important question. The understanding of security changes the understanding of Adam's corporeal reality. Risk becomes in this context a "disease like state in itself" (Fosket 331) that needs to be treated. The risk identity determines the recommendations for the different screening methods:

> Dr. Lewis, presented us with a full range of options: we could start with a noninvasive test called the "fully integrated screen," a combination of ultrasound and bloodwork to predict the likelihood of genetic abnormalities. The screen can tell you whether your fetus has a one-in-twenty or a one–in–one thousand chance of having a genetic anomaly. But it can't give you a definitive diagnosis. We could also go directly to amnio. Or we could do no testing at all. (R. Adams 99)

In this, as in most representations of medical encounters in the memoir, it seems that the security of a pregnancy, or rather its outcome is determinable by different methods of screening. Biological security is represented as a choice the individual can take by simply picking the proper security practice.

Help Yourself, So Help You Science: The Question of Responsibility and Choice

The choices offered by biomedicine and diagnostic testing are represented as unquestionably liberating, offering and facilitating the freedom to choose and to make one's own fate. Firstly though, biosecurity demands the obligation to choose choice offered by the security practices as Adams shows in the quote above: "Or we could do no testing at all" (99). This dynamic of having to choose indicates a fundamental characteristic of surveillance medicine: the responsibilization[6] of the individual and the need for "technologies of the self" as Foucault defined them in his homonymous lecture. The security narrative of total control exacerbates the responsibilization of the individual for their own body, which had become already central in the security narrative of preventive medicine. If everything is possible, then everything becomes the responsibility of the self-reliant individual. Risks can be assessed in pregnancy early on in the integrated screen between weeks 11–14, which assesses the likelihood of Down syndrome, trisomy 18, or spina bifida. For "more" security people can also opt for pre-implantation genetic diagnosis (PGD) (McCabe and McCabe 203–4), which illustrates the shift from observation of symptoms to the control of the bodily make-up facilitated by technoscientific developments.[7]

Prenatal testing can be interpreted as an early form of a pre-emptive strike, which reflects the new understanding of security. It represents an ideal of total health which requires a continuous self-control of the individual. Individuals thus have to perform

6 "Responsibilization" is a term used in sociology to describe the shift of responsibility from one level to another; here it is the shift from a governmental to the individual level.

7 Additionally, newborns are screened for "50 conditions . . . at birth in the United States, most of which are genetic" (Vailley 375).

anticipatory actions to "know" their bodies. Because security measures and practices in current biomedicine are highly individualized and *individualizing*, many scholars try to rethink Foucault's concept of biosecurity, or think beyond Foucault as it is usually called, to encompass current forces of responsibilization of the individual.[8] Nikolas Rose attempts to approximate the *beyond* as "ethopolitics"[9] rather than biopolitics emphasizing the ethical obligation of individualized security practices for oneself and for one's offspring.

Security practices of ultrasound, and further tests if indicated, have become a normative behavioral codex. They represent actions in the present that thwart a potentially diseased future. Nobody is forced to be tested, genetically or otherwise, but the engagement in the "regimes of behavior change" that testing implies is nonetheless represented as an obligation (Shostak 243). The societal compulsion of testing is expressed in every doctor's visit, but also in the representation of parenting books and manuals, in advertisements, or in conversations with friends, as Adams makes clear in her memoir. She describes how she is asked by many different people in different social contexts if she didn't get tested, after her son Henry was born with Down syndrome. The prevalence of such questions indicates how normalized and expected the security practices are. This shows that the "pastoral power [of biosecurity] . . . takes place in a contested field" (Rose, "Politics" 9) and is not simply imposed by the state.

Nonetheless, social expectation is also expressed in legislative changes. "[I]n 1986, California was the first state in the country to pass a law requiring that all pregnant mothers be offered MSAFP (maternal serum alpha-fetoprotein) screening to assess the probability that their fetuses would be affected by Down syndrome, spina bifida, or neural tube defects" (Stern 213). Biosecurity practices – or rather the proper choice for the appropriate security practice – are framed as Constitutional rights and as crucial practices of individual freedom. Regardless of the personal choice and necessity of biosecurity practices the predominant consensus is that the application and use of biosecurity measures is an individual right not to be infringed upon by the government as Elliott points out (xix). If knowledge produces the responsibility to choose and decide, and if that is framed as a right – the right to choose – then ultimately these practices are made to represent practices of freedom and citizenship.[10]

It is thus not only lifestyle and external risks that have to be controlled but the individual biological make-up. Since the body is understood as a fateful given or "preordained fate" that can be optimized and influenced, the individual needs to tend to

8 Many scholars attempt to think in this context *Beyond Foucault* (Rabinow and Rose) or *Beyond Biopolitics* (Clough and Willse), which means thinking a concept written for the relation between state and population – since "Discipline is exercised on the bodies of individuals, and security is exercised over a whole population" (Rose, "Politics" 24) – in relation to the individual (without conflating *discipline* with *security*).

