Universiteit Leiden

MSc Media Technology

Sceptics as Vigilantes of Science

An Exploration of Boundary Work of Science vs. Pseudoscience in Sceptical Texts

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1 Introduction

1.1 "Science is not an opinion, I think."

In our Western society, science is highly valued and esteemed. As science continues to advance, public attitudes towards science seem to become ever more polarized. Whereas some people put their faith in science, others consistently reject and dismiss scientific evidence (Rutjens et al., 2018, p. 125). With the growing and changing information landscape, alternative facts, theories, and practices can spread over social media easily and fast. The question then remains: what are the 'real' facts and what are the alternative facts? A group that outspokenly dismisses and tries to counter this trend are the scientific sceptics. These kind of sceptics question beliefs and claims on the basis of scientific understanding and empirical evidence.

The beliefs and claims sceptics are involved with are controversial science, which ranges from topics such as parapsychology (i.e. the study of paranormal psychological phenomena) to astrology, and from homeopathy to the existence of UFOs. These practices are called 'pseudoscience' by sceptics and scientists since they claim to be scientific, but they are not accepted as such since they do not live up towards scientific standards. For the sceptic Adriaan ter Braack, it is clear: "science is not an opinion"[1]. However, how are these two distinguished from each other? What is 'right' science and what is *pseudo*- 'false' science?

1.2 Science vs. Pseudoscience

This question, how to distinguish between science and pseudoscience, is called the 'demarcation problem'. Many philosophers of science have tried to provide answers, so called demarcation criteria, for this problem. One of the most well-known and influential ideas is that of *falsification*, provided by Karl Popper. Falsificationism states that a scientific theory must be refutable, which means that a theory should be open to the possibility of being wrong. Verification of a scientific theory was not enough. This is why, in Popper's eyes, astrology is a pseudoscience. All predictions in astrology, albeit horoscopes or matching character traits to a zodiac sign, can always interpretated in the light of astrological theory. The theory is able to explain everything, which is why it fails the falsification test.

Although the problem of demarcation seems to be solved, falsificationism has been accused of excluding legitimate science, while including some pseudoscience as science (Hansson, 2021). Other demarcation criteria have been proposed, but no idea was found to be all-encompassing. Even then, history has taught us that some subjects get recognized as science over time, as in the case of continental drift, or get degraded to pseudoscience, as in the case of phrenology. Besides, there are also some subjects that lie on the border of 'almost science' (Pigliucci, 2018, p. 42), which one day might be categorized as science, or as pseudoscience, or stay in the middle. The lines between science and pseudoscience thus are not as clear-cut as they sometimes are portrayed to be.

[1] See Instagram bio of Adriaan ter Braack, alias *Sjamadriaan* (https://www.instagram.com/sjamadriaan/)

1.3 Sceptical *boundary work*

Interestingly, demarcation often poses no difficulty for scientists (Hansson, 2013, p. 61). In practice, scientists can easily draw the line between what is science and what is not. There is thus a discrepancy between the demarcation problem in theory and in practice. Sociologist Thomas Gieryn notes that this is because demarcation gets established in social settings, rather than in academic settings (1983, p. 781). He states that demarcation problem is not necessarily about the unique building blocks of science, but more about the ideological efforts by scientists to set science apart from pseudoscience, and more generally non-science. Scientists and, for the sake of my thesis, sceptics, are involved in so-called *boundary work*, where certain characteristics are attributed to science to construct a social boundary that separates it from non-, and pseudoscience (Gieryn, 1983, p. 782).

Sceptical boundary work is about actively trying to define controversial science as pseudoscience by means of *debunking*. Via debunking they try to show that a certain, in this case, pseudoscientific claim is false. This activity happens by publishing texts on controversial science (e.g. alternative medicine) in sceptic literature, in newspapers or on personal blogs. The sceptical discourse can be identified by its strong, polemical tone. Since demarcation, and thus boundary work "will typically assert the epistemic superiority of science over non-science, the formulation of such a criterion will result in the sorting of beliefs into such categories as 'sound' and 'un-sound', 'respectable' and 'cranky', or 'reasonable' and 'unreasonable'." (Laudan 1983, p. 119-20). This sorting of beliefs into clear contrasting categories (that either belong to science or pseudoscience), is present. The categorization of 'science' (i.e. scientists, and scientific methods, knowledge and institutes) and 'pseudoscience' (i.e. alternative practitioners, practices, methods and knowledge) in distinct categories is in the interest of this thesis.

1.4 Research question

For this graduation project, I will investigate the boundary work of two sceptics, Dutch science journalist Adriaan ter Braack and Irish science author David Robert Grimes. Since boundary work is about "drawing rhetorical boundaries between *us* and *them*" (Harambam, 2017, p. 208-9), I will explore how 'science' and 'pseudoscience' as distinct groups are categorized and characterized. Since alternative practices and theories are not endorsed by the scientific worldview of the sceptics, there is an inherent opposition present between the two groups. Because the two epistemologies come together in sceptical writing, it is an interesting medium to study this opposition. The research question of this thesis is as follows:

How is contemporary boundary work of sceptics characterised and what oppositions are present between science and pseudoscience?

This question is explored by studying nine texts of sceptics Ter Braack and Grimes, covering subjects about alternative medicine such as homeopathy, supplements and detoxing. By means of Derrida's deconstruction, the abstract, underlying oppositions within the texts are identified. These oppositions are supported by arguments, rhetorical strategies, and value-laden words analysed in the texts by the use of Critical Discourse Analysis (CDA).

1.5 Relevance

The influence of science in society is growing (Boudry & Pigliucci, 2017; Ridder et al., 2018), at the same time it is suggested by Rutjens et al. that public distrust in science is once again on the rise, and that an anti-science movement is growing (2018, p. 126). As science journalists and sceptics, Ter Braack and Grimes take in an important, central position in the public understanding of science. They are one of the links among other science educators that connect science with the general public. Thus, how science is portrayed, as well as how alternative modes of knowledge are portrayed, might have an impact on how science is perceived, respected and valued. Also, the sceptics that I study for this thesis both have a considerable amount of followers on social media[2]. The impact, and what kind of impact, that they have on (digital) society is something that is, so far to my knowledge, not studied yet. This research takes a first step in identifying the discourse used by these sceptics to understand how they influence public perceptions of science and alternative knowledge systems.

Related to this, polarization is of concern in contemporary Dutch society (Miltenburg et al., 2022). According to a 2022 report on *Burgerperspectieven,* people see divisions in society, find that conflict between people with different political views is high, and that differences of opinion on social issues are increasing (Miltenburg et al., 2022, p. 4). According to Laudan, "the labelling of a certain activity as 'scientific' or 'unscientific' has social and political ramifications which go well beyond the taxonomic task of sorting beliefs into two piles." (1983, p. 120). Being grouped as 'science' or 'pseudoscience' thus has social and political consequences. If we want to close the gap on public science understanding we should be aware of the ways in which science and pseudoscience are characterised, since it might exclude people from the conversation. The manner in which discourse is presented publicly on alternative views may affect polarization, which is why I think it is important to study how these views are manifested. By examining how alternative views are framed in public discourse, insights can be gained into the role they play in deepening societal divides or, conversely, fostering dialogue.

Lastly, another reason to study sceptical discourse on pseudoscience is because views that deviate from scientific beliefs are being studied thoroughly (see Rutjens et al., (2018) for an overview), while manifestations of the scientific enterprise, such as the sceptics, are barely studied (besides e.g. Dyrendal, 2012; Hammer, 2007; Hess, 1993). Although Hammer and Dyrendal have researched the Swedish sceptic milieu, "little if any empirical research exists on sceptics as a social phenomenon in other countries" (Hammer, 2007, p. 393). This research tries to fill the gap in the literature by studying Dutch and Irish sceptics' texts.

1.6 Reading guide

In section 2, the background of this study is provided. Two fundamental concepts are elaborated upon, in 2.1 the demarcation problem, as a philosophical and sociological matter, is explored and in 2.2, the sceptics, scientific scepticism and sceptical rhetoric are discussed. In section 3, the methods of this study are described. In 3.1 the abstract concept underlying this thesis, Derrida's deconstruction, is explained. Consecutively, in 3.2 the concrete tools, by means of

[2] Ter Braack has 107.000 followers on Instagram, and Grimes has ~20.300 followers on Instagram.

Critical Discourse Analysis (CDA) are given, and in 3.3, the data is discussed. The findings are discussed in section 4, which show the general findings of the sceptic texts in 4.1, and a more in detailed analysis of the oppositions found in 4.2. Lastly, in section 5, the main findings of the analysis are summarized, and suggestions for further research are given.

2 Background

2.1 The demarcation problem

As previously discussed in the introduction, scientific sceptics accuse purveyors of alternative and spiritual practices to be involved with 'pseudoscience'. Although this term, or label, is common nowadays, what is 'pseudoscience' and what is the difference between science and pseudoscience? In this section the demarcation problem, which is the problem of distinguishing between science and non-science, and with that pseudoscience, is dissected and debated. The starting point of this discussion is the exploration of the concepts 'science', 'non-science' and 'pseudoscience' in section 2.1.1. Although defining these concepts is a matter of ongoing debate, general notions and their connotations are given to understand them on a basic level. Next, the most well-known criterion for the demarcation problem, Popper's *falsificationism,* is discussed in section 2.1.2. Lastly, the demarcation problem is discussed in section 2.1.3 in terms of a sociological boundary, so called *boundary work*.

2.1.1 Defining all *something*-sciences

As previously mentioned, the demarcation problem is about the difficulty of distinguishing science from non-science, or specifically, from pseudoscience. On a fundamental level, this problem is rooted in the question what 'science' actually is. Even though this seems like an easy question to answer, numerous definitions have been coined and have changed over time. Also, the scope of the word *science* can differ per language. For example, the Dutch word *wetenschap* has a wider meaning than the English word 'science', since the former refers to the natural sciences, social sciences and humanities, whereas the latter most often only refers to the natural sciences. A general definition of science often looks like this: "(knowledge from) the careful study of the structure and behaviour of the physical world, especially by watching, measuring, and doing experiments, and the development of theories to describe the results of these activities:" (Cambridge University Press, 2024). The word 'science' often has positive connotation, since science is highly valued and esteemed in society. The label 'scientific' often comes with the implication that something is experienced as positive or reliable, for example when something is 'scientifically proven' in an advertisement for a certain product. Besides the popular media and everyday life, science, logically, is highly esteemed in the academic world too. (Chalmers, 2013, p. xix)

Pseudoscience, on the other hand, has less positive connotations. The term 'pseudoscience' contains the Latin prefix *pseudo-* which etymologically stands for 'false', which then literally, stands for 'false science'. In more detail, 'pseudoscience' is commonly known as "spurious or pretended science; study or research that is claimed as scientific but is not generally accepted as such." (*Pseudoscience*, 2024). Also, pseudoscience often involves a constant effort to

promote teachings that do not have scientific validity at the time (Hansson, 2021). Pseudoscience is a form of non-science, which are non-scientific phenomena as metaphysics, religion, ethics and various forms of practical knowledge (Hansson, 2013, 2021). It is good to note that not all non-science is pseudoscience. As Hansson (2013, p. 62) further discusses, it is important to recognize that 'unscientific' is a narrower concept than 'non-scientific' (not scientific). The former term implies a contradiction with science, while the latter does not. Thereby, he states that 'pseudoscientific' is in its turn a narrower concept than 'unscientific', since "Fraud in otherwise legitimate branches of science is seldom, if ever, called "pseudoscience" (but it can certainly be called "unscientific")." (Hansson, 2013, p. 68). Pseudoscience is said to be more like a label than a concept, as multiple cases with different manifestations can be classified as such (Cortiñas-Rovira et al., 2015, p. 453). Examples that are considered pseudoscience nowadays are astrology, homeopathy and creationism. Thus, pseudoscience poses as science, while it is not scientific. However, the question then remains: When is something science, or scientific?

