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Obesity in Austrian News

A Semantic Network Analysis of Austrian Newspaper Articles

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Bernhard Schröttner, BA

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Betreuerin / Betreuer: Univ. Prof. Dr. Ulrike Felt

Contents

List of Figures

Introduction

What do we mean by 'obesity' or 'being overweight'? Behind this rather simple question lie many deceptively complex issues. It was the theme of the first Austrian obesity report which was published by a renowned team of Austrian medical scientists in 2006 and presented a comprehensive overview of the prevalence of obesity in Austria and its aftereffects. It also marked the point at which the 'obesity-epidemic', a term that was developed in the US to denote growing challenges with obesity, finally hit the Austrian public consciousness. Around that time media reports, political projects and private initiatives concerning obesity exploded after steadily growing in the preceding years.

In short Austria was trying to come to grips with, what was now deemed to be a national problem, in a literal and a metaphorical way. State of the art medical and life sciences tried to discern what obesity 'really is' and importantly how it could be combated effectively, while politicians tried to best each other with grand schemes of eradicating obesity once and for all. As is typical for politics though, not many of these projects enjoyed long term success. At the same time the Austrian media negotiated obesity in its very own way. Set at the interface of science, politics, economics and 'the public' the media always plays the role of balancing and negotiating truths purported by these spheres of human activity. This specific role, which is inscribed in the journalistic ethos, of coming to terms with differing views on reality comes to the forefront when the media deals with hybrid objects. A hybrid object (cf. Latour: 1991) is an object that exists in more than one realm at once, it is at the same time a natural phenomenon, a social phenomenon and the discourse about it.

Obesity on the one hand, is seen as a disease of the body by medical and life sciences. It is thus imagined as a natural phenomenon which can be dealt with in medical terms. On the other hand 'the public' and medical practioners always imagined obesity as a weakness of individuals. Strongly tied to the cardinal sins gluttony and sloth obese individuals are imagined as lacking the willpower to stay slim, healthy and attractive, a combination of properties which is strongly inscribed in the western thoughtstyle. These two strands of thought obviously do not fit together quite right. How could a bodily disease be caused by a

7

lack of willpower? How is individual weakness to be treated in medical terms? Both of these ways of looking at obesity focus on the individual. In the case of medical expertise the individual is to be treated, while blaming obesity on weakness and lack of willpower also focuses on the individual. A third strand of thought about obesity focuses on the societal aspects of weight. The basic premise being that the changes in our collective lifestyle through the advancing automation, motorization and technification leads more and more people to being overweight. Changes should thus be directed at the way we are living instead of focusing on individual minds or bodies.

The starting point for this master thesis was thus an interest in how, if at all, does the media deal with these differing and somewhat mutually exclusive ways of constructing obesity. While practitioners of science, medicine or politics share the fortune of being able to mostly focus on their distinct realm of activity the media by definition has to bring them together. The media, for instance, has reported on the food industry as promoting obesity, while also reflecting on individual eating habits and the functionality of our gastro-intestinal system. This act of situating obesity in a multitude of meanings leads me to investigate media coverage of obesity as an arena, in which the meaning of what obesity is, is negotiated, rather than a platform were truths about obesity are presented to a wider audience.

The Austrian situation, in this regard, has a number of peculiarities that make it interesting as a case. Firstly in a linguistic sense Austria[1] knows two widely used terms for obesity: Fettsucht and Adipositas. Adipositas is linguistically the exact equivalent of obesity, adipös and obese both mean 'being overweight'. While the German dictionary also translates Fettsucht into obesity, adiposeness or fatness, literally translated it would mean 'addiction to fat'. Etymologically the suffix -sucht comes from siechen (ailing) which denoted various medical symptoms, for instance Gelbsucht (jaundice). The noun Sucht means addiction though and in its modern usage the term Fettsucht derogatively links obesity to addictions, as the historical etymology of the suffix –sucht is not commonly known. By implying that being fat is linked to an individual addiction, obese people are not only blamed for their medical condition but also put into one group with alcoholics and drug addicts, the two other most prominent addictions media is reporting on. To be able to convey the subtle differences in meaning between the terms Adipositas and Fettsucht, I chose not to translate them in this paper. Thus whenever I use the term 'obesity' it refers to the entire breadth of the phenomenon, while I am using Fettsucht and Adipositas in cases where that difference seems of importance.

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[1] In stark contrast to other German speaking countries, like Germany, where the use of *Fettsucht* fell out of favor in the eighties.

Why is this partition of one phenomenon into two terms so important to require the introduction of two German words in a master thesis otherwise written in English? The answer lies in the fact that a keyword that acts as the figurehead of an issue is also doing work at forming said issue. The term 'obesity epidemic' for instance paints the issue of obesity in a specific way. Namely in a way where a phenomenon that is not in itself contagious is linked to traditional contagious diseases and endowed with characteristics of such diseases, for instance the notion of an inexorable rise in morbidity and a certain sense of threat and panic. The act of splitting what is one term in some languages into two, in the Austrian use of language, hints at a specific work being done. The discourse on obesity seems to be split into two distinct buzzwords that each carry their own specific tacit meanings. So this is the first concretion of my interest in how the media deals with hybrid objects. I am also interest in how this situation unravels when what seems to be one issue, one nationwide concern, is from the beginning split into two figureheads. How are the two terms Adipositas and Fettsucht used in the media? Are they arbitrarily exchangeable? Or does each carry a special meaning that discerns it from the other?

Secondly, as is hinted at by the late publication of the first Austrian obesity report (in 2006), the idea that obesity is a nationwide health threat, an 'epidemic', was adopted pretty late compared to other countries. Thus while the notion of obesity as an epidemic was already formulated in, for instance, the US, Austria only started to grapple with that idea in the 2000s. The national peculiarities of dealing with obesity. The temporal dimension of the Austrian obesity discourse is thus of paramount interest. Thirdly with a media landscape neatly tallied up and one of the highest concentrations of media ownage, the Austrian mass media landscape offers a clearly defined spectrum of mass media outlets that allows to analyze the difference in negotiating obesity both between regions, through regional newspapers, and among social groups, through tabloids and quality newspapers.

This master thesis thus presents a constructivist approach to how obesity is framed in the mass media, through three distinct approaches: (1) How do the buzzwords Fettsucht and Adipositas impinge on the discourse? (2) How does the discourse change over time? (3) How does the discourse differ between newspaper outlets? It is driven by another quite different interest though. With the advent of computers the data driven approach has steadily gained in importance. Terms like 'big data', the 'algorithmic turn' or 'network visualization' play an increasing role both in social science and beyond. Data is everywhere after all and while qualitative social science is of course data driven as well, the peculiar 'trust in numbers' (cf.: Porter: 1994) tends to give special weight to scientific methods that come up with numeric representations of their data. Among these methods en vogue at the moment is network visualization, whose area of application is steadily enlarged. While it was used to

visualize actual networks, for example rail networks, it is now increasingly used to represent phenomena that have to be imagined as networks first. While networks of friends, computer networks, or rail networks lend themselves quite well to the network metaphor, even newer application render language as a network, increasingly furthering the notion that 'everything is a network'. Network visualization enjoys growing appeal because it lends itself to both quantitative analysis of its underlying data and qualitative analysis of the visualizations themselves. By employing network visualization to map the semantic content of the discourse surrounding Adipositas and Fettsucht, this project aims to give an account of the obesity discourse that is at the same time quantitative and qualitative. By doing that it tries to reflect how algorithmic methods are used in the social sciences and to problematize many of the underlying processes which are often occulted by an air of promises surrounding these new technologies. This two pronged interest will hopefully provide new insight into and an empirical perspective on how the obesity discourse played out in the Austrian mass media as well as adding to our understanding of the opportunities and pitfalls associated with the algorithmic turn and network visualization.

0.1 Thesis Overview

The following is a brief account of the rest of the contents of this thesis. **Chapter One** starts by detailing my research interest. This then takes me to precisely state my research questions and to qualify each in turn. Finally, in the process of unpacking my research questions, chapter one offers a brief overview of my research approach which is detailed further throughout the thesis. **Chapter Two** provides the literature background by presenting a comprehensive overview of the state of obesity research in Austria and internationally and describing how natural and social sciences construct the issue of obesity. **Chapter Three** switches gears and focuses on methodological and theoretical considerations concerning the use of mass media as a source of scientific data. It alludes to the ever tightening coupling of science and media, termed medialization, and describes framing, one of the key theoretical tools used in this thesis. Lastly it focuses on how framing can be fruitfully employed in semantic network analysis. **Chapter Four** provides some fundamental concepts on the methods employed in this thesis. Concepts such as raw data, dark data and big data are discussed in detail. Two important paradigms for semantic network analysis, the algorithmic turn and the network paradigm are also put forward in Chapter Two. **Chapter Five** introduces the empirical data and moves step by step through the process of constructing the database, thereby also reflecting on key considerations of said process. **Chapter Seven**

finally presents the core empirical analysis. It is made up of three main blocks. The first of which compares the semantic networks split according to keywords, while the second employs a temporal analysis. Finally the third part of chapter seven analyses the discourse based on individual newspapers. Finally **Chapter Eight** summarizes the thesis and provides a brief conclusion and outlook.

1 Research Interest

Borrowing from Callon who, in his well-known paper, asks how scallops, fishermen and scientists are being done (Callon: 1999) my thesis asks how obesity is being done in Austrian newspapers. This chapter tries to develop what this 'being done' entails and what it will occult. As mentioned in the introduction this thesis aims at exploring how obesity is framed in Austrian newspapers. Obesity is often imagined as one of the biggest problems in western society. While there is a lot of research concerning obesity in US-based media, exploring the specifity of the Austrian situation will hopefully give interesting insights in how an ordinary issue becomes a public problem, a media epidemic and how different frames intertwine to form a shared narrative. By employing semantic mapping to visualize the discourse surrounding the two key terms Adipositas and Fettsucht, this thesis also aims at reflecting how quantitative methods are used in the social sciences and to problematize many of the underlying processes which are often occulted by an air of promises surrounding these new technologies. This two pronged approach will hopefully provide new insight into and an empirical perspective on how public problems play out in the media as well as adding to our understanding of the opportunities and pitfalls associated with algorithmic historiography. My personal interest lies in how obesity and bodies are constructed and negotiated in the public as well as the way in which technology impinges on our methods of knowledge generation. Thus this thesis while contentually focusing on obesity also in large parts deals with how the internet and it's millions of data change the way we do science and how we can properly react to these challenges.

1.1 Research Questions

I detailing the research questions let's focus on obesity first. My main research question concerning obesity is: **How is obesity done in Austrian mass media?** This entails analyzing the major frames used in the ten biggest Austrian newspapers and ascertaining whether a shared master narrative is visible. By employing a network analysis with 'raw' newspaper articles as the data source, I hope to unravel the narratives emplotted in the obesity discourse. Furthermore three distinct approaches will be employed to add flavor to the analysis. Firstly I will look at the differences in the semantic networks between two keywords – Adipositas and Fettsucht. Secondly I will analyze the temporal dimension – how the semantic network changes throughout the years. And thirdly I will delve into the different networks as constructed by individual newspapers. Thus creating a platform to compare the coverage of obesity in different mass media outlets. In each of these empirical approaches to what I call the 'obesity discourse' I will mind three distinct tools:

1) **How is the semantic network made up topologically?**

2) **How do keywords figure into the network?**

3) **What clusters, issues and topics are discernible?**

These three distinct tools will serve to unravel which narratives are employed and how they perform obesity. To ground this multipronged purpose I will start by developing a state of the art of obesity research both internationally and in Austria. This will be followed by an analysis of how the social sciences deal with obesity. Equipped with these two ways of looking at obesity we will delve into methodological considerations – aka how the empirical analysis is produced and how that impinges on the knowledge produced and what is occulted from view. This will finally ready us for the empirical analysis itself, as already explicated. The combination of all of these research strands will hopefully develop into an understanding of how tacit changes in semantics affect how obesity is imagined as a phenomenon.

2 Literature & Background Information

2.1 General Obesity outline

The prevalence of obesity is rising all around the world and a further increase in the prevalence of obesity is predicted for the future (cf. Adipositasbericht: 2006, Stevens et al: 2006, Kiefer: 2004, De Marchi et al: 2007). Obesity prevalence isn't just rising worldwide and at an alarming rate, developing countries are also gaining fast even though undernutritiion still coexists with obesity. Furthermore obesity is more prevalent in urban than in rural regions and women generally have higher rates of obesity than men (WHO: 2000)

Obesity is defined, by the WHO as "a condition of abnormal or excessive fat accumulation in adipose tissue, to the extent that health may be impaired" (WHO: 2000, p. 6). However there is more to it than just weight gain through positive energy balance. Obesity is also about where the fat is located in the body. Making it perfectly possible for otherwise slim individuals to be medically obese. The so called abdominal obesity – a form of obesity where most of the fat is accumulated in the belly region – is also the most dangerous one. The WHO thus suggests differentiating between those at increased risk because of "abdominal fat distribution" and those whose fat is distributed evenly across the body (WHO: 2000).

This advice doesn't impinge on how obesity is measured though. Body mass index (BMI) is seen as the most useful method to determine obesity. However, BMI does not account for the different types of obesity and thus is a crude measure for estimating risk of secondary diseases, which are especially prevalent in abdominal obesity. Furthermore the WHO recommends a differentiation between overweight (BMI>25) and obese (BMI>30) individuals.

The major health problems associated with obesity, according to the WHO, are "NIDDM, CHD; hypertension, gallbladder disease, psychosocial problems and certain types of cancer" (WHO:2000, p. 39). Most shocking of all health problems associated with obesity, is mortality. Mortality is increased 12fold when comparing lean and obese individuals (WHO: 2000). Furthermore there is an unaccountable number of debilitating conditions that affect the obese.

How does obesity develop? Large parts of the public believe obesity is a result of missing willpower. A resulting overindulgence in fatty foods leads to an energy imbalance. If energy

intake exceeds energy expenditure one gains weight. While the WHO acknowledges what I would call the "individuals fallout hypothesis", it makes clear – even in the introduction of the report - "that obesity is not simply a result of overindulgence in highly palatable foods, or of a lack of physical activity" (WHO: 2000, p. 101). Instead obesity is a complex disease whose primary cause, according to the WHO, lies in behavioral and environmental factors which in turn are influenced by external societal factors. Hence it is not the individual that is to blame per se, the increasing energy density of the diet and reductions in the level of physical activity are for the most part not individual choices but results of a shift in societal lifestyle. Furthermore genetic, biological and other factors might determine one's vulnerability to obesity (WHO: 2000).

With this discussion of the causes of obesity, we are already firmly entrenched in the societal debate that is raging over issues of responsibility of obesity. Health problems in general, for instance, AIDS, obesity or diabetes suffer from the binarity that they are either attributed to individuals or to society at large. These attributions may shape people's opinions about who is to blame for these issues.

What's interesting about these processes is that at the core these conflicts are over the attribution of responsibility. If both the blame and the cost for a given issue would be attributed to the individual, the public wouldn't react as coarsely. Thusly, while in the public image the "view holds that a social problem is caused mostly by deficiencies of individuals, often those who are affected by the problem" (Kim & Willis: 2007, p. 2) the cost is conversely attributed to the whole of society. Kim and Willis further expand on this issue by asseritung that, "social responsibilities are largely ignored, whereas individual causes and solutions are repeatedly emphasized" (Kim & Willis: 2007, p. 3). As we have seen the WHO develops a multifaceted picture of the causes for obesity. Where one to believe the coverage of obesity in mass media, the direct cause of obesity would be "individual behavior, involving eating too many calories and not getting enough physical activity" (Kim & Willis: 2007, p. 4) Healthy eating habits and physical activity are over proportionally used as individual solutions to obesity (Serdula et al., 1999). In the news media becoming obese is mostly the outcome of individual behaviors, and more importantly failures. However, both the WHO (cf. WHO: 2000) and most social scientists (cf. …) agree that societal factors, which are mostly not alterable on the level of individuals, play a massive role in the prevalence of obesity. Implementing solutions to the obesity problem on a societal level is a daunting task though. Changing the food industry, food supply at school, physical education regimes, or possibilities for outdoor activities have to be cast into legislation and generally require a larger expenditure up front than advocating for changes in individuals behavior. This will become especially clear when we look at publications concerning obesity in Austria.

2.2 State of obesity research in Austria

This chapter will build on two central publications concerning obesity in Austria, to explicate how obesity is framed from a governmental/scientific perspective. The two publications are firstly the Austrian obesity report (Österreichischer Adipositasbericht) publicized in 2006 by the department of societal medicine (Institut für Sozialmedizin) of the Medical University of Vienna and secondly the Austrian nutrition report (Österreichischer Ernährungsbericht) published in 2008 by the Department of Nutritional Sciences (Institut für Ernährungswissenschaften) of the University of Vienna.. The specific dates of publication were chosen as they fall into the middle of the analyzed timeframe. A brief glimpse into earlier and later versions of these reports couldn't detect major divergences though, thus these reports serve as a representation of the state of the art of Austrian obesity research from a medical/life sciences perspective. The analysis is further supported by smaller publications surrounding these reports, which serve both to ground the findings in a wider spectrum of analysis and as a contrast to the mainstream of obesity research.

Without further ado, let's jump into how the two major sources frame obesity. The two central publications detail all major facets of obesity in Austria. Obesity is "characterized by an excessive accumulation of fatty tissue in the body" (Adpositasbericht: 2006: p. 150). It is described as a chronic health problem and attains disease status through its accompanying increase in secondary diseases and mortality. Overweight on the other hand is defined as "body weight in excess of normal weight" (Adipositasbericht: 2006: p. 150). Whether a body is obese or overweight is determined by a number of quantitative methods of measurement. "The body mass index [BMI = body weight / height2 (kg / m2)] is most commonly used to classify individuals and population groups in underweight, normal and overweight or obesity" (Ernährungsbericht: 2008). Other measurements discussed are waist circumference and Waist-to-Hip-Ratio [WHR]). BMI is deemed to be the most reliable measure of weight though, which is reflected in so far as all references are made to BMI data.

So much for bland definitions, but let's linger on the topic a bit longer. The choice of words is quite interesting: Overweight (Übergewicht) and obesity (Adipositas) are the terms of choice to donate the phenomenona throughout the reports. The distinction between those two is made on strictly quantitative grounds, where overweight is more than >90% of the populations BMI and obesity is >97%. This distinction falls in line with European and international publications on obesity (cf.: WHO: 2000). As we will see later in this thesis, the

words of choice in Austrian newspapers are Fettsucht and Adipositas (obesity). The term Fettsucht, which is used ubiquitously in the news, is only used 9 times throughout the 354 pages of the obesity report – Adipositas (obesity) is used 1333 times. Furthermore it is used as a specialized medical expression: zentrale Fettsucht (abdominal obesity). That's our first tiny hint at a cleavage between scientific reporting and mass media reporting of obesity: The keywords and there meaning differs even on a most superficial basis. Throughout this thesis – and as explicated in chapter three - I will thus approach the media as an arena where scientific information isn't just passed on to a public, "but where ways of understanding and framing a socio-medical phenomenon are experimented with" (Oudshoorn, 2003, p. 34).

