

Snoring and the Internet:

A Cartographic Exploration of Medicalisation

BY

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Abstract

The main objective of this research is to investigate how the internet-search contributes to the medicalisation of snoring. I focus on the dynamic interactions between different levels of action represented within the internet-search when considered as a system. Throughout the thesis I use the compound word ‘internet-search’ to convey a sense of the search being a whole system comprised of many parts both human and non-human, but a whole nonetheless.

In this thesis I develop and use a novel mapping technique to visually represent different ways that searching the internet contributes to the medicalisation of snoring across multiple levels: at the micro-level of the individual searcher in terms of how they conceive of snoring; at the meso-level of the web-sites competing for searcher attention in terms of how that competition feeds back to influence subsequent searchers and thereby amplifies the medicalisation of snoring; and at the macro-level of the internet itself in terms of how the shifting conception of snoring over time reflects a dynamic pattern of medicalisation on the internet.

I recruited a group of volunteers to each generate an internet-search for snoring which I screen-recorded to form my dataset. I then analysed the recordings by constructing individual graphical representations or “maps” of each search. The maps plotted the proportion of medical language used by each searcher before and after their search, and also the language used on each web page they encountered and the sequence in which the pages were encountered. Each participant’s recorded internet-search for information about snoring resulted in individual level conception maps showing levels of medical language as locations within the conception space delimited by each map. The participant’s own conceptual shift before and after the search was revealed, showing a consistent shift towards use of more

medical language, but importantly the ‘path’ taken through the conception space was also captured.

I also explored the dynamic pattern of medicalisation on the internet and the relationship with the internet-search. I mapped the macro-level dynamic pattern as expressed by the Wikipedia page for snoring by analysing the page’s historical archive. The map showed the shift in language used on the page over time from the first article (posted in 2003) through to 2015, thereby revealing a higher-level pattern of medicalisation.

The various maps used in my analysis cartographically represented the internet-searches as whole-systems comprised of interactions at different levels of organisation ranging from the individuals conducting the searches, through to companies and organisations presenting information on a finite set of web pages selected and served up by the search engine. My overall analysis therefore advances a model wherein the internet-search acts at multiple levels linking a multitude of micro-social enactments of medicalisation, amplified through feed-back loops arising from the meso-level attention economy of the internet, to contribute to the overall macro-social dynamic process of the medicalisation of snoring.

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Disclosure

I conducted this research as a part-time PhD candidate through Victoria University of Wellington. I was also employed by the Sleep Well Clinic during the same period as Senior Sleep Physiologist and Managing Director. I also hold shares in the Sleep Well Clinic. I therefore have a commercial interest in private practice assessment and treatment of snoring and obstructive sleep apnoea. However, my first consideration is always to the ethical and clinical safety of my patients, and the integrity and impartiality of my research.

Contents

Abstract	i
Acknowledgements	iii
Disclosure	iii
Contents	iv
List of Figures and Tables	viii
Chapter One: Introduction	1
1.1 Skinny young women who snore	4
1.2 Overweight middle-aged men who snore	8
1.3 Snoring and levels of medicalisation	10
1.4 The internet-search as an “Engine of Medicalisation”	14
1.5 The Internet-search as a socio-technical actor	19
1.6 Theoretical framework and Methodology	19
1.7 Adapting the tools - the second aim of the thesis	23
1.8 Dynamic Patterns of Medicalisation - the third aim of the thesis	23
1.9 Summary of research highlights	24
Chapter Two: Snoring, Medicalisation, and the Internet-Search	26
2.1 Introduction	26
2.2 Sleep, Snoring, and Obstructive Sleep Apnoea	26
2.3 Medicalisation and Language	28
2.4 Medicalisation of Sleep and the Hypotonic Airway Spectrum	34

2.5 Conclusion.....	46
Chapter Three: Theoretical framework – General Systems Theory	49
3.1 Introduction	49
3.2 Macro/micro Dilemma and Sociological Theory.....	50
3.3 General Systems Theory applied: a “wholes approach”	53
3.4 Why use a wholes approach rather than no theoretical framework at all?.....	60
3.5 Conclusion.....	60
Chapter Four: Methodology – Situational Analysis and Perceptual Maps.....	62
4.1 Introduction	62
4.2 Situational Analysis.....	66
4.3 Perceptual maps and Conception maps.....	71
4.4 Case Study Design Frame	74
4.5 Conclusion.....	84
Chapter Five: The Search for Snoring	86
5.1 Introduction and terms of analysis	86
5.2 The actors in the internet-search for “snoring”	89
5.3 Positional maps – positions in the data (searchers).....	94
5.4 Perceptual maps – situating individuals within the positions	109
5.5 Conception maps and conception-tracking – adding sequence.....	116
5.6 Medicalisation at the micro level	127
Chapter Six: Snoring and the Attention Economy.....	136

6.1 Introduction and terms of analysis	136
6.2 Not all sites are equal in the internet-search.	138
6.3 The sites with the most attention in the internet-search for snoring	147
6.4 Language, Attention Share, and Shifting Conceptions.	160
6.5 The Attention Economy	161
6.6 Search Engine Rank Position	167
6.7 The Mathew Effect.....	169
6.8 Positional maps – positions in the data (web pages).....	171
6.9 Medicalisation at the meso level	174
6.10 Conclusion.....	179
Chapter Seven: Dynamic Patterns of Medicalisation on the Internet	181
7.1 Introduction	181
7.2 Horizontal dynamism: changes in time along levels.....	181
7.3 Vertical dynamism of Medicalisation: levels interacting with levels	190
7.4 The Dynamic Pattern of the Medicalisation of Snoring – the macro-level output of the internet-search as a whole-system.....	193
7.5 Consequences of the patterns	195
7.8 Conclusion.....	196
Chapter Eight: Conclusion.....	198
8.1 Introduction	198
8.2 Limitations	201
8.3 Thesis summary.....	204

8.4 Key findings, implications, and conclusions.....	207
Appendices.....	212
Appendix A – The Conception maps	212
Appendix B - Information Sheet	239
Appendix C - Consent Form	240
Appendix D – Snore score, Sleepiness score, and Epworth Sleepiness Score.....	241
Appendix E – Ethics Approval.....	242
References.....	243

List of Figures and Tables

Figure 1 - Proportion of google searches using "snoring" as keyword.....	17
Figure 2 - Proportion of searches for "snoring" ranked by country.....	18
Figure 3 - Positional map of who can snore in terms of gender vs weight.....	101
Figure 4 - Positional map of types of problems and types of solutions for snoring ..	107
Figure 5 - Perceptual map of web pages	113
Figure 6 - Conception map of Case LV	120
Figure 7 - Conception map of Case HK (the Sleep Specialist).....	122
Figure 8 - Conception map of Case NF	124
Figure 9 - Vector of change (all cases)	127
Figure 10 Position map of all pages.....	141
Figure 11 Relative attention share of whole sites	144
Figure 12 - Screenshot of Wikipedia editing history for article on snoring	156
Figure 13 Individual searcher positions and weighted average page positions	161
Figure 14 – Web pages positional map of who can snore	172
Figure 15 - Individual paths for TT and GS	184
Figure 16 - Conception map for three Wikipedia:snoring revisions.....	187
Figure 17 - Conception map of Case TT	212
Figure 18 - Conception map of Case QA.....	215
Figure 19 - Conception map of Case NF	218
Figure 20 - Conception map of Case KO.....	222
Figure 21- Conception map of Case AQ.....	225
Figure 22 - Conception map of Case CB	227
Figure 23 - Conception map of Case GS	228
Figure 24 - Conception map of Case CS	230

Figure 25 - Conception map of Case LV	232
Figure 26 - Conception map of Case LM	234
Figure 27 - Conception map of Case HK.....	237
Table 1 - Demographics for all participants	92
Table 2 - Ways to stop snoring	104
Table 3 - Search terms (information-based queries vs healthcare-based queries).....	111
Table 2 - Web sites encountered across all searches including time spent (seconds)	145

Chapter One: Introduction

“And outside the window was like a map, except it was in 3 dimensions and it was life-size because it was the thing it was a map of.”

— Mark Haddon, *The Curious Incident of the Dog in the Night-Time*

Our attention is fundamentally limited by the spinning of the earth, the rising and setting of the sun, and our implacable biological rhythms. There are only so many hours in a day, and we all must sleep at some point. Attention then, is a finite resource. However, we also live in a techno-scientific age of wonders wherein knowledge – particularly through the internet – is abundant. Information is effectively an infinite resource. In the world of the internet, access to knowledge is restricted only by our capacity to pay it attention, whereas in the past, knowledge was the limiting factor. Access was time-restricted to special places such as libraries, or to transmission through experts such as academics and doctors. That individuals effectively now have instant on-demand access to information through the internet without needing to schedule time with an “expert” interpreter to be in attendance creates opportunity for conceptions held by individuals, and through them by society itself, to form, and shift, and to be reinforced in new ways and with greater rapidity than ever before. Since attention has become the scarce and therefore limiting resource, “attention brokers” such as Google and Facebook have flourished by bundling eyes and ideas together, and literally selling to the highest bidder. But there are other social interactions that are shaped and influenced by the deeper processes locked within the information/attention brokering systems of the internet, and this thesis focuses on one such interaction: the internet-search and medicalisation.

Peter Conrad described the internet as a socio-technical actor – an ‘engine of medicalisation’ (Conrad, 2005). For many people, the power of the internet is harnessed

through use of search services such as Google. The internet-search can be thought of as a whole; a complex system of human and non-human actors operating at different levels of scale and organisation within the whole. The primary aim of this thesis is to explore how the dynamic interactions within and between those different levels of the internet-search contribute to medicalisation in the specific case of snoring. How does participation in an internet-search contribute to a person thinking of snoring as being medical or non-medical in nature? Is the process of medicalisation at the individual level strengthened or weakened by organisational forces interacting with the individual through the web-pages and the search services? Who is presenting information to the public, and how do they portray snoring in terms of being a medical or non-medical phenomenon?

In this thesis I review the history of snoring particularly as it pertains to the medical gaze. I also review and discuss medicalisation and describe a way medicalisation can be thought of as a shift in conceptions and language. I describe how the relationship between medicalisation and the internet-search can therefore be investigated by looking at changes in the language used by people conducting internet-searches, and the language used on the web-pages they encounter as they search. I then discuss the micro/macro dilemma at the heart of sociological theory and offer a hybrid theoretical framework based on a whole-system approach adapted from General Systems Theory, combined with a multi-level bi-directional model of medicalisation. The hybrid framework befits the cross-disciplinary scope of the overall thesis. I go on to develop an argument that the hybrid whole-system approach allows analysis of the internet-search as a socio-technological whole spanning multiple levels of agency. In the same vein, I then develop a complementary cartographic analysis technique which draws heavily from Situational Analysis but also brings in additional elements from marketing research which I use to analyse and graphically represent the language encountered in the internet-searches comprising my field research. That the theoretical framework,

methodology, and method used in this thesis are all hybrid is a direct consequence of the multi-disciplinary nature of the research topic. Academic research of the internet spans sociology, science and technology studies (STS), marketing, and many other academic disciplines. I found that my own research did not sit comfortably in any one, but that a cross-disciplinary synthesis of theory and method were required. Of course, each academic discipline have traditions and techniques that could have situated my research, including Actor-Network Theory (ANT) from STS studies, and many analytical techniques from marketing research particularly as it pertains to medicalisation. However, the exploratory impulse I felt as a researcher and also the “exploration” element of the internet-search itself suggested very early that a cartographic approach might provide insights not otherwise available using more established techniques. The methodological choice ultimately informed the choice of theoretical framework, and therefore although elements of ANT and marketing are touched upon, ultimately they do not form the basis of my research approach. In particular, although marketing research informs the discussion chapters, my hybrid whole-systems framework demands an exploration of those elements of the system that arise from mechanisms intrinsic to the internet-search itself. This is the very tight focus of my research. Although I draw from sociology and marketing research, I do not set out to explore the influence of marketing forces acting through web-page content on medicalisation directly, since that research has been developed far more fully elsewhere. Instead, I focus very tightly on the implications of the intrinsic mechanisms of the internet-search itself as revealed by my research. Despite this tight focus, in the course of the thesis I develop cartographic visualisations across micro, meso, and macro-levels of interaction arising from internet-search. At the micro-level I created conception maps of each individual internet-search comprising my field research (appendix A). In chapter six I situated all the web pages encountered across multiple searches, thereby catching a meso-level “snapshot” of the

Attention Economy as it pertains to snoring (figure 10). Finally, in chapter seven I use the cartographic visualisation technique developed through the earlier chapters and apply it to the historical archive on Wikipedia's page on snoring to hint at the macro-level dynamic pattern of the medicalisation of snoring (figure 16) – according to Wikipedia.