2.1.2 Popper's *falsificationism*

Now there has been established a basic idea of the concepts (and labels) of science and pseudoscience, the problem of discriminating the two from each other can be introduced further. The demarcation problem is a well-known problem in the philosophy of science and epistemology. It concerns the question of how science can be distinguished from non-science, and more specific pseudoscience. This question is interesting, specifically for this thesis, since there is a discrepancy between theory and practice regarding this problem. This is observed by Hansson (2013, p. 61), who notes that in practice it is easy for scientists to distinguish science from pseudoscience, and that often they unanimously agree with each other. However, the question of how they demarcate in theory, with which general principles, is divided amongst scientists and far from clear.

Philosophers of science have struggled with this problem in the past, and up until this day no consensus has been reached. The philosopher that has proposed the best known and most influential demarcation criterion is Karl Popper. Popper was not satisfied by the logical positivists answer to the demarcation problem which was the idea of *verificationism*, which stated that only statements about facts that are gained from observation, experimentation, or logic, are meaningful. Popper's idea aims specifically at differentiating between a scientific method and a non- and, later more specifically as, a pseudoscientific method. The pseudoscientific method gives the pretences of being a valid method, but does not live up to scientific standards.

Theories prominent in the twentieth century such as the Marxist theory of history, Freud's psycho-analysis and Adler's individual psychology, made Popper doubt the scientific status of these claims. What impressed supporters of these theories, and what made Popper sceptical, was the "apparent explanatory power" of these theories. They seemed to be able to explain everything that happened in the fields to which they referred. Popper observed that "the study of any of them seemed to have the effect of an intellectual conversion or revelation, opening your eyes to a new truth hidden from those not yet initiated. Once your eyes were thus opened you

saw confirming instances everywhere: the world was full of verifications of the theory. Whatever happened always confirmed it." (Popper, 1963, p. 34-5).

So, the problem that Popper extracted from these theories was that they could always be verified. Each instance could be interpreted in terms of the theories. This makes it look like a strong theory, while in fact it makes it weak. According to Popper, there should be a possibility that "the theory is incompatible with certain possible results of observation" (Popper, 1963, p. 36). In Popper's words, a statement has to be *falsifiable*. This meant that: "statements or systems of statements, in order to be ranked as scientific, must be capable of conflicting with possible, or conceivable observations." (Popper, 1963, p. 39). In other words, genuine scientific theories had to be bold and open to refutability. For astrology, descriptions of personality traits are vague in such a way that it makes it impossible to test them, which is a crucial element of falsification. This way the predictions can hardly fail, and become irrefutable. So, astrology does not pass the falsifiability test, and thus can be said to be 'pseudoscience'.

Although the problem of demarcation seems to be solved, the idea of falsificationism has been received with criticism. For instance, Mahner (2019, p. 30) observes that under the falsifiability criterion, only some cases get recognized as pseudoscientific, while it fails to do this for many other pseudoscientific claims. Many other well-known demarcation criteria have been proposed like Kuhn's criterion of puzzle-solving (1974) and Lakatos' "sophisticated (methodological) falsificationism" (1970) (see Hansson (2021) for a concise account on these theories), but no general consensus has been reached. However, on a practical level, the majority of philosophers and scientists agree on the fact that fields like astrology, creationism, homeopathy, psychokinesis, faith healing, clairvoyance, or ufology are either pseudoscience or at least lack the epistemic status to be taken seriously (Mahner, 2019, p. 30-31).

2.1.2.1 From pseudoscience to science, vice versa and everything in between

There are examples in science where the boundaries between science and non-science are harder to distinguish. Pigliucci talks about four examples that he calls 'almost science', which are string theory, SETI (search for extraterrestrial intelligence), evolutionary psychology and even history (see Pigliucci (2018, p. 41-72) for elaboration on these topics). 'almost science' is Pigliucci's term for science which is in the middle of science and non-science, which either will be recognized as science some day, degrade to pseudoscience, or stay in the middle (2018, p. 42). One of these examples is string theory. The problem with this theory is that it does not comply with one of science's most important premises, which is the idea that a theory, or an hypothesis, should be empirically testable. Also, it is accused of not being falsifiable, since the parameters in the theory could be altered to suit any new data (Pessoa, 2016). According to Popper's demarcation criterion, string theory would not categorized as science, but rather as pseudoscience. String theory is one of various other examples that show that the boundaries between science and pseudoscience are not as set in stone, and can be quite blurry.

Even though a theory or field of research has been defined to be science or pseudoscience, over time the (pseudo)scientific status of a certain claim can change. Popper argues that "myths may be developed, and become testable; that historically speaking all--or very nearly all--scientific theories originate from myths, and that a myth may contain important anticipations of scientific theories." (Popper, 1963, p. 38). An example of this would be continental drift, a theory that

states that the Earth's continents move relative to each other over time. First, when Alfred Wegener proposed this theory at the time called 'continental displacement' in 1912 (published in 1915), it was ridiculed and named "Germanic pseudo-science". This was probably because despite presenting substantial evidence for continental drift, he was unable to offer a compelling explanation for the physical processes that could have caused it. During the 1960s, with the development of the theory of plate tectonics, Wegener's theory could be explained and became a cornerstone of modern geology. (Conniff, 2012). It is thus interesting that pseudoscience and science can succeed one another, but it can also go the other way.

An example of the latter would be the study of phrenology which was developed in 1796 and influential in the 19th century. Phrenology claimed that the shape and bumps of the skull could determine a person's personality and mental abilities. According to phrenology, the brain is composed of different muscles and the ones that are used more often are bigger, which results in different skull shapes. The problem was that the methods of phrenology were doubtful, even for the scientific standards at the time. From the 1840s on, phrenology was discredited as a scientific theory. However, its practices continued to be used and influential in the 19th century. From the early 20th century on, phrenology is considered and labelled as pseudoscience, as it lacks empirical support and has been discredited by advances in neuroscience. It was also accused of being discriminative on grounds of race and gender. (Thompson, 2024)

2.1.3 Demarcation in practice: *Boundary work*

Now the theoretical side of the demarcation problem has been illuminated, what happens in practice when demarcating between science and pseudoscience? As previously discussed in section 2.1.2, Hansson (2013) says that delineation often offers no problem in practice for scientists. The line is often drawn in the same place. So, interestingly, there appears to be a discrepancy between the demarcation problem in theory, and in practice. About this, Sociologist Thomas Gieryn says "even as sociologists and philosophers argue over the uniqueness of science among intellectual activities, demarcation is routinely accomplished in practical, everyday settings:…" (1983, p. 781).

In Gieryn's view, the demarcation problem is not only an academic effort, but more so an ideological effort by scientists, which he calls *boundary work:* "the attribution of selected characteristics to [an] institution of science (i.e., to its practitioners, methods, stock of knowledge, values and work organization) for purposes of constructing a social boundary that distinguishes some intellectual activities as "non-science"." (1983, p. 782). Boundary work studies how science is presented in everyday life, and how its epistemic authority can be explained. So, "the contours and contents of what we regard as science, …, are not intrinsic to the nature and practice of the institution itself, but are better thought as the provisional result of repeated and endless dynamics of the inclusion and exclusion of people, knowledge, and practices; efforts, that is, to carve science off from other domains of life." (Harambam, 2017b, p. 206). In other words, what we regard as science is not inherent or unique, but it is about ongoing social processes that determine what is included or excluded.

This perspective by Gieryn on the boundaries of science puts the question of power in the picture, which is because "all drawings of inside-outside boundaries in knowledge are theorized

as power moves" (Haraway, 1992). With the inclusion in the domain of science, certain power privileges such as status, money and authority come into play. Laudan notes on this that demarcation "will typically assert the epistemic superiority of science over non-science, the formulation of such a criterion will result in the sorting of beliefs into such categories as 'sound' and 'un-sound', 'respectable' and 'cranky', or 'reasonable' and 'unreasonable'." (1983, p. 119-20), which is in the specific interest of this thesis. Laudan goes on with explaining that "the labelling of a certain activity as 'scientific' or 'unscientific' has social and political ramifications which go well beyond the taxonomic task of sorting beliefs into two piles." Thus, although the demarcation criteria are often intended to be of an epistemic nature, the consequences are often non-epistemic. (Laudan, 1983, p. 119-20).

Harambam further notes that nowadays the public image of science, or "professional ideology" (Gieryn, 1983), is that of being sceptical, objective, rational, disinterested, and truthful. This image is the reason of science's superior societal position, which is powerful and authoritative. "Because we believe science to be a pure source of knowledge, untroubled by dogma, religion, politics, and material interests, we value it with resources and esteem. No wonder that rival parties will argue in battles for epistemic authority that they are really scientific" (Harambam, 2017b, p. 208). These rivals, the 'pseudoscientists' (e.g. astrologists, homeopaths and parapsychologists) are attacked and excluded by 'boundary workers' like the sceptics, who show that these 'pseudoscientific' practices fail to conform to the methods of science.

In other abstract words, Harambam states that boundary work is about amplifying difference (2017b, p. 208-9). One has to distinguish oneself from the opposed *other* and conceal potential similarities with the *other* group. Otherwise it might undermine the justification of science's distinct societal position. Boundary work creates clear stereotypes of the *self* (i.e. science) and the *other* (i.e. non-science/pseudoscience). So, even though science and pseudoscience are not always as far apart as one might think, as shown in section 2.1.2.1, they are portrayed to be as such to maintain a certain public image of science. The sceptics play a key role in the social control of this boundary between science and pseudoscience. In the next section, scientific scepticism, the sceptical movement and sceptical boundary work are discussed.

2.2 Sceptics

As shown in section 2.1 above, the demarcation problem is not only of academic importance, but also of political and social, which has been termed *boundary work* by Thomas Gieryn. Boundary work is about drawing "rhetorical boundaries between us and them" (Harambam, 2017, p. 209-9), which are needed to differentiate oneself (i.e. science) from the opposed other (i.e. pseudoscience). A group that is actively involved in boundary work, are the (scientific) sceptics. To understand the workings and activism of the sceptics, this section pays specific attention to multiple facets of this group. First, in section 2.2.1, scientific scepticism as a concept is explained. Secondly, sceptics as a social movement is discussed in section 2.2.2. Lastly, in section 2.2.3, specific attention is given to sceptical boundary work and the sceptical argumentation that is used within boundary work.

2.2.1 Scientific scepticism

The views of the sceptics that are studied in this thesis are compliant with scientific scepticism. Confusingly, 'scepticism' means slightly different things in different domains. In philosophy, scepticism refers to the philosophical views that question the possibility of knowledge. It differs from other forms of scepticism by rejecting even highly plausible knowledge claims that we ordinarily think we know, like 'the sun will come out tomorrow' or 'I have two hands' (Comesaña & Klein, 2001). In contrast, scientific scepticism is more specific in its scepticism, since it questions beliefs on the basis of scientific understanding and empirical evidence. It particularly focusses on the application of the scientific method to what Hammer calls "controversial science" (e.g. intelligent design and parapsychology), New Age claims (e.g. complementary and alternative medicine, divination, UFOs etc.), aspects of Christian religion (e.g. creationism) and other religious movements (e.g. Scientology) (2007, p. 391).

The difference between philosophical and scientific scepticism is the fact that the first is equally suspicious of all empirical claims, while the second is only suspicious and distrustful of empirical claims that are controversial through the eyes of the scientific[3] worldview. "Sceptics, in this sense, are sceptical of particular sets of propositions because they are problematic when viewed from the perspective of these normative methods." (Hammer, 2007, p. 382). Scientific scepticism is thus unsceptical about the foundations and methods of science (Hammer, 2007, p. 382). It is good to mention that scientific scepticism is not the same as 'science scepticism'. Science scepticism is "systematic and unwarranted rejection of science" (Rutjens et al., 2022, p. 102). However, interestingly, the two are closely linked to each other. People who are sceptical of science, are often involved in pseudoscientific and/or spiritual practices.