For now let's stick to the reports. Both estimate the prevalence of obesity for the entire population of Austria and according to sex, education, age and region. The nutritional report sees overweight on the rise in all investigated age groups (cf.: Ernährungsbericht: 2008). Boys or men were more likely than girls or women to have a BMI above the desirable range. But contrary to these findings "Obesity is particularly high amongst economically weaker, less educated women and women in low status jobs" (Adipositasbericht: 2006, p. 255). Age also showed an increase in the incidence of overweight/obesity. Also striking is the strong east-west divide in all age groups. While the obesity report comes to the same conclusions the actual numbers differ slightly. A quick search for media sources of the prevalence of overweight/obesity in Austria found a wide variety of numbers. While the obesity report considers 3–23% of men and 2–24% of women (cf.: Adipositasbericht: 2006) to be obese, a Forbes report considers 57,1% of Austrians as such (Streib: 2007). A quick search revealed a number of scientific papers that estimates the prevalence of obesity in Austria differently as well. A paper by Schober et al, for instance, estimated obesity at 5.8% for the study population in 2007 (Schober: 2007). These differences might be a result of the different times at which the papers and reports were produced and diverging definitions of what is deemed overweight or obese, but they also reveal an underlying problem of obesity assessment: it is almost impossible to produce a reliable set of numbers on the prevalence of obesity, as the population of any given country is not regularly weighed and measured by a central agency and definitions of obesity, as well as the methods to measure it, differ ever so slightly between actors. For all its troubles quantification of obesity plays a supreme role both in the reports and in the media. The actors on the ground need to have faith in their numbers though. Statistics of the phenomenon are seen as desirable as they lend themselves to a naturalization of social or economic observation through quantification (cf.: Porter: 1995). One of the ways to ensure credibility is to rely on the conscript health investigation which is routinely conducted by the Austrian military. Except for the evident caveat that only men are measured, this method is still considered to be better by some researchers on the issue, than

just approximating the numbers. A study by Rami et al. observed the prevalence of obesity in 2000 – right at the start of my study - at 4.9% for the male population (Rami et al: 2004).

Other than assessing the prevalence of obesity in Austria the reports also need give policy recommendations by recourse on the causes of obesity. The chief cause leveraged in both reports, albeit in slightly differing language is the so called "obsogenic environment" (Adipositasbericht: 2006) – an environment that is particularly well suited for obesity. "This includes, amongst other things, lack of incentive to partake in physical activity in day to day life, passive free time activities, easy access to and aggressive marketing of cheap, energy dense foodstuffs, large portions, and eating out" (Adipositasbericht: 2006: p. 256). The nutritional report, for instance describes how a diverse choice of food, is usually associated with a higher energy intake. And subsequently claims that the increasing diversity of the food supply is causing the increase prevalence of overweight and obesity. Both reports also stress psychic and psychiatric factors, for instance, binge eating, attempts at dieting, alcoholism and other societal factors, like values and beliefs about the body image. Still while these societal factors are acknowledged in the reports - in the case of the "obsogenic environment" even take center stage - the solutions proposed march to a different tune.

As for both reports the most important factors, in the development of obesity, are still considered to be sedentary and energetic overeating, the goals of obesity therapy and serious diet programs are the reduction in body weight and body fat and especially the long-term stabilization of the reduced weight (cf.: Ernährungsbericht: 2008). The factors that are easiest to influence, after all, are individual eating and exercise habits. "Appropriate lifestyle modification" (Adipositasbericht: 2006, p. 256) is thus suggested as the best strategy against obesity and should merely be stimulated by suitable Public Health strategies. Or as the nutritional report puts it: Lack of exercise and a poor diet are the main risk factors that need to eliminate it as part of an effective prevention (cf.: Enährungsbericht: 2003).

2.3 Obesity in Social Science

The last two chapters showed how the medical/life sciences deal with obesity. Now we will switch gears a bit and look at how the social sciences approach the issue. Not surprisingly many social science authors reject what they deem to be an overly "mechanistic view" of obesity. While not being sceptic about the actual existence of overweight, most social scientists are sceptic about the depth and breadth of the issue

The work of 'obesity sceptics' has largely been ignored in the medical research community. The few dissenting articles in significant journals had, according to Gard (Gard:2009) have had little impact on the scientific discourse, much less on the popular discourse on obesity. Conversely the idea that obesity is an epidemic has gained notable acceptance in the scientific health community and the public. According to Wright and Valerie, a long standing tradition of critiquing the 'cult of slenderness' pervasive in western societies and in particular how "women regard themselves and their bodies" (Wright & Valerie: 2009). Furthermore there has been a "fat activist movement" (cf.: Saguy and Riley 2005). However with the advent of the "obesity epidemic" a plethora of diverse perspectives have shifted their gaze onto this new discourse. Bio-sciences, social sciences, and cultural studies have been at the forefront of "anti-obesity research" (cf.: Wright & Valerie: 2009). Most of whom challenge the "truths" of the dominant discourse on obesity. By criticizing, for instance, the quality of the methodology, the interpretations and theorizing from the data these authors try to provide alternative understandings of obesity as a societal problem.

> "As these scholars point out, the research that would support the claim of an 'obesity epidemic' and the importance of overweight and obesity to health is far from conclusive (e.g., Campos et al. 2006; Gard and Wright 2005; Mark 2005) and certainly much less certain than we are led to believe in the media and by government policies and initiatives. Some of the criticisms include: the easy conflation between obesity and overweight in the use of the term 'obesity'; the use of the very blunt instrument of the Body Mass Index (BMI) as a measure of overweight and obesity; and the claims made about the causal relationship between over- weight and obesity and a wide range of diseases". (Wright & Valerie: 2009, p. 13)

Leading scientists seem to be very fond of calculating energy costs and intake/output formulas, but not all humans adhere to the same mechanical laws. Differences can be found according to culture, ethnicity, gender and so forth. Furthermore biological differences between people mean that they are affected differently by different foods. In contrast to the dominant obesity discourse, which works with and mechanical view of the body and focuses on input, diets and exercise, in short with what is deemed to be lifestyle choices, the social sciences stress the generative and performative aspects of this narrative. The main insight to be gained from literature critical of the health sciences is that medical research is embedded in a fat-phobic context and that this matters in the design and interpretation of research on obesity.

The critique already starts with the choice of language: The usage of the term epidemic is heavily criticized by, for instance, Campos et al. (2006) or Boreo (2007), who argue that the

term 'epidemic' should be reserved for "an exponential pattern of growth" (cf.: Campos et al.: 2006) and leads to the phenomenon being "cast in a language and moral panic of more 'traditional' epidemics" (cf.: Boreo: 2007). Another strand of critique lies in the proposed mortality rates. Some authors argue that morbidity and mortality has a stronger correlation with cardiovascular fitness than with BMI or fatness of bodies. Studies by Blair and LaMonte suggest that cardiovascular fitness may be the main factor in defining poor health outcomes, such that sedentarity, not obesity, would be the main culprit (Blair & La Monte: 2004).

A further strand of critique focuses on weight loss. There is consensus in medical research that weight loss and subsequent weight maintenance are significantly improving health of overweight people. Some authors argue, that weight gain has happened even though western culture is obsessed with dieting (cf.: Blair & La Monte: 2004). He criticizes studies focusing on one year weight loss schemes, even though it is, according to him, well known that people regain their weight over the course of one to three years. Others have noted that weight cycling may even be more dangerous than being overweight (Cai et al. 2010). Seen in this light the emphasis on weight loss may indeed be dangerous to patient's health. Finally the focus on individuals in almost all of the medical research on obesity is worth mentioning explicitly. Even if the blame is put on toxic environments or socioeconomic factors, for most researchers the privileged site for intervention is the individual.

2.4 State of "Obesity in Media" research

As already hinted at in the introduction, there seems to be a divide between the analysis of obesity on the scientific level and mass media representations of it. While the former frequently stresses either biological/genetic arguments which frame obesity as a disease or argue the role of societal environments, mass media representations tend to exaggerate the role of the individual. Furthermore I tried to show the differences in the imaginations VERBUNDEN with obesity between the medical/life sciences and the social sciences. Following this last strand of analysis, the coverage of obesity in mass media offers a critical approach to social scientists. These research strands on obesity and the mass media are, according to Natalie Boreo, coalescing around three themes: "framing and constructing obesity as a social problem, the media and obesity policy, and media and the science of obesity" (Boreo: 2013, p.: 371). Following Boreo's analysis, I will look at each of these three avenues of approaching how the mass media deals with obesity in turn, thus collecting an outline of how the mass media deals with obesity.

The first theme looks at how obesity is framed by the mass media. Focusing on how obesity emerges as a problem in the media Kim, for instance, shows that the news media makes a particular viewpoint on obesity salient, leading the public to make value judgments about individual responsibility (cf. Kim: 2007). Through a Lexis Nexis search using the keyword 'obesity' or 'obese' Kim collected a sample of 300 articles and 200 transcripts. Many articles were either duplicates or unrelated to the issue of human obesity though. A problem I faced in this thesis as well and which will catch the limelight later on. The media didn't just make made more references to individuals than to society in discussing solutions, they also located the cause for obesity in individual deficiencies more often than not. They identified an unbalanced emphasis on personal responsibility in public health issues, which is consistent with prior studies and found evidence supporting the idea that framing in mass media, focusses on individual behaviors and motives, rather than on societal or environmental factors, in attributing responsibility to both the cause and for possible solutions of the issue (Kim & Willis: 2007). It is, however, important to note that along a longitudinal axis of analysis Kim and Willis discovered changing trajectories for individual and societal attributions over time. While personal causes and solutions to obesity have largely remained stable, mentionings of medical or genetic causes of obesity have undergone a stark decline. References on societal causes, on the other hand, have experienced a considerable increase, which Kim and Willis attribute to a change of perspective in both scientific and policy debates on the issue. Furthermore they assume that the realization has set in among health experts, which the individual approach alone doesn't suffice in solving the problem with obesity. While these tendencies are becoming more salient Boreo notes that the general observation of the reporting on obesity is that it is alarmist and "uncritically takes the existence of an 'obesity epidemic' as a starting point" (Boreo: 2013). Other viewpoints on obesity are thus frequently occulted by the dominant frame of obesity as a problem of 'epidemic proportions'. In her 2007 book, 'All the News That's Fat to Print: The American "Obesity Epidemic" and the Media', Boreo uses a textual analysis of 751 New York Times2 articles to show that in this influential publication obesity in the US is framed as out of control, a problem of culture and environment, couched in the language of traditional biomedical epidemics and yet also a problem that can be solved by simply relying on common sense. Boero concludes that the contradictions in these framings appear unproblematic in large part because our pre-existing individualized, raced, and gendered understandings of fatness render these paradoxes invisible (cf.: Boero 2007, 2012). In her study of mass media coverage of obesity, Shugart analyzes how obesity shifts from being framed as caused by environmental factors to a fatalistic epidemic which is unavoidable and inevitable (Shugart: 2001). According to Shugart this fatalistic view occults a more complex discussion of obesity and weight (Shugart 2011).

Secondly mass media reporting on research concerning obesity is of particular focus . Most scholars show that the media tends to focus on research that lends itself to sensationalist headlines, thus skewing the representation of research reports. Furthermore the media tends to oversimplify research conclusions and to fit them with their pre-conceived narrative of the issue, while also rarely showing skepticism about what they are reporting on (Boreo: 2013). Thus understanding how the media represents research on obesity is critical to this thesis, as it frames how people think and feel about their weight. Saguy and Almeling, for instance, analyzed the interconnectedness of medical science and mass media in shaping obesity as a social problem. Drawing on a mixed sample of scientific publications, news reporting and press releases, they compare how obesity is framed as a problem. Interestingly they argue that even the terms themselves are loaded with a specific meaning of the issue. Terms like "overweight" or "obesity" are used as a framing devices that are constantly contested and (re-)negotiated. Different models of constructing obesity impinge on how the problem is imagined. Framing obesity as the product of unhealthy choices by individuals fosters arguments about morals and deviancy, while framing obesity as a preventable illness, much like smoking tends to benefit societal explanations. One of the most interesting findings of this paper was the ways in which dramatization works in the news articles. Through what Saguey and Almeling call "war-metaphors" obesity was painted as a severe public crisis by likening it to historical events, like the "battle of the bulge", or stressing the temporal dimension of the epidemic, e.g. "time bomb". These extreme examples give exaggerated impressions of both the spread of obesity in society and the severity of the issue. Once again both individual and social frames where found as both cause and explanation of obesity and overall the framing devices stressing the role of the individual were more salient. But similarly to the analysis conducted by Kim and Willis, mass media "further accentuates the focus on individual blame" (Saguy & Almeling: 2008, p. 77). Discussing "weak" social groups, like children, migrants, the poor or women, further increases the probability of attributing blame to individuals. Furthermore they concluded that the news media tended "to blur weight categories" to overemphasize the severity of the "obesity epidemic".

Switching countries for a bit, Roy et al. examined the ways in which obesity research is framed in Canadian news media outlets (Roy et al.: 2007). Once again they assess that the mass media's framing of responsibility for obesity vigorously debates whether individual characteristics or social factors are to blame for the "obesity epidemic". Instead of solely relying on textual data, they also conducted a series of interviews with Canadian journalists and researchers about how they see their role in the construction of obesity as an issue. They found that newsworthiness was central to the choice of Canadian researchers working on obesity and journalists subsequently took up key elements into their news stories because

they "were readily available for the journalists to incorporate into their reports" (Roy et al.: 2007). Diminishing editorial resources of journalists and the growing influence of public relations professionals lead to a situation where journalists are increasingly relying on ready-made stories. This notion is supported by Schudson's analysis of the role of political observatories in making journalism a "reliable representation of the world" (Schudson: 2010, p. 1). For Roy et al. the failure of journalists "to critically assess the research that forms the foundation for policy initiatives advocated by health organizations" (Roy et al.: 2007, p. 590), renders the mass media "as a passive and complacent conveyor belt for interest groups with well-resourced public relation machines" (Roy et al.: 2007, p. 590). Neglecting critical engagement with sources steers journalism away from incorporating the wider context in which the issue of obesity is embedded and may very well, according to Roy et al., be the driving factor behind the mass medias emphasis of individual over societal factors.

Thirdly scholars often focus on the interconnectedness of the media's construction of obesity and obesity policy. For understanding policy decisions concerning obesity the media, and it's construction of social problems, is paramount. Ries et al. show that different countries frame policy differently given their own context and that advocates of different policy approaches use the media as a way to advance their policy positions (Ries et al.: 2011). The media framing thus not only informs policy decisions, but forms an arena which also impinges on funding of solutions. For instance, painting children as "impressionable and innocent drives childhood obesity policy that focuses on television advertising of 'junk' food and banning toys in fast food meals for children" (Udell and Mehta 2008, p. 537). Extending this area of inquiry, Saguy and Gruys examine the wider context of social problem construction through shared cultural values. Drawing on a comparative study, which yielded a sample of 238 articles from the New York Times and 94 articles from Newsweek, they analyze how news reporting frames the issues of eating disorders and obesity. Opposing the thesis that mass media simplifies the context of obesity and focuses on individual factors, they find that "a host of complex factors beyond individual control contribute" (Saguy & Gruys: 2010, p. 231) to the construction of eating disorders as a problem. News media tend to reinforce cultural images of white females as victims of larger societal or environmental forces beyond their control. In the case of obesity though they asses that arguments about bad individual choices , like blameworthy overeating, are dominating the discourse. "Moreover, while heaping the blame on individuals, news reports also draw upon and reproduce stereotypes of fat people as gluttonous, slothful, and ignorant, and of parents of fat children as neglectful and irresponsible" (Saguy & Gruys: 2010, p. 244). To further accentuate this imbalance between the coverage of obesity and anorexia, the solution for obesity is framed as being easy and common sense, news media thus imply "a logic under which those who have fat children

must be stupid, ignorant, or willfully disobedient" (Saguy & Gruys: 2010, p. 245). They conclude that the strong cultural tropes, which are leveraged in news media reporting, specifically support the framing of anorexics as "victims of cultural and biological forces beyond their control, while blaming the obese for their weight" (Saguy & Gruys: 2010, p. 247). Thus the negative associations with obesity are reproduced by the mass media and subsequently reinforce cultural value judgments.

This chapter tried to show that the mass media frames "obesity as a moral problem of gluttony and sloth" (Boero 2007), "overwhelmingly blame bad individual choices" (Saguy and Almeling 2008) and build upon "shared cultural values" (Saguy & Gruys: 2010) while much of the information is conveyed by public relation machines (cf. Roy et al.: 2007). Hence the way obesity is constructed as a problem, has far reaching consequences for how matters of responsibility and solutions are imagined. Particularly mass media have a considerable stake in this negotiation process as their visibility and cultural authority renders them as central sites of meaning making. Likewise this master thesis tries to join the investigation of news reporting on obesity and tries to tease out the major themes discussed in the above chapter.

3 Theoretical/ Methodological Framework

3.1 Why study the media?

In the chapter on how obesity is framed in different contexts I also eluded to the media playing a number of roles, among which are information dissemination, representation of scientific research, policy instruction, moral framing and so on, and so forth. This chapter focusses on how exactly I imagine the media to work in this thesis. Media analysis has long been at the center of the scientific study of social problems (Gitlin 1980, Epstein 1996). Although the mass media can be seen as a reflection of society I choose to analyze it as the site were societal problems are being constructed. In other words, the mass media does not simply reflect the existence of social phenomena, it creates them. Social scientists studying health and illness extended media construction to the interplay of health, medicine, science and the media, looking at how our ideas of health are shaped by our consumption of mass media accounts (cf.: Epstein 1996; Lupton 1999).

As the previous chapter revealed, in recent years scientists have also begun to analyze how the media constructs the obesity epidemic. In this process the media can be understood as

an arena where ordering regimes and ways of understanding and framing a social as well as medical phenomenon are experimented with (Oudshoorn, 2003). Thus I understand media articles as one place where the work of social ordering is done (Mol & Law, 1994) through 'emplotted narratives' (Czarniawska, 2004). This work entails experimentation with frames thus through studying them we can gain insight into "how some (kinds of) stories manage to gain a higher degree of visibility and thus become part of what one could call the 'repertoire of legitimate stories'" (Felt et al.: 2012, p. 6). The following chapter will explain how the mass media can be understood as a place where stories on obesity are constructed.

3.2 Medialization

It should no longer be breaking news that science, scientists, research practices and results have become news items in the popular press (Rèodder: 2012). The ever tighter coupling of science and mass media has led to a series of theoreticalizations concerning the specific nature of their relation. While the term media might refer to the technologies used to disseminate information to an audience, mass media specifically addresses the institutional arrangement that serves to provide "observations of society" (Rèodder: 2012). This includes, as the most obvious ones, newspapers, radio and television. The trait that distinguishes these systems of communication from a mere technological arrangement are the particular selection criteria employed by them. Albeit addressing unspecific audiences, the imagined public is in fact constructed through the so-called news values. These "constructed publics" (Roedder: 2012) are institutionalized in addressing audiences, for instance by targeting a specific reader- or viewership. The difficulty of how to represent an unorganized public that is 'out there', has led to the mass media being used as a sort of a proxy for the public.

Due to the increasingly tighter coupling of mass media and science – which is constituted by the former through attributing higher news values to science, and by the latter through paying attention to how science might be pushed onto the mass media agenda – the importance of mass media for the acceptance of science has grown. As Roy et al argue, "for many people, the mass media is their main source of information about health. How health research comes to the attention of and is processed by the media are important questions that have been neglected in the studies of health reporting in the news." (Roy et al.: 2007, p. 576)

This issue has been taken up by sociologists of science and communication scholars alike. According to Felt et. Al. (1995), political attention is shifted to the issue of interaction between science and public, if "policy-makers see a need to regain public trust in times when the

relationship of science" (Roedder: 2012, p. 6). Much of the interest has subsequently been motivated by the perceived ignorance of the public concerning science. One of the key difference according to Roedder et. Al. (2012) has been the disparity in knowledge forms between science and mass media. The former being "esoteric, elitist and partly inaccessible" while knowledge shared by the mass media is easy to grasp? But how can this difference between expert and lay competencies be accommodated?

According to the science popularization model, transmitting news is a one-way information flow beginning with refereed scientific journals, who provide information to journalists which in turn popularize the specialized scientific knowledge for lay readers and viewers (Franzen: 2012). According to Lewenstein, "studies based upon the model of science popularization generally conclude that not enough information was published, and that what was published was not provided in sufficient quantity or detail to have been useful" (Lewenstein: 1995, p. 347). The relationship between science and media should be thought of as more complex. The thesis of medialization refers to the increasingly tighter coupling of science and media, stipulating that a growing dominance of the mass media in public communication impinges back on the scientific realm. According to this thesis the mass media form an important resource for the public legitimacy of science in modern mass democracies, thus gaining an indirect influence on or at least competing with the self-steering mechanisms of science (Weingart: 1998). Instead of the one way imaginations of the science popularization model, medialization imagines the interactions between science and media as going both ways.