I touch on those ideas again in the remainder of this introduction and also develop them in much further detail in later chapters. However, first I need to describe why I chose snoring as the case-study for my research investigating how the internet-search contributes to medicalisation.

1.1 Skinny young women who snore

1.1.1 Beginnings and pre-conceptions

I started my medical career in the late 1980s as an orthotic technician. I was attracted to orthotics because the idea of making exo-skeletal supports to aid physical function appealed to the science fiction fan in me and I approached my new hospital job with an anticipation of being involved with something akin to the Six Million Dollar Man. The reality was more prosaic. Instead of being involved with cutting edge technology, I spent my first three years in medicine making shoes, knee braces, and wrist splints. My pre-conception had misled me.

However, during the political upheaval and healthcare restructuring of the early 1990s in New Zealand I was offered the opportunity to re-deploy into the Respiratory Medicine Department at Christchurch Public Hospital. More specifically I was asked to help establish the new sleep disorders laboratory. I eagerly anticipated computers, brain waves, long printouts of various waveforms on sinuous trails of chart paper printing inexorably through the night. Once again, my pre-conception proved to be quite wrong. My first year as a sleep

technologist involved sitting in a small dark room listening each night to a sleeping patient. Listening to snoring. All night. The monotony was broken only occasionally when I made notes by shaded torchlight. No computers to begin with, not in those early days. No EEG printouts providing a window into dreams and nightmares – just me, the patient, and the darkness. And the snoring.

For the most part, the patients I sat listening to in those first years were middle-aged and overweight. Almost all of them were men. At that time the only sleep disorder to attract specific public health funding was obstructive sleep apnoea (OSA). However, the source of most referrals to the sleep service were family doctors who themselves held pre-conceptions about the type of person most likely to have OSA. And so middle-aged overweight men were referred for specialist investigation, whereas those who did not fit the type – i.e. skinny young women – were not. However, the phenomenon most commonly associated with obstructive sleep apnoea is snoring, and young people can snore. Skinny people can snore. And women can snore. So, there was a disconnect between those who might benefit from assessment, and the gatekeepers of the assessment process, although I was not yet aware of that disconnect at the time.

1.1.2 Persistence of pre-conceptions despite new knowledge

Over the ensuing years the threshold for admittance to the sleep laboratory broadened. We started testing younger people and we also tested skinny people. And we finally started testing more women. It became increasingly apparent to us that OSA could occur across all ages and all morphologies and genders. The way OSA was defined based on instrumentation specifically measuring frequency of cyclic airway closure during sleep, meant that middle-aged overweight men were more likely to ‘test positive,’ nonetheless atypical patients started to make up a significant fraction of our diagnoses thereby challenging our conception of who

to test and how to pre-screen for limited access to the service. Despite this growing awareness, the conception of a stereotypical OSA sufferer has persisted in general practice and also in the general population through to the present thereby reducing the likelihood that women will be referred to a sleep disordered breathing service compared to men with identical symptoms. (Lindberg et al., 2017).

I left the Christchurch Hospital Sleep Service in 2003 to join Sleep Well Clinic as Senior Sleep Physiologist. Sleep Well Clinic is a privately-owned sleep clinic that provides diagnostic, consultation, and therapeutic services throughout New Zealand. Perhaps because patients can self-refer, thereby avoiding to some extent the potential selection bias of a family doctor, we see a wider range of patient demographic than the specialist services offered by the public hospitals. We found that our conception of a ‘typical’ snorer or OSA patient and their likely response to treatment had to be modified and broadened. By challenging those ideas, it also became apparent to me that snoring and OSA were both part of a larger spectrum linking a physiological phenomenon related to sleep and airway structures that simultaneously sat on a spectrum of ‘medical-ness’ with some people struggling to have a problem recognised and treated as medical while others struggled to not be forced into diagnosis and treatment of something with which they had no problem. That there was a conceptual tension regarding the medical or lay nature of snoring became increasingly apparent.

The plight of the skinny young woman who snores struggling to be recognised as having a serious problem is attested to in online blogs and also from the many stories from patients who finally make their way to self-referral clinics such as ours after years of being told they can’t have OSA or that OSA is a health problem but snoring is ‘just annoying’ and can be ‘easily solved with earplugs’. A recent study reported that women were nearly half as

likely to have been offered investigation or treatment than their male counterparts despite having identical symptoms and risk factors (Lindberg et al., 2017).

Snoring itself can be a socially debilitating problem whether it is linked to a medical condition or not, even in the absence of elevated cardiometabolic risk. It can strain marital quality (Troxel, Robles, Hall, & Buysse, 2007) and affect daytime alertness and cognitive performance in bed-partners (Ulfberg, Carter, Talbäck, & Edling, 2000). As one snorer, Daily Mail correspondent Hannah Borno, wrote in an online article:

Ever since I was a young girl, I've snored. [...] the sound coming from those supposedly dainty tubes was like a hippopotamus on a Harley-Davidson. [...] As I grew older, my snoring continued. 'You want to know how bad your snoring is?' asked my husband of two years, Charlie. 'Ask the man in the all-night kebab shop three doors down. And every so often, your snoring stops and there's a silence while I wonder if you're still alive. Then there's a massive grunt, which sounds like you're gasping for air, and it starts again. It's disconcerting (Borno, 2009)

In this case of a skinny young woman trying to access help for a problem no-one else seems to recognise, there is a tension that prevents her from shifting her problem into the medical domain. At the level of the individual, there appears to be a struggle to recognise snoring as a problem that could be resolved through accessing medical services, but to some extent that struggle arises from the tension between how snoring is conceived of at a social level versus the individual application of that conception, and the congruence or lack of accord between those conceptions. However, in other cases the problem can be reversed leading to individual medicalisation where the individual perceives there to be no problem.

1.2 Overweight middle-aged men who snore

1.2.1 Testing for sleepiness on the basis of weight

In contrast, the problem is similarly fraught, but much different in configuration in overweight men. The following example makes this point saliently. In 2008, two pilots fell asleep in the cockpit of a commercial airliner operating between Honolulu and Hilo, and overflowed their destination by thirty miles before waking and returning to Hilo. The investigation cited sleep debt arising from work schedule as the main underlying cause of the incident, but it was noted that the captain was subsequently diagnosed with obstructive sleep apnoea.

This event sparked a response by the United States Federal Aviation Authority (FAA) first with education about the dangers of untreated OSA, and then eventually the development of a policy first proposed in 2013 under which pilots with a body-mass index (BMI) of 40 or more are required to be evaluated for OSA. The FAA Federal Air Surgeon who developed the policy introduced it in an editorial (Wayda, 2013) within which he said “Once we have appropriately dealt with every airman examinee who has a BMI of 40 or greater, we will gradually expand the testing pool by going to lower BMI measurements until we have identified and assured treatment for every airman with OSA”.

At the time of writing this thesis, the requirement has been dropped to a BMI of 35 or more. It is important to note that the requirement for testing is not triggered by poor performance, but by BMI alone. If OSA is diagnosed, pilots are grounded until treated – again, irrespective of actual sleepiness or poor performance. Pilots with significant OSA who happen to be skinny are arguably less likely to be diagnosed since they aren’t targeted by the new test guideline and those not targeted are tacitly ‘off the radar’.

Understandably, the policy was hotly contested by pilot groups when first proposed. The Civil Aviation Medical Association wrote a letter to the FAA, objecting to the proposed policy for several reasons. They felt that the FAA should not be tasked to provide long-term prognoses and also noted that there was no scientific body of evidence demonstrating undiagnosed obesity or OSA had compromised aviation safety. They also pointed out that obesity might very well be a national health issue, but that unified educational efforts might be more likely to be successful than regulatory measures. They estimated over 120,000 American pilots had a BMI of 30+, and therefore the proposed policy would greatly burden a “Critically taxed medical certification system already suffering from very significant processing delays” (AINonline 2013)¹.

1.2.2 Regulatory tendrils from the US reach New Zealand

Despite these objections and others, the policy was adopted and remains in place. The FAA is not alone in selectively targeting large men to be tested for OSA. The U.S. Department of Transportation’s Federal Motor Carrier Safety Administration have been involved in similar regulations regarding OSA evaluation for truck drivers in the U.S. Within the New Zealand context, the Civil Aviation Authority Medical Examiner’s Medical Manual guidelines for medical examiners does not quite go so far as to order mandatory testing above a certain BMI, but the guidelines do direct the examiner’s attention to weight - “ICAO recommends that the diagnosis of OSA should be considered in crew members who are overweight, have Type 2 diabetes, have a history of snoring or complain of excess daytime sleepiness.” – and then go on to point out that “People with a BMI of 35 or more have a ~ 70-75 % likelihood of suffering from OSA and those with a BMI of 40 or above, a ~ 80%

¹ <https://www.ainonline.com/aviation-news/business-aviation/2013-12-12/>

likelihood of having OSA.” (New Zealand Civil Aviation Authority Medical Manual, 2016 rev 1, 2018, p 17). In this case then, the non-sleepy pilot who happens to be overweight is required to pay for medical testing. If found to have even the mildest obstructive sleep apnoea (present in at least 10% - 20% of the middle-aged population) even if completely asymptomatic, nonetheless he or she is required to engage in long-term therapy in order to hold his (or her) licence. Skinny colleagues who might have far more profound obstructive sleep apnoea will be overlooked.

1.3 Snoring and levels of medicalisation

How did the notion that middle-aged overweight men suffer from OSA and skinny young women don't form in the first place? How has it been maintained in the face of evolving knowledge to the contrary? The core focus of this thesis is about conceptions. Pre-conceptions, conception formation and re-formation, and conception entrenchment. The conception that snoring might belong in the medical domain is relatively recent and still evolving, and as such makes a good case study from which insights might be gained about medicalisation in general. Snoring is in the midst of being medicalised. Therefore, snoring makes a good case study for researching the role the internet-search plays in medicalisation.

Medicalisation is the process whereby aspects of human life become defined as medical conditions and thereby subject to diagnosis and treatment (Conrad, 1992; Szasz, 2003; Zola, 1972). When first discussed in the sociological literature, medicalisation was seen as a manifestation of medical imperialism (Illich, 1975; Zola, 1972) expanding the medical reach through appropriation of areas previously deemed non-medical. It was conceived as a form of social control whereby medical authority increases its reach by re-conceiving everyday phenomena such as anxiety, obesity, grief, shyness, and child

restlessness, by way of examples, as medical problems subject to medical modes of authority and control.

The concept of medicalisation initially focussed on medical regulation of daily life which had previously been regulated by the church or the law. Homosexuality, for example, was long considered a sin. But through the social process of shifting authority from church to law to medicine, homosexuality shifted from sin to crime, and thence to disease. The social conception of homosexuality serves further to illustrate ‘de-medicalisation’, considered by some to be a separate process (Clarke & Shim, 2011) although considered by others to be implicit in the conception of medicalisation itself (Conrad, 2008; Halfmann, 2012). As the conception of homosexuality shifts away from disease and medical control through to lifestyle choice, and now most recently to an intrinsic identity and expression of self.

More recently, the linkage between medicalisation and medical social control has been seen as problematic due to the plurality of medicalising trends not all of which are necessarily social-control-based (Correia, 2017) or authoritarian even though medicalisation arises from concepts of authority. Throughout this thesis, I adopt a definition of medicalisation which refers to the social process whereby the generally accepted authority over an everyday phenomenon shifts from non-medical to medical. The adopted definition does not require a motive of social-control to necessarily be part of the process.

Doctors still largely retain their gatekeeper role. However, new technologies and health care structures have shifted some of the power away from medical professionals, so that commercial and marketing forces have now become new drivers of medicalisation. The internet-search is one such emergent yet increasingly pervasive source of influence through which particular conditions are medicalised such that Conrad refers to the internet as one of a number of “engines of medicalisation” (Conrad, 2005).