The scope of scientific scepticism, as described by prominent sceptic Steven Novella, is summarized below:

- **Respect for Knowledge and Truth**: Sceptics prioritize truth, subjecting all claims to rigorous evaluation.
- **Methodological Naturalism**: Sceptics believe the natural world operates by consistent laws, and empirical knowledge must be gained without invoking the supernatural.
- **Promotion of Science**: Science is vital for understanding the natural world, and sceptics promote its role in society, protect its integrity, and advocate for high-quality education and research.
- **Reason and Critical Thinking**: Sceptics value logic and critical thinking alongside science.
- **Science vs. Pseudoscience**: Sceptics seek to differentiate legitimate science from pseudoscience and educate others on how to discern the difference.
- **Ideological Freedom**: Science and free inquiry require a secular society free from imposed ideologies.
- **Neuropsychological Humility**: Sceptics recognize the limitations and biases in human cognition and seek methods to mitigate them.

[3] In this case the 'scientific' worldview will mostly refer to that of the natural sciences, since most sceptics are from and prominent in the natural sciences (Hammer, 2007, p. 386, p. 391).

- **Consumer Protection**: Sceptics work to protect the public from fraud and deception by exposing false claims and educating others.

(Novella, 2013)

2.2.2 The sceptical movement

Besides its ideas, scientific scepticism is predominantly characterised by and as the social sceptical movement. An important group in the establishment of this movement was the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), now called Committee for Skeptical Inquiry (CSI). This organisation was co-founded and chaired by Paul Kurtz and Marcello Truzzi in 1976 (Hammer, 2007, p. 387-8). Nowadays, CSI's mission is "to promote scientific inquiry, critical investigation, and the use of reason in examining controversial and extraordinary claims." (Center for Inquiry, 2024).

The sceptical movement consists primarily of men with a higher education (Dyrendal, 2012, p. 879; Hammer, 2007, p. 389). The sceptical movement is devoted to the disclosure and debunking of pseudoscience. Often this is done by the production of sceptical texts in journals such as the *Skeptical Inquirer,* which is the official journal of CSI. The texts are often produced by researchers and science writers from the natural sciences (e.g. Carl Sagan) as well as psychologists (e.g. Susan Blackmore), philosophers (e.g. Paul Kurtz), and interestingly, (professional) magicians (e.g. James Randi). Remarkably, the humanities and social sciences are less or non-present. (Hammer, 2007, p. 389).

Besides the more prominent activists, Dyrendal observes that "lay scepticism" is now a common practice because of the internet. This brings sceptics in direct contact with pseudoscientific claims and claimants. Sceptical activism nowadays takes place in science blogs, podcasts, YouTube videos and on discussion forums. In particular with blogging, more practicing scientists are now engaged with sceptical activism, most of who are unaffiliated with any sceptical organization. (Dyrendal, 2012, p. 885). According to Hammer, sceptical movements have developed a shared discourse over the years, which can unite individual activists, despite their individual differences. This shared discourse is reflected in the topics that are covered, the way controversial beliefs are presented and argued against, and the search for explanations why people keep on believing in controversial practices that in the eyes of sceptics are bizarre and irrational. (Hammer, 2007, p. 390).

2.2.3 Sceptical boundary work

As previously discussed in section 2.1.3, boundary work is about the creation and policing of a social boundary to distinguish science from non-science, and in the case of the sceptics, from pseudoscience. Sceptical boundary work is called 'debunking', which is "to show that something is less important, less good, or less true than it has been made to appear" (*Debunking*, 2024). In their activism, they try to show that a certain alternative claim lacks scientific validity and credibility and therefore define it as 'pseudoscience'. Thus, sceptics debunk when alternative truth claims (in the eyes of sceptics) are rejected as false (Dyrendal, 2012, p. 887). The topics that are debunked often are New Age theories and practices (e.g. complementary and alternative medicine, and other spiritual practices). An interesting

observation made by Dyrendal (2012, p. 885) is that the sceptics' movement has run parallel with the New Age movement, whose claims are the main targets of the sceptics. Debunking is part of the boundary work that sceptics carry out.

Besides debunking as sceptical boundary work, Dyrendal argues that sceptics are also involved in moral boundary work (2012, p. 880). Controversial claims and practices are presented in sceptical discourse as social problems; they are 'harmful' to individuals as well as society. Sceptics therefore act as *moral entrepreneurs*[4], which in Hammer's words are "individuals or groups who set up normative standard of behaviour and depict the activities of other who do not conform as deviation." (Hammer, 2007, p. 393). Hammer adds that this deviance is only deviance from a certain norm, in this case the norms of scientific scepticism, and thus never absolute. As moral entrepreneurs, sceptics take on the role of 'consumer protectors' (Hess, 1993), where they work on both appealing to people's emotions and challenging the arguments of their opponent (Dyrendal, 2012, p. 894). Sceptic organisations, like CSI, fulfil this moral entrepreneurship by making rules for rational behaviour, and by pointing out offenders who break those rules. The sense of moral urgency, and the perceived need to convince others of that urgency, can be seen clearly in the sceptical discourse (Hammer, 2007, p. 394).

The sceptical discourse can be identified by the strong, polemic language, where the alternative party is described in terms of "bogus" and "nonsense", while the sceptical party described with words like "clear thinking" and "rationality". Metaphors regarding war and acute danger are also present in sceptical texts (Hammer, 2007, p. 395). A term that is suitable for this behaviour are sceptics as 'scientific vigilantes', who "act in the name of society even as they may transgress some of its rules (Collins & Pinch, 1982, p. 42). Just as superheroes may overstep the boundaries of the law in order to preserve the rule of law, so skeptics may overstep the boundaries of scientific methods in order to preserve the rule of science." (Hess, 1993, p. 88). In other words, sceptics might use unscientific tactics like mockery or public shaming in order to defend the overall authority and credibility of science.

2.2.3.1 Characteristics of sceptical discourse

As previously mentioned in section 2.2.2, sceptics have developed a shared discourse, with shared rhetorical strategies and arguments. Hammer has identified sceptical argumentation that is used in debunking or other sceptical accounts. One of the most common themes in the sceptical discourse is that sceptics try to understand why people keep on believing in debunked pseudoscientific claims, which is what Hammer calls the 'psychological model' (2007, p. 393). Narratives about human credulity, the deceit and charisma of proposers of pseudoscientific claims and the lack of critical judgment of the media are proposed. Also certain explanations concerning psychological mechanisms are given as to what makes it difficult to asses controversial claims, like a lack of understanding of statistical results and innumeracy. This model also relates to the 'Neuropsychological Humility' that has been described by Novella as part of the scope of scientific scepticism (section 2.2.1).

Two other explanatory models, different from the psychological model are the argument of pathology and the argument of immorality. The first argument states that believers of

[4] A term coined by Howard Becker in his study *Outsiders* (1963, 147-163).

'pseudoscientific' claims must be naïve, deluded or irrational, and that there is something fundamentally wrong with them. The second argument, the argument of immorality, states that all actors of the alternative, spiritual scene (astrologers, psychics etc.) are conmen who want to make money at the cost of gullible clients. Both arguments depict controversial, alternative practices as a threat to society. So, on one hand sceptics try to understand why purveyors of the alternative belief in pseudoscientific practices, and on the other hand depict it as a social problem. (Hammer, 2007, p. 391-4).

3 Methods

In this section, I discuss the approaches that I use for the analysis of the sceptical texts. The method finds it basis in Derrida's deconstruction. Deconstruction aims to find opposing (hierarchical) binaries in the text and with that to explore the hidden meanings in texts, which are either implicitly or explicitly imposed on the reader. This is done to understand the relationship between a text and its meaning. Since the fundament of this thesis is about a specific opposition (science vs. pseudoscience), I think it is important to pay attention to other underlying binaries in the texts. I analyse these by a method called Critical Discourse Analysis (CDA). CDA looks for the hidden meaning in texts and relates them to power relations, social hierarchies, and ideologies by looking at different textual and social layers of a text. So, deconstruction is the abstract philosophical framework of the analysis, and CDA provides the concrete tools necessary to provide evidence for the oppositions that have been found. After having discussed deconstruction (section 3.1) and CDA (section 3.2), the data of this study, and how it is analysed are discussed in section 3.3.

3.1 Derrida's deconstruction

Jacques Derrida is known for developing the philosophy of 'deconstruction'. By means of deconstruction he wanted to question and challenge the assumptions of Western philosophy, but more generally of Western culture. Deconstruction is something that is applied to texts, which is the reason why it is applicable to this research. According to deconstruction, each text, and specifically each reading of a text is unique, and should be read in its singularity. By this is meant that each text has assumptions 'hidden' in the text, which are sometimes explicitly, but mostly implicitly imposed on the reader. When one 'does' deconstruction, it lets the text speak before the reader, which does not mean that 'a text means what I want it to mean' (McQuillan, 2017, p. 3-6).

Deconstruction, as McQuillan describes it, "examines the way in which Western thought is structured" (McQuillan, 2017, p. 8). A major part of this examination is the search to binary oppositions, like Man/Woman, White/Black and West/East, since Derrida suggests this is how Western thought is structured. These binaries are not complimentary to each other, like yin and yang, but they are in hierarchical opposition to each other. One is always privileged over the other. Since this hierarchy finds its expression in language, language users can be 'trained' to accept this hierarchy through its repeated use. An example of a binary pair is that of West/East (with west being privileged over east). Below in Table 1, this opposition and their accompanying (binary) characteristics, are given. Interestingly, the West/East binary depicted below shows

quite some overlap with the oppositions found in the science/pseudoscience discourse studied here. In section 4.2, this is elaborated upon.

West	East
Rational	Irrational
Progressive	Backward
Recognisable	Exotic
Scientific	Mystical
Masculine	Feminine
Moral	Amoral
Reason	Superstition
Democracy	Despotism
Order	Chaos
Culture	Nature

Table 1. Examples of West/East binary as depicted by McQuillan (2017, p. 9-10)

McQuillan importantly clarifies that the binary oppositions are not the reality of how things are but rather are representations of Western thought. He elaborates by saying that these representations of the unprivileged, for example Women and the East, are not "accurate descriptions of the lived experience of those who occupy these positions. However, the function of such descriptions is not to reflect lived reality but to construct the identity of the privileged term (in this instance either Man or the West)." (McQuillan, 2017, p. 10). The idea is then that the identity of the privileged term is constructed and expressed in language, and this way language users are 'trained' by habitual use into thinking this (the privileging of one term over the other) is the natural order of things. (McQuillan, 2017, p. 10).

Thus, the notion is that the inequality that exists between binary oppositions, depends on how the inequality is presented in discourse (philosophical, literary, etc.). This idea finds its roots in the 'logocentrism' of Western thought to which Derrida contends. Logocentrism is "the general assumption that there is a realm of 'truth' existing prior to and independent of its representation by linguistic signs." (The Editors of Encyclopaedia Britannica, 2024). This way, logocentrism encourages us to treat linguistic signs as distinct from the phenomena they represent, rather than as inseparable unit. McQuillan nicely formulates that deconstruction teaches us that "we should not assume that the way we perceive the world is the same as the way the world actually is." (McQuillan, 2017, p. 11).