This mutual interference generates the need for sts to also look at media for analyzing what is often imagined as being located entirely in the scientific realm. Obesity, while being a phenomenon constructed also by scientists, is shaped by the mass-media to its specific needs. Maja Horst argues that while media heavily depends on others to provide its news stories should not solely be understood as an arena for representations (Horst: 2007). Instead media constructs experiences as relevant public issues by translating individual experiences into public experiences, and as such they have constitutive influences for how the public "do politics" in relation to science. In this sense media representations of 'the obesity epidemic' have an impact on how it' is imagined in science as well.

If we look even further back, to Ludwig Flecks notion of the though collective, we find the assertion that so called thought products are never finalized in their form, but "can undergo transformation through intracollective or even intercollective inter action" (Fleck: 1981, p. XIII). In his notion of this process, Fleck stresses the symmetry that is "democratically preserved" between the cycle, or thought collective, of experts and the exoteric cycle of the wider public. Fleck goes as far as claiming that the experts "are more or less dependent,

whether consciously or subconsciously, upon "public opinion, that is, upon the opinion of the exoteric circle" (Fleck: 1981, p. 105). Against this background I want to argue that the media science interaction should be imagined as a two way interaction process. Surely scientists are just as much influenced in their daily work by the mass media as mass media accounts of science are influenced by them.

Furthering this point, Hicks and Wang have published a paper on the New York Times as a resource for Mode 2, stressing the fact that the New York Times "receives more citations from academic journals than the American Sociological Review" (Hicks & Wang: 2013, p. 851). Among the reasons for this trend are studies about the newspaper itself, but also and more importantly the New York Times is frequently leveraged as a scientific resource itself. By treating the New York Times as a primary source of knowledge researchers turn the imagined relation between science and the mass media on its head. According to Hicks and Wang many social researchers argue for the importance of understanding knowledge creation beyond science and medicine (Hicks & Wang: 2013). Both the theoretical musings of Ludwig Fleck and the empirical case study by Hicks and Wang seem to establish that mass media has to be treated as an important partner in knowledge production, not just as an outlet for 'finished' scientific knowledge. The press, after all, does not simply report, they also frame the issues at hand in very specific ways, amplifying certain attributes and certifying importance (Schudson: 2003) to lay people and experts at the same time.

This project is thusly, built on acknowledging the complexity of science and media interaction. The relevance of media for science studies stems from lay people as well as experts in other arenas being informed/ affected by mass media communication. Thus looking at mass media communications about obesity does help us to understand how the mass media constructs obesity and on a broader level informs us about how media produces and negotiates frames.

3.3 What are Frames?

As we have seen mass media play an important role in setting the boundaries of social problems, furthermore journalism work fundamentally shapes reality. By selecting certain issues and occulting others social reality is constructed (Berger & Luckmann, 1966; Tuchman, 1978). This chapter will now deal with how this simple idea may be operationalized in a research setting. Firstly let's stress that framing is a diverse concept. Gamson and Modigliani, for instance, define framing as "a central organizing idea or story

line that provides meaning to an unfolding strip of events" (Gamson & Modigliani: 1987, p. 143). Early works, like Gamson & Modigliani's, referred two models of framing: the media frame and the individual frame. Newer works expanded this idea. In her 1999 paper Hallahan defined seven models of framing, all of which feature distinct modes of operating. Furthermore, the concept of framing operates across levels of analysis (J. M. McLeod, Pan, & Rucinski, 1994; Pan & McLeod, 1991).

Already in this introductory paragraph we come across the difficulty that research based on framing uses diverging meanings of its core term: the frame. While researchers like Entman argued that frame theory is in dire need of an unifying theory (Entmann: 1993), others like D'angelo countered that thrust by arguing that the different paradigms prevalent in framing research facilitate its success (D'angelo: 2002). As of now no single framing theory achieved dominance over the other, thus to conceptualize framing for this paper we have to follow D'angelo's lead and immerse ourselves in various, diverging and even competing theories.

Generally the goals of framing are, to identify frames, to investigate how these frames came into being, and finally to examine the impact of these frames on either the individual or society. Whether one sees frames as emerging from individual will or collective processes, and whether one frames their effect as either directed to the individual or to public opinion, impacts the research in profound ways and might serve as one clue to explain the many different concepts swirling around. Furthermore, according to Entmann, frames are located in at least four different actors: "the communicator, the text, the receiver, and the culture" (Entmann: 1993, p. 52). Analyzing one location where frames are generated might lead to inferences about the other actors, and as we will see later in this chapter my research focuses on text as its primary, if not only, source of frames and bases its conclusions about the obesity discourse on these findings.

For now though let's dive deeper into frame theory. Among the proponents of the idea that frames are primarily constructed in "the individual structures of the mind" (cf. Popkin: 1993) journalists are the focus of attention. Journalists are seen as playing the role of a conduit (Weaver & Wilhoit, 1986) either consciously or according to their socialization, trying to provide the public with information that is salient that enables them to gain 'true' insights about the subject matter. These frames subsequently alter the recipient's train of thought by exposing the individual to its internal logic. Speaking about health issues, for instance, Andsager and Powers (1999) stated, "It is important that news media present accurate and complete portrayals of health issues" because women "tend to rely on magazines in seeking information about breast cancer." (Andsager & Powers: 1999, p. 531). From a critical perspective though, something larger than the individual's state of mind is at stake. Through

the combined efforts of many individual frames hegemonic social relations might come to structure the news and sharing in this joint effort becomes necessary for success (Hallahan: 1999). Critical scholars argue that news frames "constrain economically distressed communities from seeing their assets, … constrict political awareness of individuals and … thwart the aims of social movement groups" (Hallahan: 1999, p. 207) Finally, news frames shape public discourse in such a way as to promote or occult a particular problem definition, causal interpretation or moral evaluation. Once again health issues serve as an appropriate example to underpin the dramatic consequences different frames might have. AIDS has been framed both as a disease involving "high-risk groups" and as resulting from "risky practices". Research suggests that sympathy for AIDS victims varies considerably on which of these frames is made more salient in the news items (Goss & Adam-Smith, 1995; Spears, Abraham, Abrams, & Sheeran, 1992).

Furthermore frames are not just matters of definition, as most social issues also include questions of responsibility. The attribution of responsibility can be framed as either controlled or uncontrolled by either individuals who are labeled as being either responsible or not. To frame, for instance, AIDS, drug abuse or obesity as problems of individuals attributes blame to those individuals and concurrently emphasis these individuals as addressees of treatment rather than dealing with the root causes at the societal level.

Shifting from how framing is conceptualized to the nitty gritty questions of operationalization, we find ourselves embedded in a multitude of concepts once again. Early works described framing as a "schemata of interpretation" (Goffmann: 1974) that is to say that a description is always provided from a certain perspective. According to this view, words are like triggers that help individuals negotiate meaning. More recently, framing is discussed in a number of theoretical contexts. In communication studies, for example, framing is employed for studying the latent meanings of observable messages in their contexts (e.g., Scheuffele, 1999). In social-systems theory the focus has been on codes of communication which can be symbolically generalized (Luhmann: 2002; Leydesdorff, 2007). In contrast to Goffmann's concept these newer perspectives shift their attention from the word to the connections between words. Gamson argues, for example, that a word never has meaning in itself, but it is formed by the frame in which it is used (Gamson: 1989).The communication of meaning (Vlieger & Leydesdorff: 2011). Is now to be found in a vector space that relates words to each other. Communication after all is not just a transmission of facts, which could be attributed to individual words, but a negotiation of meaning through combining words in phrases.

Frames thus construct meaning through combining concepts, issues or topics. They endow certain dimensions of a topic while occulting alternative ways of making sense. Especially for politicians and journalists breaking complex events down into simple messages is vital. Sometimes this process is derogatorily labeled as spinning, but while spinning carries an explicit or implicit value judgment, issues can be conceptualized positively as well as negatively in a shared frame. The difference between spinning and framing is furthermore often differentiated by whether the process of selection happened consciously or unconsciously. In the controversy over embryonic stem cell research, for example, Nisbet et al. (Nisbet, Brossard, & Kroepsch: 2003) showed how opponents framed it as morally wrong to destroy embryos, since they constitute human life, while proponents framed the same issue as morally right because research could lead to important cures. Both sides, while agreeing on the frame, under which the issue was to be discussed, still disagreed on the conclusions to be drawn from the common association of stem cell research with moral/ethics. While a frame theoretically may be imagined as valence free, in practice most framings are employed to push a topic in a specific direction. In fact we can imagine the mere act of relating a topic to another as adding a specific valence to it. A simple act like using one synonym over another suffices to push the meaning of a text into a certain direction.

At that point it seems to be a good idea to briefly dabble into two frame devices which may shape the obesity discussion in Austria. A frame device is an instantaneous translation (Nisbet: 2009b) of an underlying frame through a buzzword, catchphrase or keyword. The term obesity itself is subjected to two different translations in German: Fettsucht and Adipositas. They are often treated as synonyms but carry quite different implicit framings of the topic of obesity. Adipositas is linguistically the equivalent to obesity, adipös and obese both mean 'being overweight'. While the dictionary also translates Fettsucht into obesity, adiposeness or fatness, literally translated it would mean 'addiction to fat', or 'addicted to being fat'. The underlying frame seems to be that obese people are addicted to eating fat-laden food. While the qualifier Fett (fat) is commonplace for addressing obesity - obese itself means 'being fat' – the noun Sucht (addiction) is quite extraordinary in the context of a disease. By framing obesity as an addiction, it is implied that obese people lack the willpower to overcome their disease themselves. Framing obesity as an addiction means that obesity is linked with lifestyle. Lifestyle is an individual modifiable risk factor (Niewohner et al: 2001). This perspective is implicitly underpinned by the notion of the autonomous subject prevalent in Western science, economics, and philosophy including medical ethics (Sahlins1996). Secondly biological and social aspects remain clearly separated from the individual addiction that lies at the heart of the problem.

3.4 How to assess frames in media?

Let's take one step back for now and think about how frames could be assessed in the media. In qualitative social sciences implicit frames or concepts are usually coded manually (e.g. Kim & Willis: 2007, Boreo: 2006, Roy et al.: 2007). For large junks of text an automated method is needed though. The ongoing trend of analyzing social networks and the accompanying methods of factor analysis and network analysis are currently reworked to fit to semantic networks. The semantic pendant of social network analysis is co-word analysis (Callon et al., 1983; 1986) Here discourse is considered as a relevant system of reference (Vlieger & Leydesdorff: 2011) in much the same way as, for example, mutual friendship can be considered as a system of reference in social networks (cf.: Ball & Newman: 2012). Textual frames are formed, among other things, by the use of certain key words and their relations (Vlieger & Leydesdorff: 2011). These frames are often powerful, as changing a specific frame by a source might be interpreted by relevant audiences as inconsistent or unreliable. Furthermore the absence of relations in such a network can then be as informative as their presence (Burt, 1995).

Examining the literature on media framing, Matthes and Kohring distinguished five approaches to detecting media frames (Mathes & Kohring: 2008). Firstly, in the qualitative Hermeneutic approach, frames are identified by linking the content to broader cultural elements. Sandberg, for example, analyses thematic frames in four Swedish newspapers (Sandberg: 2007), raising questions about the mode of statements made about obesity. The findings, that overweight is frames either as a health risk or as a beauty dilemma, are subsequently linked to differences in the reader's attitude and gender issues.

Secondly in the linguistic approach, the unit of analysis is the paragraph, not the article. Thus a more fine-grained analysis is achieved that focusses on specific words and phrases as the building blocks of frames. Boreo (Boreo: 2006) links a linguistic approach with grounded theory to work out three dominant discursive pairings: "chaos and containment, professionalization and "common sense" and, nature and culture" (Boreo: 2006). The main difference to the hermeneutic approach is that Boreo links these broad categories to the occurrence of specific keywords and key phrases in the newspaper articles. Furthermore as her focus in on a detailed linguistic analysis, a smaller number of articles in analyzed in-depth.

In the holistic manual approach, frames are generated through qualitatively analyzing a small sample of articles first and are subsequently coded in a more quantitative manner in a large set of articles. In their article on how responsibility for obesity is attributed in US newspapers (Kim & Willis: 2007), Kim & Willis defined a coding instrument first, generating 4 main frames: Personal Causes, Societal Causes, Personal Solutions and Societal Solutions. Each of these frames was subdivided into four groups. Subsequently the frames were coded using quantitative content analysis. Each of the sub-groups was coded as either not present (0) or present (1), rendering the total number for the frames between zero and four. One of the problems associated with this method, as problematized by Mathes and Kohring is that once a codebook is defined other frames are difficult to discover (Mathes & Kohring: 2008). Since Kim's & Willis' research interest is appropriately narrow – they are only focusing on whether cause and responsibility of obesity is attributed to individuals or society – this caveat doesn't carry as much weight. If one tries to trace the discourse around obesity though, this approach is set up to fail.

The fourth and final method to deriving frames from media – the deductive approach – suffers from the same short comings. Frames are theoretically derived from the literature and then again coded quantitatively. One of the crucial prerequisites, of this approach, is that one needs to have a clear idea what frames will be present in the media before analyzing the data.

As a fifth category Mathes and Kohring mention the computer-assisted approach. Recently the drive to use more objective and comparable methods has led to a stark increase in computer-assisted frame-mapping, as an automated approach to generating frames from a text. Instead of discovering the frames manually, the task is now outsourced to a program that computes the frames automatically. While the qualitative methods to discover frames, suffer from subjective tendencies in researchers and coders, the computer-assisted approach is certainly prone to black-boxing the employed method entirely. Still, to trace a discourse that is not known to the researcher in advance and to deal with large sways of data, computer-assisted methods are an indispensable tool.

According to Mathes the aforementioned frame mapping was described "as a method of finding particular words that occur together in some texts and do not tend to occur together in other texts" (Mathes: 2008, p. 4). This co-occurrence of key terms and in extension the textual incarnation of language is directly taken as a signifier for frames. As Watson argued language practices are a central resource in rendering discourse intelligible and sensible (Watson: 2009). In difference to the qualitative approaches introduced above, language is taken at face value, implying that words and phrases have the same meaning within every

instance in the dataset. As Vlieger and Leydesdorff assert, the computer is unsuited to understand human language with all its subtlety and complexiveness (Vlieger & Leydesdorff: 2011), instead treating words as raw data. To begin our un-boxing of how the computer-assisted approach works, we thus need to start by looking at how data is imagined in them.

4 Paradigms and Turns: The Building Blocks of this Project

"The Internet is a research site where one can ground findings about reality" (Rogers: 2010, p. 241)

A peculiar set of new paradigms and turns drives the future of digital social research. Under labels like the algorithmic turn in social research, Big Data or the Network Paradigm these trends change how social science is done drastically. In this chapter I will try to introduce some of the imaginations driving these buzzwords and how they affect my research.

4.1 Big Data, Dark Data, Raw Data?

According to Schudson (2010) "the database is to the digital age what the narrative was to the modern era of the novel and the cinema". The implications with the digital age are not just felt in the realm of native digital data though, but also in the increasing amounts of analog data being transformed and subsequently gathered on the internet. The growth of the internet, measured in amount of words, is estimated to be 2.5 quintillion bytes of data every day (Zicari: 2012). No wonder that analysis of Big Data is seen as the key to competitiveness, innovation and general wellbeing in the 21st century (Hilbert, Lopez: 2011).

While Big Data is already recognized as a key component in the aforementioned areas, social science has been slow to pick up on the trend. According to Zicari "very few people seem to look at how Big Data can be used for solving social problems. Most of the work in fact is not in this direction." (cf. Zicari: 2012) Why is that the case? Big Data can help the analysis of complex circumstances and the emerging stories are of value to the wider public. Social scientists world-wide need to hop on the Big Data bandwagon now and start telling stories about them that will grab people's attention. Lest we will fall more and more behind an ever growing web full of unrealized research opportunities. "Databases have become part of

the lives of anyone who searches for information online. Our own transactions online make us part of databases ourselves; databases 'r' us" (Schudson: 2010, p. 8).

The Big Data craze probably started in earnest in the early 2000s. Proponents of big data solutions claim then, for the first time, huge amounts of data were available and in need of new solutions. Most stories talk about a sudden "information explosion hitting large organizations" (cf.: Schueren: 2013). But when is data big enough to be called Big Data? Wikipedia[2] tells us that Big Data starts around exabytes of data; an Exabyte being the analogous 6th power of 1024 bytes. Truthfully my data is much smaller than that. But Thankfully Gartner, Inc., a Stamford, Connecticut based information technology research and advisory firm came up with an alternative definition:

> "Big data are high volume, high velocity, and/or high variety information assets that require new forms of processing to enable enhanced decision making, insight discovery and process optimization." (Laney: 2001, p. 1)

According to Laney volume, velocity and variety are the key characteristics of Big Data. These three V's reflect the relativity of Big Data, the volume at which new forms of processing are needed, for example, depends mostly on the tools employed before the 'information explosion' happened. While ~2000 newspaper articles may be small data for some, in my case, it is probably the biggest dataset I ever dealt with. Furthermore Big Data isn't just about size, it is also about the speed with which the data changes and the variety of its 'assets'. In her article on the three V's Sicular added another dimension to Big Data: dark data. Dark data is hidden data, according to Sicular it is "similar to dark matter in physics" (cf.: Sicular: 2013). It cannot be seen directly, but it can be discovered using special instruments. While this may seem esoteric at first, it helps to think about what is imagined as data. The newspaper articles my master thesis analyses, for instance, can be read quite obviously, but using them as the source of this project, they get transformed into data. If we stick with Sicular's metaphor we could say that dark data suddenly comes to light. Kranzberg & Bowker came to quite similar convictions writing that: "data needs to be imagined as data in the first instance, and this process of the imagination of data entails an interpretation" (Kranzberg & Bowker: 2011, p. 5).

As researcher we thus need to publicly account for the way we imagined our data and its limits as well as the limits of how we can frame our research to coincide with our data. For Kranzberg & Bowker the imagination of dark data – or raw data as he calls it – is both an oxymoron and a bad idea (Kranzberg & Bowker: 2011). The way in which we imagine our

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[2] http://en.wikipedia.org/wiki/Big_data

raw data impinges directly on how our processed data will look like after all. For Kranzberg & Bowker Big Data's value comes from its fundamentally networked status. In this project I try to heed Kranzberg & Bowker's warnings by documenting each step of my algorithms in detail and reflecting to the best of my ability on the implicit properties inscribed by these computational practices. Finally, in a time were Big Data reigns supreme, the value of small data should not be underestimated. By subjecting conclusions drawn on the grand scale to tests on a much smaller level, for instance through close readings of newspaper articles, crucial decision in the quantitative parts of the analysis can be informed and also validated (Lindgren and Lundström, 2009).