1.3.1 Snoring and the rise of sleep medicine

Unsurprisingly, given that snoring occurs only during sleep, the history of the medicalisation of snoring tracks alongside the rise of sleep medicine as a medical subspecialty of neurology and/or respiratory medicine. Starting with a single sleep laboratory at Stanford Medical School in the USA, clinical sleep laboratories proliferated from the mid-1970s onwards so rapidly that in 1999 Nancy Collop wrote in the journal *Chest*: “Sleep laboratories are opening regularly in this country. What is required to set up a sleep laboratory? Money and a building! Anyone can open a sleep laboratory, and it seems that just about everyone is.” (Collop, 1999). Sleep laboratories were initially used as research facilities for neurological investigation of sleep and disorders such as narcolepsy. The ‘discovery’ of obstructive sleep apnoea dramatically changed that. Snoring, previously considered as merely a marker of very deep sleep, was transformed into a symptom of a recognised clinical diagnosis.

Obstructive sleep apnoea was (and still is) defined by indices measuring the frequency of airway collapse during sleep, which could only be arrived at through overnight multi-channel sleep studies conducted in those specialised sleep laboratories. Snoring is a common marker of OSA due to the extremely high level of association between the two. Almost all people with OSA snore, although not all snorers have OSA. Given the cost of overnight sleep monitoring, determining which snorers had OSA became big business, particularly since half the middle-aged population snore to some degree.

The relationship between snoring and OSA arises due to the shared underlying physiological mechanism of airway muscle relaxation during deep sleep which, in the snorer, involves audible vibration of structures in the oropharynx, and in the OSA sufferer proceeds from vibration through to full airway collapse. Snoring and OSA therefore represent two

points on a spectrum of hypotonia during sleep which is shared by everyone to one degree or another. One end of that spectrum, the non-snoring non-apnoeic sleeper, does not yet come under medical jurisdiction. The other end, the sleep apnoeic who chokes over a hundred times an hour every night, lies firmly in the medical domain. Snoring straddles the grey area in the middle, and as such provides an opportunity for rich insight into the process of medicalisation.

1.3.2 Medicalisation has vertical complexity

Medicalisation takes place across multiple levels of social analysis – at a macro conceptual level, at an institutional or organisational level, and at a micro or individual level such as the doctor-patient interaction (Halfmann, 2012). At the macro or conceptual level, medical discoveries and definitions are adopted by non-medical groups such as government or courts of law. Society is ordered around those adoptions which mandate who is to control the problems thus defined. At the meso or organisational level physicians might be involved as gatekeepers or regulators, but as in the case of the FAA mentioned earlier in this introductory chapter, the organisation is not specifically medical in nature. At the micro level of doctor-patient interaction, a physician might define a problem as medical and apply a medical treatment (Conrad and Schneider (1980) give the example of prescribing tranquilizers for an unhappy family life). Even before the physician-patient interaction, however, a person must go through a micro-medicalisation process of deciding to go to the doctor in the first place. Halfmann (2012) points out that since there are different levels at which medicalisation operates as a process, it follows that medicalisation of a given phenomenon might occur unevenly across those levels, thereby setting up a dynamic process of different levels strengthening or weakening the medicalisation process at the other levels. Importantly, therefore, it is reasonable to view any given case of medicalisation as a system

with internal dynamism both along and between levels. I have chosen to treat the case of medicalisation of snoring accordingly throughout this thesis.

1.4 The internet-search as an “Engine of Medicalisation”

1.4.1 Engines of Search

People living in countries with relatively easy access to the internet increasingly use search services such as Google to gather information about the medical nature of problematic everyday phenomena such as snoring (Mager, 2009; Hesse, Moser, & Rutten, 2010; Veer, Alder, & Ullal, 2014). How do I fix this thing? Is this a symptom of a disease or is it something else? Should I be worried? The new world of portable personal devices such as smartphones and tablets have brought around-the-clock access to the internet, and in that world one particular internet search engine not only dominates the digital environment of search services, but actively and deliberately contributed to the society-changing development of internet-search at everyone’s fingertips through the adoption and promotion of mobile device internet-search functionality (Levy, 2011). The dominance is such, that the name of the service has become a verb in popular usage in much the same way that the vacuum cleaner brand ‘Hoover’ came to be used as a verb for the act of cleaning with any brand of vacuum cleaner. Thus, the search engine ‘Google’, created and owned by the company ‘Google Inc’ has given rise through sheer domination of the internet search market to a neologism: the verb ‘to google’ meaning to search the internet. People ‘google’ to find out where the nearest bar is, or ‘google’ a film to find out the name of an actor that is eluding them in conversation. In January 2018, netmarketshare.com, an online aggregator of internet search engine activity, showed Google accounted for 83% of the English-speaking search engine usage, whereas Microsoft’s Bing (which is shipped and enabled as the default browser on all computers with the Windows operating system) had less than 10% at the time of

reporting. The extremely high use of Google makes it a useful research tool insofar as it can be used to sample that aspect of the internet most likely to be encountered by individual users. Although I did not specify that participants use Google during the data collection phase of my research, nonetheless all of them did.

1.4.2 The internet-search is a dynamic process

That search engines are not passive implies that the processes at work behind the search engines are worthy of study as active agents involved in social processes such as medicalisation. Rather than thinking of the internet as a blank wall upon which people stick billboards (or post-it notes) with relatively equal likelihood of exposure, the internet can instead be thought of as a library within which the search engine actively acts as librarian – sorting, filing, and most importantly, directing attention to this book on a particular topic, rather than that book. And this other book? Well that's just not for general lending.

Search engines do not give equal access to all websites – they filter and sort and in particular, they rank some sites more highly than others on the search engine result page (SERP) resulting from any given internet-search. The mechanisms of search engine page ranking algorithms in general, and Google's page ranking system in particular, are the subject of much study in Science and Technology Studies (STS), an academic field interested in technology as socio-material phenomena including associated forms of knowledge and social organisation. STS research has helped fuel a rising academic interest in social phenomena involving interaction with the internet, such as how people use the internet-search to find healthcare resources and information (Mager, 2009). That people now commonly 'google' to find out whether they need to 'go see a doctor' about a given problem creates an opportunity to study sociological mechanisms of concept formation and change, and specifically the mechanisms of medicalisation and the internet, through studying the internet-search itself

including the human actors (the searchers) and the web pages they encounter when searching and most importantly, the intermediary role of the search engine service.

1.4.3 Do people conduct internet searches for information about snoring?

Put another way, is the medicalisation of snoring important to understand for practical reasons as well as purely academic interest? Fortunately, the domination of Google as a search engine has provided a rich source of information for social researchers. Digital information is searchable information, and that combined with Google's indexing and archiving means that the social researcher can sample aspects of broader society through Google's many support and analysis tools. The Google Trends tool ([google.com/trends](https://www.google.com/trends)) is a service whereby Google's archived data regarding search keywords is made available to the public. Academic researchers have used Google Trends to investigate the frequency of internet searches for 'snoring' and 'OSA' to look at seasonal variation (Ingram, Matthews, & Plante, 2015). Their data, which I have reconstructed in figure 1 from my own use of Google Trends Tool, showed an overall upward trend in the proportion of searches for snoring and OSA relative to all other all search terms in each time period over the decade preceding 2016. Note data is randomly sampled and then normalised to account for changing total number of searches each year by assigning a value of 100 to the year with the highest use of snoring as a

keyword relative to all other terms, and then all the other years are scaled and assigned values proportional to that year.

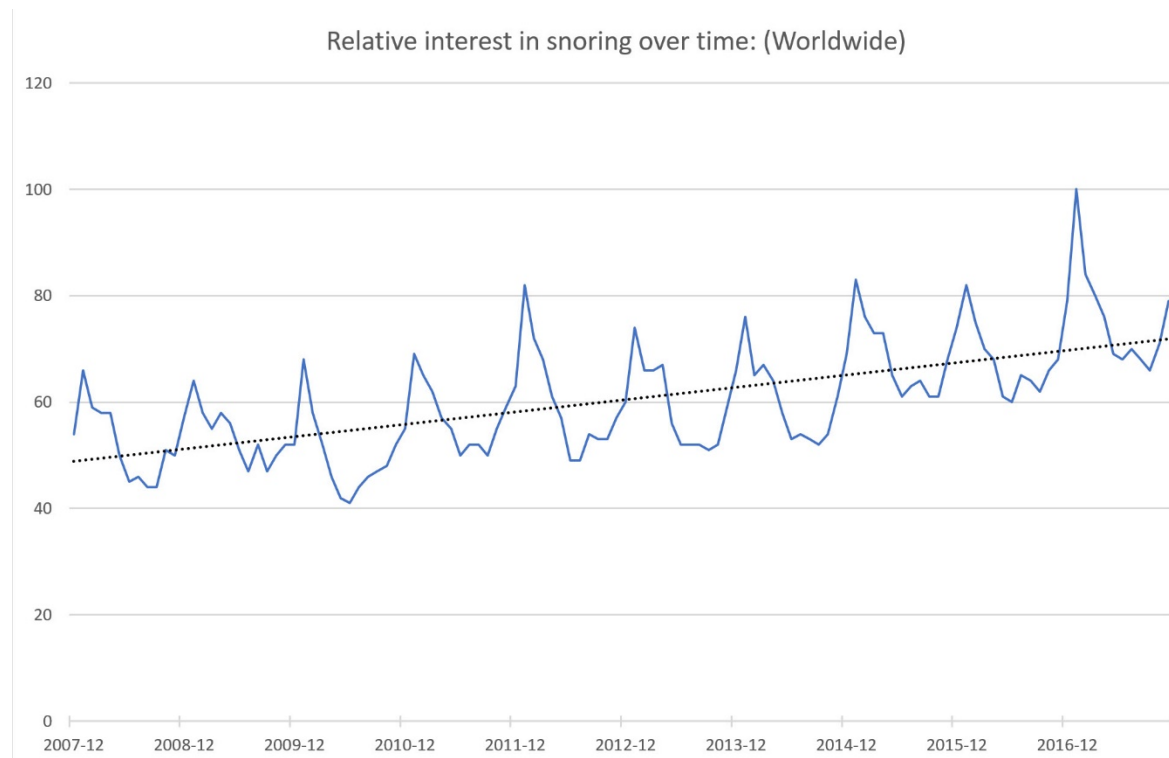


Figure 1 - Normalised relative proportion of google searches using 'snoring' as keyword vs all other searches.

The study was looking at cyclic seasonal fluctuations which the authors proposed arose from nasal congestion during winter increasing the incidence of snoring in the population. Of importance to this introductory chapter, is the upward trend indicating an increase in overall interest in snoring or at the very least, a higher proportion of internet searches for snoring.

1.4.4 Is this relevant to the New Zealand context?

As further background research, I also conducted a regional search using the Google Trends tool which ranks countries based on the proportion of searches conducted in that

country using the search term of interest, relative to all other search terms (figure 2). The results are again normalised for population (i.e ranking is based on overall proportion for the whole population, irrespective of the size of that population).

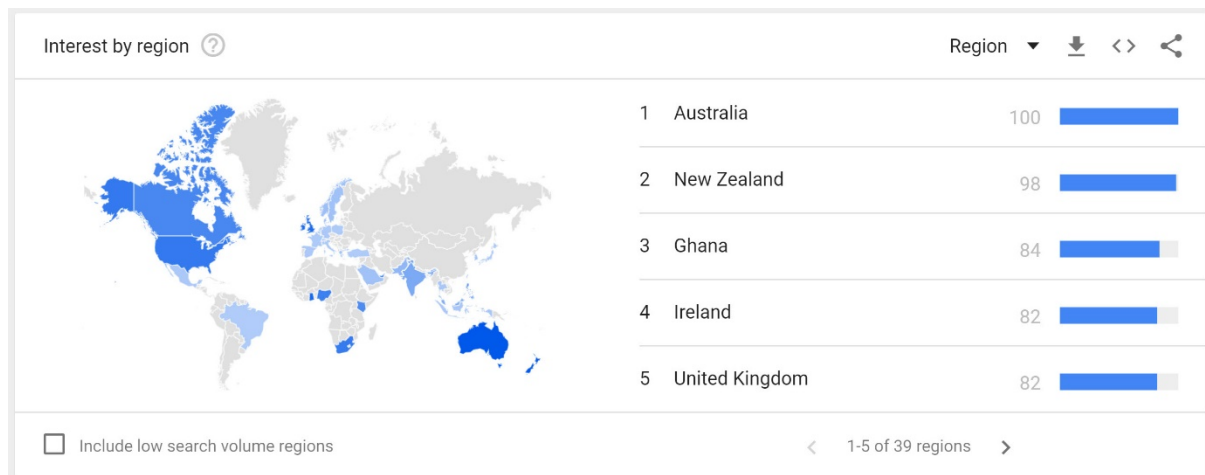


Figure 2 - Proportion of searches for 'snoring' vs all other keywords ranked by country.