So, by means of deconstruction, within a text there exist opposing binaries. McQuillan nicely summarizes that the task of deconstruction is to identify (and undo) the opposing binaries, and show that the meaning of the text is dependent on the assumption of this binary reasoning. The second task of deconstruction, after having identified the binary, is "to displace the whole system of binary thinking". This is done to prevent the analysis of creating another set of binary oppositions, and with that inequality. However, for the scope of this thesis I will only engage in the first part identifying binaries. The binaries in the texts are identified on the basis of certain themes (e.g. *reality, dogma,* etc.) that I found by the tools of Critical Discourse Analysis (CDA), which are categorized along overarching oppositions (e.g. scientific vs. mystical). The method of CDA is discussed in section 3.2 below.

3.2 Critical Discourse Analysis (CDA)

Critical Discourse Analysis (CDA) is an approach to analyze language as a form of social practice. It is not a single method, but rather an approach that aims at revealing socio-psychological characteristics of (a) person(s), like the attitude towards a certain topic. In Fairclough's (1995) three-dimensional framework the aim is to map three separate forms of analysis onto one another: analysis of language texts, analysis of discourse practice (processes of text production, distribution and consumption) and analysis of socio-cultural practices. This way he combines micro, meso and macro-level interpretation. CDA aims to show how these three levels are interrelated. I will explain briefly what these three levels are and what the overall objective is of the method.

Figure 1. shows what CDA's three-dimensional conception of discourse is, which illustrates the idea that the meaning of a text derives from the words that are used but, more importantly, how the words are used in a particular social context (Huckin, 1997, p. 80). One of the notions that CDA is built upon is that language is not merely presenting a state of affairs, but also constructs social relations between participants and projects a version of this relationship (Kress, 1990, p. 89). This relationship is formed by past interactions, in which power relations are established. The choice of one form over the other is based on power-difference between the two participants, for example: "Can I borrow your laptop this afternoon?" vs. "I can borrow your laptop this afternoon, can't I?" As Kress notes "choice enables the possibility of changing the actual, or projected social relations and structures; the possibility of choice comes with greater power" (Kress, 1990, p. 89). Thus, CDA states: language is not neutral. All linguistic forms always express a particular stance of the represented thing.

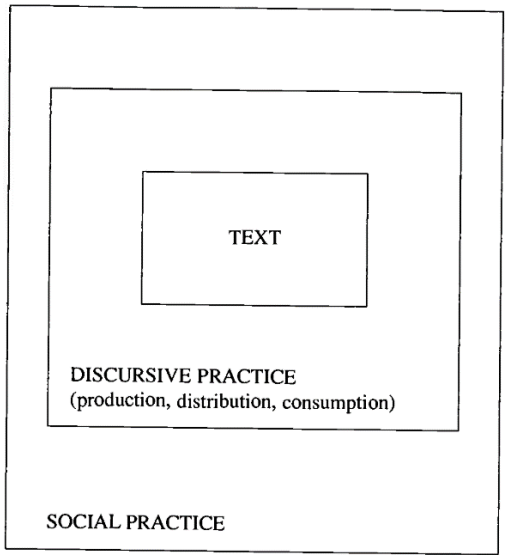

Figure 1. Three-dimensional conception of discourse (Huckin, 1997, p. 80)
(from Fairclough (1992)).

Although CDA is not a step-by-step method, Huckin (1997) and Kress (1990) have given well-informed accounts on text-analytic tools that one can use to perform CDA. On the micro-level, a text can be analysed as a whole and on sentence-, phrase- and word-level. On a meso-level, the means of production and consumption are studied, for instance, who produced a text and who is the target audience. Finally, at the macro-level, the broad, societal currents that affect the text are being studied. For this thesis, the analysis is mainly on the micro-level to uncover the oppositions present in sceptical boundary work.

For the analysis of the texts, the following questions are asked:

- Genre: What type of text is it and does it conform to the formal set of characteristics that belong to the genre?
- Framing: How is the content of the presented? What perspective does the writer write from?
- Register: How formal/informal, technical etc. is the text? And why is the register used?
- Foreground/backgrounding: Which concepts are emphasized and which are de-emphasized?
- Presupposition: What ideas are taken for granted? What is the non-discussed alternative?
- Agent-patient relations: Who initiates actions (and thus exert power) and who is the (passive) recipient of these actions?
- Connotations: What (positive/negative) connotation does a word or phrase have?
    - Labels: How is it labelled? (ex. *pro-life* vs. *anti-choice*)
    - Metaphors: What kind of metaphor is used? And what is it trying to convey with that metaphor?

(Huckin, 1997, p. 81-4; Kress, 1990, p. 90-2)

3.3 Data

In this subsection I will explain how I collected and structured the data. I will also explain who the subjects of my study are and why I chose them for this study.

3.3.1 Subjects

For this study, I analysed nine articles by two sceptic science writers named Adriaan ter Braack and David Robert Grimes who write about what in their view counts pseudoscientific practices and theories. Adriaan ter Braack (1986) is a Dutch independent science journalist, writer and podcaster (ter Braack, n.d.). He writes weekly on his Substack called *Sjamadriaan*[5]. Ter Braack writes about "bizar health claims and comical pseudoscience", which he tries to debunk in his texts (ter Braack, 2024). He also tries to find answers why pseudoscience is in demand, when something is proven scientifically and why doing one's own research is a bad idea. He states that he does this with "cynical humor and a critical eye" (ter Braack, 2024). This view is represented in the titles of his newsletters, e.g. *'Arie Boomsma's dogmatic supplement gospel'*[6] and *'If only there were a vaccine against ignorance and overconfidence'*[7]. Besides giving his own personal opinion on the matters, he also tries to educate the reader. Not only does he write newsletters about pseudoscience and faulty health claims, he also tries to counter pseudoscience online, via, for example, checking claims from (health) influencers and reporting them when faulty.

David Robert Grimes (1985) is an Irish, as described on his website, scientist, broadcaster and author "with a keen interest in the public understanding of science" (Grimes, 2022b). He often writes for newspapers like The Irish Times and The Guardian (Grimes, 2022a). Besides writing sceptical pieces, both Ter Braack and Grimes are active on social media like Instagram to

[5] https://www.sjamadriaan.nl/
[6] https://www.sjamadriaan.nl/p/arie-blijkt-een-orthodoxe-supplementendominee
[7] https://www.sjamadriaan.nl/p/bestond-er-maar-een-vaccin-tegen

debunk controversial alternative practices and theories. Subjects that both sceptics often write about our homeopathy, food supplements and vaccination.

For this thesis, I assume Ter Braack and Grimes are both sceptics. Although there are no defined characteristics that determine whether someone is a sceptic, it is important to categorize them as such to understand and explain certain standpoints in their texts that come with scientific scepticism. Hansson (2021, p. 12) very simply states that criticism of pseudoscience is often called scepticism, which would fit both Ter Braack and Grimes. Furthermore, Grimes is a fellow with the Committee for Skeptical Inquiry (CSI), which is an organisation that wants "to promote scientific inquiry, critical investigation, and the use of reason in examining controversial and extraordinary claims" (Center for Inquiry, 2024). Fellows of CSI are ambassadors of science and scepticism, and they are elected by the committee for their distinguished contributions to science and scepticism. Other well-known fellows are Richard Dawkins, Neil deGrasse Tyson and Steven Pinker. Grimes can thus formally be said to be a 'sceptic', and is also recognized as one. Although Ter Braack is not a fellow of CSI and not a known member of another sceptical organisation, I do consider him to be one. Besides the sceptical character of his texts, he often also references sceptic sources, like *Vereniging tegen de Kwakzalverij*[8] and *Skeptical Inquirer (*Journal of CSI)[9]. He has also been a guest at a podcast by *Stichting Skepsis*[10] and has written an article in their journal named *Skepter*[11]. Because of this, I assume that he sympathises with these sceptical organisations, and their cause.

3.3.2 Material

For this thesis, I have analysed nine texts, from which four are from Adriaan ter Braack and five from David Robert Grimes. Grimes' texts are published in period from 2011-2020, while Ter Braack's texts are all published in 2023. The texts were chosen on the basis of their topics. First, I made a list of all the articles published by David Robert Grimes (as stated on his website[12]) and Adriaan ter Braack (the articles from *Sjamadriaan*[13]) and categorized each article according to their subject, for example 'vaccination', '5G', 'supplements' or 'celebs'. Then I identified which categories were both present in Ter Braack's and Grimes' texts. I found seven overlapping categories: 'supplements', 'homeopathy', 'detox', 'influencers/celebs', '5G', 'science in general', and 'vaccination'. I then looked at the articles more closely to see which were the most similar content wise and chose the first three topics, 'supplements', 'homeopathy' and 'detox' to analyse. Since Ter Braack's texts had a total word count of 4818, and Grimes' only 3851, I decided to add one extra article from Grimes' list, about influencers and detox (which Ter Braack has also written about). In total this made the word count of Grimes' texts 4815. In Appendix I: List of articles, a list of the articles, as well as where they are published, and their word count, is given.

[8] https://www.sjamadriaan.nl/p/homeopathie-biomedisch-luchtgitaar?utm_source=publication-search
[9] https://www.sjamadriaan.nl/p/kritisch-denken-wat-was-dat-ook-alweer?utm_source=publication-search
[10] https://skepsis.nl/skepsis-podcast-6/
[11] https://skepsis.nl/een-koude-douche/
[12] https://www.davidrobertgrimes.com/media-work
[13] https://www.sjamadriaan.nl/

3.3.3 Data analysis

For the data analysis, I took the following steps.

1. I first read the texts to get a gist of the (kind of) words that were being used, as well as the rhetoric and arguments.
2. Then I 'coded' the texts, which entailed that I deep read the text and marked certain words and phrases that stood out. This were either words or phrases that occurred multiple times, had a certain value judgement in it (either positive or negative) towards the science or non-science group, or rhetorical strategies and argumentation (e.g. diminutives and augmentatives). The first coding attempt, I used MAXQDA, which is a software program that is designed to handle qualitative data, like textual analysis. Since this first attempt had many redundant codes, I did a second coding attempt manually in a word document. The coding was a reiterative process, since each text revealed new codes that had to be applied to the previous coded texts. Until I found that all the important, meaningful and remarkable words, phrases and arguments had been coded, I stopped this process.
3. Following up, I gathered all the sentences that had coded words and phrases in them in one document. Each of these sentences were provided with the article they are from.
4. Finally, I tried to categorize the coded sentences into themes, which related to either an opposition (within the science/'pseudoscience' binary), a type of argumentation or rhetorical strategy. Since much overlap was found with the oppositions of the east/west binary of McQuillan (2017, p. 9-10) presented in section 3.1, I decided to classify the themes according to these oppositions.

4 Analysis

The analysis is focused on looking for binary oppositions in the science/pseudoscience opposition. In Derrida's philosophy, binaries are hierarchically opposed to each other where one is always privileged over the other. Since the identity of the privileged term is constructed and expressed in language, this should be visible in the discourse on boundary work of science/pseudoscience. With the application of CDA, this analysis aims to explore these oppositions within the overarching binary and how they are presented in discourse. As previously mentioned, nine texts by two sceptics, Adriaan ter Braack and David Robert Grimes, are studied. Although often in CDA texts are studied individually, this analysis looks at multiple texts. A more general analysis of the patterns found, is provided. A distinction between the two authors, Adriaan ter Braack and David Robert Grimes, is often made explicit. The translations of the Dutch texts are translated with the help of DeepL.

4.1 General characteristics

To get a general idea of the opposition of science vs. pseudoscience itself, it is good to start by looking at the texts as a whole. On this level, CDA looks at the genre, framing and the register of the texts (see description of words in section 3.2). Since "genres are always seen as the linguistic products of particular social occasions, encoding the social organization, structures etc. of that occasion." (Kress, 1990, p. 90), it says something about how the language and the

form of a text cohere. Generally, the texts by both sceptics seem to conform to the characteristics of their genres, which are newsletter and column. They both very emphatically express their subjective opinions on the matters in an informal manner, which also suits the genres. This informal tone is very noticeable in the examples 1) and 2) below. Here the personal stance of the authors concerning homeopathy is very apparent, namely that they are not in favour of it (even against it) and do not share the alternative beliefs of homeopathic practice. The tale-like manner of the story (in the case of example 1)), the strong (polemical) tone and the pejorative language use seem to be prototypical for both sceptics.