4.2 The Algorithmic Turn

The algorithmic turn is a concept quite similar in appearance to the Big Data movement. While Big Data, as the name implies, focusses on challenges associated with large datasets, the concept of the algorithmic turn zooms in on just what we do with this new data landscapes. As Kranzberg & Bowker alluded to, the value of Big Data comes from the patterns that can be derived by making connections (Kranzberg & Bowker: 2011). The question just how these patterns and connections are constructed seems even more pressing in light of the Big Data craze. The practice of data mining, i.e. deriving patterns, is interpreted as a fundamental new form of technical expertise in business and scientific research (Jones 2013). Barocas approaches algorithms from an even broader angle, and takes them as a new form of rationality, symptomatic of a new mode of social ordering (Barocas: 2013). He detects a tension about algorithms: on the one hand they are invoked as powerful entities, which "govern, judge, sort, regulate, classify, influence" (cf.: Barocas: 2013) the process of data retrieval, on the other hand they are imagined as elusive and borderline unstudiable. Luckily Marres & Welteverde tried the seemingly impossible and investigated just how scrapers- a specific type of algorithms for extracting data from the web – work. The parser employed in this study can be seen as an offline instance of a scraper, the only difference being that it scrapes the data from a text file instead of retrieving it straight from the web. Scraping, they write, is offering new opportunities: "it promises to enable the development of new ways of collecting, analyzing, and visualizing social data" (Marres & Welteverde: 2013, p. 2). A scraper is thus a device with many properties: It is responsible for gathering the data, for analyzing it and for making it visible. Taken as an opportunity, algorithms offer the possibility to scrutinize research in the making. First and foremost, scraping offers a solution to the circumstance that data out there on Web pages and

platforms is not edited to fit into common statistical software packages. As recent twitter studies highlighted (f.e.: Lindgren & Lundstrom: 2011; Ausserhofer & Maireder: 2013), data on the web is both pre-structured and unstructured at the same time. In the case of twitter large quantities of user-generated and in the first instance unstructured data are amassed. Through the use of hashtags and @tags structure is reintroduced. Scraping holds the promise of using the pre-structured elements of any given dataset while at the same time detecting patterns in unstructured parts of the dataset. As will be shown later, the newspaper articles analyzed in this project are quite similar: they consist of pre-structured parts like the name of the newspapers, the publication date or the page number, while the full text of the articles is unstructured and can be analyzed separately using semantic network analysis. Scraping also holds a second promise: "it may potentially solve the long-held research problem raised by online digital data, often referred to as a problem of 'dirty' data" (Marres & Welteverde: 2013, p. 13). Seen from the perspective of a scraper data, in fact, is never dirty. It is either well-structured or less well-structured. As the very purpose of a scraper is to analyze emerging patterns, the question of quality partly depends on the operations that devices and researchers perform. Structuring 'dirty' data is a challenge every scraper needs to face, restating the relation between objects and methods of digital social science. In my case the utter mess in the resort category attached to every newspaper article enabled me to rethink the given categories and to come up with a categorization that is more stringent and more relevant to my own research interest. The aim is to determine which formats and categories are analytically most productive for social research and to implement them into the scraper, leading to a circular research-design.

4.3 The Network Paradigm

While the first two paradigms or turns, dealt with data handling, at first sight the network paradigm seems to be all about visualization. Far from it though, networks are deployed as tool, rationale, and proof within the methodological canon of social network analysis (Mayer: 2012). Historically speaking network visualizations took the backseat for a long time. Matrices and mathematical means were deemed more objective in handling the data. With the advent of new powerful visualization programs (f.e.: Pajek, Gephi) this relation was turned upside down and network visualizations have become 'obligatory passage points' once again (Mayer: 2012). In network analysis, producing and representing knowledge are closely related. Hence it makes sense to think about just how knowledge is produced via network visualization? In "From Data to Wisdom" Ackoff distinguishes between data,

information, knowledge, understanding, and wisdom (Akoff: 1989). While his imagination of data resembles the concept of raw or dark data discussed previously, information is data that has been given meaning (Brandes: 2006). In today's understanding of the network metaphor, network visualizations serve as just that.

The very act of mapping data in a network provides it with meaning. Network visualizations act as an exploration and proof at the same time and have penetrated into everyday life, as is evident by the current trend to map one's friends on Facebook [3], or to map twitterconversations [4]. According to Mayer "further automatization and limited access to manual image processing, network diagrams become objectified matters of fact and digital interfaces to social space" (Mayer: 2012, p. 174). Once again the only way to open up these technologies seems to be detailed documentation and explicitly stating decisions made on the way.

5 Building the Database

5.1 From ‚raw' data to smart data
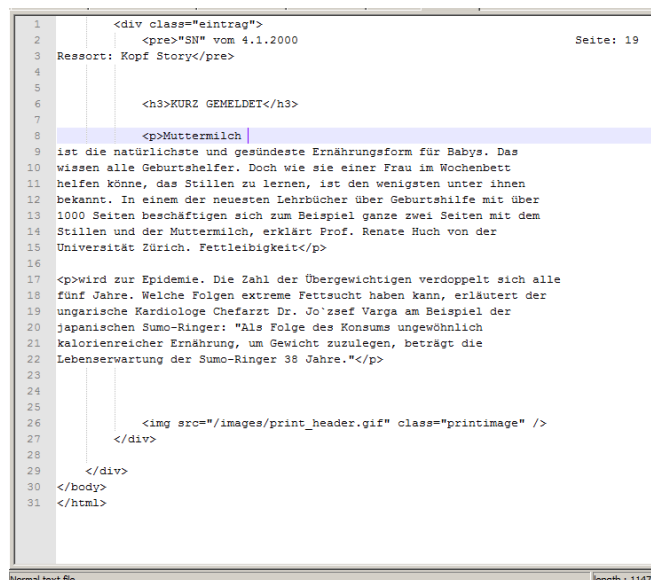
Newspaper articles for this study came from a keyword search of the apa defacto-campus database. Using the keywords Adipositas, Fettsucht, adipös and fettsüchtig appearing in the headline, lead paragraphs, or full text, I retrieved articles published in twenty-three national and regional newspapers. The analysis included articles published between January 1st 2000 and December 31st 2010. The initial search yielded a total of 2848 articles.

The entire dataset was retrieved as a continuous xml-file and saved as a text file. A self-made parser was employed to transform this vast set of newspaper articles into a semantic network representation. The parser was written entirely in java and produces a table

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[3] www.facebook.com/myfriendmap

[4] twittermap.appspot.com/

Figure 1: A quick look at the (not so) raw data

representation as well as a gexf file. To produce this output the parser goes through a series of steps: (1) all meta tags - including authoring newspaper, publication date, page, resort, title and fulltext - are parsed into a table; (2) the Stanford parser is automatically invoked to compute grammatical relations of the title and full text; (3) the Porter Stemmer is used to stem the grammatically annotated words in the title and the fulltext; (4) the initial table and the now translated text modules are recombined. At this point the table representation is finished. (5) In the last step this table is translated into a network representation as a gexf-file.

Figure one shows the first article that came up within the search parameters mentioned above. It is opened in a standard word processor. As is readily apparent some things are quite different from how newspaper articles normally look. First of all it is presented in Hyper Text Markup Language (html). The small elements enclosed in angle brackets (f.e.: <p>) are called tags and delineate text based content from each other. Every article starts with a <div> element and ends with a </div> element. These pairs are the outer boundaries of the article and are used by the parser to differentiate between articles. The parser starts by fetching the first article and simply analyzes it top to bottom. Between the <pre> and </pre> elements plenty of meta-data is hidden. "…" denotes the name of the newspaper; in the case of figure 1, SN stands for Salzburger Nachrichten. This is followed by the publication date of the article (4.1.2000) and after a plethora of blanks the 'Seite:' string points to the page number, followed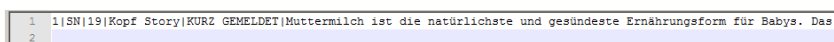 by the resort, practically tagged by 'Ressort:' Following the article to line six, the <h3> and </h3> elements confine the header of the article, followed by its full text, bounded by <p> and </p>, from line eight onwards. The <img…/> element simply denotes the footer and is ignored as are all other image elements which might be included in the article. The first and quite simple step the parser performs is to collect all those tags and write them into a different text file (shown in figure two). Now that all the easily obtainable raw data was collected from the articles, they were reworked into network data, through a series of steps. Firstly, and between each subsequent step, the data was cleaned according to my own routines, secondly its grammatical structure was worked out with the

```
1    1|SN|19|Kopf Story|KURZ GEMELDET|Muttermilch ist die natürlichste und gesündeste Ernährungsform für Babys. Das
2
```

Figure 2: The first article in the database

Stanford parser and thirdly the individual words were stemmed using a modified snowball stemmer.

5.2 Automated Cleaning

Now that all articles were joined in one text file, I could clean the text to make grammatical parsing possible. First of all, quotation marks had to be deleted, because the Stanford Parser treats them as individual words, which frequently resulted in wrong grammatical dependency tables. Furthermore sentences longer than 100 words were ignored to keep computation time down. Parsing all articles even without including those exorbitantly long sentences needs more than 2 hours on my laptop. Thankfully sentences longer than 100 words are not just the result of exceedingly bad writing style, but are mostly lists of birthdays, fatalities or TV programs. As articles which present these kinds of data – fatalities are often presented with the cause of death, thusly they feature the term obesity in some instances – weren't of any interest to my project, I decided to delete the entire article if it contained a sentence that long. Next up I deleted all articles that didn't feature any periods. Once again a newspaper article missing periods entirely was hinting at the article being a list of events instead of a proper article. After these cleaning procedures 2641 articles remained in the database. These automated cleaning processes, while important didn't shrink the database too much and a quick glance at some of the articles revealed that further manual cleaning would be necessary. Prior to that, I implemented the next step in transforming the database.

5.3 Stanford Parser

A list of newspaper articles, even a cleaned one, still isn't a network. A network is defined as a dataset where some objects are connected to others. These objects are called nodes and the connections are commonly referred to as edges. One of the central issues of network analysis is how to move from a table representation of the data to a network representation of it. In some instances, for example social network analysis, the move seems natural. If we would try to render a list of friends as a network, we could construct people as nodes and friendship as edges. Still questions as to how and why this form of representation is eligible are justifiable. In semantic network analysis no apparent method of constructing the network offers itself. One common method is to aggregate variables in a matrix which is normalized in terms of co-occurrence (cf. Leydesdorff: 2010). As these matrices do grow larger with every added word and most textual sources contain too many different words for mapping all of them, somehow the relevant words need to be extracted and the meaningless words need to be cast aside. This is often done by using stop-word tables (f.e.: Leydesdorff: 2010). These stop-word tables are pre-defined lists of 'meaningless' words which are often selected by third parties to avoid bias by the researcher or are qualitatively assembled for a specific issue at hand. Yoon, Janghyeok and Kim, Kwangsoo refined this easy albeit crude method by

adding subject–action–object (SAO)-based semantic analysis (Yoon et al.: 2011). SAO structures are syntactically ordered sentences that can be automatically extracted by natural language processing of text. Natural language parsing works out the grammatical structure of sentences, for instance as in the case by Yoon and Kim, which words are the subject or object of a verb. They explicitly show the structural relationships between subjects, objects and verbs. Furthermore they help with removing clutter as they, in the case of SAO-structures, only consider nouns and verbs from the outset and at the same time already carry co-occurrence information, which can be used for visualization or further inquiry. Building on this ingenious idea this thesis uses natural language parsing for removing unwarranted words and constructing the co-occurrence table at the same time.

To that end, in the early 1990s the first probabilistic parser were developed to enable context-free parsing. However, early results on the utility of PCFGs (Probabilistic Context Free Grammar) were disappointing at best (Klein & Manning: 2003). The best-performing lexicalized PCFGs have increasingly made use of sub categorization. This process was defined by Chomsky as the division of syntactic categories into smaller units (Chomsky: 1965); for instance, by dividing verb phrases into finite and non-finite verb phrases (Klein & Manning: 2003). Probabilistic parsers use knowledge of language gained from hand-parsed sentences to try to produce the most likely analysis of new sentences. Through employing statistical methods, the margin of error depends on the quantity and brevity of the hand-parsed data. Many of the techniques developed to help English language parsing, unfortunately don't increase performance in German language parsing (Rafferty & Manning: 2008), as the word order in phrases is much freer in German than in English. Because parsing German is considerably harder and thus more time consuming computation wise, Part-of-Speech tags were chosen as the output format. Part-of-Speech tags were designed specifically to help people without linguistic expertise who want to extract textual relations and non-linguists thinking about tasks involving information extraction from text (Marneffe & Manning: 2008). The parser was trained with the NEGRA corpus, a syntactically annotated corpus of German newspaper texts, particularly suitable to annotate other newspaper articles. Especially for languages featuring free word order, the flat representation of grammatical relations is better suited for producing appropriate annotations (Skut et al.: 1997).

Fleshing out an example of how natural language parsing can be used to develop network structures might help immensely in making sense of the technicalities discussed above. Given a set of randomly chosen sentences about obesity:

"In the fight against obesity New York City Mayor Michael Bloomberg wants to limit the sale of sugary soft drinks such as cola on half-liter sizes."

"In the fight against obesity a tax on chocolate was introduced."

"The fight against obesity: now chocolate and cola will be taxed among others."

Given such a small sample size – only three sentences – working out the central concepts is easy. All three frame obesity in terms of "fighting against it" and then provide an act of how this fight is carried out. In the first case by asserting that the major of New York wants to introduce a tax on sugary food stuffs. In the second by stating that a tax on chocolate was introduced and in the third by claiming that both chocolate and cola will be taxed. If we imagine for an instant that instead of just three sentences we are confronted with a few thousand newspaper articles we can imagine that our individual ability to tease out the common themes in all of them might abruptly come to a halt. If we carry on with this little demonstration and parse those sentences with the Stanford Parser, the result is a list of grammatical relations. Shown here is the beginning of the first sentence:

```
root(ROOT-0, In-1)
det(fight-3, the-2)
pobj(In-1, fight-3)
prep(fight-3, against-4)
pobj(against-4, obesity-5)
aux(introduce-7, to-6)
infmod(fight-3, introduce-7)
det(tax-9, a-8)
dobj(introduce-7, tax-9)
prep(introduce-7, on-10)
pobj(on-10, chocolate-11)
```

Each lines starts with the label of the grammatical relation, for instance "det" for a determinant. In parentheses the two words which share the grammatical relation are noted and provided with a number that denotes their number in the sentence. Now all requirements of a network structure are fulfilled. The words are the nodes and their grammatical relation is the edge between them. If we visualize the sentences above and apply a bit of magic the following visualization results:
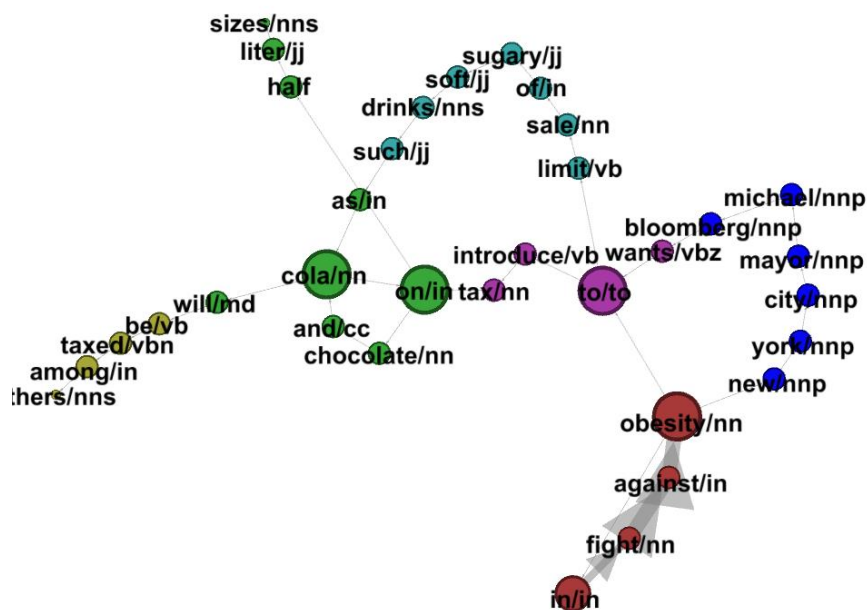
Figure 3: Visualization of three sentences

While in the case of using three sentences as a basis for the network visualization, clutter might be generated the basic premise should still be clear. The center of the visualization shows the nodes "tax" "on/in" "cola" "and" "chocolate", which is the basic piece of information all three sentences contained while the red tail at the bottom denotes the phrase in fight against obesity. The other parts of the network, which are only featured in one of the sentences are grouped around this informational core. A network visualization using typed dependencies as a resource for edge generation, thus achieves two things: Firstly words that are used frequently are moved to the center of the visualization, letting us interpret what is important to the discourse at hand. Secondly using typed dependencies groups words according to how they are used, which allows us to interpret the make-up, i.e. the style of language used.

5.4 Snowball Stemmer

By now all core functionalities are in place. Data was compiled using a parser, cleaned and then translated into a network using the Stanford parser. These steps already generate a

usable visualization, but one more key problem had to be solved. In natural language words are used in a plethora of different inflections. An inflection is a change in the characters of a word either through a prefix, suffix or infix or even through a vowel change (Brinton: 2000). The verb "write", for instance may be used as "writes", "written", "wrote" and so on and so forth. Some of these changes only alter the end of the word – which is called a suffix – while others like in "wrote" change the middle of said term. As German is using an extensive case system it is considered a highly inflected language, in difference, for instance, to modern English which experienced a heavy deflection compared to old English (cf. Haspelmath: 2002, Katamba: 1993). As different inflections of the same word don't bestow any analytical surplus to a semantic network analysis; in fact they confuse it without adding any benefit; inflection hat to be removed from the final dataset.

To make things a bit more challenging German isn't just extensively using the case system, it is also one of the morphological most complex languages (Caumanns: 1999). Its particular complexity stems from the fact that lexemes don't just change the end of a word, but also its root. For example, while the singular 'house' inflects into the plural 'houses' in English, the German language changes 'Haus' to 'Häuser'. Automated stemming algorithms thus have an exceedingly difficult time with correctly reducing words do their root forms. But let's start at the beginning: What is the goal of stemming? According to Caumanns, a stemmer should conflate together all and only those pairs of words which are semantically equivalent and share the same stem (Caumanns: 1999). This means that ideally our aforementioned 'Haus' (house) and 'Häuser' (houses) should both be conflated to the root form 'Haus', while a word like 'Behausung' (housing, dwelling) should not be stemmed at all, as it is considered to be a different morphological root. Now the difficulties become clear to see. How to train an algorithm to change either the beginning of a word, its end, its middle or none of them at all? The entire situation becomes even more mind boggling if we consider the words Leber (liver) and Bilder (pictures). Both end on –er, but while Leber is singular and thus doesn't need to be stemmed, Bilder is plural and it' correct root would be Bild (picture). Luckily minds, far greater than mine, occupied themselves with this riddle and came up with an ingenious algorithm.

Already in the 1980ies Porter designed his stemmer, at that time still called an algorithm for suffix stripping (Porter: 1980). Since then the algorithm was extended to strip prefixes and inflexes as well. The German version of the Porter stemming algorithm was initially written in snowball, a small string-handling programming language, but was since ported to java. Hence implementing the Porter stemming algorithm in my parser was rather easy, the results unfortunately are a mixed bag of goods. While some words are correctly stemmed others are not – German is just too complex – and my attempts to improve the original stemmer

algorithm to better suit the textual data where quickly halted by either unintended consequences or restrictions placed on computing power and time. In some cases terms had to be stemmed manually and I did so whenever I stumbled upon one.

5.5 The table representation and Manual Cleaning

After working out the grammatical structure with the Stanford Parser and stemming the individual words using the Porter Stemmer, I decided to go through with another round of both automated and manual cleaning. Through looking up the articles associated with cryptic resort names, I could detect most articles about TV-programming, calendars of local events as well as the remaining birthday and fatality lists and deleted them manually. Next I wrote a small script that deleted all duplicate articles both by title and by fulltext. Lastly I went through the entire database article by article to make sure that everyone was suitable. After finishing this tedious piece of work 1947 articles remained.

5.5 The Gexfparser

Finally a parser was used to transform the final text file into a gexf. GEXF (Graph Exchange XML Format) is a language in which complex networks can be written, similar to how homepages can be written in html. As GEXF stems directly from the makers of Gephi – the program I used for visualization – using GEXF was natural. It is also the most complete language to describe complex networks in terms of features. Both hierarchical structures and network dynamics are incorporated.