That New Zealand is second only to Australia in terms of internet-searches for snoring per population lends further suggestion to the local relevance to the choice of snoring as the case study of medicalisation for this thesis. The Google Trends tool shows that people are increasingly searching the internet for information about snoring, and that a higher proportion of the population search for information about snoring in New Zealand than any other Google-using country except for Australia. Therefore, my choice to investigate medicalisation through study of the internet-search for information about snoring would appear to be sound since a) increasing proportions of people worldwide are searching for information about snoring using Google, and b) the country with the second highest proportion of people searching for information about snoring is New Zealand.

1.5 The Internet-search as a socio-technical actor

1.5.1 The research question

The primary aim of the thesis is to explore the dynamism of the interactions between the different levels of medicalisation represented within the internet-search, and through that exploration to re-present the internet-search as a socio-technical actor driving one of Conrad's engines of medicalisation (Conrad, 2005). The fundamental research question can therefore be framed thus: how does the internet-search contribute to the medicalisation of snoring?

1.6 Theoretical framework and Methodology

1.6.1 General Systems Theory – a 'wholes' approach

Academic investigation of digital and social media is experiencing explosive growth, and consequently social science academics are developing new research tools and/or new theoretical frameworks specifically for the human-technological hybridisation of the modern technological era. A common feature of theoretical frameworks such as Actor-Network Theory (ANT) arising from the Science and Technology Studies (STS) branch of academia is that they specifically embrace both human and non-human or technological assemblages within systems as equal social agents (Latour, 2007). ANT was informative and influenced me deeply when I first formulated my research strategy. However, as I developed my research, I found it increasingly important to recognise that although I was certainly analysing constituent elements within the internet-search, it was the whole system of the internet-search itself that was of particular interest to me and which I needed to emphasise and defend. I was interested in assigning agency to human and non-human actors including social actors such as organisations and institutions, but also (and equally) technological actors

such as search engine algorithms, website ‘cookies’, and data aggregation and marketing tools. But despite that analysis of the constituent elements, or perhaps because of it, I needed to consistently come back to the idea that the object of study was the internet-search itself, particularly when considered as a whole system. Furthermore, it became increasingly evident that the dynamic process of the internet-search demanded recognition, and that the object of study was not just a human-technical hybrid, but most importantly, a system.

In the end, I was guided by Barbara Hanson (1995) who advocated an applied version of General Systems Theory (GST) which she describes as a ‘wholes approach’, a term I continue to use throughout this thesis when referring to her theoretical approach (Hanson, 1995). A wholes approach places emphasis on the whole being greater than the sum of its parts. It invites analysis to begin wherever a phenomenon that appears to be relevant exhibits properties when two or more constituent parts interact, that are not present in the parts alone. Hanson proposes that it is this single point of departure that is the sole requisite of a wholes approach which, although informed by General Systems Theory, she offers instead as an approach rather than a theory in the conventional form.

Even before I adopted a suitable overarching theoretical approach, I was challenged to find a suitable methodological framework that would allow me to tease out the vertical dynamism between the different levels of action within the internet-search whole system. I was particularly interested in the workings of the internet-search as a dynamic engine of medicalisation and anticipated that at least some of the power of that engine would arise from the interplay between what I would come to describe as the macro, meso, and micro levels of action. From a very early time in planning stages of my research, I was attracted to a methodology that looked at elements within a whole system without losing sight of the

whole, and which did so through an interesting visual analysis technique that makes use of maps: Situational Analysis.

1.6.2 Situational analysis

Situational analysis is both a methodology and a method which extends grounded theory by emphasising relational positions which are represented for analysis cartographically (Clarke, 2003, 2005). Situational analysis seeks to retain the heterogeneity, complexity, and messiness of relationships and conceptualisations. It uses three levels of cartographic representation promoting exploration of the complexities that emerge from the analysis. The cartographic approach to analysis plots the situational, relational, and positional elements loosely corresponding to macro, meso, and micro levels of the data to create visual maps that provoke analysis.

The positional maps encourage the analyst to give thought to the positions themselves rather than the individuals or groups that hold them and emphasises marginalised or missing positions.

Social Worlds/Arenas maps work at a meso level. They are used to visually represent and arrange the collective actors, key nonhuman elements, and the arena(s) of commitment and discourse within which they are engaged in on-going negotiations.

The social worlds/arenas maps allow meso-level interpretations of the situation that are rooted neither in examination of the individual, nor “macro-level grand theoretical abstractions”, but instead in social collectives such as business groupings (insurance companies, government departments, hospital administration) or professional groupings (nurses, allied health professionals, patient advocates) (Clarke, 2005 p 110 - 117). The analysis of social groupings helps the researcher locate the situation in the larger field of

interest. The creation of these maps allows the researcher to ask about collective activity and interactions. It also facilitates thinking about the possibilities contained within the overall situation, and encourages analysis of missing groups and the implications of their omission (Wulff, 2008). Situational maps are used to bring the underlying elements of the situation together to assist theory generation.

All three kinds of maps are intended as analytic exercises, fresh ways into social science data. They are intended as supplemental approaches to traditional grounded theory analyses that centre on action-basic social processes. Instead, these maps centre on the situation of inquiry. Through mapping, the analyst constructs the situation of inquiry empirically. The situation *per se* becomes the ultimate unit of analysis and understanding its elements and their relations are the primary goals.

Because SA embraces multi-level interaction and does so using a visual tool designed to turn abstract conceptions into spaces, I chose to use those specific aspects for my research. The micro-level 'positional maps' which chart concepts within a spatial frame to assist analysis through visualisation, influenced me profoundly. In unmodified SA, the purpose of positional mapping is to define and analyse the positions within the situation, but not the positions taken by specific individuals or groups. Each map defines a conceptual space cartographically but is always a static representation. Since I was interested shifts in conceptions, I felt that positional maps were an ideal tool to represent a conceptual space such as the degree of 'medicalness' of snoring, but unlike SA, that I could use that constructed space to trace movement of individuals, or organisations, or society, through that space. Furthermore, I also wanted to visually represent abstractions such as order of sequence, and attention share to help unravel some of the elements contributing to shift and

movement. In short, I needed to modify the standard SA technique to make it more suitable for tracking conceptual shifts.

1.7 Adapting the tools - the second aim of the thesis

1.7.1 Concept-mapping and conception-tracking

The second aim of the thesis, therefore, is to contribute to the cartographic methodology of Situational Analysis, by introducing additional dimensions to position maps to facilitate tracking movement through conceptual space over time.

In subsequent chapters I discuss in more detail how my addition to SA enhances what is already a useful social science research method to create a new and powerful visual-based analytical tool specifically suited not only for social phenomena arising from and within the internet, but also any other area of academic investigation focussing on concept interaction or conceptual dynamism.

1.8 Dynamic Patterns of Medicalisation - the third aim of the thesis

Finally, the third aim of the thesis is to develop a theory of dynamic patterns of medicalisation building on the insights gained through studying the particular case of the medicalisation of snoring using the newly developed tool of conception mapping. Different instances of medicalisation ‘play out’ or ‘take hold’ of society at different rates over time – sometimes expanding rapidly, and at other times slowly and at still others, perhaps contracting (demedicalisation). Therefore, I develop the idea of dynamic patterns of medicalisation as it pertains to snoring and examine how the internet-search contributes to that pattern not just for snoring, but potentially for any other medicalised phenomena as well. I use the new conception mapping tool to visualise the macro-level dynamic pattern of medicalisation for snoring through analysis of the Wikipedia historical page archive. The

conception map shows the medicalisation shift of information on the pages of Wikipedia as a shift through the conception space defined by the map. The Wikipedia entry for snoring holds a publicly available record of all the published changes made to the Wikipedia snoring page since the first entry in 2003 through to the present day. This further analysis used the conception-tracking technique to visualise macro-level society-wide shifts in concepts about snoring as represented by the Wikipedia entry, thereby representing the macro-level medicalisation of snoring as a vector.

My discussion centres on advancing a model wherein the internet-search acts at multiple levels linking a multitude of micro-social enactments of medicalisation, amplified through feed-back loops arising from the meso-level attention economy, to contribute to the overall macro-social dynamic process of the medicalisation of snoring. I then examine some of the contemporary social issues that might arise from the medicalisation of snoring and relate those issues to the proposed dynamic pattern noting that this is only one among many possible dynamic patterns of medicalisation.

The thesis concludes with an expansion of the theory of medicalisation that focusses on the importance of recognizing the range of possible dynamic patterns medicalisation might follow, each with their own implications and potential consequences.as a possible amplifying force augmenting the driving power of the internet as an engine of medicalisation linking and arising from tensions between the varying rates and directions of medicalisation (and de-medicalisation) happening simultaneously within micro-level, meso-level, and macro-level dimensions.

1.9 Summary of research highlights

The internet is a rich site of potential influence in the shaping of conceptions of health and disease at a micro-social level of individual encounter. This research analyses micro-

level encounters using a novel cartographic technique: conception-tracking. Conception-tracking enhances the analytical breadth of situational analysis' positional maps to include and give focus to actions such as conception formation, re-formation, and canalisation.

The research also uses conception-tracking to explore the role the internet-search plays in concept shifting and medicalisation in general through examination of the medicalisation of snoring as a specific case study. The internet represents an attention economy within which cumulative advantage accrues to a finite few meso-level actors – a sociological process referred to as The Mathew Effect after the biblical parable of the talents found in the Book of Mathew. This research examines the amplification arising from feedback loops set up by Google page ranking as an example of the Mathew Effect, and explores how those feedback loops span multiple levels of social interaction so that the micro-level informs the macro-level and vice versa.

Wikipedia holds records of all past versions of any given entry. Conception-tracking is used to map the progression of medicalisation historically which creates a visual representation of a dynamic pattern of the medicalisation of snoring. The implications arising from dynamic patterns of medicalisation are discussed and an extended model of medicalisation incorporating dynamic patterns is advanced.

Chapter Two: Snoring, Medicalisation, and the Internet-Search

2.1 Introduction

How does the internet-search contribute to the medicalisation of snoring? The research must begin with a close examination of the elements of the research question. What do I mean by ‘snoring’? What do I mean by ‘medicalisation’ and ‘internet-search’? For that matter, what do I mean by ‘contribute’?

In this chapter I will discuss the history of snoring particularly as it pertains to the medical gaze. I will also explore the concept of medicalisation and describe the way medicalisation can be thought of as a shift in conceptions, and how traces of the medicalisation process can be detected by tracking shifts in language. I introduce some elements of the internet-search as an agent of social process which are expanded in later chapters. I then finish the chapter by discussing the interaction between snoring and medicalisation.

2.2 Sleep, Snoring, and Obstructive Sleep Apnoea

2.2.1 The Hypotonic Airway Spectrum

Snoring represents one end of an experiential spectrum of epiphenomena arising from the relaxation of muscles in the oropharynx during sleep. As a person descends through progressively deeper stages of sleep, muscle tone reduces dramatically throughout the entire body including the upper airway. In many people the natural hypotonia of the muscular elements of the upper airway during deeper stages of sleep, and rapid eye movement (REM) or dreaming sleep in particular, allows the airway to become labile or ‘floppy’ during the negative phase of breathing. For some sleepers this has no discernible functional effect. For

others it sets up low frequency vibration of the hypotonic muscles in the airway which makes the audible noise we know as snoring (Kryger, Roth, & Dement, 2010).