1) 'IMAGINE YOU WENT to see a doctor with a health complaint. He (or she) nods thoughtfully, then suggests a remedy. Except the solution they propose has been debunked for hundreds of years, is physiologically nonsense and would have to violate the laws of physics to be effective. You might think your doctor had been hitting the liquor a little too hard of late, and you'd most likely go elsewhere to find a reputable physician.'
(Grimes, 2011)

2) *Dit idee is tegenstrijdig met alle kennis over de natuur en logica in zijn geheel. Nooit is een dergelijk watergeheugen ergens aangetoond. De oplossing is scheikundig gezien niet anders dan wanneer er niets in was verdund. Homeopathie is een soort onzichtbare magie.*
'This idea contradicts all knowledge about nature and logic as a whole. Never has such water memory been demonstrated anywhere. The solution is chemically no different than if nothing had been diluted in it. Homeopathy is a kind of invisible magic.'
(ter Braack, 2023c)

The informal register is accompanied by relatively untechnical language, considering they are both science writers and need to know how to convey scientific concepts to a general public. However, even though the texts are not technical, I found that the texts are not written for an audience that endorses alternative, non-scientific views. Rather it is written for people who are already interested in science and 'belief' in science, and thus already agree with the stances of the authors. This notion is shown in the sentence depicted in example 3), where Ter Braack says that most people do not understand the notion that of scientific evidence. Interestingly, he seems not to be referring to his readers, but rather to the 'other' who do not understand science.

3) *<u>De meeste mensen snappen dit niet</u>, zien een dergelijke lijst en denken dat er degelijk wetenschappelijk bewijs dat D-mannose helpt bij blaasontsteking en diabetes, wat op de pagina wordt geclaimd.*
'<u>Most people do not understand this</u>, see such a list and think there is solid scientific evidence that D-mannose helps with cystitis and diabetes, which is claimed on the page.'
(ter Braack, 2023b)

Since the sceptics take such a strong, polemical stance against alternative practices, discussion is not welcomed on the topic. This evidently shows that the opposition between science and pseudoscience is an hierarchical one. Science is right and good, while pseudoscience is wrong and bad. Example 4) below shows this notion explicitly.

4) ‘By clinging to delusion, belief in alternative medicine denigrates the very wonder of science and medicine and the massive strides we as a species have made over the last century or so in understanding the world around us, and how our bodies work.’ (Grimes, 2012)

Different from most columns and newsletters, Ter Braack sometimes provides references for the claims he makes, with links in the footnotes at the end of an article. These references are scientific papers, science news websites or other ‘official’ (subsidized by the government) healthcare websites, for example Voedingscentrum. In Grimes articles no references are provided, only in one instance in The Guardian where links to other news articles are present. As might be expected, it seems that Ter Braack has more freedom considering the style and format of his own newsletters, while Grimes has to adhere to the standards and the format of the medium he is writing for.

The framing of the texts is from a clear perspective, namely that of a ‘science’ perspective. Besides the fact that they are both science writers, their position concerning a specific topic is also obvious from their titles, like in Grimes’ articles on homeopathy: “*Homeopathy isn’t just useless – in the wrong hands it’s dangerous”* (Grimes, 2011) and *“Homeopathy does not work beyond a placebo effect”* (Grimes, 2012). These examples immediately show that the author is not in favour of homeopathy, or even against it. The same accounts for other articles by Grimes: *“Most health supplements have no health value and should be taxed”* (Grimes, 2019b)*, “Resolve never to detox again”*(Grimes, 2019a) and *“From vagina eggs to anti-vaxxers: is it time for an influencer detox?”*(Grimes, 2020). Ter Braack’s titles are often more sarcastic or pejorative in nature, for example *Slik niet zomaar alles, behalve supplementen “Don't just take anything, except supplements”*(ter Braack, 2023d) or *Homeopathie: biomedisch luchtgitaar “Homeopathy: biomedical air guitar”*(ter Braack, 2023c). Also considering the fact that the name of Ter Braack’s newsletter is ‘Sjamadriaan’, which is a wordplay of his first name and *sjamaan* ‘shaman’, it sarcastically refers to the alternative circuit who uses words related to healing (*Skepsis Podcast #6*, 2024). Thus, it is clear that these titles show a certain value judgement towards the topic, and thus a certain frame.

4.2 Oppositions

Since Ter Braack and Grimes are both science writers, and more specifically sceptics, they are advocates of science. This fact forms an inherent opposition to the topics they write about, which are about ‘pseudoscience’. What I mean by this is that they write about topics where the scientific community already has a firm stance about, since, e.g. homeopathy, are for the most part either seen as pseudoscience or at least lack the epistemic warrant to be taken seriously (Mahner, 2019, p. 30-31). Along the texts both sceptics try to argue as to why a certain non-science practice is false, bad, and dangerous, and why that is according to science. In the texts, I found a number of themes on how science is characterized versus how pseudoscience is characterized. These themes corresponded to an overarching opposition. Since quite some oppositions are shared with the binaries found in the West/East opposition of McQuillan (2017, p. 9-10), I have categorized my findings according to these distinctions. Namely the binaries progressive vs. backwards, reason vs. superstition, scientific vs. mystical, moral vs. amoral, and rational vs. irrational. These are discussed in further detail below.

4.2.1 Progressive vs. backwards

The first opposition within the science and 'pseudoscience' binary is that of progressive vs. backwards. Often progressive is connotated with modernity and the future, while backwards is connotated with oldness and the past. This binary is explicitly found in the texts, in terms of modern vs. old.

4.2.1.1 Old

An argument that is often given against pseudoscience is that its research and studies are old. Words like '(terribly) outdated', *stokoud* 'very old', 'medieval' and 'archaic' are used to describe pseudoscientific studies, while the word 'modern' is used in the context of science and medicine. In this case all the words connected to 'old' are used in a negative way, as can be seen in examples 5)- 7). A clear value judgement is present concerning this binary: old equals bad, while modern equals good.

5) 'But it will not be superstition and archaic ritual that shed light on these mysteries but rather methodological research, conducted with a sceptical attitude through the scientific method that brings new advances and understanding.'
(Grimes, 2012)

6) 'But popular as this option may be, it is based on frankly medieval notions of medicine.'
(Grimes, 2019a)

7) *De zogenaamde referenties zijn stokoud of verwijzen naar onderzoeken naar ratten. Dit wordt dan 'wetenschappelijk ondersteund' genoemd.*
'The so-called references are [ancient] or refer to studies on rats. This is then called "scientifically supported.'
(ter Braack, 2023b)

4.2.1.2 Modern

In all instances, 'modern' is used as an adjective (as shown in examples 8) and 9)), where it is used to create and emphasize the opposition between modern vs. old. There are namely also instances where nouns as 'science' and 'medicine' stand alone, so the adjective 'modern' has been deliberately put in the contexts where it needed conviction.

8) 'Modern science has utterly debunked them as demonstrably useless and built upon long-discredited notions.'
(Grimes, 2019a)

9) *Ook hier geen woord over dat het misschien gewoon niet zo'n hele handige actie was en dat Denise misschien op z'n minst, als ze toch wist dat ze zich tegoed zou gaan doen aan allerlei verlichtende activiteiten die haaks staan op de moderne medische wetenschap, een extra reisverzekering af had kunnen sluiten.*
'Again, no word here that maybe it just wasn't a very convenient action
and that Denise might at least, if she did know she was going to feast
going to indulge in all sorts of enlightening activities at odds with modern medical science, she could have taken out extra travel insurance.'
(ter Braack, 2023a)

4.2.2 Reason vs. superstition

The binary of reason vs. superstition relates to the idea how people think about the world. Reason relates to knowledge that is grounded in logic and empirical evidence, while superstition, in contrast, relates to belief that does not have rational explanations, but rather is based on supernatural understandings. As previously mentioned in section 2.2.1, reason is an important cornerstone of science, and with that of scientific scepticism. In example 10), the two oppositions come together in one sentence where 'superstition' is opposed to 'methodological research', 'sceptical attitude' and 'scientific method', which represent reason. Furthermore, reason, as part of 'science', is presented in the texts under the notion of 'common sense', while 'dogma' relates to the superstitious character of pseudoscience. Below these notions are dissected in more detail. In example 10) the notion of superstition for pseudoscience is opposed to pillars of science, which are 'methodological research', 'sceptical attitude' and 'scientific method'.

10) 'But it will not be superstition and archaic ritual that shed light on these mysteries but rather methodological research, conducted with a sceptical attitude through the scientific method that brings new advances and understanding.'
(Grimes, 2012)

4.1.2.1 Common sense

Although not explicitly described as 'reason' in the texts, one notion that represent this is the notion of 'common sense'. By means of this, the sceptics present information in a manner as if it is 'logical' and 'just' the way things are. This is shown in the way how the words 'simply' and 'just' are used. It shows the apparent straightforwardness of the claim that the author implies. It also indicates a certain nonchalance concerning the topic, as it takes the alternative for granted, in the case of examples 11) and 12). In example 13), the notion of common sense is more prominently present by referring to the 'truth'.

11) 'Treatments that have been proved to work are called simply medicine'.
(Grimes, 2011)

12) 'There is simply no way around the fact that homeopathic medicines are quite simply just water and sugar.'
(Grimes, 2012)

13) 'The simple truth is we already possess a biological detoxification system: our lungs, liver and kidneys, which excrete the vast majority of toxins to which we're exposed.'
(Grimes, 2019a)

4.1.2.2 Dogma

Although 'superstition' and 'dogma' may not be related at first sight, both notions do involve beliefs that are accepted without evidence or questioning. Ter Braack uses various religion-related words for the alternative side, and I think they specifically refer to the dogmatic character that religion is occasionally accused of. Some are very explicit, like *orthomoleculaire evangelie* 'orthomolecular gospel' (example 14) and *sekteachtige beweging* 'cult-like movement' (example 15), while others are more implicit like *orthomoleculaire leer* 'orthomolecular doctrine' (example

16). Even more implicit references to religion, although not directly related to dogma, are *heil*[14] *zien in* 'to see advantage in something', and 'devious charlatan'.

14) *De kersverse coaches verspreiden na het behalen van hun fopbul dolenthousiast het orthomoleculaire evangelie onder hun klanten en online volgers, waardoor het supplementensprookje zich als een lopend vuurtje verspreidt.*
'After gaining their [fake] bull, the brand-new coaches spread the orthomolecular gospel to their clients and online followers with gusto, causing the supplement fairy tale to spread like wildfire.'
(ter Braack, 2023b)

15) *Zo ook bij Denise, die in principe slachtoffer is van de aantrekkingskracht van een sekteachtige beweging, waardoor haar het een goed idee leek liters water in een kort tijdsbestek naar binnen te gooien in het kader van een detox.*
'Similarly with Denise, who is basically a victim of the appeal of a cult-like movement, which made it seem like a good idea for her to gulp down gallons of water in a short period of time as part of a detox.'
(ter Braack, 2023a)

16) *De orthomoleculaire leer begon aanvankelijk als psychiatrische behandelmethode, maar later werd het voedingsstoffen-evangelie uitgebreid naar fysieke aandoeningen*.
'Orthomolecular teaching initially began as a psychiatric treatment method, but later the nutrient gospel was extended to physical conditions.'
(ter Braack, 2023b)

Making references to religion, seems like a rhetorical strategy to position the alternative party on the opposite end of the spectrum. Especially considering that amplification of difference is important to justify one's distinct societal position in boundary work, which is previously discussed in section 2.2.3. Harambam justifies this idea by saying that the positioning of science in opposition to religion is "an easy way to devalue alternative truth claims." (2017, p. 214). He also says that "while science stands for modern, sceptical, objective, rational, disinterested, and truthful, religion stands for premodern, dogmatic, irrational, dangerous, and largely false thought." Since religion and science are perceived to be complete opposites of each other, it helps to use religion-related words to distinguish oneself from the divergent other. This way no similar ground can be found between the two opposing parties, and thus science's position cannot be undermined and stays in tact (Harambam, 2017, p. 209).