As Gephi is still in beta, gexf changed the way it worked quite a bit during the course of my project, which resulted in sleepless nights and quite a bit of hacktivism. Frequently working parts of the language were tinkered with, resulting in me having to rebuild the parser from scratch. One especially painful realization was when I realized that the switch to gexf4j 0.4.4 beta – the java library for gexf[5] - changed the way in which edges can be constructed. While newspapers and articles are unique entities in the database – each single newspaper or article only occurs once – words are used in a multitude of articles. Thus constructing the edges between words is quite the challenge. Every time a word occurs the parser has to

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[5] https://github.com/francesco-ficarola/gexf4j/releases

check whether the corresponding node already exists in the database and, if so, add the new edges with a timestamp. If it doesn't exist the parser has to generate the word as a new entry in the database. While the latter is rather easy, the former required some tinkering and I finally settled on adding new edges as attributes to the word-nodes. Unfortunately this method of adding edges didn't work following version 0.4.4 of the gexf4j, leaving me with a parser where new nodes and edges were written correctly, but the addition of edges to already existing nodes failed miserably. The final GEXF file being more than 2,7million lines long, I also overlooked that mistake for quite some time. In the end I settled on converting the non-functional edges into working edges via a quick and hacked band-aid, instead of reworking the parser as a whole.
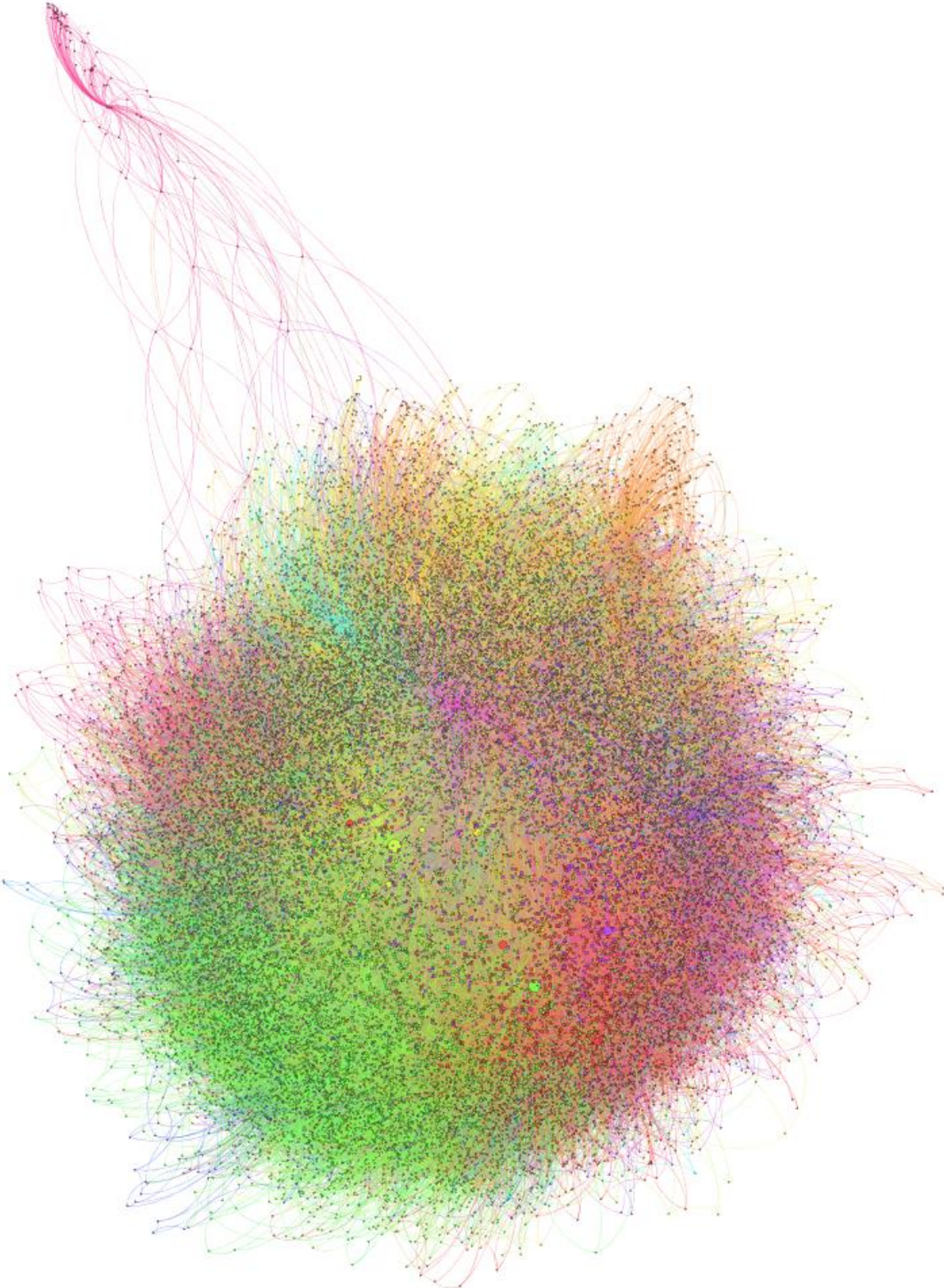
Figure 4: The entire network visualized

5.6 Pictures of Nothing?

Figure 5, was done using the 1947 articles which are featured in the final database. It shows the entirety of the network over the entire timespan. Each little point in the visualization is a word used in one of the articles. Words are colored according to their modularity and size is determined by the frequency at which they occurred over the entire timespan. The connections – as far as they are distinguishable - are co-occurrences in sentences. Is it a picture of nothing though?

In his famous paper Lynch tackled how graphic elements are conveying an impression of rationality through what he calls "rhetorical mathematics" (Lynch: 1991). Otherwise heterogeneous realities are re arranged as "orderly flows of causal influences" (Lynch: 1991). The issue with these modes of ordering is that they are flattening out heterogeneity in otherwise chaotic and messy findings. The visualization above, I would argue, does the opposite. It shows the complexity of the database and in extension of the underlying newspaper articles. It doesn't flatten the multiple for clarity and precision, but instead embraces the vagueness of rendering ten years of news coverage in one database and one visualization. Certainly it is an awful mess to look at. TO write about obesity, 34708 distinct words were used over the timespan of 10 years. The absurd amount of 379265 different combinations of words were used in sentences at one time or another. The complexity is surely mind boggling. It is a reminder of the power of framing devices. Each of the newspaper articles only realizes a tiny, almost miniscule, amount of what has been written about obesity overall. And we have to remember that this is just what has been written in ten Austrian newspapers, much more text is produced daily in television, academic writing, art and so on. And still then, if we would collect all texts written on obesity, they would only contain what has been written, not what could be written. Surely the possibilities are limitless. Subsequently this visualization serves as a powerful reminder that this project only analyzes a tiny contingent of the communication on obesity and that any single instance of communication necessarily chooses a small fraction of what can be said about the subject. The next chapters will try to unravel these complexities and show how the collective framing exercise emphasizes some aspects of obesity while occulting others.

6 Empirical Analysis

This chapter analyses the data extracted from aforementioned newspaper articles using the methodological approach highlighted in chapter five. It is divided into four parts which each present their own analysis. Part one will contextualize the phenomenon under scrutiny by giving a short overview of the data and contextualizing it with by applying Google's ngram-viewer. The following three parts each analyze one of the major interests developed in chapter one. Therein part two takes a closer look at the two keywords Adipositas and Fettsucht and engages in analyzing both frequency data and semantic network visualizations. Part three switches gears and presents a longitudinal analysis of changes in the semantic network of obesity over time. Finally part four analysis differences in the coverage of obesity between individual newspapers. By splitting the empirical chapter into separate parts it is possible to evaluate each approach in turn. Later parts of the analysis are, of course, influenced by earlier findings though, which might serve to explain the direction of focus taken in parts four and five.

6.1 First glance at the dataset

9 daily newspapers contributed to the final group of articles in varying intensity. The tabloid Kronen Zeitung contributed by far the largest number of articles (306), which doesn't surprise any connoisseur of the Austrian media landscape. As of 2008 more than 5 million Austrians read a daily newspaper (Plasser: 2010), more than 42% of which read the Kronen Zeitung, Austria's biggest tabloid. The Kleine Zeitung Austria's second largest tabloid is only read by 12% of all daily newspaper consumers, which exemplifies the extreme horizontal and vertical concentration of the Austrian media landscape. The so called quality newspapers Der Standard, Die Presse and Salzburger Nachrichten only add up to 13,5% of all readers. The Kurier which is often described as a hybrid between a tabloid and a quality newspaper reaches 8,8% of daily newspaper readers.

Table 2: List of Newspapers and Articles

Newspaper	Article Count
Krone	306
Kurier	238
Oberösterreichische Nachrichten	186
Kleine Zeitung	178
Die Presse	163
Der Standard	143
Salzburger Nachrichten	125
Tiroler Tageszeitung	115
Wiener Zeitung	109

To make sure that every newspaper included in the final data aggregation is balanced in its coverage of obesity, I chose to only use the 9 newspaper which published most articles on the subject. Newspapers with smaller coverage would not offer the needed depth and breadth of coverage to allow for the in-depth analysis they are subjected to when a semantic network analysis is performed. The chosen set features both national newspapers and regional newspapers, thus even though the smaller regional varieties were left out, the breadth of coverage in Austria is still accounted for. A healthy mix between so called tabloids and qualitative newspapers is achieved by the selection as well.

6.1.2 Contextualization via google tools

Google offers a number of exploratory tools for researchers and people alike, to gain a quick oversight over search topics and occurrences of keywords in books. Figure 3 shows the occurrence of the keywords Fettsucht and Adipositas in Google's ngram-viewer. This tool displays a graph showing how often those keywords were used in Google book's corpus of

German publications. Before 1975 Fettsucht was the more common term, but slowly lost its lead and was finally overtaken by Adipositas in 1975.
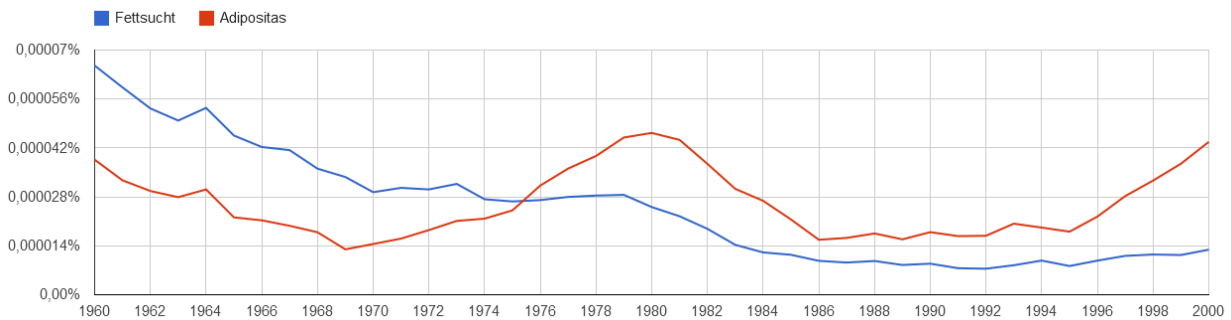
Figure 5: Google N-Gram of terms Fettsucht and Adipositas

Adipositas peaked around 1980 and has been falling steadily until 1996. The next bump upwards started in 1996 and again while the increase for Adipositas is readily apparent, Fettsucht only sees a marginal growth. We have to consider though, that this graph is drawn using all German speaking books. The situation in Austria might be quite different. This hunch is backed up, by Google search trends analysis. Google Trend's allows us to gauge what people are searching for on Google Search. Adipositas and Fettsucht were mapped again, this time zooming in on the regional search rates in German speaking countries. The numbers in table three represent search volume relative to the highest search frequency which is always 100. The comparison reveals that Fettsucht is way more common in the Austrian context, than in other German speaking countries.

Table 3: Google Trends Search Rates

Adipositas		Fettsucht	
Germany	100	Austria	100
Austria	87	Germany	53
Switzerland	57	Switzerland	27

6.2 Adipositas and Fettsucht

As my early exploration via google tools reveal a stark contrast in the usage of Fettsucht and Adipositas over time, I subsequently looked at the frequency of both terms in my data sample. As a control variable I also added the term Übergewicht. Figure six shows how often these three terms were used in all newspaper articles for each year. The grey columns (Count) indicate the number of articles, while the blue, red and green lines show the number of times each of the associated keywords appeared in those very articles. From 2000 to 2007 the number of articles about obesity increased continuously, but then dropped heavily in 2008, to reemerge in 2010. The relation between Adipositas and Fettsucht is marked by the former
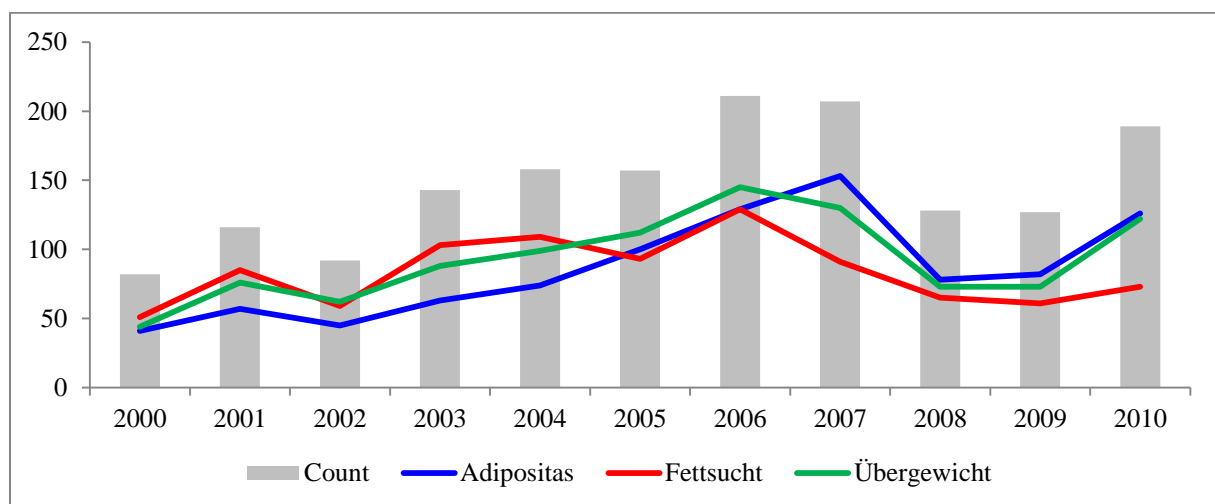
Figure 6: Occurrence of keywords (absolute)

edging out the lead at first. In 2005 Adipositas takes a dip though and the ratio is turned on its head, with Fettsucht being the more popular term until the end. In all years but 2005 and 2006 Übergewicht achieved second place clocking in at slightly less mentioned than the particular winner. At first I 'didn't think much of this but as latter analysis revealed this pattern will prove to be quite meaningful. As both terms can be featured more than once per newspaper article and can both be used in the same article figure seven shows relative values for both. Here the overall trend becomes even clearer. Adipositas and Fettsucht switch roles during 2005 and 2006. The former being used more frequently before that, while

the latter is being used more often after that incision. This of course poses a number of questions, which I'll try to answer during this project.
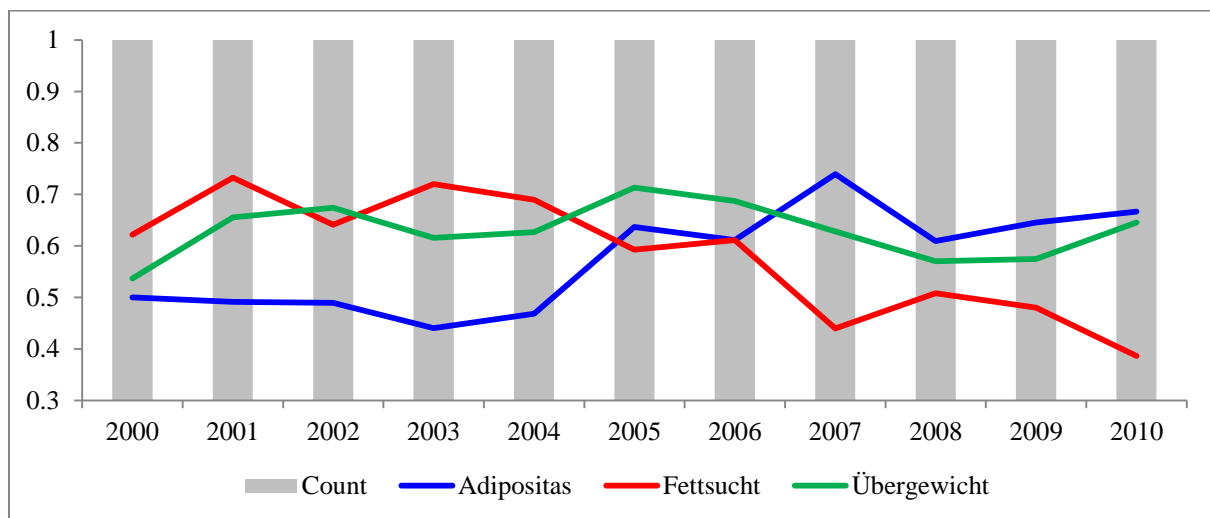
Figure 7: Occurrence of keywords (relative)

First among which is the question of what happened in the period of change between 2005 and 2006? Did one term just slide out of favor and was replaced by the other, or did a profound change in how obesity is imagined take place that is exemplified by the changed frequency of those two keywords? What is the role of Übergewicht in all of this? Before going into a detailed account of the semantic network emerging from my data, I will look at possible cyclicity patterns for each year.
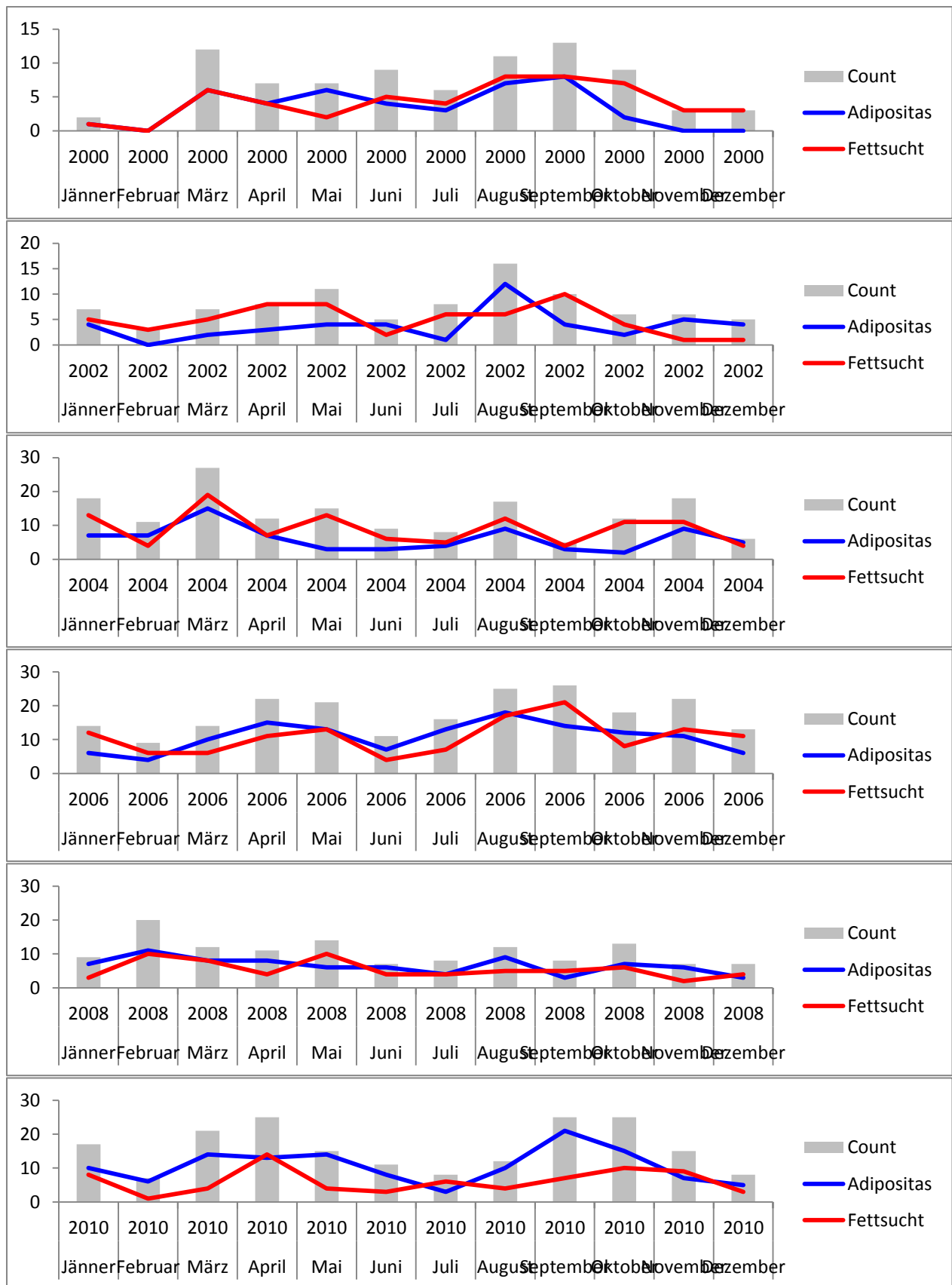
Figure 8: Cyclicity Patterns from 2000 to 2010

6.2.1 Cyclicity or Not?

Cyclicity denotes the concept, which media coverage of issues tends to increase and fade in patterns. Media reports of mass shootings, for instance, tend to be re-reported a year after the event, while reports on epidemics, like swine flu or SARS are reported around the same time every year. My initial hypothesis was that obesity coverage in Austrian newspapers would follow a similar yearly cycle, with coverage being intense during the winter months, as people are generally eating more and do less sport and at the beginning of summer when people try to slim down again.