9 "If discipline individualizes and normalizes, and biopower collectivized and socializes, ethopolitics concerns itself with the self-techniques by which human beings should judge themselves and act upon themselves to make themselves better than they are" (Rose, "Politics" 18).

10 Melinda Cooper points out that George W. Bush legitimized the research on already available embryonic stem cell lines as well as the unconditional health care for unborn babies with the foundational rights of the United States, "chief among them being the right to life" (Cooper 152).

their biological make up. Knowing represents in this context both an indispensable tool for recovery (Rose and Novas, "Citizenship" 447–448) and a prerequisite for security. For such a structure of responsibilization to work the individual needs what Rose and Novas call "scientific literacy" ("Citizenship" 443). They point out that education enabled people to take responsibility for reproductive choices and their own heredity ("Citizenship" 442). Only with appropriate information and knowledge can one choose the right measures. The American Pregnancy Association for example provides information about the diverse birth defects as "awareness and education are key to preventing birth defects" ("Birth Defects" n.p.). The prerogative of this pregnancy related biosecurity education is thus prevention and pre-emption. The information about biosecurity, however, is provided not only by governmental, scientific, or pharmaceutical institutions, but increasingly also circulated in online self-help forums and social networks. This describes the changed production, distribution, and consumption of biosecurity narratives (Clarke et al., "Biomedicalization" 163). These new forms of distributing a biomedicalized understanding of security represent the shift in authorship of security narratives, which are no longer merely produced by scientific experts. The diversification of knowledge production and distribution is often understood as a democratizing force. Nevertheless, in these "new" forms of distribution the dominant logics of biosecurity are reiterated and restaged and the responsibility and obligation of the individual is further enforced. In either case, the choices for security rely on narratives, fictions of security, to produce the "appeal" of a particular understanding.

Fictions of Security: Biosecurity and Good Life

Prenatal testing mandates decisions or rather choices based on the knowledge tests provide. The choice, however, is more often than not based on a fiction of security. Every screening method and every diagnosed risk represents future scenarios that are formulated in security narratives. Since "[r]isk factors, above all else, are pointers to a potential, yet unformed, eventuality" (Armstrong 402) the narratives established by individualized surveillance medicine are necessarily "fictive." The indication of a risk potential leads, if one chooses to pursue biosecurity, to further screening and diagnostic testing and to the decisions that potentially follow every exam. However, the security practice of the ultrasound exam does not yield certainty. The most immediate information that comes with the consultations about the test is based on statistic averages. They are "what if" scenarios in which the individual is "invited" to think through life with common but also increasingly rare conditions.

The information these scenarios are based on is authored largely by the "Biomedical TechnoService Complex, Inc." (Clarke et al., "Biomedicalization" 162) and therefore comes from the institutions that celebrate the possibilities of surveillance medicine and the possibilities of intervening in life. The authors promote a clear desirability of "total health" that appears accessible – after all, their messianic promise is the eradication of diseases and the vision of total control. However, in many cases the "what if" scenarios do not fulfill the promise of "total security" but lead to the choice between termination or continuation.

> If the ultrasound scan shows a fetus to be normal, parents can relax and enjoy the rest of their pregnancy; if the sonographer detects fetal defects, the woman and her partner can decide to terminate the pregnancy. In both instances, ultrasound is said to offer the parents peace of mind and hence be a desirable practice. (van Dijck, *Transparent* 107)

The security narrative offered in these exams reiterates the prerogative of knowing and defines the limit between "acceptable" and "unbearable" life. Such norms of life and livability are based on averages, which indicate when the acceptable is transgressed and interventions become necessary (and possible). The decision for or against abortion is never a direct suggestion. Rather, counseling informs the individual about the potential future explaining it from a biomedicalized perspective. The implications of the test, however, reiterate the clear desirability of a healthy baby without any recognizable, or rather foreseeable potential "lacks." Though diagnostic technologies represent ever new ways of visualizing the body, these medical practices are never just diagnostic in the same way as diagnostic categories are never simply descriptive. They communicate "a normative ideal" which represents the matrix in which the individual can understand their own body (van Dijck, *Transparent* 15).