Although more of a political character, another reference to dogma is that of when Grimes states that Gwyneth Paltrow sells different kinds of 'pseudoscientific regimes', as seen in example 17). Here the critique of Grimes seems to be towards the enforcing of certain ideologies (i.e. products) of an authority (i.e. Gwyneth Paltrow).

17) 'For those so inclined, Paltrow sells all manner of pseudoscientific regimes, from "jade eggs" (essentially rocks that Paltrow recommends women carry in their vagina, despite

[14] lit. 'salvation'

gynaecologists imploring people not to do this) to “healing stickers” to a $75 candle that ostensibly smells of Paltrow’s vagina.’
(Grimes, 2020)

4.2.3 Scientific vs. mystical

The binary of scientific vs. mystical is closely related to that of reason vs. superstition. However, I would argue that the binary of scientific vs. mystical refers more to the notion in what way people understand reality and less to the manner of how they think and reason. A scientific worldview is about empirical evidence and that way it gains knowledge of the world, while the mystical relates to non-empirical, personal (spiritual) experiences. Scientific relates to things that are observable, and mystical more often to the unobservable, or inexplicable. In the texts, the scientific notion is demonstrated by laws and logic, and reality, and references to the mystical are magic and spirituality.

4.2.3.1 Laws and logic

The cases in which the ‘scientific’ side of this opposition is evident is when the authors want to argue that a certain premise of an alternative practice is wrong by saying that it violates certain scientific principles and empirical observations, like in the case of examples 18) - 20). Referring to ‘laws’ also shows the orderliness and rational character of science. Also note the use of the word ‘simply’ with the phrase ‘laws of physics’ in example 18), which seems to imply a certain straightforwardness of the scientific laws, as if it is obvious and self-evident.

18) ‘Homeopaths skirt this issue by claiming that even though none of the original substance is left, water has ‘memory’. This simply violates the laws of physics.’
(Grimes, 2011)

19) ‘This is the antithesis of what is observed in nature,’
(Grimes, 2012)

20) *Dit idee is tegenstrijdig met alle kennis over de natuur en logica in zijn geheel.*
‘This idea is contradictory to all knowledge about nature and logic as a whole.’
(ter Braack, 2023c)

4.2.3.2 Reality

Although not explicitly linked to ‘scientific’, words regarding ‘reality’ and ‘in practice’ are mentioned in the texts of both sceptics. I think this type of words link to a premise of science, which is that of a knowable reality. Reality is the way the world is, which is precisely the things that science studies. This is clearly shown in example 21) where the connection between (modern) science and reality is made explicit. Also, notice the contrast between the use of the word ‘reality’ and ‘perceptions’ in example 22), where it shows a clear discrepancy between an objective reality, and subjective perceptions. In example 23) it seems that ‘in practice’ is used to depict the difference between theory and practice, which therefore shows what the reality of things is. Ter Braack uses the word *daadwerkelijk* ‘actually’ in his texts to refer to the notion of ‘in reality’, which is shown in example 24).

21) ‘However, modern science cannot take a position so clearly divorced from reality.’
(Grimes, 2012)

22) ‘The reality is that for better or worse, we do not exist in a vacuum, and our perceptions are more influenced by external coverage than we might realise.’
(Grimes, 2020)

23) *In de praktijk reinigt het niets en schopt het de zoutbalans van je lichaam in de war.*
‘In practice, it cleanses nothing and kicks your body's salt balance into disarray.’
(ter Braack, 2023a)

24) *Doordat ook grote namen als Arie Boomsma en Rianne Meijer de supplementen van Vitakruid aanprijzen, kunnen socialmediagebruikers het idee krijgen dat supplementen daadwerkelijk nut hebben.*
‘Because big names like Arie Boomsma and Rianne Meijer also tout Vitakruid's supplements, social media users may get the idea that supplements are actually useful.’
(ter Braack, 2023d)

An argument found in the texts related to the notion of reality, is the argument ‘placebo’, specifically in the context of homeopathy. A ‘placebo’ is a substance or treatment that has no medical effect, only a psychological one. Ter Braack and Grimes argue that homeopathy does not work, beyond a placebo effect. Both authors mention, and thus acknowledge, that “homeopathy sometimes works”, but that it is because of the placebo effect, and therefore homeopathy does not work for ‘real’. Both sceptics really try to convince their public as to why this is a bad thing. Dyrendal notes that the reasoning is that if people believe in alternative medicine (with ‘natural’ therapies), they will not undergo real medical treatment and therefore will suffer unnecessary health problems, and even death. Since sceptics (the moral entrepreneurs) see pseudoscience as a social problem, they try to construct narratives that evoke moral distress, so called ‘atrocity tales’ (Dyrendal, 2012, p. 896). These atrocity tales are meant to illustrate how problematic the issue is.

In example 25), Ter Braack argues why homeopathy sometimes works. It is visible that the sceptics really try to understand why people believe and engage in alternative practices and theories, which is characteristic for sceptic discourse (Hammer, 2007, p. 391-393).

25) *Dat homeopathie soms werkt, maar nooit meer dan placebo, heeft alles te maken met het gebeuren eromheen: het consult, je gehoord voelen door de dienstdoende genezer, etc. Maar niets met de remedie an sich. Wat voor veel alternatieve geneeswijzen overigens het geval is. Het om de tevredenheid met betrekking tot hoe je als patiënt wordt behandeld en niet om de behandeling zelf.*
‘That homeopathy sometimes works, but never more than placebo, has everything to do with the event surrounding it: the consultation, feeling heard by the healer on duty, etc. But nothing to do with the remedy per se. Which, by the way, is the case for many alternative therapies. It is about the satisfaction regarding how you are treated as a patient and not about the treatment itself.’
(ter Braack, 2023c)

4.2.3.3 Magic and spirituality

In the texts of Ter Braack, magical things like ‘magic’ (example 26) and ‘fairy tale’ (example 27) represent the mystical worldview of the alternative group. In the same fashion, Grimes uses the

word ‘miraculous elixir’ (example 28) and ‘panacea’ which both refer to a magical potion that cures diseases. All these words seem to either touch upon the implicit notion of the supernatural, things that are inexplicable or things that are not real. This is in contrast with the scientific that studies ‘real’ things which are explainable. Also notice in 27) that *sprookje* ‘fairy tale’ and *fopbul* ‘[fake] bull’ are used in the same sentence.

26) *Homeopathie is een soort onzichtbare magie.*
‘Homeopathy is a kind of invisible magic.’
(ter Braack, 2023c)

27) *De kersverse coaches verspreiden na het behalen van hun fopbul dolenthousiast het orthomoleculaire evangelie onder hun klanten en online volgers, waardoor het supplementensprookje zich als een lopend vuurtje verspreidt.*
‘After gaining their [fake] bull, the brand-new coaches spread the orthomolecular gospel to their clients and online followers with gusto, causing the supplement fairy tale to spread like wildfire.’
(ter Braack, 2023b)

28) ‘CBD oil, for example, is frequently lauded as a miraculous elixir, despite the overwhelming scientific evidence showing it to be largely medically useless.’
(Grimes, 2019b)

So, all these words refer in some way to things that are either made up, not real, or mysterious and thus not known or completely understood. Interestingly, this seems exactly to be the opposite of how science wants to be seen, as previously discovered in section 2.2.3: “science as sceptical, objective, rational, disinterested, and truthful” (Harambam, 2017, p. 208). Science extracts facts from the real world by means of explicable processes. Therefore, science is not mysterious, since conclusions are drawn from observable experiences. This is another way of the sceptics to distance science as far away possible from the alternative group.

Furthermore, both sceptics both use words that refer to spiritual concepts with concern the mystical, like *goeroe* ‘guru’ and ‘mantra’. The words are deployed pejoratively, in the case of ‘detox mantra’ (example 29) or, in the case of *fopgoeroe* ‘[fake] guru’ (example 30), descriptively, where it seems to refer to the repetitive character of detox advertisement, and the (holy) power it has over of detox products users.

29) ‘While the detox mantra is seemingly innocuous, we ought to resist its allure – for when charlatans and fools are allowed act with impunity it fosters misunderstandings which imperil us all.’
(Grimes, 2019a)

30) *Deze begeleiding was uiteraard niet van een arts, maar van een of andere fopgoeroe met een ýogaschool in Mexico.*
‘This guidance was obviously not from a doctor, but from some [fake] guru with a ýogas school in Mexico.’
(ter Braack, 2023a)

4.2.4 Moral vs. amoral

A very prominent theme in the sceptical texts is that of morality, and especially that of immorality or even amorality. As seen in section 2.2.3.1, Hammer distinguishes two types of arguments. First, the argument of pathology (which is discussed in section 4.2.5) and secondly the argument of immortality. The argument of immorality says that practitioners of 'pseudoscience' are conmen who take advantage of gullible clients and try to shake them down for money. (Hammer, 2007b, p. 393). The immoral character of the alternative is made explicit by literally using an argument about money, as well as using martial, violence-related metaphors. The moral character of science is not made explicit, but rather implied. By amplifying the immoral character of the alternative group, the moral character of science is presupposed.

4.1.4.1 Charlatans and their money

That alternative practitioners are in it for the money, can be found in all the texts about homeopathy, supplements and detox. The sceptics argue that instead of, for example homeopaths, having sincere intentions, they try to scam people. This money-argument is made very explicit by literally saying that all these alternative medicine practices are 'motivated by profit', 'to line their own pockets' and has 'huge money', as seen in examples 31), 32) and 33). Notice how words like 'disingenuous' and 'exploit' show negative value judgement in the sentences along the money-argument.

31) 'This is disingenuous – there is huge money in homeopathy.'
(Grimes, 2011)

32) 'The glib response is to reiterate the adage about fools and their money, but our contempt should be reserved for those who would exploit our collective scientific ignorance to line their own pockets.'
(Grimes, 2019a)

33) 'In the current Irish context, a cynic might be forgiven for thinking that the industry's vocal protestations are more motivated by profit than concern for public wellbeing.'
(Grimes, 2019b)

Besides the money argument, it is also noticeable in the way how the practitioners of alternative medicine are described as 'charlatans' (example 34), *geniepig* 'sneaky' and 'disingenuous'. In example 35) the people are described as being tricked into something by alternative practitioners. Also see how in example 36) how the alternative party is described as an abuser, and thus is an actor of a morally wrongdoing. All these sentences show the immoral behaviour of the alternative side. Other examples in the texts are 'underlying strategy of deception', *valse claims* 'foul claims', 'deceptive practice',

34) 'While the detox mantra is seemingly innocuous, we ought to resist its allure – for when charlatans and fools are allowed act with impunity it fosters misunderstandings which imperil us all.'
(Grimes, 2019a)

35) ‘Some colon-cleansing supplements even contain polymerising agents which give faeces an unusual plastic-like appearance, lulling buyers into a false sense of vindication about their purchase.’
(Grimes, 2019a)

36) ‘With dark irony, even this ‘real’ form of detoxification has been abused by purveyors of alternative medicine.’
(Grimes, 2019a)

4.1.4.2 Lofty and enlightened

The alternative side has been characterised as ‘privileged’ and ‘lofty’ in the texts. These words are related to the amoral description of pseudoscience since when you are ‘lofty’ or ‘privileged’ you might have no or less regard for the ethical implications of your behaviour. You might ignore moral boundaries, becoming amoral in the process. The link between amoral behaviour and loftiness is made explicit in example 37).