The visualizations on the left show the breakdown of newspaper articles and Adipositas, Fettsucht occurrences by month, for every other year starting in 2000. Quite contrarily to my initial assumptions though, no clear pattern of coverage emerges. In some years March is strong in others February. Some years feature a spike in august and September, while others don't. If any kind of conclusion concerning cyclicity could be drawn it would be that there is a spike in spring and another one in fall, but that coincides with the general ebb and flow of news coverage, I.e. media is in a general lull in the summer and holiday season. If coverage of obesity doesn't follow a strict cycle determined by media logic the reason for the observable ebb and flow has to lie outside of media.

While looking through the newspaper articles during timeframes of intense coverage, I stumbled upon a lot of event announcements, thus I tried to map obesity related events in Austria through using the Austrian Press Agencies' press release service. As it turns out most, if not all, of the spikes in obesity coverage seem to be triggered by some kind of national event. Regional anti-obesity initiatives, press conferences by the ministry of health or NGO's and even presentations of research results are both lining up with the ebb and flow of obesity coverage and are heavily cited in the corpus of newspaper articles. The reports mentioned in the chapter on the state of obesity in Austria also seem to create spikes in the timelines observed. Remarkably enough while the early focus was on obesity treatment for adults and associated secondary diseases, the coverage switched around 2005/2006 and now concerned itself mostly with obesity in children as a consequence of bad diet and sedentary lifestyle. As Felt et al. observed, this focus on children "plays a crucial role in describing and dramatizing the threat to the nation's future" (Felt et al.: 2014). By focusing on children traditional imaginations of family order seem to be under attack by a modern

environment, whose speed and stress force parents to neglect traditional childcare. As we will see in the temporal analysis of the semantic network, children as a focal point of coverage are taking center stage from 2005 onwards and remain one of the most important topic clusters from then on.

6.2.2 Topological comparison of Adipositas and Fettsucht

To get a better grasp at how the shift in usage of Adipositas and Fettsucht impinged on the content of the newspaper articles, I continued by splitting my overall database into two parts. One which solely contained the word Fettsucht and another with articles only using Adipositas. By subjecting those two resulting databases to semantic network analysis separately, differences in the coverage of each keyword should become apparent. Thankfully roughly the same number of articles feature one or the other term, 568 articles for Adipositas and 565 for Fettsucht, hence comparability should be ensured and both networks should be roughly the same in size and topology. Moreover most newspapers published roughly the same number of articles for both keywords. The only outlier in this regards is the Kronen Zeitung, which published 148 articles solely using the keyword Fettsucht and only 80 articles only featuring Adipositas. Furthermore the average length of articles is roughly the same (Adipositas: 2365,7; Fettsucht: 2184,2).

keyword/ newspaper	Der Standard	Die Presse	Kleine Zeitung	Krone	Kurier	Oberösterreichische Nachrichten	Salzburger Nachrichten	Tiroler Tageszeitung	Wiener Zeitung
adipositas	54	44	58	80	88	84	71	38	49
fettsucht	38	59	63	148	72	59	52	39	34

Both databases were loaded into Gephi and subjected to k-brace filtering, to extract the most important topic clusters and move them as close to 100 nodes as possible. As the Fettsucht database started at 11498 nodes, while the Adipositas database only had 11047 to start with, the former was filtered with level 4 of the k-brace algorithm while the later had to be filtered at level 5. Modularity was then computed for both databases and used to as a basis for the color of nodes. The size of the nodes expresses their frequency in the articles. The networks were visualized using Force Atlas 2 in linlogmode with overlap prevention on, to ensure readability.
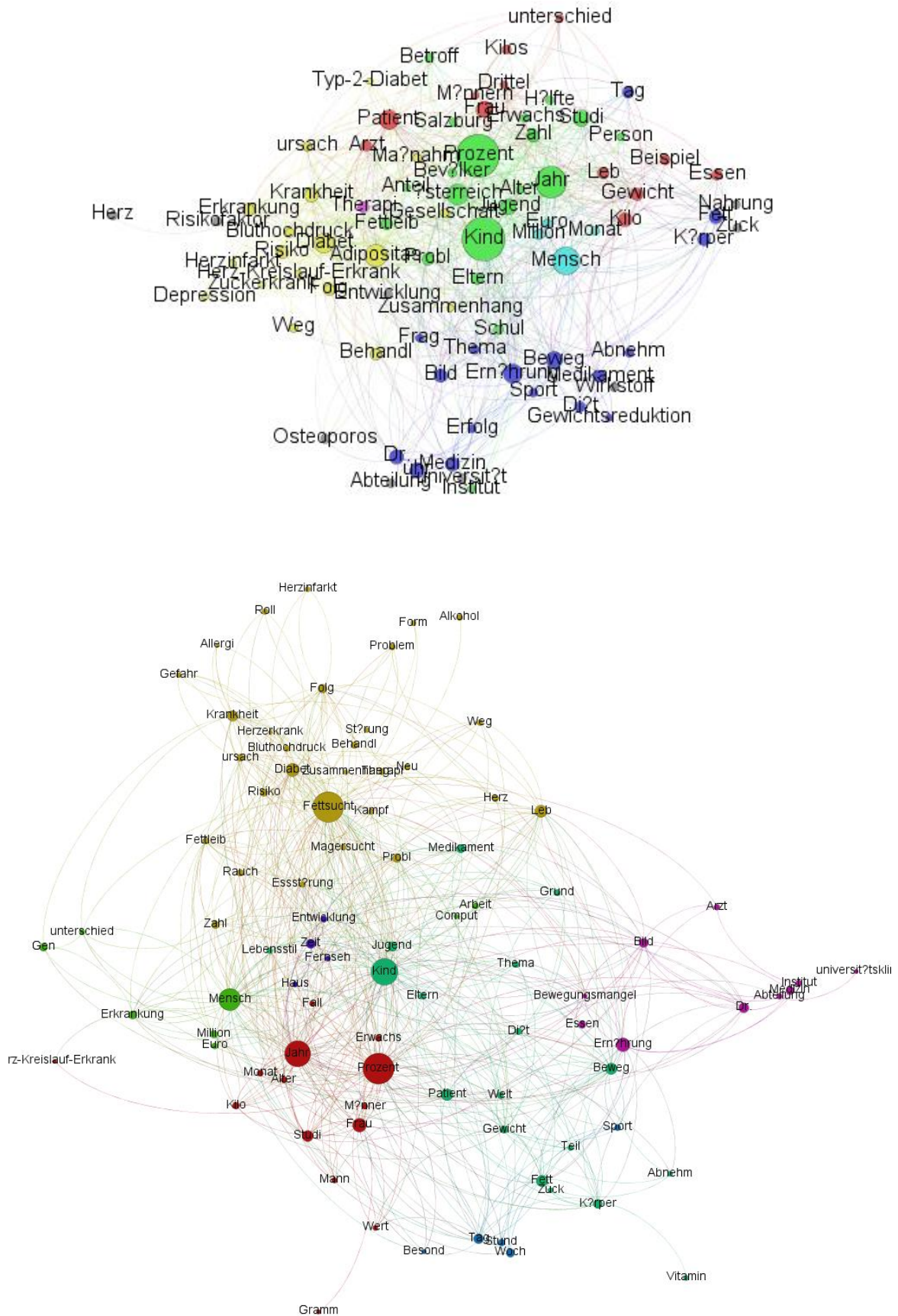
Figure 9: Semantic Network of Adipositas (Top) and Fettsucht (Bottom)

The first network visualization on top shows the semantic surrounding of Adipositas, the second shows the same for Fettsucht. If we start by considering the topology of the networks we can immediately recognize a stark difference between the two. While the Adipositas network is comparatively dense and the nodes are huddled together, the Fettsucht network is spacious with fewer and less strong connections between the nodes. This variation of basic topological features comes down to a number of factors: Sentence length, publishing newspapers and time of publication.

First of all sentence length is decidedly different between the two databases. With most of the articles of the Fettsucht database stemming from the Kronen Zeitung and the Tiroler Tageszeitung, both of which employ the shortest sentences of all communicators, the overall sentence length for Fettsucht is considerably shorter than for Adipositas. This impinges on the way the networks are drawn, as the connections between nodes are based on grammatical relations. Shorter sentences mean less complex grammatical structures, which in turn mean fewer connections between nodes per sentence. Secondly sentences in those two newspapers aren't just shorter, they also use smaller vocabularies than the other newspapers, contributing to the relative scarcity of edges. This should not be construed as a mere technicality as the differences, while being translated into a visible phenomenon by the methods employed, do originate in the language styles used by the newspapers. Tabloid newspapers like the Kronen Zeitung or Tiroler Tageszeitung do prefer shorter articles, shorter sentences and less varied vocabularies. The targeted audience might also be a factor in using the term Fettsucht, as it is a less technical term than Adipositas, giving the topic an air of approachability and common-senseness. Keyword usage, language style and newspaper seem to form an assemblage in which each impinges on the other.

Secondly as shown in figure 10, similarly to the pattern observed on how often which keyword is featured in the complete database, newspaper articles which only use one or the other buzzword also fluctuate distinctly over time. The red line indicated the number of articles which only used the term Adipositas, while the blue line shows the same for Fettsucht.
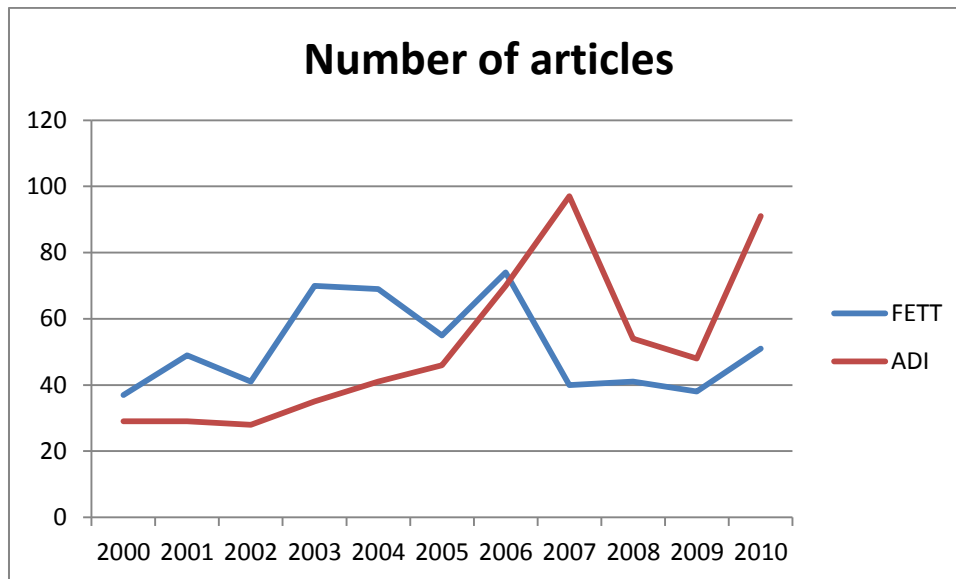
Figure 10: Frequency of Adipositas and Fettsucht over time

Once again the term Fettsucht starts in the lead, but is overtaken in frequency by Adipositas around 2006. The latter keeping its lead for the rest of the observed timespan. This tells us that the difference in topology between the two visualizations is also a result of one of them being predominantly based on the early years, while the other is obtaining its data mostly from the later years.

If we switch from evaluating the topology of the two networks to analyzing the semantic content, the differences between the two networks take the forefront once again. The Adipositas network is clearly structured in 4 major, but interrelated, clusters. The green cluster in the center deals with the number (Zahl) and percentages (Prozent) of the Austrian population (österreichische Bevölkerung) being affected by obesity. Other significant human actors are adults (Erwachsene), children (Kinder) and adolescents (Jugend). This mirrors the disposition of persons at risk we have found both in policy reports on obesity nationally (cf. Adipositasbericht: 2006) and international scientific publications. Contrarily the Fettsucht network, while also featuring a green cluster dealing with affected groups at its center, omits hints at statistics. Instead parents (Eltern) are introduced as a central node. The two discourses feature distinctly diverging styles as to how the issue of obesity is introduced. Coverage of Adipositas tends to emphasize the role that numbers play, as exemplified by the start of an article in the Kronen Zeitung:

> „In Österreich sind bereits 11 Prozent der Menschen, das sind etwa 800.000 (!) davon betroffen. Sie haben einen Body-Mass-Index (BMI) von mehr als 30. Ein BMI von

57

etwa 20 bis 25 ist normal" (Krone: Starkes Übergewicht (Adipositas) ist eine Krankheit. Noch dazu..., p.: 12, 2001-06-09)

Newspaper articles using the term Fettsucht, on the other hand personify the story to make it salient for their audiences by introducing lifelike situations parents may face:

„Immer mehr Kinder leiden an Fettsucht, beim Abspecken müssen auch die Eltern mitspielen Wie viel Stück Zuckerwürfel kommen einem halben Liter Cola gleich?" (Der Standard: Urlaub mit starken Freunden, p.: 11, 2007-07-20)

That doesn't mean statistics and percentages are completely omitted in the coverage of Fettsucht though. They are relegated to a subsidiary role though and can be found in the red cluster to the left of the network, where percentages of men and women affected by obesity are discussed. The center of the network, though is firmly in the hands of parents, their children and how they might cope with obesity. Saguy and Gruys found a similar pattern in their analysis of news reports: parents were painted as being neglectful and irresponsible if their children were obese (cf. Saguy & Gruys: 2010). It seems as if in the German context the term Fettsucht lends itself more readily to blaming individuals. This is further accentuated by the yellow clusters in both networks. Both of them deal with secondary diseases, in strikingly different ways though. The Adipositas network focuses on cardiac diseases (Herzkreislauferkrank, Herzinfarktrisiko Herzinfarkt, Bluthochdruck) and diabetes, while the Fettsucht network is concerned with smoking (Rauchen) alcoholism (Alkohol) anorexia (Magersucht) and eating disorders (Essstörungen). Once again this difference in semantic content implies diverging arguments. Culturally smoking, alcoholism and eating disorders are framed as addictions, looked at it in that light it is suggested that obesity itself might be an addiction, an individual failure due to gluttonous or slothful behavior.

All in All it seems like the differences between the semantic network surrounding Adipositas and Fettsucht are both topological and textual. Both the language style, expressed through sentence length, vocabulary size and grammatical complexity, as well as the issues and frames with which the articles are concerned with differ between the two keywords. While it is true that articles are written by journalists, they use a language style which is deemed popular with their readership, thus impinging on which keywords and catchphrases are suitable. The decision whether to report about Fettsucht or Adipositas in turn, opens up specific frames while occluding others. To get a clearer picture about how the two key terms are used and to look at the temporal dimension of these changes, the next chapter presents an analysis of the entire database.

6.3 Coverage of obesity over time

To get a more in-depth view of how these two keywords impinge on the obesity discourse the semantic network for 4 years was mapped. The first map shows the initial situation in 2000. The second map is from 2003, where the gap between Fettsucht and Adipositas was widest and Fettsucht dominated the discourse. Two more maps (2005 and 2007) then show how the discourse went back to equilibrium between the two terms and at the same time increased its scale and scope. Through weaving together the quantitative aspect of mapping semantic surroundings and the qualitative aspect of following interesting findings to their sources in specific newspaper articles, a richly textured appreciation of the discourse could be developed. Hopefully shedding some light on the changes in the narrative about obesity over time.

Figure 11: Semantic Network in 2000

Figure X shows the semantic network in 2000. By far the most used term is Prozent, which can be attributed to the all too common practice of describing just how many percent of children (Kinder), the populace (Bevölkerung)or even the whole society (Gesellschaft) in Austria (Österreich) suffer (leiden) from the disease (Krankheit) as which obesity is imagined.

The Neue Vorarlberger Tageszeitung opens one of its articles by stating that "8.5 percent of the Austrians literally have a 'big problem'." (Neue Vorarlberger Tageszeitung. 30.03.2000), while The Kurier contents itself with estimating "that 15 to 20 percent of 1,753.000 Austrian children and adolescents (0-18 years) are overweight." (Kurier: 13.08.2000) Guessing seems to be the most applied method of generating data about obesity as it is prevalent across all newspapers to estimate approximations without publishing the sources. These guestimates, however fishy their advent may be, do serve an important role though: they define obesity as a social problem.

The second biggest cluster (violet) recites a host of different diseases (Krankheit, Erkrankungen) associated with obesity: diabetes (Diabetes) high blood pressure (Bluthochdruck), cancer (Krebs) and of course obesity (Übergewicht, Adipositas) itself. These two clusters form an argumentative unity as the first describes just how big a problem obesity is and the second argues why it is a problem. "Diabetes, high blood pressure and heart attacks may be the result" (Salzburger Nachrichten: 02.05.2000) of obesity and the Kleine Zeitung expands that "high blood pressure, bad cholesterol, an increased risk for diabetes and depression are the serious adverse reactions, from which a large number of obese people suffer." (Kleine Zeitung: 05.08.2000). These two clusters really constitute the core of what is constructed as the major threat of obesity: rising levels of obese people and accompanying secondary diseases would make our society or at least our health system crumble.

Curiosly our third keyword for obesity, Fettsucht, is not present in the big catalogue of diseases. Instead it is on the very edge of the network, oddly placed in a red cluster which stretches the relation (Zusammenhang) of diet (Ernährung), health (Gesundheit) and our bodies (Körper). For now Fettsucht seems to be situated at the very fringe of the network, whereas Übergewicht and Adipositas are more frequently used and more central to the semantic network. This circumstance will change soon. But for now we still have to take a look at the other two clusters of the map. The small green cluster only comprising three nodes is devoted to Dr. Widhalm and his study which was heavily cited in Kurier, Krone, Standard and Kleine Zeitung, among others. It claimed that being underweight is as much a problem for children as being overweight. From the vantage point of the media this may be a controversial hypothesis which would explain his unique position in the network: being present in the center but at the same time not being affiliated with the other discourses. The final yellow cluster, which is only loosely connected, calls attention to a number of alternative factors like diet (Ernährung), exercise (Sport) and smoking (Rauchen) and also points to the role of science (Studie, Universität) and medicine (Medizin).

Throughout 2001 and 2002 (not pictured) the basic look of the system remains intact although it expands in scope with the number of clusters going up to seven and includes more words. In 2003 the system suddenly contracts itself though, and the buzzword Adipositas disappears from the scene altogether. Fettsucht is used way more frequently now and gains a central position in the network. If we compare the relative position of Fettsucht in figure 2 and figure 3 this drastic change becomes readily apparent. Together with this shift in relevance of Fettsucht and Adipositas, the entire network changes its composition. The medical discourse, which played a dominant role in the previous years, suddenly leaves the scene altogether and is only represented by individual nodes scattered over the entire network. Instead fat-related terms, like **Fett**sucht, fatness (**Fett**leibigkeit) or fat (**Fett**) take the forefront.