Some snorers develop sufficient destabilisation that the airway partially or completely sucks shut or obstructs enough to affect ventilation. In those cases, the person will begin to rise out of deep sleep, in response (via several neurophysiological pathways) to the obstruction. It is important to note, that the vibration alone can be enough to be detected by the sleeping brain even in the absence of full obstruction. As the person rises back up through progressively lighter sleep stages in response to the airway instability, the muscle tone increases again until full patency and stability is restored, thereby ending the noxious stimulation and associated sleep disruption. The individual obstructions are referred to as 'hypopnoea' (when partial) and 'apnoea' (when complete). If a person is found to experience a sufficient frequency of apnoeic or hypopnoeic events per hour of sleep (the Apnoea-Hypopnoea Index or AHI), then that person can be diagnosed as suffering obstructive sleep apnoea (OSA) (Hauri, 2005; Kryger et al., 2010). So, on one end of the Hypotonic Airway Spectrum the muscles relax but there is no other effect. A little further on, the airway relaxes enough to vibrate and make noise, but nothing more. Further along again, and there is noise along with associated sleep-disrupting response. OSA sits at the far end of the spectrum including vibration, noise, sleep disruption, but also actual 'choking' or obstruction (Deary, Ellis, Wilson, Coulter, & Barclay, 2014). The term 'Hypotonic Airway Spectrum' is presented here in this thesis for the first time to unite the terms 'simple (or uncomplicated) snoring', 'upper airway resistance syndrome (UARS)', and 'obstructive sleep apnoea (OSA)' used more conventionally by the sleep medicine fraternity. However, I think it is useful to link those concepts under a single term to better identify and acknowledge the common underlying mechanism and therefore emphasise the idea that snoring and OSA can sit together on a single spectrum when considered in those terms.

2.3 Medicalisation and Language

Studying the differences in language used by lay people and web pages encountered during internet-search for snoring provide a rich opportunity to think about and better understand the interaction between levels of medicalisation and diagnosis. How does the degree of ‘medicalness’ of snoring versus OSA influence non-diagnosis, pre-diagnosis, and diagnosis of OSA or simple snoring, and is the system dynamic? How do both sides of the diagnosis/non-diagnosis tension play out on the hypotonic airway spectrum and can that tension be reflected by demarcation into medicalised and non-medicalised regions?

The diagnosis of ‘OSA’ or ‘not OSA’ almost always starts with a problematic snorer (or a person affected by a problematic snorer) who must decide that their problem and possible solutions for that problem might best lie with medicine. That critical first step is one that will occur as a result of a wide variety of influences, including (but not limited to) socio-economic predisposition to accessing medical services, personal or shared experience, and media advertising. This research focuses of course on the internet, regarding it as an emergent yet increasingly important source of influence, shaping conceptions regarding who can snore, who can have OSA, who can be treated, and how therapies for snoring can be accessed. The research extends Tiago Moreira’s (2006) examination of medicalisation through analysis of OSA and CPAP therapy, by recognising that along with consideration of the OSA group and CPAP therapy, examination of the ‘non-diagnosis’ group (i.e. snorers) adds an important missing group to the analysis of micro-level interactions which sheds further light on medicalisation in general.

The concept of medicalisation emerged during the 1970s, coincidentally around the same time that the first sleep laboratories started to appear in the United States. In part, the initial impetus for the concept of medicalisation derived from criticism of the burgeoning

domain of psychiatry, which was seen to be increasingly bringing everyday phenomena into the realm of medicine (Zola, 1972). When used as a sociological concept in the literature, medicalisation most frequently carries an implicit sense of excess—extending the medical grasp beyond what is warranted, even as medical imperialism or hegemony, but that is not a mandatory reading of the concept (Conrad, 2008; Correia, 2017). The early literature often gave examples of medicalisation that were motivated by special interest rather than medical necessity. Cases such as obesity, adult attention deficit disorder, and social anxiety are all examples of aspects of everyday life – adiposity, inattention, and shyness in those examples – that have been brought into the medical domain through the deliberate promotion of conditions by vested medical interest groups such as pharmaceutical companies (Conrad, 1992; Blackburn, 2011). But as Peter Conrad pointed out, medicalisation is necessarily at the heart of all phenomena defined in medical terms (Conrad, 2008) and may not be the result of vested interests or imperialism, rather as a result of advancing knowledge and recognition of previously unrecognised relationships between cause and effect. Similarly, not all vested-interest medicalization is driven by medicine itself. Non-medical interest groups have successfully advocated for the medical recognition (or medicalisation) of ‘conditions’ such as post-traumatic stress syndrome (PTSD), and alcoholism for example. The pharmaceutical industry has also driven medicalisation of previously non-medical phenomena by reframing them and promoting them as medical ‘conditions’ such as female hypoactive sexual desire disorder (Jutel, 2010) and social anxiety (Conrad, 1992; Scott, 2006)

My research approaches the hypotonic airway spectrum with Conrad’s reading at the forefront of the analysis. That medicalisation is a sociocultural process which might or might not involve the medical profession itself is an important consideration for social researchers framing their investigations within medicalisation theory. I remain throughout this thesis cognizant of the premise that despite the commonly implied imperialist motivations,

medicalisation need not necessarily involve the medical profession, nor lead to medical social control, nor be the result of intentional expansion by the medical profession. Indeed, Conrad has more recently described what he calls “engines” of medicalisation, including the medical devices and various institutions such as insurance companies which increasingly play a role in the process by which particular phenomena become part of the purview of medicine (Conrad, 2005). The engines feeding into the internet portrayal of snoring are analysed in greater detail later and the interplay between those institutions and the attention economy of the internet is discussed in chapter six along with some of the less obvious inferences derived from examination of my data. The medicalisation of the hypotonic airway has certainly been influenced by a variety of ‘engines’, to use Conrad’s terminology, and it is not surprising to find some of them at work within the internet-search.

Conrad (1992) maintains that although differing definitions of medicalisation have been proposed, the key to understanding medicalisation lies in the definitional issue itself. In other words, he suggests that medicalisation consists of defining a problem in medical terms, although one could argue any phenomenon could be so defined, including those that are not intrinsically problematic. Medicalisation occurs when a given ‘problem’ is defined using medical language, or when a medical framework is used to understand that problem, although once again one could apply the definition to non-problematic phenomena or behaviour as well. Medicalisation also includes the use of medical interventions to ‘treat’ problems, and Clarke’s (2010) concept of biomedicalisation includes the transformative influence of technologies within the medical domain. Correia (2017) makes this tension explicit when revisiting medicalization and argues for a knowledge-based approach to medicalization that includes all forms of medical knowledge in a global society beyond just that defined by the dominant biomedical knowledge, thereby allowing for medicalizations (plural).

Despite sociological debate and critique as to whether medicalization represents merely an overall social pressure to move social control of deviance away from church and law thereby changing ‘sin’ to ‘crime’ and finally ‘sickness’ (Rose, 2007), nonetheless the theory has continued to develop so in the modern form it more explicitly includes other movements away from medical authority and back – ‘demedicalisation’ and ‘remedicalisation’ and retains utility (Hislop & Arber, 2003; Williams, 2004; Conrad, 2008; Correia, 2017; Busfield, 2017).

Language is a central concept of medicalisation. A medical vocabulary is intrinsic to definition, and definition lies at the heart of medicalisation (Conrad, 2008; Correia, 2017). A medical vocabulary then, is one of the tools that order or define a phenomenon as belonging to medicine (or not). It is reasonable to expect, then, a shift in language used to define a phenomenon at the outset of medicalisation as a sociocultural process. However, a change in language used to describe a phenomenon might also reasonably be expected to be seen at the micro-level of an individual trying to work out whether this problem requires a doctor’s visit or not.

At an individual level, a shift in language might then be seen as a marker of micro-medicalisation as a first step in seeking diagnosis. In that light, Brown (1995) discussed the importance of diagnosis in social construction of illness, and argued for the centrality of social construction in medical sociology (Brown, 1995). However, there are variants of social constructionism, including strict traditional constructionism, which ignore the fundamental social aspects of society including stratification elements such as race, class, gender, and professional or institutional factors; through to sociology of science which argues for the production of facts as a result of mutually conceived actions by professionals combined with efforts to promote that work in public or official arenas. Brown argued for a synthesis of

viewpoints, and a review article by Conrad and Barker (2010) suggests a maturation of the social constructionist approach to medical sociology has occurred in the intervening years (Peter Conrad & Barker, 2010). Conrad and Barker (2010) discuss the three overarching contributions of social constructionism to medical sociology. The first is that some illnesses are particularly laden with cultural implications that do not necessarily derive from the condition itself. The second is that all illnesses are socially constructed based on the individual experience for those living with the condition. The third is that medical knowledge is not necessarily discovered in nature but constructed by claims-makers and interested parties. Context is everything, and Correia (2017) echoed that sentiment when talking about a plurality of medicalizations.

Brown (1995) argued for the centrality of diagnosis in the theory and practice of medicine and importantly, for the social construction of illness. When medical labelling is used as a form of social control, diagnosis takes a prominent role. Brown describes giving the name as being the starting point for social control ranging from routine levels of socialisation, labelling of behaviour and access to therapy for example. Despite the importance of diagnosis to medical sociology, he noted there was a paucity of attention paid to diagnostic issues despite a preponderance of discussion around issues to which diagnosis might be considered germane, although he noted psychiatry as a prominent exception.

Taking up Brown's call for a sociology of diagnosis, Jutel offered a synthesis of perspectives pertaining to the role of diagnosis in medical sociology (Jutel, 2011), and in doing so advanced the development of a formal theory. Her analysis unpacked the interactive relationship between social framing on the one hand, (encompassing classification, risk profiles, disease discovery, and diagnostic technologies), and social consequence on the other (allocation, legitimization, exploitation, and stigmatization). She presents the relationship as

circular and self-referential, which necessarily suggests a likelihood of canalisation and entrenchment. An emergent concept is that diagnoses are “not prior ontological entities but social categories that organise, direct, explain, and sometimes control our experience of health and illness” (p. 145). Although diagnosis and medicalisation are related but distinct concepts, contextual definitions are central to both, and the choice of language or specific vocabulary is an essential element of definition.

Of relevance to this research, Conrad highlighted the definitional aspect of medicalisation thus:

Medicalization consists of defining a problem in medical terms, using medical language to describe a problem, adopting a medical framework to understand a problem (Conrad, 1992).

The research presented in the following chapters of this thesis will examine the internet through analysis of language used in the internet-search for snoring, but visualised as an interactive spatial environment within which concepts regarding the hypotonic airway are compared, rehearsed, challenged, reinforced, and subverted. The analysis will also examine the interactions and concept encounters within a theoretical framework examining the social processes of medicalisation.

My interpretation of medicalisation as a specifically dynamic process operating at different levels (and potentially different directions) simultaneously is not unique (Halfmann, 2012), but my attribution of those levels within the “whole system” (Hanson, 1995) of the internet-search well might be. Before proceeding further, however, I need to introduce the history behind some of the language already in use within the existing medical framework when talking about snoring, sleep and obstructive apnoea.

2.4 Medicalisation of Sleep and the Hypotonic Airway Spectrum

Sleep is an essential physiological and social phenomenon. From a purely physical perspective, sleep is governed by the interaction between the 24-hour metabolic circadian cycle and the regulatory rise and fall of homeostatic pressure. However, sleep is also governed by social rituals: special apparel, special locations and furniture, and rules regarding where, when, and with whom it is acceptable or unacceptable to sleep. Within the arena of sleep medicine, there has been much research published on the various physical and metabolic aspects of sleep, but relatively little from a sociological perspective.

In the late twentieth century ‘sleep medicine’ arose and rapidly grew into a distinct concern in modern allopathic medicine (Wolf-Meyer, 2008). Over 90 individual disorders peculiar to sleep are now described in the International Classification of Sleep Disorders (Hauri, 2005). Obstructive Sleep Apnoea (OSA) is one of the most visible of the newly described medical conditions related to sleep, and an entire medico-legal-industrial infrastructure devoted to diagnosing, regulating, and treating OSA has enjoyed explosive growth over the last forty years.