Rayna Rapp shows in her study *Testing Women, Testing Fetus* that not all prenatal tests that indicate a possibility of a disease end in diagnosis, implying the high rate of detected risk markers which turn out to be "false positives," but also the many abortions which are based "only" on probabilities of disabilities and disease. Yet furthermore she makes clear that not all prenatal diagnoses, such as the prior knowledge of a present birth defect, end in abortion. The dangers of testing are the focus of bioethics committees and are further expressed in the critique of prenatal testing as a renewal of eugenic methods and thinking expressed by such diverse scholars as Minna Stern, Linda and Edward McCabe, or Jürgen Habermas. The fear is that "if driven solely by market demand, American's tendency to choose the 'best' for their children could eventually translate into two branches of Homo sapiens: a wealthy genetic elite that replicates itself through designer babies and a medically underserved genetic underclass" (Stern 12). Similarly, disability rights groups warn against the widespread routine practice. The biosecurity narratives define good life as well as undesired life, and performatively reiterate this "undesirability" of persons with disability in every security practice with the underlying logic of the eradication of disability. In a way, the practices produce and make visible the disposability of individuals and not only of "disposable populations" (Giroux 186).[11]

The biosecurity practices have pervaded American culture and the understanding of life so deeply that the by now routine application of ultrasound exams to secure the baby's health is not just used as a diagnostic device. Rather "the ultrasound exam of a pregnant woman is concurrently a medical diagnostic checkup, a psychological event, and a photographic ritual" (van Dijck, *Transparent* 101). This medical routine is understood as a crucial practice of bonding with the unborn baby, which the FDA promotes as a beneficial effect (FDA "Ultrasound"). While the "fetus" is monitored and checked for birth defects, it only

11 Henry Giroux speaks about a "biopolitics of disposability" (175) in his analysis of hurricane Katrina and the structural racism it made visible.

seems to turn into an "unborn baby," a future person *through this act*. And the visualization of this future can be materially fixed in take-home ultrasound images. These images materially manifest the security of the pregnancy – fixing it temporarily – and therefore represent the promise of a happy future. Ultrasound images exist in color and in black and white, in 2D, 3D, and 4D. The ultrasound is a medical practice as well as a consumer good in its own right. In 4D – a 3D scan in motion – the baby is shown as if the fetus was waving, walking or sucking its thumb, staging it in peaceful acts that embody security and make a not yet existing future (identity) present. This crucial first way of knowing a person normalizes a biomedicalized understanding of identity. These images of biosecurity have become a fixture in life narratives represented in family picture books, and social media, movies, art, and literature. The urge for ultrasound testing has thus produced entirely new consumer markets. Ultrasound diagnostics are a growing market in the U.S. and worldwide. It is estimated to reach $7.2 billion by 2022 with a growth of 5% (MarketWatch). In comparison, the NIH invests approximately $41.7 billion in scientific research annually in total (NIH, "Budget" 2020). Besides the rising healthcare sector of sonography so called "keepsake" sonograms are offered by companies under no proper medical oversight.[12] This trend reflects the increased marketization of health and life.

Clarke et al. emphasize the commodification of the entire health sector – including care and research – as one of the most crucial characteristics of biomedicalization. This shift is also visible in the changes of corporative structures of biotech companies as Bud asserts: "A study of the founders of U.S. biotechnology companies has shown that whereas in the period of 1971–80 almost twice as many had academic as had business origins, by the mid-1980s, two-thirds were from business" (Bud, *Uses* 193). Biocapital not only describes the corporatization of science but the commodification of life itself. Scholars such as Kaushik Sunder Rajan and Melinda Cooper describe how life and bodily matter have been renegotiated as biocapital. Analyzing for instance the market of embryonic stem cells, Cooper asserts that "what is at stake and what is new in the contemporary biosciences is not so much the commodification of biological life . . . but rather its transmutation into speculative surplus value" (Cooper 148). She shows that "the emergence of the biotech industry is inseparable from the rise of neoliberalism as the dominant political philosophy of our time" (Cooper 19).[13] This "surplus life" is part of a growing industry and decisively driven by venture capital and risk investment, which means by future markets and fictions of potential future success.

Similar to Cooper, Sunder Rajan focuses on the market structures dominating the creation of the value of life by analyzing patent laws of genomic material and information (*Biocapital* 7). More so than Cooper he emphasizes the symbolic capital of biomedicine asserting that it is "both material and symbolic" (Sunder Rajan, *Lively* 19). With reference to Marx he emphasizes the "*mythical* and *magical* nature of the commodity" (*Bio-*

12 The FDA warns against this non-medical use of ultrasound (American Pregnancy Org., "Keepsake" n.p.).

13 Cooper stresses that the current state of bio-economy relied on the changes of intellectual property rights such as the Bayh-Dole Act in 1980 that permitted the ownership and patenting of government funded research: "the biotech 'revolution' would have been inconceivable without a full scale legislative and political campaign to revolutionize property itself" (Cooper 145).