Figure 12: Semantic Network in 2003

This may be explained by the renewed efforts to fight against the obesity epidemic in the US which is exemplified by die Presse's pathos driven statement that "war against obesity was declared U.S. scientists." (Die Presse: 2003-02) Die Wiener Zeitung also focusses on US developments writing that, "while from 1960 to 1980 a quarter of Americans were overweight, obesity increased from 1980 to 1991, a period of transition to a cholesterol-and fat-free diet, to even a third of the population. This represents an increase of obesity in ten years by 32 percent." (Wiener Zeitung: 2003-04-25) Subsequently the concept of weight (Gewicht,

Kilogramm) gains central relevance and the idea of monitoring daily nutrition (Essen, essen, Tag) emerges as its own cluster. "Thus, pure dietary measures alone are not sufficient to properly lose weight, or to even be satisfied visually with the result." (Kronen Zeitung: 2003-02-15)

Together these phenomena, as observed in the network visualization and emphasized through the examples, point at a stunning shift in the discourse on obesity. The focus changes from indicating the impact of obesity through the scientific-medical complex and various secondary diseases, like diabetes (Diabetes) high blood pressure (Bluthochdruck) or cancer (Krebs), towards individual causes of obesity like (quite obviously) weight, nutrition and exercise. While in 2000 terms like sickness (Erkrankung) and treatment (Behandlung) were central connectors in the network, this very role was taken by fatness (Fettleibigkeit) and weight (Gewicht, Kilogramm). 2004 accentuates this trend by elevating a term into prominence that serves to link the diverse clusters of individual causes of obesity. Lifestyle (Lebensstil) connects to the communities around weight, nutrition and exercise and nicely illustrates the new direction the discourse has taken now targeting the way in which individuals conduct their lives: "If the lifestyle isn't rigorously changed, the WHO forecasts, that in 2040 nearly half of adults in developed countries will be obese." (Die Presse: 2003-09-20)

Figure 13: Semantic Network in 2005

Following this phase of contraction around individual causes the system expands again. By 2005, both Adipositas and the cluster around secondary diseases has reemerged as central actors in the network. The latter has even added a few new entries like stroke (Schlaganfall) and heart attack (Herzinfarkt). The terms that were defining the discourse in 2003 and 2004, like weight, fat and lifestyle, are still relevant though and get further developed and integrated with the surrounding clusters. The community containing nutrition, for example, adds vegetables (Gemüse) , fruits (Obst) and food (Food) to its repertoire: "Actually, everything would be pretty simple: you eat enough fruit and vegetables, renounce salt, sugar and fat and exercise daily, at least one hour" (Wiener Zeitung: 2003-08-18).

Table 5: Modularity, communities and unique words 2000-2009

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Modularity	0,242	0,295	0,300	0,261	0,242	0,258	0,262	0,226	0,288	0,311
Communities	5	7	5	5	4	7	7	8	6	7
Words	86	105	75	51	46	107	207	322	91	126

In the coming years the discourse continuously expands with the number of communities staying high (table 1) and the number of unique words going all the way up from 51 in 2003, to 322 in 2007. By 2005 this expansion is accompanied by a growing integration of topics into one master narrative which combines 5 core topic clusters. These 5 tenets are:

1) **statistics on the prevalence of obesity**
2) **societal causes/obsogenic environment**
3) **attribution of individual blame/ diet and exercise instructions/lifestyle choices**
4) **secondary diseases**
5) **influence of genes on obesity/obesity as a hereditary disease**

Over time articles increasingly stick to these 5 frames, which could hint at a growing pragmatism by the journalists. Tendencies according to keyword, whether Fettsucht or Adipositas, still remain though and change whether the cluster surrounding individual lifestyle choices or the cluster about medical treatment of obesity is brought up more often. Thus
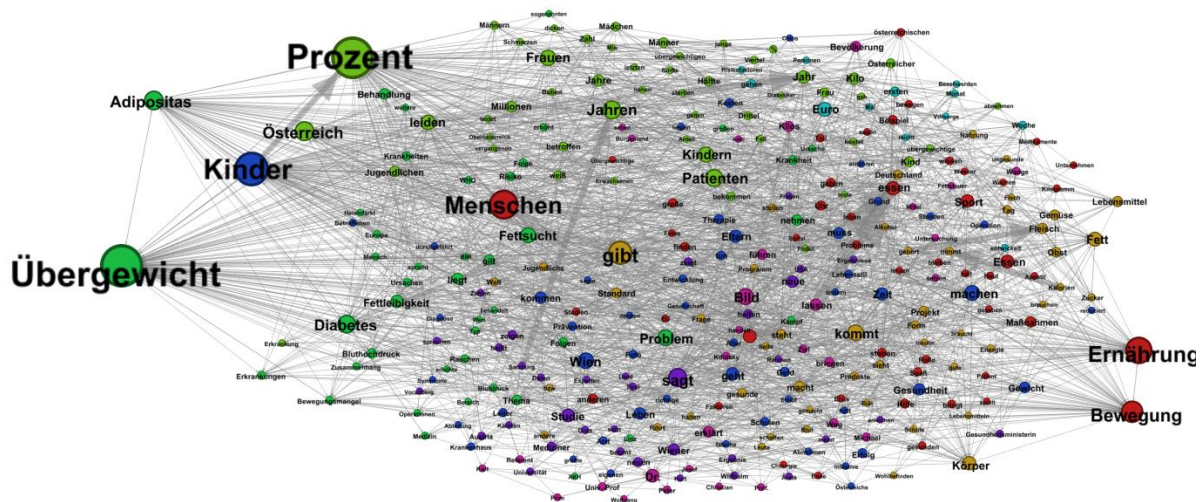
Figure 14: Semantic Network in 2007

Curiously though in 2007 Übergewicht emerges as a frequent term. While Übergewicht didn't even exist in prior years, it isn't just here now, it is one of the most used terms in the entire network. Fettsucht and Adipositas are both comparatively small and remote. At first I had no idea what to make of that, but including Übergewicht into my timelines gave me an idea. To recount: Before 2005 Fettsucht was the most frequent of the three terms closely followed by Übergewicht. From 2006 onwards Adipositas was the most frequent term, once again Übergewicht came in second. In 2005 and 2006, the two years in which Adipositas and Fettsucht were neck and neck, Übergewicht was used more frequently than both of them. As both Fettsucht and Adipositas feature distinctly different semantic surroundings it seems like Übergewicht is used as a catch-all term that connects the two divergent realms of obesity. During those times where the very content of obesity coverage was changing profoundly, Übergewicht enjoyed its heydays. The two periods, during which one of the two keywords was firmly in control over the discourse Übergewicht was marginalized, but as the communication system got unstable a different term was needed to negotiate between the two sides. Articles using Übergewicht seem somewhat liberal at using any of the 5 ore frames identified so far. It seems as if Fettsucht and Adipositas respectively, serve to pull the discourse into specific directions while Übergewicht serves to hold it together and allows for experimentation.
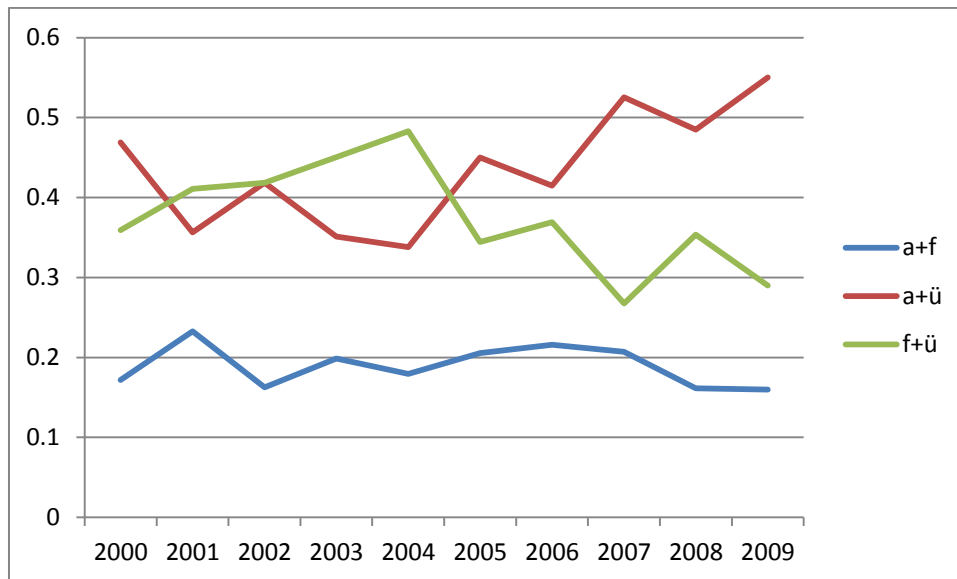
Figure 15: Co-occurrence of keywords in articles

Just one more point to substantiate this hypothesis: Figure 15 shows that Adipositas and Fettsucht (blue line) co-occur much less often than both Adipositas and Übergewicht (red) and Fettsucht and Übergewicht (green) co-occur. The relation of Übergewicht to Adipositas and Fettsucht is marked by the established changing of the guards in 2005. This means that while co-occurrence of Fettsucht and Übergewicht was more common before 2005, co-occurrence of Adipositas and Übergewicht was much more common after 2005. This further substantiates the hypothesis that Übergewicht serves as a neutral term between the two major narratives. It is much less likely, after all to read an article that mentions both Fettsucht and Adipositas, than it is to read one mixing in Übergewicht. This rounds out my analysis of the temporal vector. While the network started small and somewhat underdeveloped, it soon grew both in size and in texture. 5 core frames could be distinguished which, formed over time and importantly were used distinctly different according to keyword. Lastly I will now analyze the differences according to newspaper.

6.4 Coverage of obesity in individual newspapers

Let's start with an easy and obvious observation: The average length of newspaper articles differs quite a lot. While the length of an article differs according to what page it is printed on by far the more substantive variable in determining article length is the newspaper it

originated from. The longest articles are written by the Wiener Zeitung, the Presse and the Standard while the shortest are written by the Kleine Zeitung and the Tiroler Zeitung. Time in fact is not a factor in the length of articles. Throughout all years article length for all articles published in a single year stays roughly the same on average. Table seven summarizes the findings for each newspaper. The number of articles published in a newspaper doesn't correlate positively with article length, subverting the idea that both the number of articles and their length would be dependent on the attention the newspaper pays to the issue of obesity. In the case of the Wiener Zeitung, for instance, only few articles are published they are among the longest from all newspapers though.

avg	Kleine	Presse	Standard	Krone	Kurier	Ober	Salz	Tirol	Wien
number	15.6	14.7	12.8	27.2	21.3	17.3	15.2	9.8	9.7
length	270.1	494.1	453.9	353.2	279.7	309.6	380.1	249.2	562.8
varp	2279.5	8771.0	20095.5	1842.4	897.0	3383.1	3148.1	4563.0	38234.6

Each set of articles from individual newspapers was transformed into a network representation, with the already described modularity and layout algorithms performed unto them. Interestingly the number of communities computed for the networks fluctuates between 5 and 11. This hints at the newspapers taking up obesity in varying depth. The Salzburger Nachrichten, for instance with only 5 communities only covers a narrow number of topics on obesity. Consulting figure XX, we see the 5 topic clusters. The big red cluster deals with secondary diseases, the violet one to the left with statistical numbers the blue and green one deal with lifestyle choices like smoking, nutrition and exercise and the yellow cluster focusses on children and family. This core set of 5 cluster was already described in the chapter on "obesity over time" as the five topics that pop up in every single year. Let's take a look at the actual articles to substantiate the analysis of the quantitative data. Characteristic of the way in which the Salzburger Nachrichten covers obesity is one article from March, 2010. Opening up with "Die Fettsucht droht zur Regel zu warden" „Obesity threatens to become the norm". It starts with giving us numbers to estimate the prevalence and danger of obesity: „60 Prozent der Österreicher werden 2020 übergewichtig sein, sagt der Historiker Lothar Kolmer und mahnt eine Kehrtwende ein" then focuses on children: „Die Zahl der übergewichtigen Kinder wird 40 Prozent betragen." Then brings in lifestyle choices about eating fat and on the run: Die Industrie wird sogar noch mehr Fertigprodukte in Großpackungen auf den Markt bringen. „Es wird auch noch viel mehr unterwegs gegessen. Weshalb es kaum noch fixe

Essenszeiten geben wird." „Wir kaufen Unterhaltungselektronik, Handys, Autos. Wir messen unserer Nahrung also leider auch nicht mehr den Wert bei, der ihr gebührt." The only topic cluster absent from this specific article is the one about secondary diseases. But as we see the article focuses on eating habits and lifestyle and opens up with the term Fettsucht – by now this combination shouldn't surprise us anymore – in fact it's expected. A different article explicates the other discourse on obesity beautifully. In January 2010 the Salzburger Nachrichten opens with: "Genschalter für Übergewicht entdeckt" and goes on to speak about new research results concerning genes and belly fat – while leaving out lifestyle choices, exercise or diet. Interestingly the term Fettsucht is wholly absent from the article. Each article in the Salzburger Nachrichten seems to either focus on Adipositas or Fettsucht and thus only uses a subset of the 5 core topic clusters. "Gene, die wir im Krebsgeschehen untersuchen, spielen eine zentrale Rolle bei Übergewicht. Gewisse Krebsgene fungieren gleichsam als Schlankmacher" „"Von einer möglichen Entwicklung von Medikamenten sind wir weit entfernt", sagt Aberger. Der "Markt" wartet natürlich darauf: Laut Weltgesundheitsorganisation (WHO) ist weltweit eine Milliarde Menschen übergewichtig. Mehr als 300 Millionen Frauen, Männer und Kinder sind adipös. Das bedeutet, sie sind krankhaft übergewichtig und haben ein erhöhtes Risiko für Herz-Kreislauf-Erkrankungen, Krebs und Diabetes vom Typ 2."
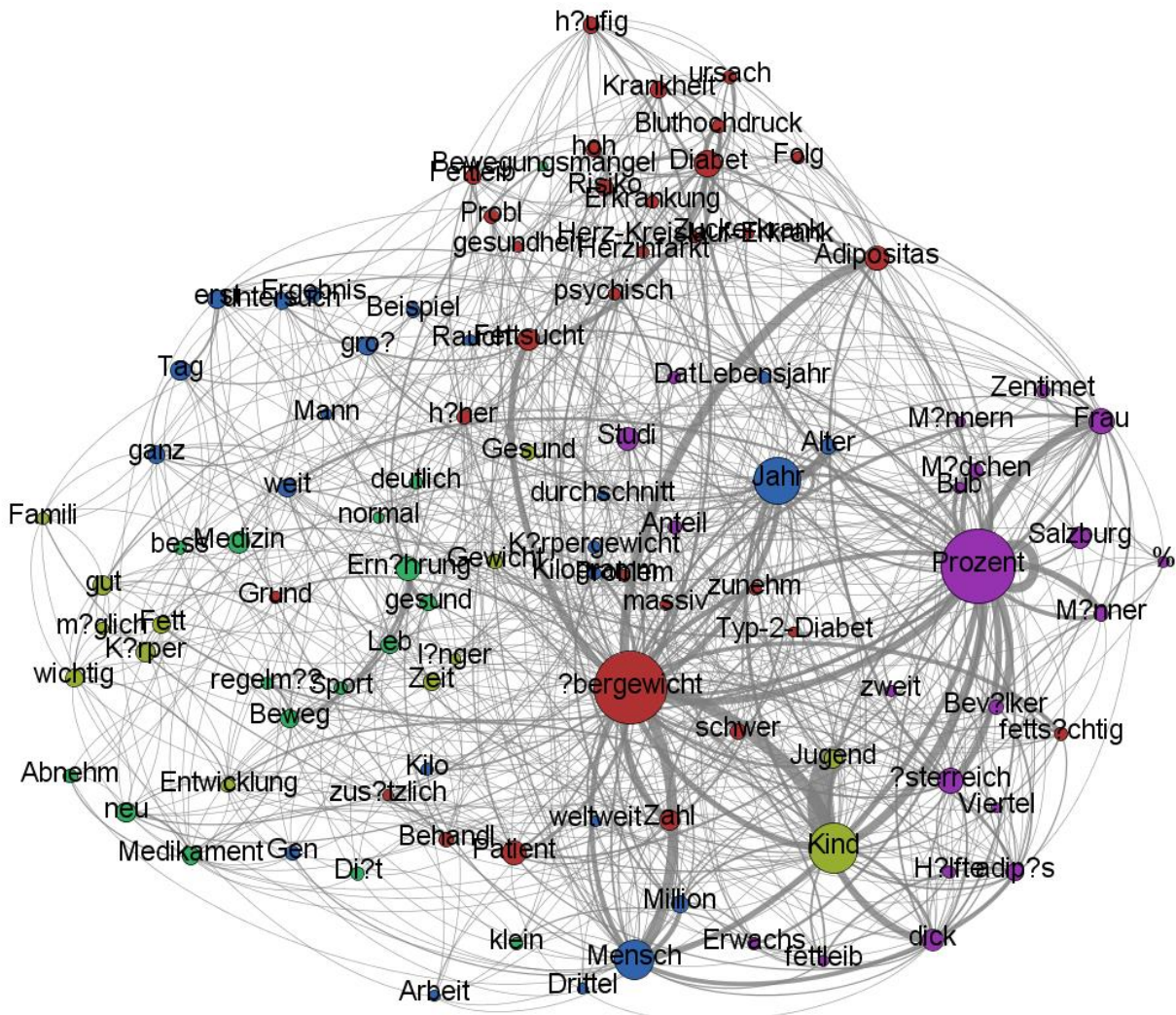
Figure 16: Salzburger Nachrichten

Contrarily the network visualization of the Wiener Zeitung shows eleven topic cluster, adding a cluster on costs of obesity in brown, one on prevention of obesity in green and one on projects for obesity prevention in light green. One on actions of the parliament concerning obesity – because the Wiener Zeitung serves as the official gazette of the Austrian government. Defining newspaper articles in the Wiener Zeitung proves to be almost impossible. To diverse are the topics and the way in which the articles approach obesity.

Figure 17: Wiener Zeitung

The Salzburger Zeitung and Wiener Zeitung show the biggest differences in their respective networks, while the rest form a middle ground. What are the differences between them? First the similarities: they are both regional papers with a supra-regional audience. The Wiener Zeitung as the official gazette of the Austrian government presents the widest view of obesity delving into material that is wholly unsuitable for 'normal' newspapers – the government stuff – but notably also looking at topics that don't feature often in other newspapers: shame etc. The Salzburger Nachrichten on the other hand, focus on a very narrow representation of obesity sticking to the core tenets of the obesity discourse. Overall the difference in the semantic networks between newspapers is shockingly large. Depending on which newspaper an avid reader might look at, he/she would gain a different impression about what obesity is all about. Some newspapers, for instance the Wiener Zeitung, seem to actively engage in the "modes of ordering" through experimentation with different frames, while tabloids and regional newspapers seem to stick to a very small set of proven topic clusters

when dealing with obesity. Figure 18 shows the heavy reliance of two Austrian tabloids and one regional newspaper on the combination of statistics (Prozent), children (Kind) and obesity (Übergewicht). These three terms form the core of all networks except for the Wiener Zeitung, the Standard and die Presse. Only the three top-quality daily newspapers in Austria have the ability to experiment enough, akin to which narratives and stories concerning obesity they feature, to generate semantic networks that are not dominated by the combination of those three terms.
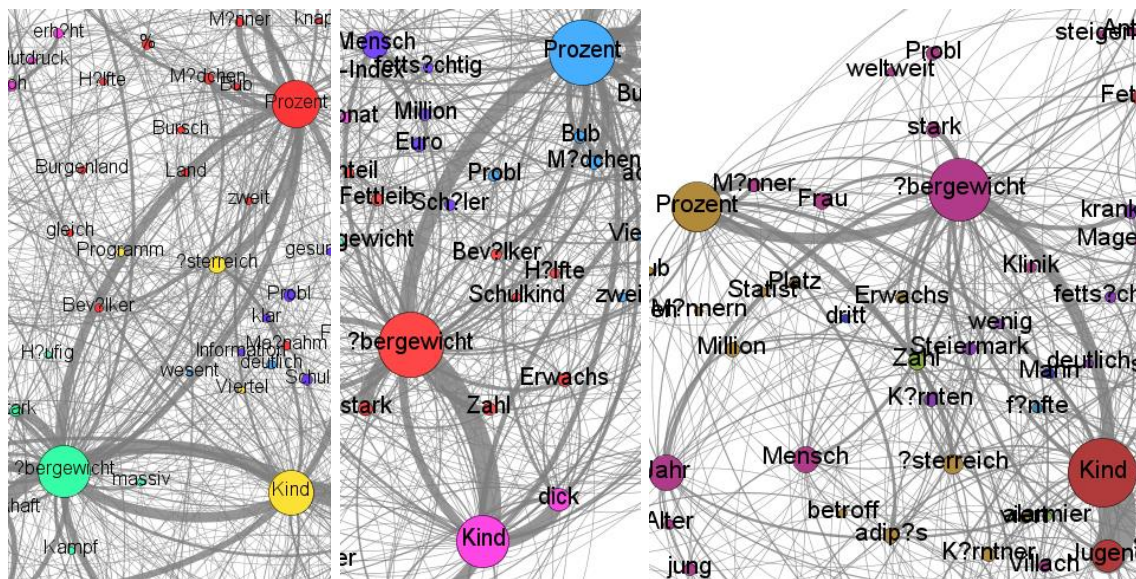

Figure 18: Part of Kurier, Oberösterreichische Nachrichten and Kleine Zeitung

With narratives of children as victims and constant repetition of epidemiological data (cf.: Felt et al: 2014) as the two most important topic clusters, the question arises what imaginaries of obesity the avid reader of tabloids will gain. The difference in the layout and importance of topic clusters being massive between tabloids and quality newspapers, readers of one or the other surely gain a different understanding of obesity. That said quality newspapers are of course not exempt of using children as a hook to gain attention for the article and they certainly do use numerical data just as often as tabloids, but they also publish articles that develop other aspects of obesity.