In the early 1970s the first specialised medical sleep clinics were established following the development of instruments capable of recording electrical activity of the brain (Aserinsky & Kleitman, 1953). The electroencephalogram or EEG was first used to describe and then subsequently define sleep in terms of ‘sleep stages’ of neurological activity. Additional measurements were subsequently added to the EEG-based montage such as electrocardiography and electromyography. In many respects the sleep clinic with multi-channel polysomnograph (PSG) revealing the facts of the patient’s illnesses with the patient utterly voiceless and passive during sleep, represents an exemplar of Foucault’s observation that the medical gaze sees the patient as a barrier to the truth (Foucault, 1976). Most notably

for this research, the addition of respiratory measurements led to quantification of a phenomenon previously described in popular media (Dickens, 1840) wherein loud snoring is associated with periodic choking during sleep and daytime sleepiness and therefore an early medicalised name for the nascent condition was ‘Pickwickian Syndrome’ (Bickelmann, Burwell, Robin, & Whaley, 1956).

After the establishment of the first sleep medicine laboratories, terms such as ‘apnoea’ and ‘hypopnoea’ originally used to describe respiratory activity observed during sleep were used instead to define a hitherto unrecognized bona fide sleep disorder of epidemic proportions rivalling obesity and diabetes. Indeed, the PSG became to snoring what scales are to obesity (Kroger, 2007). An apnoea-hypopnoea index (AHI) above a certain cut-off can be used to make a diagnosis of Obstructive Sleep Apnoea (OSA), in the same way a body-mass index (BMI) above a certain cut-off is used to diagnose obesity. Both are measurements that locate a person within a population distribution. However, both are also located within a social frame shaping the reality of those at risk of or affected by the disease (Jutel, 2011), or conversely, those affected by ‘not-disease’ through mechanisms such as limitation to treatment access, social stigma, or de-legitimization of other symptoms.

Within the social frame forming around and within clinical sleep medicine following the adoption of PSG, OSA quickly replaced narcolepsy as the main focus of the sleep clinics, particularly following the development of an effective treatment for OSA in the 1980s in the form of continuous positive airway pressure therapy (CPAP) (Sullivan, Issa, Berthon-Jones, & Eves, 1981). CPAP therapy is based on use of a bedside flow generator which uses positive air pressure delivered via a mask worn during sleep to splint (and therefore mechanically stabilise) the hypotonic airway (Kroger, 2007). Interestingly, even though developed only for the most severe cases of OSA, in more recent times CPAP therapy has been found to be

equally effective for eliminating snoring even in the absence of apnoea itself. Nonetheless, with the advent of an effective therapy, diagnostic criteria came to be used to rule people in or out of access to therapy by medical funders such as medical insurance companies in the United States, and government health funders in countries such as New Zealand. The social frame positioned snoring as something of trivial, or at least non-medical concern, a problem to be solved outside medical sleep clinics.

Lobby groups, legislation, medical and occupational insurance policy criteria all contributed to the proliferation of sleep clinics and healthcare providers geared towards diagnosing and treating the newly described (or ‘discovered’) disease (Dement, 1998). Debate in the literature ranged along topics such as how long an apnoea had to be for it to be defined as such, and how much flow limitation defined a hypopnoea. The instrumentation-centred language of the measurement tools defined the way medicine engaged with the hypotonic airway spectrum. In the first couple of decades following the formal medical definition of OSA, snoring was thought to be but one symptom among several associated with OSA – despite sharing the same fundamental underlying process – but notably being put on a par with excessive sleepiness and obesity (Hauri, 2005). However, when snoring and OSA are considered as two ends of a single spectrum the process and consequences of medicalisation can be seen more clearly.

The hypotonic airway spectrum represents one example of the medicalisation of sleep (Moreira, 2006; Williams, 2002), but there are others. Simon Williams (2002) argued that sleep had been colonised by various vested interest expert sectors including both industrial and medical. He examined the public conceptualisation of sleep and especially lack of sleep as constituent components of a ‘sleep sick society’. Williams used the term ‘healthisation’ as distinct from ‘medicalisation’ to refer to the process of identifying a phenomenon as critical

to overall good health (although Conrad would argue that healthisation is also already inherently contained within medicalisation). He argued that the healthisation of sleep, and medicalisation of disrupted-sleep arise from and influence pharmaceutical and commercial interests as well as medical practitioner interests. He raised the issues of power and surveillance at work within the medicalisation/healthisation process. He noted concepts such as sleep debt and sleep hygiene illustrate the impact of the social framework within which sleep is situated – moral language appears (‘good’ sleep and ‘bad’ sleep and ‘sleep hygiene’), but only makes sense within an eight-hour-at-night context. He states that sleep and the social enactment of sleep is a “complex, multifaceted, multidimensional phenomenon, which is irreducible to any one domain or discourse”.

Importantly for my research, both Kroll-Smith (2003) and Seale (2007) have examined popular media for constructions around excessive sleepiness and sleep (Kroll-Smith, 2003; Seale, Boden, Williams, Lowe, & Steinberg, 2007). Williams (2008) specifically looked at the role of media in the medicalisation of insomnia and snoring (Williams, Seale, Boden, Lowe, & Steinberg, 2008). All noted a seemingly pervasive portrayal of sleep as a health concern, suggesting medicalisation at least at the conceptual level, operating even outside the medical profession.

Hislop & Arber (2003) published an article arguing against Williams’ portrayal of medicalisation of sleep (Hislop & Arber, 2003). They felt he had portrayed sleepers as passive ‘consumers’ of medicine (Moreira, 2006). They then proposed an alternative view to the medicalised interpretation of sleep, using a case-study of women engaged in a three-tier model of insomnia management within which medicalised solutions are last-resort or extreme. Williams subsequently refuted Hislop & Arber as having set up a simplistic model of medicalisation as a straw-man to knock down (Williams, 2004). He argued that the

medicalisation concept includes de-medicalisation, noting that the de-medicalisation of insomnia did not constitute evidence against the overall medicalisation model pertaining to sleep as they had implicitly claimed. Quite the opposite, he felt that it spoke to the complex and multidimensional nature of the medicalisation/healthisation process as a bi-directional dynamic process.

Moreira (2006) examined OSA and CPAP as two case studies of a generative sociological process involving medicalisation/demedicalisation, but also a shaping force emerging from a lay engagement with therapeutic technology within the social context of ordinary life, neither engaging with nor actively resisting the disseminators of the medicalised model. An examination of public internet discussion boards revealed people talking about modifications and adjustments that occurred outside the medical framework. It is possible that Moreira's analysis represents a further dimension to the medicalisation model as it applies to sleep in general and OSA in particular. A post-modern working of medicalisation as it has developed from Zola's medicalisation of life (Zola, 1991) through Conrad's medicalization and social control (Conrad, 1992), and shifting engines of medicalisation (Conrad, 2005) must include an appreciation of process and movement both toward and away from medicalisation. It must include spaces outside of engagement and outright rejection; of partial process and re-process. Adele Clarke's (2010) group extends the analysis beyond jurisdiction and control, into 'transformations of such medical phenomena'. (Clarke, Mamo, Fosket, Fishman, & Shim, 2010). Of importance to my research, biomedicalisation is also applied to the "panoply of biomedical institutions organizationally transformed through technoscience, along with biomedical practices (diagnoses, treatments, interventions) and the life sciences and technologies which inform them" Furthermore, biomedicalisation encompasses 'the metamorphosis of 'patienthood' through the integration of information from social health movements, the media and the internet – all essentially

means to the public's further scientisation' (p. 2) which provides an apt theoretical framework from which to critique the social forces dividing the hypotonic airway spectrum (Clarke et al., 2010)

Under close scrutiny the distinction between snoring and OSA and the location of each on the hypotonic airway spectrum becomes somewhat blurred and difficult to pin-point. The presence of a single apnoea is insufficient to make a diagnosis of OSA (officially defined as five apnoeic and/or hypopnoeic events (each lasting longer than ten seconds) per hour of sleep as measured by PSG), although the absence of any apnoea at all can certainly be used to exclude it. Furthermore, since OSA can also include partial collapse of the airway (hypopnoea) rather than including only full collapse (apnoea) as part of the diagnostic criteria, the degree of ventilatory impairment required to constitute a hypopnoeic event adds an additional potentially arbitrary element to the demarcation between regions (Thornton, Singh, Ruehland, & Rochford, 2012). What frequency of apnoea is required for a person to be located in one region of the hypotonic airway spectrum and not the other? How much airflow limitation needs to occur before a hypopnoea stops being a snore, and starts being a criteria for diagnosis (Pépin, Guillot, Tamisier, & Lévy, 2012)? Clearly, the hypotonic airway spectrum is subject to the same possibility of arbitrary division which is so often seen in other everyday experiences including property demarcation and conceptions of life-stages (O'Brien, 2010) or cut-off definitions of obesity based on body-mass index (Jutel, 2009). That this can be the case becomes critically important when considering the high prevalence of social and health problems associated with both the medicalised and non-medicalised regions of the hypotonic airway spectrum (Ulfberg et al., 2000; Kohler et al., 2008; Lieberman, 2009; Pépin et al., 2012). It should be noted for this research, that access to one region or the other of the hypotonic airway spectrum will be facilitated or inhibited by how

closely a given person conforms to the pervasive conceptions regarding who can or should have OSA or snoring and who cannot or should not.

The essential first step in engagement or disengagement of the medicalised model of the hypotonic airway spectrum is the layperson's identification (or not) with the medicalised portrayal of the epiphenomena arising from the spectrum such that they engage, disengage, are forced into, or refused entry into the diagnostic process. People are subject to a myriad of influences and sources of information against which they form, test, rehearse, and reform conceptions. The Internet now plays an increasingly important role in concept checking and concept formation and rehearsal, influencing the subsequent decision to act or not act.

Sarah Nettleton, building on Nicholas Jewson's concept of historically and socially contingent medical knowledge, introduced the concept of 'e-scaped' medicine to describe the explosive development of internet access and dissemination of medical information such that it could be considered as a new medical era (Nettleton, 2004). According to Jewson's medical cosmology, the era of bedside medicine was followed by hospital medicine, and then laboratory medicine. Nettleton drew on the earlier work of Jos De Mul to suggest the current era in Jewson's cosmological terms might reasonably be considered to be one of 'e-scaped medicine'; an era within which medical knowledge has become informatised and therefore more broadly accessed by lay people and experts alike (Mul, 1999).

There is a small but rapidly growing literature describing how and why people use online health information and the impact it might have on their health status. Powell et al (2011) reported results from a large survey of health-related internet use in the UK in 2009 which reported 70% of UK households had access to the Internet and 68% of UK Internet users were using the Internet to access information related to health. The survey identified four main concepts related to motivation for use: the desire for reassurance; the desire for a

second opinion to challenge other information; the desire for greater understanding to supplement other information; and perceived external barriers to accessing information through traditional sources (Powell, Inglis, Ronnie, & Large, 2011). The study concluded the findings supported an evolutionary rather than revolutionary change in the use of internet-based health information.

Miriam McMullan summarized the literature pertaining to the use of the internet for health information and concluded most studies showed internet searches were typically conducted for specific medical conditions, and were motivated to seek information to manage their own healthcare independently, or to decide whether they need professional help. Alternatively, health information was sought after a clinical encounter because of dissatisfaction with the information provided during the encounter or to seek reassurance (McMullan, 2006). From a research perspective, the literature has reflected a robust interest in the social implications of this new environment in terms of doctor-patient relationships (McMullan, 2006), disease experience self-management of chronic illness (Ayers & Kronenfeld, 2007), and the mediated interactive doctor-patient-internet actor-network itself (Mager, 2009).

Both lay people and experts in any given field can be exposed through internet searching to specialist publications, editorial content, personal accounts, advertising, and educational content, all delivered in a shifting context iteratively constructed by the person's own search strategies. It would be wrong however to consider the internet as a singular source of information. Instead it is a knowledge-polyglot of many voices and indiscriminate access. The resultant informational melting pot contains channels which in some cases reflect the old channels such as print-publications delivered on subscription basis, but in many other cases are entirely new. Tiago Moreira (2006) explores the patient driven redefinition of OSA

and CPAP therapy through analysis of online observations of an internet discussion group about sleep disorders (Moreira, 2006). His findings included insights into the redefinition of sleep as a medical problem and explored the tension between medicalisation of one aspect, OSA, demedicalisation of insomnia, and the opting-out of the medicalisation process by patients themselves through sharing their experiences on an internet forum.