capital 18). Sunder Rajan specifically highlights the centrality of the "theological character of the commodity" in Marx (*Biocapital* 18). Stressing the influence of ideology in the question of valuation Sunder Rajan identifies the symbolic capital of biotechnology and biomedicine as the underlying promise of "being in the business of saving lives" (*Biocapital* 19). This symbolic capital is especially important as biotechnological developments rely on speculative capitalism. They depend on what Sunder Rajan calls the articulation of vision and hype as the "grammar of biocapital" (*Biocapital* 111). More important than the actual monetary gain that is produced by the emphasis on the promised future, his analysis shows that the messianic narrative of scientific salvation structures the understanding of the practices, services, and goods that surround it. He defines American "biocapital as salvationary" (*Biocapital* 185) representing magical cures, promising a better future and the security of life, today as much as in the past. The symbolic capital produced by the messianic narrative of scientific salvation encompasses not only biomedical practices and goods as such. Promising security by perpetual and constant control, surveillance biomedicine has been brought into the home through a wide array of (mostly digital) devices: in pregnancy it is over-the-counter fetal heartbeat monitoring systems, pregnancy apps, or milestone calendars. Thriving in a neoliberal "stakeholder society" (Petersen, "Governmentality") these devices have become a normal part of life and of understanding life.

Similar to ultrasound, other biosecurity practices have left the confines of strictly medical use and entered the extended market of biotechnological consumer goods, such as genetic testing. 23andMe is a biotech startup which sells DNA kits over the internet. For $198 one can obtain the diagnostic analysis of one's DNA for "genetic health risks," "inherited conditions," "traits," and "wellness" (23andMe "Find out").[14] The individualized biosecurity practice echoes the medical self-reliance that was central in the 18th and 19th century. However, the security narrative that suggests genetic testing seems much closer to the Puritan hermeneutic insecurity and the belief in a predestined fate, a true self that has to be revealed – albeit now these revelations are secured in biosecurity narratives.

But 23andMe establishes not only genetic risk, it promises to decipher the genetic identity of the individual. The gene is described as the key to understanding the human in regard to the bodily security as well as to identity itself as Nelkin and Lindee have shown in their analysis of the DNA as a cultural icon. The reports on wellness and traits that 23andMe offer gesture in this direction (23andMe "Advertisement"). More aggressively, however, their commercials drive this point home. The test provides knowledge that will help the consumer understand themself better. It thus represents "biological identity

14 Initially the test was marketed as a security practice offering the diagnosis of hundreds of genetic diseases. This had to be temporally halted following a warning by the FDA in November 2013 to discontinue the marketing and sale of the test as a diagnostic tool (Gutierrez 2013). It was reintroduced in 2015 with fewer disease diagnoses. Today, it provides information about 10 "genetic health risks" (such as BRCA1/BRCA2 (selected variants), coeliac disease, late-onset Alzheimer's Disease, Parkinson's Disease), reports on the individual's status as "a carrier for [40] inherited conditions," as well as 25 reports on "Traits" (features, taste, smell, hair loss) and 5 reports on wellness (23andMe, "Find out").

practices" (Rose, "Politics" 18).[15] Additionally, the test includes the ancestry service which provides information about which population groups are represented in one's DNA. The security practice of genetic testing has thus become a recreational identity practice.[16]

The prime actor in the contemporary drama of biosecurity is the gene and genetic markers. Diagnostic tools that provide a new insight into the body have revolutionized the conceptualization of health, making self-surveillance an integral part of everyday life. Identity and the understanding of the body become therefore more and more intimately entwined with biomedical security practices. They have become common identity practices simulating security based on knowing one's genetic identity, one's past (heritage) as well as one's future (fate).

15 Similarly, Sunder Rajan asserts that "In one register, then, Lively Capital . . . refers to the lively affects—the emotions and desires—at play when technologies and research impinge on experiences of embodiment, kinship, identity, disability, citizenship, accumulation, or dispossession" (Sunder Rajan, *Lively* 16).

16 Together with Ancestry DNA, Living DNA, Family Tree DNA, and MyHeritage DNA, 23andMe represents the leading companies for ancestry testing. On its homepage it declares itself to be the biggest ancestry service in the world providing certainty about one's heritage. However, this promised security is nothing but a marketing stunt as these tests are notoriously unreliable. This problem had been raised early on by experts of population genetics and has recently gone viral in social media. In January the story of identical twins who had tried ancestry DNA testing was published on marketplace. They sent their DNA samples to the five biggest companies offering the service, receiving 10 different sets of results of possible genetic heritage.