37) ‘Too often, homeopathy stirs mistrust of conventional medicine with lofty holistic promises it can simply not substantiate.’
(Grimes, 2011)

A metaphor referencing to this characteristic is that of ‘lightness’ (either referring to ‘light’ and to ‘air’). This ‘lightness’ metaphor is not only found in the text, but is also a metaphor that is commonly used in talking about spiritual people or practices. In Dutch, spiritual people are often described as *zweverig* ‘woolly, floaty’, which refers to being ‘vague’. Generally, it has an unfavourable value judgement in it. In Ter Braack’s texts, spiritual people and/or practices are describes by words like *gefladder* ‘flutter’ and *verlicht* ‘enlightened’, which can be seen in examples 38) and 39). This metaphor is clearly meant pejoratively. Also see how in example 40) enlightenment is put together with ‘privileged’.

38) *Wel de lusten, niet de lasten en geen enkele kritiek van buitenaf op dit metafysische gefladder*.
‘All the pleasures, none of the burdens and no outside criticism of this metaphysical fluttering.’
(ter Braack, 2023a)

39) *Ze menen hartstikke verlicht boven de maatschappij te zweven, maar beseffen niet dat diezelfde maatschappij hun vangnet is*.
‘They think they are heartily enlightened floating above society, but do not realize that the same society is their safety net.’
(ter Braack, 2023a)

40) *Maar alleen geprivilegieerde verlichte spiriwiri meisjes crowdfunden meer dan een ton bij elkaar door middel van landelijke mediaaandacht en connecties die goed in de slappe was zitten*.
‘But only privileged enlightened spiriwiri girls crowdfunded more than a ton through national media coverage and connections that are well into the slack.’
(ter Braack, 2023a)

4.1.4.3 (Medically) dangerous and harmful

As moral entrepreneurs, sceptics "tend to describe their opponent in terms of a moral crisis" (Hammer, 2007, p. 396). This moral entrepreneurship is seen in operation when they point out why alternative practices and practitioners are 'dangerous' or 'harmful'. This way, the sceptics show how the norms that they themselves entail are broken by the other party, like in the examples 41) and 42) below. Interestingly, both parties call each other out on the notion of being 'dangerous', as in the case of example 43), where Grimes says that homeopaths argue that conventional medicine is dangerous.

41) *Daarbij komt dat zij zelf en haar omgeving geen flauw benul lijken te hebben van hoe schadelijk het eigenlijk is waar ze mee bezig zijn en geen enkele wroeging tonen*.
'Added to this, she herself and those around her seem to have no idea of how harmful it actually is what they are doing and show no remorse at all.'
(ter Braack, 2023a)

42) 'Across social media, influencers perpetuate wellness trends and dubious diets, frequently promoting completely useless or even dangerous advice.'
(Grimes, 2020)

43) 'Many homeopaths shun conventional medicine and inform their clients it is dangerous.'
(Grimes, 2012)

Interesting, however, is that sceptics disapprove of pseudoscientific practices and manners, while the sceptics themselves deploy their activism from an 'unscientific' place. Namely, "what hard, empirical evidence is there to suggest that controversial beliefs are a danger to social fabric?" (Hammer, 2007, p. 401). Sceptics thus seem to violate their own scientific premises. As previously mentioned in 2.2.3, this might be explained by sceptics as 'scientific vigilantes'[15], who act in the name of science even though they might surpass some of its (scientific) rules. Since the sceptics practice their activism as journalism, they can justify this 'unscientific' attitude.

4.1.4.4 Martial metaphors

In CDA, one of the questions that is asked is: what kind of metaphor is used? And more importantly, what is it trying to convey with that metaphor? Metaphors are often used to "reflect and facilitate different ways of viewing topic, experiences and phenomena" (Demjén, Zsófia and Semino, 2020, p. 213). Metaphors are thus interesting to study as to how science and pseudoscience are framed.

Both Ter Braack and Grimes use several martial metaphors, conceptualised as 'fight', 'battle' and 'war'. As previously mentioned in section 2.2.3, these kind of metaphors are typifying for the sceptical discourse community. For example, in one instance Ter Braack talks about orthomolecular specialists are 'armed with' old research about rats (example 44), and in another instance where he says that homeopathy is an 'attack on common sense' (example 45). In the same fashion, Grimes talks medically unsound therapies that are 'targeted at' the families of autistic children, where children were 'forced to' partake in (example 46).

[15] A term coined by Collins & Pinch (1982, p. 42).

44) *Gewapend met de eerder genoemde stokoude onderzoeken over ratten, die ortho's vaak zelf niet hebben gelezen, slingeren ze maffe claims over gezondheid de wereld in die nauwelijks hout snijden*.
'Armed with the aforementioned ancient studies on rats, which orthos themselves have often not read, they hurl wacky claims about health into the world that barely make sense.'
(ter Braack, 2023b)

45) *Homeopathie is een aanslag op het gezond verstand, toch zijn er flink wat mensen die er bij zweren*.
'Homeopathy is an attack on common sense, yet there are quite a few people who swear by it.'
(ter Braack, 2023c)

46) 'By the same tortured logic, autism can be 'cured' by removing these toxins, and so there exists a lucrative market for medically unsound chelation therapies targeted at the families of autistic children. This is dangerous nonsense which has killed children forced to partake.'
(Grimes, 2019a)

In most violence metaphors seen in the texts, the 'pseudoscience' side is the agent, which means it is the executioner of the violent act. In CDA, the agent is seen as the one exerting power, with the patient being the (passive) recipient of those actions (Huckin, 1997, p. 83). It is thus interesting to see how the patient(s) of the acts are portrayed as being helpless victims. Often times explicit "children have also been the victims" (example 47), or more implicit "...left her unable to fight the eye infection that killed her" (example 48) and "...autistic children have been subjected to chelation treatments..." (example 49).

47) 'Children have also been the victims.'
(Grimes, 2011)

48) 'In 2009, homeopath Thomas Sam was convicted of the manslaughter of his nine-month-old daughter Gloria in Australia. Gloria suffered from eczema, which wore down her body's defences and left her unable to fight the eye infection that killed her.'
(Grimes, 2011)

49) 'An estimated 7 per cent of autistic children have been subjected to chelation treatments by irresponsible cranks peddling myths about toxins.'
(Grimes, 2019a)

The martial metaphor shows that the sceptics frame the alternative party as the one in power, and the people partaking in alternative as the helpless victims. By using this type of metaphor, the sceptics emphasize the immoral image that they have created of purveyors of pseudoscience. The ones in power misuse their power at the cost of innocent people. Furthermore, it is interesting to see how all agency has been taken away from the people. By this I mean that although the people (might) have chosen the alternative practice themselves, the sceptics do not discuss this assumption. Relating this finding to CDA, the backgrounding, or de-emphasizing, of this assumption seems deliberate. The power and thus the agency is with the

alternative practitioners, so they should be held accountable for their actions, not the gullible clients. In this way, they act as 'consumer protectors', as previously mentioned in sections 2.2.1 and 2.2.3.1.

In most cases 'the people' or 'the people undergoing alternative therapies' are the victims, but in one example, a practitioner of pseudoscience was the real victim themselves, since she got in a coma after a detox. Although previously Ter Braack had sympathy for the victim (example 50), in the latter case he seems less sympathetic as she was 'the victim of her own ignorance' (example 51).

50) *Zo ook bij Denise, die in principe slachtoffer is van de aantrekkingskracht van een sekteachtige beweging, waardoor haar het een goed idee leek liters water in een kort tijdsbestek naar binnen te gooien in het kader van een detox*.
'Such is the case with Denise, who is basically a victim of the pull of a cult-like movement, which made it seem like a good idea to her to gulp down gallons of water in a short period of time as part of a detox.'
(ter Braack, 2023a)

51) *Maar het echte verhaal is niet Denise, die nog altijd vooral slachtoffer is van haar eigen onwetendheid en die van de wellnessbeweging*.
'But the real story is not Denise, who is still mostly a victim of her own ignorance and that of the wellness movement.'
(ter Braack, 2023a)

4.2.5 Rational vs. irrational

As mentioned in section 2.2.3.1, Hammer identifies two modes of sceptical reasoning of which one is the argument of immorality and the other of pathology. The argument of pathology says that "there is something fundamentally wrong with people who believe in New Age claims. They must be unusually naïve, deluded or irrational." (Hammer, 2007, p. 393). The presentation of 'science' as rational and 'pseudoscience' as irrational is very explicit in the texts. For example, in the texts, the methods of science are described as 'careful' (example 52), while alternative medicine is portrayed as 'dubious', *ordinair* 'vulgar' (example 53) and 'nebulous'.

52) 'More importantly, HPRA-licensed products are carefully controlled to ensure they are safe.'
(Grimes, 2019b)

53) *Zo raakt de orthomoleculaire leer via een pseudowetenschappelijke piramidespel almaar meer genormaliseerd, terwijl het in de kern gewoon ordinaire kwakzalverij blijft*.
'Thus, through a pseudoscientific pyramid scheme, the orthomolecular doctrine becomes increasingly normalized, while at its core it remains just vulgar quackery.'
(ter Braack, 2023b)

4.2.5.1 Crazy

From the texts, the irrational character of the pseudoscience side is indicated by describing alternative practitioner as 'crazy'. They are described as 'fools', *gestoordste complotdenker*

'craziest conspiracy theorist' and *wappoïde homeopaten* 'crazy homeopath' (example 54), who make *maffe claims* 'weird claims'. The adjective '*wappoïde'* in Dutch comes from the noun 'wappie', which mockingly and pejoratively refers to those who make firm claims about a subject (such as Covid or other medical topics), while others consider those claims to be nonsense. Plainly, it refers to someone who is crazy. Interestingly, an important attribute of the word is that the claims of 'wappies' have little or nothing to do with reality (Onze Taal, 2024), which also relates to the notion that the alternative party does not operate in the 'real' world, as explored in section 4.2.3.3. For this reason, conspiracy theorists are often called 'wappies'. So, these references to the craziness of alternative practitioners, and even followers of, embody the irrational character of them.

54) *Alsof het allemaal nog niet gek genoeg is, bieden wappoïde homeopaten tegenwoordig aan je vaccinaties te ontstoren*.
'As if it's all not crazy enough, these days [crazy] homeopaths offer to de-stigmatize your vaccinations.'
(ter Braack, 2023c)

4.2.5.2 Laughable and entertaining

Another way to show that the 'pseudoscience' side are irrational is by making fun of the alternative practitioners. Both authors show in their writing that alternative claims are either something 'to laugh' about (example 55) or something 'hilarious' (example 56). A niche within this category is that of circus-related words. Both Grimes and Ter Braack mention things like 'Barnumesque[16] theatrics' (example 57), 'circus' and *clownerij* 'clowning'. All these things refer metaphorically to something that is entertaining or laughable, in a pejorative sense. This category very evidently shows that the authors do not take the alternative group seriously, or think that they should not be taken seriously. This is a typical *argumentum ad hominem*, in which the argument is directed toward the person instead of the argument.