To first engage with the medical process, a person must form some conception that there is at least a possibility their concern might have a medical explanation (Leder, 1990). The new media of the 21st century and especially the increasingly widespread use of the Internet, has become important for the formulation and dissemination of medical information. A person taking the first steps of diagnosis who decides to make use of the internet will encounter information that is collected and sorted through provider gateways, most notably the search engine service Google (Mager, 2009). The interactions between the human and non-human actors can be traced through analysis of the search itself (Mager, 2009). In that sense the internet-search as an actor-network becomes the object of study rather than the individual searchers. Mager found that participants in her research who were asked to use the internet to search for information on randomly assigned chronic conditions tended to use the search engine Google in particular, and that they sampled information from within websites often out of the intended context inferred by the site design, using Google as an obligatory point of passage for their overall search.

High traffic sites appear ranked more favourably on Google's search engine ranking pages. In other words, if a lot of people are attracted to a site, it will rank higher on subsequent search result pages, and therefore be even more likely to be encountered by those new searchers. The behaviour of people using search engines to access websites influences the designs (and therefore content) of the websites themselves, and through the designs the

behaviour of subsequent searchers is also influenced. In such a highly self-referential feedback system ideas and conceptions quickly become canalised and entrenched. Dissenting conceptions become increasingly marginalised. Mager found her research participants gave greatest weight to information they encountered regarding their assigned conditions not based on the various credentialing systems adopted by healthcare information providers, but instead on the basis of frequency of encounter. In other words, re-encountering the same information on multiple sites carried more weight than the credentials attached to any given site offering the information once.

I did not set out to study the human participants in my research in isolation. Instead, I wanted to study the internet-search for snoring considered as a whole system, within which conception formation/reinforcement/subversion interactions take place dynamically. Where does a person locate snoring on the hypotonic airway spectrum? How does that affect the medicalised/non-medicalised divide in terms of the language they use and the language they encounter during the search? And if the search itself shifts their conceptions, based on shifts in language, is the shifting of conception a one-way trickle-down process impacting only that one individual? Or do a multitude of micro-level individual instances of concept shifting in some way feedback up to the next level – the meso-level of institutions and organisations and the content formation of the internet itself.

2.4.1 Medicalisation of snoring and the internet-search

In the preceding section I have described snoring on the hypotonic airway spectrum as representing the non-medicalised aspect of the spectrum, but it would be more accurate to say that although OSA represents a more medicalised aspect of the hypotonic airway spectrum, that is not to say that snoring itself has not been medicalised also. Snoring is an everyday

phenomenon but due to association with OSA, it has been at least partly medicalised through that association.

It is therefore not uncommon for people seek information or advice about snoring on the internet, and when they do so, they necessarily start the internet-search with pre-conceptions about the nature of snoring. Each web page the searcher encounters, however, will portray conceptions about the nature of snoring which might or might not align with those held by the searcher at the start of their search. If they are aligned, then they have the potential to reinforce the searcher's own preconceptions and become a mechanism of concept entrenchment. If the encountered conceptions differ from those initially held by the searcher, the interaction has the potential to subvert or re-shape those of the searcher, and therefore might be a mechanism of concept formation or re-formation. Re-formation towards a more medical conception would be an instance of micro-level medicalisation, and re-formation away would be an instance of micro-level de-medicalisation. That re-formation is possible at all, speaks to the medicalisation potential of the internet-search, since Conrad's (2008) model includes movement in both directions (Conrad, 2008). At the end of a search, the searcher might hold new or shifted conceptions, or they might conclude the search with exactly the same conceptions they held at the outset. Either way, the internet-search can be considered as a system with an input (the pre-conception) and an output (the post-conception), and a process (encountering web pages). Each of these elements can be captured through cursory analysis of the language used by the search before the search and after the search, and by the pages encountered during the search.

Whether there was a shift or not, the searcher's starting and ending conceptions can be visualised in relation to movement through the conceptions encountered during the search. The entire search can be considered as a single actor-network, and higher level analysis of

several such searches can be used to provoke theorization regarding the workings of the internet-search as an engine of medicalization (Conrad, 2005) through the action of concept formation, and re-formation.

There are also many conception positions contained within the internet-search that might lend themselves to Clarke's (2005) Situational Analysis positional mapping technique discussed in more detail later in chapter five. Positional maps depict positions of interest to the issue of medicalisation including those relating to which types of people – in terms of weight, gender, ethnicity, and lifestyle – are most likely to snore. Others might include those regarding whether snoring is an intrinsic problem, or a problem only for those sharing sleeping arrangements with someone else, or whether it should even be considered a problem at all. To that end, however, I finish this chapter with some thoughts as to why snoring is an important case for studying medicalisation.

2.4.2 The importance of snoring as a case study of medicalisation

As described earlier in this chapter, snoring and obstructive sleep apnoea (OSA) can be thought of as two ends of a single hypotonic airway spectrum defined by the underlying physical process and physiological consequences of the oropharyngeal muscles becoming hypotonic during sleep. One region has been largely the domain of medicine, and until recent decades, the other has not. Although fundamentally related, the conceptions that surround snoring and OSA are pervasive and influence the initial stages of the diagnostic process. Preconceptions regarding 'classic' OSA sufferers include age, gender, and weight. Overweight middle-aged men are expected to have sleep apnoea, whereas skinny young women are not (Lettieri et al., 2005). However, snoring itself has started to become more medicalised in recent years, and to some extent OSA has become somewhat de-medicalised.

Both shifts are reflected on the internet web pages that talk about snoring ‘cures’ on the one hand and offer direct-to-consumer sales of CPAP therapy on the other.

Websites and user groups are heterogeneous and provide a microcosmic reflection of the societies from which content is derived. Commercial sources, special interest sites, professional publications, support groups, and very many other interests are presented and promoted and interconnected on the internet. The interaction between content providers, regulators, and searchers constructs an interactive network of conceptions shaping the search, the searcher, and the searched. Furthermore, the interaction of the conceptions held by the searcher and those contained and promoted within the internet and also the conceptions held by those contributing content to the internet can all influence the lay person by strengthening or weakening their starting conceptions regarding snoring.

One of the key precursors of diagnosis is the formation of a concept that a given phenomenon might or might not be a ‘symptom’ of a condition belonging in the medical domain (Leder, 1990). Holding the active concept that the phenomenon is not likely to be a symptom is equally part of the process of diagnosis, insofar as diagnosis includes ruling-out as well as ruling-in. Understanding how lay people’s ideas about snoring as medical (or not) in nature help gain insight into the internet-search as a whole system. Snoring lends itself to this type of analysis, since it can be conceived of as either medical or non-medical. There are few other examples of phenomena so well balanced between the lay and medical domains.

2.5 Conclusion

The hypotonic airway spectrum provides a rich case-study from which critical insight into the sociological process of diagnosis can be drawn. Internet use in our society has reached a point whereby it can be recruited as a sampling tool for wider sociological processes. Furthermore, internet searching as a source of health information has become, for

a growing segment of our society, an important activity in the diagnostic process. Prior to any diagnosis, a potential patient has to make a decision to engage with the medical domain in some form. The shift in their concept regarding a given phenomenon has to be towards the medical, and therefore represents an internal micro-level individual instance of medicalisation. As such, studying the mechanics of the decision-making process as it is enacted on the internet sheds light on medicalisation itself. This research contributes to healthcare knowledge by furthering our understanding of how some of the emergent agents and arenas of lay diagnosis interact with one of the engines of medicalisation: the internet. The research uses snoring and OSA – together constituting the hypotonic airway spectrum – as a particular exemplar of transitioning or incomplete medicalisation. Other phenomena that have more completely transitioned from the lay domain into the medical – or indeed, come out of the medical domain back into the lay – provide less insight than the hypotonic spectrum because it is so balanced between the two. It is the transitioning nature that allows the research to probe the dynamic pattern in the midst of enactment, thereby highlighting the contributing forces that push one way or pull another often simultaneously.

People are exposed to many influences which form their conceptions and preconceptions, and the study of how those conceptions might be manipulated and shaped, thereby creating a two-way feedback loop of concept interaction, has reached previously impossible levels of sophistication with the advent of the Internet and its inherent capacity to closely track patterns of information use. An internet-search is a traceable two-way exchange between the searcher, the content, and the content providers. The pervasiveness of snoring and the amenity of the hypotonic airway spectrum to division along the lines of more medical and less medical ends provides an opportunity for research to closely examine the contribution of the internet-search to the medicalisation of snoring.

No other sleep medicine research has been published expanding sleep-disordered breathing (snoring and obstructive sleep apnoea) to include the entire shared sleep phenomenon which this research introduces for the first time, as the hypotonic airway spectrum. Nor has any internet-centred study of the hypotonic airway spectrum been published in New Zealand nor indeed, internationally. Therefore, the research presented here is empirically original. The treatment of the internet-search as a multi-level highly dynamic whole system processing conceptions and thereby mediating medicalisation is also theoretically original.

Chapter Three: Theoretical framework – General Systems Theory

3.1 Introduction

How does the internet-search contribute to the medicalisation of snoring? In Chapter Two I explored the background and concepts contained within the research question. My research is intended to be situated first and foremost within the academic field of health science, and I hope therefore that it will contribute in some small yet practical way to the actual practice of healthcare. It is not my intent to advance a major new sociological theory, nor even to modify substantively any of the many minor sociological theories that have been advanced to encompass various social phenomena. However, the research itself does need to be supported within a theoretical framework such that the analytical requirements of the constituent concepts within the research question can be met. In this chapter I will discuss in more detail some of the challenges associated with selecting a suitable theoretical framework and the solutions I have adopted to meet those challenges.

I have chosen to be guided methodologically in part by Adele Clarke's Situational Analysis (Clarke, 2005), particularly her use of cartographic techniques to assist analysis of abstractions. I also draw upon Drew Halfmann's typology of medicalisation (Halfmann, 2012) wherein he describes medicalisation as continuous and dynamic value as opposed to the more typical discussion of medicalisation as a category or state. These two theoretical foundations, and therefore my own discussion, make much use of the terms 'macro', 'meso', and 'micro'. These terms come heavy-laden with meaning outside the context of my own research and indeed beyond the field of medicalisation.

Nonetheless, the theoretical and methodological frameworks within which I have chosen to couch my analysis both use those terms and I am therefore compelled to follow suit. Before proceeding, therefore, I need to pay attention to their pedigree within the

academia of theoretical sociology and then explain the meaning I attribute to those terms within the confines of this dissertation. Specifically, in this chapter, I provide an overview of some of the pertinent aspects of the macro/micro divide – i.e. the explicative tension in social theory that arises from the dichotomy of supremacy of micro causes versus supremacy of macro causes.

Next I introduce a specific application of General Systems Theory (GST) as described by Barbara Hanson (Hanson, 1995), a theory which prioritises analysis of wholes rather than layers or parts, and which therefore offers an alternative to the micro/macro divide. Hanson's version of GST allows me to contain the macro/micro terms as used by both Clarke (2005) and Halfmann (2011) by emphasising a 'cybernetic' or self-steering model of causality as a key interpretative focus.

Finally, I discuss those aspects of Hanson's version of GST that lend that approach to studying the internet-search as an engine of medicalisation. I describe the levels of action in medicalisation research and argue that since I am investigating the role of the internet-search in medicalisation, Hanson's wholes-based theoretical framework is particularly suited to my own research and analysis.