7 Conclusion & Discussion

This thesis aimed at exploring two broad themes. The first of which was how the mass media in Austria deals with the issue of obesity. The second was about how new quantitative techniques, like network analysis, shape how research is being done and what is occulted by the emergence of these methods. We thus have to look at each in turn. The empirical analysis of articles collected from ten Austrian newspapers looked at the Austrian obesity discourse according to three distinct themes. Through describing the obesity discourse based on keywords, time, and newspapers I tried to work out three different perspectives which would flesh out the different dimensions of this complex hybrid object. Secondly I reflect on how semantic network analysis constructs its research object and what is occulted through algorithmic historiography.

7.1 Empirical Conclusion

The main research question of this thesis was how obesity is being done in Austrian mass media reports. To approach this rather broad issue I decided to employ a semantic network analysis of ten year's worth of Austrian newspaper articles. This analysis retrieved the major themes of the observed discourse and made them readable according to three distinct perspectives. This chapter will unite the findings of each of these perspectives and draw a conclusion on them.

7.1.1 Keyword analysis

The analysis of keywords showed that both linguistically and topologically the two discourses are starkly different. In terms of frequency the first five years Fettsucht was in the lead – albeit a shrinking one. From 2005 onwards Adipositas was the more frequent key term. This changing of the guards was accompanied by a curious frequency pattern for the term Übergewicht. While Adipositas and Fettsucht were balanced, Übergewicht was the most used term denoting obesity, thus hinting at these terms having differing meanings and performing different kinds of work. An analysis of co-occurrences of these three terms further underlined this idea. While both Adipositas and Fettsucht were combined with Übergewicht quite frequently, Adipositas and Fettsucht are seldom featured in the same article. This means that these two terms are in fact not arbitrarily interchangeable. On the contrary they are the signifiers of two distinct spheres of meaning.

The second step was thus two figure out what those differences are. To this end the semantic networks for Adipositas and Fettsucht were drawn individually, albeit with exactly the same settings to ensure comparability. The differences between the two visualizations were immediately obvious. While the semantic network surrounding Adipositas showed a focus on statistics, secondary diseases and scientific findings, the visualization for Fettsucht placed exercise, eating habits and lifestyle choices at its core. The analysis of the two networks revealed that Fettsucht is closely related to what many scholars of obesity have called 'individual causes' of obesity and hence purports a worldview that places the blame on these lifestyle choices. The network surrounding Adipositas, on the other hand, with its focus on morbidity rates, secondary diseases and (bio)medical science constructs obesity quite differently. This very difference seems to be at the center of the Austrian obesity discourse. One of my research interests was how the mass media deals with a hybrid object like obesity. One part of the answer, for the specific case observed, is that through the usage of two distinct keywords the issue is split in two.

7.1.2 Temporal Analysis

Articles about Adipositas focus on the (bio)medical dimension of obesity and espouse a worldview in which the body and its physical attributes come to the forefront. Obesity in this discourse is a disease that people are affected by. Its causes are genetic or evolutionary or due to mental issues. What is at stake is either the collective or the individual health and solutions are thus aimed at one of the two. Either by treating overweight people through professional practitioners like doctors, nutritionists and psychiatrists, or through health and fitness programs that aim at increasing awareness in the populace. Articles featuring the term Fettsucht espouse quite a different worldview. They focus on the individual's lack of willpower, bad choices or unhealthy lifestyle. In this discourse blame plays an important role. Either the individual is to be blamed for his weaknesses or society is to be blamed for a collective loss of societal order. This falls in line with analysis by other social scientists who diagnose an intertwinement of societal narratives with the obesity discourse (cf.: Gard and Wright: 2005).

The temporal analysis of obesity shed more light on how the mass media constructs obesity as an object. A number of core clusters were discerned which act like building blocks and which are combined in various ways. At least in the early years a lot of freedom seems to have existed as to how to combine and arrange these topical clusters. This finding concurs with the notion that the mass media acts as an arena that experiments with how an issue is to be framed instead of just relaying information to the public. By 2006 a common structure was found that was mirrored in most, if not all, articles that were primarily about obesity. This structure consisted firstly of a hook to generate interest. This function was usually either played by a mention of the rise of the prevalence of obesity and was supported by statistics supporting said rise, or by an individual's history of suffering. This use of either statistics or an individual story also serves to create an air of facticity for the claim that obesity is a health threat. The articles then either detailed societal causes of obesity or described an obsogenic environment. Thirdly blame was either attributed to the individual or to collective lifestyle choices. Lastly secondary diseases are discussed to further substantiate the obesity epidemic. Over time articles increasingly

stick to these 5 frames. They thus form a master narrative that is followed by most articles on obesity. Two prominent variations play an important role to this blueprint though. Not surprisingly they can be classified by two keywords. Articles about Fettsucht tend to focus more on the story of individuals, on moral claims about natural and good ways of living, and on disciplining individuals. While articles using the term Adipositas approach obesity from a (bio)medical standpoint focusing more often on secondary diseases, and medicinal treatment of obesity.

7.1.3 Newspaper Analysis

Finally the empirical analysis according to newspaper revealed differences in how the newspapers approach obesity as an issue. Interestingly these differences were neither correlating with regions nor with the type of newspaper, i.e. quality newspaper or tabloid. A closer look revealed that tabloids are depending much more on recurring usage of children and numerical data than quality newspapers. While high end newspapers do employ both themes a lot as well, they also feature articles that are exploring other aspects of obesity. This can be observed by both the more relaxed structure of their semantic networks and by the comparatively looser coupling of terms. This opens up the question how imaginaries about obesity compare between the different readerships. Each newspaper having each own style of reporting on obesity and favoring different frames is already quite remarkable. It seems as if these cultures of doing obesity survive throughout the years. While national cultures certainly do shape the media construction of an issue (cf.: Bauer: 2006, De Jong: 2005), a plethora of forces seem to each express their own understanding of obesity. This thesis thus supports the idea that while obesity is imagined as a global issue, it is in fact negotiated in a local, situated context leading to a specific national style, lending credence to the conclusion drawn by Felt et al. that a narrative emerges that expresses "a specifically Austrian version of a loss of social and natural orders that are imagined to threaten the nation's core and stability as a collective subject" (Felt et al.: 2014).

7.2 Methodological Conclusion

Like every scientific method, semantic network analysis displays some characteristics of the research object while occulting others. What is often concealed in publications using said method is the immense amount of work going into preparing the visualizations. The work of transforming newspaper articles into statistics and ordered lists does not follow any natural law or guiding principle. While the database, which results from these practices espouses order, it is the product of generative work and not just the starting point of scientific analysis. I tried to account for this by extensively describing what it was exactly that I was doing to the newspaper articles. In how far I reached my goal of making the entire process transparent is to be judged by the reader, but to me personally it was a transformative experience. The mere act of writing down even small changes in my data, forced me to reflect extensively on what I was doing. My best guess that these practices which would normally be subsumed under 'data cleaning' seldom reach the awareness of those who are doing them. I thus start this chapter by reflecting on data collection and cleaning methods, an area that is overlooked far too often, before delving into deep water and giving a final verdict on what I feel is achieved by semantic network analysis in this case.

7.2.1 Collecting Data

"My own data may once have been raw, but by the time I began any serious interpretation, I had cooked it quite well" (Rosenberg: 2014)

On a first level collecting data already involves decisions about which data to include and how to include it. At least since the emergence of the internet data are everywhere. Bowker suggests, that data are always already "cooked" and never entirely "raw" (Bowker: 2014). Firstly data is already privileged by its mere inclusion into a sample. Choosing to start with one year and to end with another, choosing to

use some newspapers and not others and choosing to include some articles over others are all impactful decisions on how the data set is made up. While each of these decisions can be argued, these arguments have to be worked out. The realities they try to describe have to be done. The decision to use 10 years for my data collection, for instance, is probably as much a result of my education in a culture that uses the decimal system as it is a sound scientific choice. The boundary between an article that fits the research purpose and an article that misses the mark, in many instances, comes down to instinctive gut decision. The deconstruction of these millions of small decisions, which in large parts constitute what is left in the end, helps to avoid the unnoticed assumption that the data used in this work are transparent. They are of course not 'the obesity discourse' and self-evidently so, they are the result of roughly a year of tinkering and prodding, hacking and patching. To cite Rosenberg: "

7.2.2 Cleaning Practices

"One person's data is another person's noise." (Cole: 1986)

Secondly several acts of manual cleaning were needed to achieve this look. Besides errors in the underlying data many decisions had to be made about what to include and what not to. These decisions while certainly often based in rationality were just as often predetermined by necessity or sheer pragmatism. I tried my best to describe these modes of ordering (Law: 1994) as unadorned as possible. Shedding light on the messy and chaotic ways in which this work was assembled after all argues a broader point. To borrow from Law: "If the world is complex and messy, then at least some of the time we're going to have to give up on simplicities" (Law: 2004). To manage the messy nature of mass media communication, even if it is broken down to the level of a newspaper article database, we have to handle the indistinct and slippery a feat which is only possible if we acknowledge said qualities.

It would have been possible to rely on cookie cutter statistical analysis, for instance word frequencies, to paint a neat picture of the semantic realities of the obesity

discourse, but what kind of knowing would that have been? To make 'knowing' even possible, I relied on deliberately imprecise methods: the interpretation of visual clues in highly abstracted networks. In much of the sciences quantitative data is interpreted with the highest standards of rigor and exactness, but I would like to argue with Law that to overcome the quantitative/qualitative iconography (Law: 2004) we have to merge the realms of rigorous mathematical knowledge and messy qualitative knowledge. This less exact way of getting to know quantitative data allows for insights which are at least different if not more exciting.

7.2.3 Imprecise methods

"The world is so rich that our theories about it will always fail to catch more than a part of it; that there is therefore a range of possible theories about a range of possible processes; …" (Law: 2004)

As Law argues "standard methods are often extremely good at what they do, they are badly adapted to the study of the ephemeral, the indefinite and the irregular" (Law: 2004) though. Rather than to fit my research interest and data into a standardized methodological toolbox, I chose to develop them on the fly, through recurring clashes with the data and my research interests. The methods and practices employed subsequently, not only describe reality, they also produce the reality that they aim to understand. This simultaneous emergence of a reality and the methods by which it is described proved fruitful in generating a textured perspective on the obesity discourse.

Using semantic network visualization also supports the idea of a fractional reality (Law: 2013). They tend to show the messiness of the underlying data instead of occulting it like, for instance, table representations of aggregated frequencies. In the chapter entitled 'Pictures of Nothing' I showed a visualization of the entire network. Each subsequent visualization had to be carved out of this first monstrosity. By thinking about what my research question entails I decided on three deliberately chosen approaches – keywords, time and newspapers – to serve as my guiding

perspectives. Each in turn was subjected to a number of tools. Again the process of making these network visualizations took the forefront as it creates the obesity discourse I described in my empirical chapters. Semantic network visualization offers the possibility to occupy oneself with the messiness of the underlying data, by not scraping complexities and unduly simplifying it. Importantly it doesn't distinguish beforehand between (1) what an important act of communication is - all articles are a priori treated the same; (2) what an important keyword is: (3) which edges are important. According to Law it is impossible to separate "(a) the making of particular realities, (b) the making of particular statements about those realities, and (c) the creation of instrumental, technical and human configurations." (Law: 2004). The methods employed in this thesis try to account for that. In practical terms I was quite lucky to be able to build my own package of methods and practices and to deliberate unto how they are to be used. This gave me an in depth view into how "phenomena are thoroughly constituted by the material setting of the laboratory" (Latour: 1986). The reality is thus not to be seen as "independent, anterior, definite" (Law: 2004), but as created by this set of practices. I would thus liken the 'obesity discourse' I 'visualized, 'created' or 'analyzed' to a fractional object (cf.: Law: 2014). The practices and their correspondent realities enact parallels or alternatives that never come together. Different practices would have surely produced a different 'obesity'. A fractional object is thus according to Law "more than one and less than many" (Law: 2014).

In contrast to qualitative methods of data analysis the algorithmic approach used in this thesis relies on a strict match between signifier and meaning. This means that if articles would present the same meaning in different terms the quantitative approach would not pick up on it, while the qualitative minded researcher would surely do. The resemblance of topic clusters both over time and between different newspapers does hint at a basic compliance by all communicators as to how issues are to be worded. Still the strength of the algorithmic approach surely lies in developing the broad themes over large corpora of data, while it is entirely inept when dealing with subtle differences in meaning or tacit shifts in the discourse. A task qualitative researchers excel at. Whenever I tried to look at details, for instance less than a year of data at once, the underpinnings grew shaky and the algorithmic tools stopped to present sensible information.

Furthermore as the tools employed in this thesis split up sentences, paragraphs and articles into atomic units, meaning can only be generated by the combination of these pieces, not by the consequence of their combination. Qualitative methods are usually focused on the richness of the data analyzed and tacit changes in it. Consequently qualitative research can be a lot richer and more substantial in its claims as it relies on a deeper understanding of the data material than quantitative methods. The algorithmic approach at this time is stuck at the level of displaying how often what terms are used together. While this is in itself a remarkable piece of information it does for some comparatively unremarkable results. All statements in this thesis that are more than just number crunching were generated by qualitatively looking up individual newspaper articles. Finally the differences in both approaches come down to being capable in differing areas of application. If ones interest lies in how often, or in what combinations a certain topic comes up in a large corpus of text, or if one wants to gain an overview the issues discussed in such a corpus the algorithmic approach can surely carry its weight.

7.3 Discussion

The conclusions drawn from this thesis, while somewhat interesting, where of course hampered by the lack of time and resources to conduct a more in depth analysis of the data. Focusing on that grand a timeframe, while surely providing an unique longitudinal view of the obesity discourse, also resulted in an underdevelopment of strands of inquiry that could be elaborated further. This means that while some parts of the empirical work are detailed enough, others remain stunted. Focusing on a shorter timeframe would surely lend itself to a more in depth view of the obesity discourse, especially as I have noticed that after 2006 changes are few and far in between.

A consolidated analysis could tackle some areas which had to be left untouched. The influence of (bio)medical science on the discourse could be observed at every turn, but was not included in the analysis. As Weingart observes the "ever tightening coupling of media and science" (Weingart: 2012) deserves an in depth analysis. Unfortunately the two major publications concerning obesity in Austria, the Austrian

Obesity Report and the Austrian Nutrition Report could not be linked to the database algorithmically. While the influence these reports, and undoubtedly a plethora of other (bio)medical publications, had on de mass media discourse, was apparent I cannot give any statistical representation of that correlation. The future surely lies in combining heterogeneous datasets, for instance newspaper articles and scientific publications, algorithmically through smart data applications.

The research also showed that a multitude of data analysis approaches is needed to generate a textured representation of the underlying data. By looking at the empirical data in three distinct ways, the weight of each was undermined by the others. On the one hand keywords seem to carry their own semantic networks. The two different styles of dealing with obesity seem to be mostly excluding each other. As was shown in part two of the empirical analysis, the temporal dimension plays an important role in defining the obesity discourse as well. Both the entirety of the network and all the small topic clusters evolve over time and become more fleshed out. Lastly the newspaper an article originates from has a large impact in how obesity is imagined in that specific instance. This multipronged analysis impedes a conclusion that discusses cause and consequence of any single dimension. Keywords, temporalities and newspapers all seem to share their part in defining the obesity discourse and thus what is meant by obesity.

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Appendix I – Curriculum Vitae

Bernhard Schröttner

Personal Information

Date of Birth: October 03, 1986

Place of Birth: Vienna, Austria

Email: schroettner.bernhard@gmail.com

Education

2011 – 2014 University of Vienna, Institute for the Social Studies of Science and Technology: Master's studies in Science, Technology and Society

2006 – 2010 University of Vienna, Departement of Political Science: Bachelor's studies in Political Science

Elementary and High Schools in Vienna, Austria

Appendix II – Abstracts:

English:

This thesis analyses the ways in which obesity is framed in Austrian mass media between 2000 and 2010. The main aim was to unravel how obesity is constructed as a major threat over time and how these constructions change. To this end three perspectives of semantic network analysis were developed. Firstly the impact of keywords like Fettsucht or Adipositas on the discourse were analyzed. Secondly special importance was given to the temporal dimension and to changes in the ebb and flow of the obesity discourse over time. Thirdly differing views on obesity between Austrian newspapers were compared. Once these examinations were complete the method employed was reflected upon. The findings strongly suggest that it is fruitful to imagine obesity as a heterogeneous object, which is shaped by a diverse set of actors. the semantic network surrounding the term Fettsucht was focused on personal frames and narratives while the semantic network surrounding Adipositas was focused on prevalence rates, secondary diseases and overall a more abstract frames. Furthermore the treatment of obesity in the news is heavily dependent on both time and source. Not only did trends in coverage emerge over time, a veritable blueprint of how to write about obesity was formed and subsequently adhered to in most articles. The findings give credence to the importance of place, time and source in the production of media stories and subsequently the public understanding of obesity.

German:

Diese Masterarbeit untersucht wie Übergewicht in den österreichischen Massenmedien zwischen 2000 und 2010 konstruiert wurde. Das Hauptziel war, zu entwirren wie Übergewicht als eine große Bedrohung dargestellt wurde und wie diese spezifische Art der Darstellung sich verändert. Zu diesem Zweck wurden drei Perspektiven einer semantischen Netzwerkanalyse entwickelt. Zuerst wurde die Auswirkung von Schlüsselwörtern wie Fettsucht oder Adipositas auf der Diskurs

analysiert. Zweitens wurde besonderer Wert auf die zeitliche Dimension und auf Veränderungen des Adipositas Diskurs gelegt und diese gesondert analysiert . Drittens wurde die Berichterstattung der verschiedenen österreichischen Tageszeitungen verglichen. Anschließend wurde die angewandte Methode intensiv reflektiert. Die Ergebnisse deuten stark darauf hin , dass es fruchtbar ist Übergewicht als ein heterogenes Objekt, das durch eine vielfältige Reihe von Akteuren geprägt ist vor zustellen. Das semantische Netz rund um den Begriff Fettsucht fokussierte auf persönlichen Narrative, während das jenes rund um den Begriff Adipositas vor Allem Prävalenzraten , Folgeerkrankungen und insgesamt eine abstraktere herangehensweise zeigte. Weiters ist die Darstellung von Übergewicht in den untersuchten zeitungen stark abhängig vom Zeitpunkt und der Quelle Quelle . Nicht nur, dass Trends in der Berichterstattung im Laufe der Zeit entstehen, eine wahre Blaupause entwickelt sich, welche anschließend in den meisten Artikeln eingehalten wird. Allgemein konnte festgestellt werden, dass die Ergebnisse stark von Ort, Zeit und Quelle eines Medienberichts abhängen. Dies wirft Fragen bezüglich der Imaginationen von Übergewicht in der Öffentlichkeit auf.