55) 'It's tempting to laugh and utter something about fools and their money, but it is undeniable that celebrity influence has a tangible effect on public perception.'
(Grimes, 2020)

56) *Om af te sluiten wil ik ter lering ende vermaeck nog wat hilarische homeopathische remediën delen*.
'To conclude, I want to share some hilarious homeopathic remedies for your learning and entertainment.'
(ter Braack, 2023c)

57) 'While they are useless, those selling them are not above Barnumesque theatrics, employing various gimmicks to convey an impression of efficacy.'
(Grimes, 2019a)

In sentence 58), besides *clownerij* 'clowning', the pejorative character is emphasized by combining it with a diminutive. Although more implicit, Ter Braack uses diminutives to amplify the mocking tone of his texts . This way, he seems to literally 'belittle' the other party. By making

[16] "resembling a circus of spectacle" (Barnumesque, 2024)

something look smaller, it can be seem to be less important, or less of value. Examples of other diminutives in the texts are *potjes en poedertjes* 'little pots and powders' and *supplementenzwendeltje* 'little supplement scam'.

58) *Denise heeft zelf een praktijkje, waarin ze vergelijkbare pseudowetenschappelijke clownerij aan de man brengt.*
'Denise has a little practice of her own, marketing similar pseudoscientific clowning.'
(ter Braack, 2023a)

4.2.5.3 Nonsense

The most common way sceptics refer the irrational character of 'pseudoscience' is by stating that alternative practices are *ongein/onzin* 'nonsense', 'tripe' and 'bogus', as shown in examples 59) - 61).

59) *Het echte verhaal is dat dit soort ongein keer op keer weer de kop op zal steken, met uiteindelijk doden tot gevolg, omdat niemand in lijkt te grijpen op de almaar verder rondwoekerende groei aan pseudowetenschappelijke welzijnsnonsens.*
'The real story is that this kind of nonsense will resurface again and again, eventually resulting in deaths, because no one seems to intervene on the ever-escalating growth of pseudoscientific welfare nonsense.'
(ter Braack, 2023a)

60) 'Despite the protestations of homeopaths, this is nothing to do with 'world view' , 'healing modalities' , 'patient-experience' or any of the tripe used to insulate this deceptive practice from the criticism – this is simply about the question of whether it works.'
(Grimes, 2011)

61) 'But the stark reality is that these products are inherently bogus, and can do more harm than good to both our wellbeing and public understanding of science and medicine.'
(Grimes, 2019a)

5 Synthesis & future research

In this last section, I summarize and reiterate the main findings of the thesis. Besides this, suggestions for further research are discussed.

5.1 Synthesis

In this thesis, I have studied the boundary work of two sceptics, Dutch science journalist Adriaan ter Braack and Irish science writer David Robert Grimes. In total nine texts on topics about alternative medicine are analysed with the use of CDA. The goal of this thesis was to study the boundary work of these sceptics and to see how the science/pseudoscience opposition is presented in terms of other binary oppositions. To recall, the research question was:

How is contemporary boundary work of sceptics characterised and what oppositions are present between science and pseudoscience?

To summarize, boundary work is about attributing characteristics to 'science' to create a social boundary that distinguishes science from non-science, and more specifically, pseudoscience. Boundary work is about drawing rhetorical boundaries that amplify the differences between 'us' and 'them' (Harambam, 2017, p. 208-9), which is also in line with the philosophy of Derrida, which says that Western thought is structured in opposing binaries. One side of the opposition is always privileged over the other. In the case of the science/pseudoscience opposition in the sceptical texts, science is favoured over pseudoscience. On one hand this is hitherto logical, considering the fact that sceptical texts are about explicitly devaluing pseudoscience, however, implicitly this hierarchy also exists. The latter is supported by five binary pairs that characterise either a notion (so-called themes in this thesis) about science or 'pseudoscience'. The oppositions that are found are Progressive vs. backwards, Reason vs. superstition, Scientific vs. mystical, Moral vs. amoral and Rational vs. irrational. Below, some key findings of the study to oppositions and characterizations of contemporary sceptical boundary work are illustrated.

5.1.1 Moral entrepreneurship

Contemporary sceptical boundary work mostly entails debunking, where the sceptics undermine alternative, controversial claims with the goal to define them as pseudoscience. The texts that I analysed all fall under this type of sceptical boundary work. A key characteristic of boundary work by Ter Braack and Grimes is that the texts are not about explicitly attributing positive characteristics to science, but more about explicitly attributing negative characteristics to pseudoscience. Often, the positive attributes of science are implicitly implied, by opposing it to the moral wrongdoings of pseudoscience, which are especially found in the oppositions moral vs. amoral, and rational vs. irrational. As already noted by Dyrendal (2012) and Hammer (2007), sceptical boundary work often has a strong moral character, which is also present in texts by Ter Braack and Grimes. Dyrendal and Hammer describe sceptics as so-called *moral entrepreneurs*, who make up norms for behaviour, and depict activities that are outside this standard as a violation of the norm. In the texts, controversial claims and practices are presented as social problems; they are 'harmful' and 'dangerous' to individuals as well as to society. Martial, warlike metaphors also enforces this idea, where pseudoscientific practices are a dangerous force, where practitioners are seen as misusers of power and where clients are portrayed as helpless victims. These notions show explicitly that the alternative practices are morally wrong in the eyes of the sceptics.

Next, another main characteristic that belongs to moral entrepreneurship of sceptical boundary work is the ridiculing of the alternative group. The argument of pathology identified by Hammer (2007, p. 393) corresponds to this notion, where the sceptics try to show that there is something wrong with practitioners and purveyors of alternative practices. This is especially present in the opposition of rational vs. irrational, where they and their practices are portrayed as crazy, laughable, entertaining and nonsense in the texts. This characteristic is observed in the texts by Ter Braack and Grimes alike. Also the overall pejorative and polemical tone of all the texts fits the description of the argument of pathology.

5.1.2 Consumer protection

Besides the argument of pathology, the argument of immorality by Hammer (2007, p. 393) which relates to the notion that alternative practitioners are out to make money of gullible clients, is very common in the sceptical boundary work studied in this thesis. Since often alternative (medicine) practices cost money, while they are not proven to work (scientifically), they want to protect the clients by informing people about why the practice does not work. This way, Ter Braack and Grimes act as *consumer protectors* (Hess, 1993, p. 88-9), which is also the scope of scientific scepticism according to Novella (2013). Interestingly, although the sceptics seem to have sincere intentions of wanting to protect people against exploiters and scammers, I am doubtful whether their activism reaches the group of people they want to address, which are people who are involved with alternative practices. The sceptical texts seem to be written for an audience that is already involved with science, and endorses these views, which was made explicit by the notion of 'common sense' (section 4.1.2.1) in the texts.

5.1.3 Rhetorical distancing

Another interesting characteristic is that of distancing science from pseudoscience by using concepts that are the opposite of science. By this I mean that certain concepts that are the opposite of science, or does not fit within the image of science, are used to describe the alternative group. An example is Ter Braack's use of religion-related terms. Since science and religion are perceived to be complete opposites of each other, this can be seen as a rhetorical strategy by the sceptics to conceal potential similarities between science and pseudoscience. As Harambam stated, one has to distinguish oneself from the opposed other and conceal potential similarities between the two groups. Otherwise it might undermine the justification of science's distinct societal position (Harambam, 2017b, p. 208-9). These religious references create a sharp contrast between science and pseudoscience, amplifying the difference between the two groups. The same distancing takes place when using the concept of 'reality' for science, while using the concept of 'magic' for pseudoscience. The latter conceptualises the idea of pseudoscience being involved in this that are made up, not real, or mysterious, while the image of science is the opposite: factual, real, and transparent.

5.1.4 Scientific vigilance

Lastly, another interesting characteristic of sceptical boundary work is the policing of the borders of science, but sometimes trespassing these borders themselves. As previously mentioned in section 2.2.3, according to Hess (1993, p. 88), sceptics are 'scientific vigilantes', who sometimes overstep the rules of science themselves to protect the rule of science. Occasionally, arguments are given against pseudoscience that are not necessarily supported by scientific, or even empirical evidence, which is against the premises of science. Also, science is viewed as being disinterested and objective (Harambam, 2017, p. 208). However, the work of sceptics has a clear and strong motive, which is that of showing that science is 'right', either in terms of being factually correct and/or of being morally superior. So, interestingly, the tactics that sceptics use occasionally mirror the same lack of empirical backing that they criticize in pseudoscience. This raises important questions about the nature of the authority of sceptics and the limits of their role as defenders of scientific norms.

5.2 Future research

5.2.1 Studying different sceptical media

Since both Ter Braack and Grimes are active on social media, it would be interesting to study the contents on these social media platforms, like reels, TikToks and stories. Both sceptics actively make videos where they respond to, and debunk, controversial claims made by influencers. Interesting about this is that the contents are about recent trends, which reflect contemporary cultural and social interests on social media. This way, it would be interesting to study the interplay between the sceptics and the influencers they comment on and what that tells us about the power dynamics between the two groups.

5.2.2 Effectiveness of sceptical discourse in the public understanding of science

Another thing I have noticed on the sceptics' social media, is the interplay between the sceptics and the people in the comment sections. Often times people comment on the contents sceptics produce, where an interesting dialogue comes forth. Some people completely agree with the sceptics, while others completely disagree, but the most interesting case is when people partly agree, but also disagree about the tone of the sceptics:

"Hi @sjamadriaan, am somewhat of a fan of your account and understand your tone as well. Apparently there is a gap between science and professionals who apply it and people who are suspicious of it. I wonder if this tone contributes to closing that gap. Have you ever thought about this? Aren't you worried that this is actually causing all those [braggarts] to benefit from this?" (comment on Instagram post of Sjamadriaan[17])

An interesting question to study would be the effectiveness of sceptical discourse: Do sceptics, and with that the sceptical movement, make any difference? (Hammer, 2007, p. 396). So far, this is something that is not studied yet. Since Ter Braack and Grimes have a reasonable following, it would be interesting to know what influence these sceptics have. Do they help improve public science understanding or is their way of doing counterproductive? The findings of this type of study could have major implications for the way science journalism is executed.

[17] https://www.instagram.com/p/Ct6ys3HINFt/

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Appendix I: List of articles

Adriaan ter Braack		
Article	*Published in*	*Word count*
Het orthomoleculaire dieet (2023)	Sjamadriaan https://www.sjamadriaan.nl/p/het-orthomoleculaire-dieet	1895
Slik niet zomaar alles, behalve supplementen (2023)	Sjamadriaan https://www.sjamadriaan.nl/p/slik-niet-zomaar-alles-behalve-supplementen	1086
Wat we kunnen leren van een bijna fatale detox (2023)	Sjamadriaan https://www.sjamadriaan.nl/p/wat-we-kunnen-leren-van-een-bijna	1028
Homeopathie: Biomedische luchtgitaar (2023)	Sjamadriaan https://www.sjamadriaan.nl/p/homeopathie-biomedisch-luchtgitaar	809
David Robert Grimes		
Article	*Published in*	*Word count*
Most health supplements have no health value and should be taxed (2019)	The Irish Times https://www.irishtimes.com/opinion/most-health-supplements-have-no-health-value-and-should-be-taxed-1.3817879	885
Resolve never to detox again (2019)	Business Post https://www.businesspost.ie/health/resolve-never-to-detox-again/	1071
Homeopathy does not work beyond a placebo effect (2012)	The Irish Times https://www.irishtimes.com/opinion/homeopathy-does-not-work-beyond-a-placebo-effect-1.534500	888
Homeopathy isn't just useless – in the wrong hands it's dangerous (2011)	The Journal https://www.thejournal.ie/readme/column-homeopathy-isn%E2%80%99t-just-useless-%E2%80%93-in-the-wrong-hands-it%E2%80%99s-dangerous-198129-Aug2011/	1007
From vagina eggs to anti-vaxxers: is it time for an influencer detox? (2020)	The Guardian https://www.theguardian.com/lifeandstyle/2020/jan/21/from-vagina-eggs-to-anti-vaxxers-is-it-time-for-an-influencer-detox	964