3.2 Macro/micro Dilemma and Sociological Theory

Sociological theory provides a way to explain social interactions and groupings. Unlike other sciences which often have a single overarching theory, the discipline of sociology has several. Having an awareness of the level of analysis likely to be encountered during the research is important when selecting a theoretical framework. However, thinking about levels of analysis a social researcher will inevitably encounter the 'micro/macro dilemma' in sociology, a term applied to the epistemological questions arising from the circular relationship between micro (agency) and macro (structure) (Tsekeris and Lydaki,

2011). Furthermore, the terms ‘micro’ and ‘macro’ can have specific but various technical meanings in sociological literature, and therefore require explication for this thesis. Micro and macro are sometimes used to mean ‘scale’ (or size), and at other times social ‘level’ wherein micro means actors, and macro means system or grouping. Sometimes micro is used in reference to social structures to mean less, and macro more structure, or alternatively micro can mean action, or agency and macro means structures. Furthermore, micro can be used to refer to individuals and macro in that context is used to mean groups – oftentimes represented as having emergent qualities beyond the summation of qualities of the constituent individuals comprising the group. Berger, Eyre, and Zelditch (1989) describe the macro/micro problem arising in part from theoreticians treating all the various definitions as part of a single dichotomy wherein scale, level, structure, and actor are all intertwined such that micro is given the meaning of “small, unstructured systems of individual actions”, whereas macro means “large, structured systems, often groups, without action” (Berger, Eyre, & Zelditch, 1989). They go on to argue that the definitions and variability so described are not only actually analytic and arbitrary but also not necessarily correlated. The number of levels, they argue for example, can increase as a system size increases, but even the smallest system has at least two levels – actor and system. Similarly, they point out that even the smallest system has structure, and even the largest has action. This is an important insight for my own research which looks specifically at the internet-search as conducted by individuals through which I hope to unravel some of the workings of medicalisation – a sociological process that occurs at the high ‘levels’ and large ‘scale’ (governments, insurance industry, medical associations etc) but which I seek to understand through studying individual level examples. Does the macro/micro problem therefore paralyse my own analysis? And if not, how can the problem be avoided?

Barbara Hanson (1997) discusses the micro/macro dilemma in terms of the mutually exclusive analytical frameworks offered by various social theories. She argues that the dilemma arises from the need to assign causal determinacy to levels (Hanson, 1997), and goes on to offer solutions in the form of a whole-system approach which encompasses micro and macro agency simultaneously (Hanson, 1997). I use Hanson's terminology and theoretical approach extensively in my later analysis chapters, but marry it with a framework taken from medicalisation literature described by Drew Halfmann (2012).

It has been a part of medicalisation literature that medicalisation can occur at multiple levels. Conrad and Schneider describe three levels – the conceptual level, the institutional level, and the doctor-patient interaction level (Conrad & Schneider, 1980). Halfmann points out those levels broadly correspond to macro, meso, and micro levels of analysis, with national organisations such as governments and courts at the conceptual or macro level, smaller organisations such as hospitals and alcohol programmes at the institutional or meso level, and individuals such as doctors and patients and the doctor-patient interaction at the micro level (Halfmann, 2012).

Halfmann (2012) expands the schema by explicitly emphasising the macro-meso-micro division which then allows the interactions described by Conrad and Schneider to be specifically considered at each of those levels in turn. In Halfmann's expanded analysis, medical conceptualisation can be examined not only when constructed, disseminated, and deployed by macro-level actors such as a Ministry of Health, but also by meso-level actors such as hospital departments, or micro-level actors such as internet bloggers or allied health workers. Halfmann also expands Conrad and Schneider's (1980) analysis by looking beyond the doctor-patient interaction to include other micro-level interactions that although occurring between non-medical actors such as employers, teachers, and journalists, nonetheless

contribute to medicalisation at the micro-level through mechanisms such as identity construction.

Halfmann's typology of medicalisation considers three broad analytical dimensions – discourses, practices, and identities (and actors) – at each of the macro, meso, and micro levels thereby creating a rich interconnected model allowing for medicalisation occurring at different rates (and directions) in a variety of ways at each of those levels. However, for the purpose of this thesis, when considering the medicalisation of snoring within the context of the internet-search, it is appropriate to identify macro level and the meso level elements both being contained simultaneously within the internet-search even when considered from the point of view of an individual searcher. The individual starts the search using an internet search engine (Google in the case of all the participants in this research), which presents pages from which the searcher can select. The ranking of those pages, however, comes from a multitudinous array of interactions between prior searchers and other pages, the hosting sites behind the pages, the companies and organisations behind those sites, and the real-world interactions and agendas that contribute to them hosting the sites. The internet-search for snoring is a rich and layered object of study, and Situational Analysis provides an equally rich method for analysis. Situational Analysis, along with Halfmann's typology, retain a micro-meso-macro level of analysis and the levels are certainly encountered within the internet-search. However, the wholeness of the internet-search, each individual case, demands a theoretical framework comfortable with wholes.

3.3 General Systems Theory applied: a wholes approach

Barbara Hanson (1995) describes her particular application of General Systems Theory as a “wholes approach”, and I will continue to use that term henceforth to refer to her model (Hanson, 1995). A wholes approach places emphasis on the whole being greater than

the sum of its parts. In the context of my own research, this suggests the analysis of the internet-search as a 'whole' is appropriate without necessarily extending analysis to larger scale interacting systems. Indeed, Tom Inglis (2010) argues that case studies such as those used in my own research can be approached forensically since structure of social action reflects to some degree the structure of the society of which it is a part. When examining a particular case, the various theories and analytical techniques are all tools used to find clues to reveal the relationships between scales. In that sense, the micro and macro are linked intrinsically when approached through analysis of case studies (Inglis, 2010).

Hanson's description of a wholes approach places emphasis on the notion of non-summativity that the whole is greater than the part. It invites analysis to begin wherever a phenomenon that appears to be relevant exhibits properties when two or more constituent parts interact, that are not present in the parts alone. Hanson proposes that it is this single point of departure that is the sole requisite of a wholes approach which, although informed by General Systems Theory, she offers instead as an approach rather than a theory in the conventional form.

3.3.1 Nonsummativity, system, and unit

There are several aspects of the wholes approach which are not individually definitive of the approach, but which when taken together do define its characteristics. The first three, are nonsummativity, system, and unit.

Nonsummativity refers to the whole being greater than the sum of the parts. In practical terms, it means that phenomena must always be related back to the whole. For example, in my own research it is not enough to note that a searcher found eight web pages in their search. Why is it that those pages were presented by the Google search engine in that rank order? What search terms were used, what is it about those pages that brought them into

that search with that person? In what way were they linked in sequence, and how much attention did each one capture? How did conceptions interact within the search and to what effect? How do those effects feed back into the system? That it is the search entire which is the object of study must always be held in mind during the analysis of each case in accordance with the principle of nonsummativity. Relationships are the central focus of the research and are recorded in such a way that they are retained intact throughout.

System is defined by Hanson (1995) as any two parts that are related, such that change in any one part changes all parts. A wholes approach does not set out to negate the idea that there are parts to a system. Indeed, my separation of results into chapters has been based around the focus of the research shifting between parts of the internet-search for snoring – the person, the search-engines, the encountered pages, and the conceptual interactions between those parts. The idea of systems, when considered in a wholes approach, recognises that there is no such thing as a single cause and effect relationship. Any action will “reverberate through the entire system leading [...] sometimes to effects that are precisely the inverse of the intended effect” (Hanson, 1995). Importantly for my research, the wholes approach aspect of systems directs the researcher to look beyond the immediate first reaction and towards the concerted playing of parts. This means that the dimension of time, which becomes so important a part of the discussion in chapter seven, is at the forefront of the analysis. It is in the continuous sequence of systemic change that the effects ripple through to all parts of the data – wholeness and process are retained. Situational analysis, discussed in more detail in the next chapter, does not share in the emphasis of this aspect of the wholes approach. It is this very sense of trying to capture some of the workings of medicalisation as a process which feature so heavily in my analysis of the internet-search for snoring and how it relates to medicalisation detailed in subsequent chapters.

Unit draws attention to the boundaries within which the system is delineated. In a wholes approach, the boundaries or divisions are such that relationships are retained. This means the analysis should be conducted in such a way that at a minimum an analytical unit must retain two parts in relational integrity. A wholes approach will move back and forth through theory, data, and analysis but always in such a way that relational data can be retained. In my research, this is reasonably straightforward to identify insofar as the analytical unit is the internet-search.

As Hanson (1995) points out, statistical techniques for analysing relational data in flux are not commonly available and she goes on to note the need for the development of applicable techniques. I have adopted some of the visual analysis techniques outlined in Situational Analysis which I discuss in the next chapter, specifically to help analyse the relational interactions between human searchers and the pages they encounter during an internet-search for snoring. Taken together, the three aspects of nonsummativity, system, and unit form the foundational perspective of Hanson's wholes approach which I have adopted.

3.3.2 Causality and cybernetics

Causality refers to the inference of relationships between things such that the combination brings about a result (Hanson, 1995). Hanson also identifies linear causality as an underlying contributor to the micro/macro debate (Hanson, 1997). In her discussion of linear causality and the micro/macro debate she argues that the implicit assignment of determinacy to levels creates an irresolvable dilemma. The focus on linear causality "grafted onto sociology from the physical sciences originally" can be overturned through application of a general systems theory approach and especially a cybernetic mode of causality which is an important component of a wholes approach.

‘Cyber’ is a Greek word related to oar handling (and therefore steering) in boats, and when used in conjunction with systems refers to the self-regulating (or self-‘steering’) capabilities of that system. Sociocybernetics is that branch of sociology (the International Sociological Association specialist research committee RC51) which puts a focus on self-regulating social systems. Although not exclusively falling in the camp of sociocybernetics, Hanson nonetheless draws on some of the concepts and terminology of that sub-discipline. The cybernetic component of Hanson’s whole approach removes the notion of independent cause attributable to any particular level, and instead focuses on looking for co-emergent events which are self-driven through feedback (both positive and negative).

The nature of search-engine optimisation activities on the part of web-site hosts and search-engine algorithms themselves, as will be discussed in more detail in later chapters, builds feedback into the internet-search and therefore creates a chicken-and-egg problem of causality if viewed through the linear causal lens. Furthermore, causal agency at any specific analytical scale or level, be it micro, meso, or macro, within the ‘whole’ of the internet-search is not necessarily helpful in looking for insight into the contribution of the internet-search to medicalisation. A cybernetic model, however, already contains notions of feedback and co-emergence and therefore provides a particularly suitable theoretical framework from which to examine the internet-search for snoring and how the search relates to medicalisation.

3.3.3 Feedback, action/inaction, and co-emergence

Feedback refers to the ability of a system to reintroduce output as input. Central to this idea, is the notion that a system by definition is dynamic – it is made up of working relationships between at least two parts, and all parts of the system are inter-related. One turn of the crank, so to speak, is not the end of a system, it is just one iteration. Systems do work

and feedback refers to the situation wherein the output of any given cycle influences the start conditions of a subsequent cycle.

For example, in the system of ice cream sales in a mall the predisposition of the salesperson (start condition) of any given encounter with a new patron buying an ice cream (the interaction) can be influenced by the output of the previous encounter. A series of churlish patrons might increasingly make it more likely that any new encounter might start with a curt and annoyed salesperson, which would then make it more likely for that encounter to also turn sour which then feeds back into the even more ill-disposed salesperson beginning the next encounter and so on. Of course, the opposite is also true. Circularity of causation (or indeed, 'cybernetic' causation through feedback) is at the heart of the wholes approach, and importantly represents one of the aspects Hanson advances as a circumvention of the micro/macro dilemma.

Action and inaction are equally causal in a system because everything is related to everything else. This idea is also related to co-emergence, or the idea that there are certain things that exist as a joint production. For example, in the system of a music concert, musicians play music and an audience listens to it. Without the musicians, there is merely a group of people sitting in silence. Without the audience, there is merely a group of musicians playing to an empty venue. With both coinciding, there is a co-emergent concert. In this example the action of playing the music is critical to the co-emergence. However just as importantly, should the musicians engage in inaction there would be no co-emergence. Action is felt through the whole of the system, but so too is inaction.

3.3.4 Change, and equifinality/multifinality

The wholes approach embraces the dynamism of systems, and as such needs to be cognizant of change. What changes when a system is at work, and what stays the same? How

much does a system need to change before it is no longer that system, and how much can it be said that a dynamic system is the same as it changes through time? It is important to examine not only what alters, but also what stays the same.

The idea of change is at the very heart of my analysis of the internet-search and medicalisation of snoring. Indeed, medicalisation by definition, refers to a change in conceptions from a phenomenon being in the lay domain at the outset changing so that it is conceived as being more (or change in the opposite direction in demedicalisation) in the medical domain. Interestingly, however, a wholes approach provides the flexibility to see a pattern of change (in a sense of increase or decrease) as nonchanged if it is consistently the case that the system works in that way. Once again, the relevance of this to theory is that it builds a dimension of time into models, since change reflects differences over time or in sequence during process.

The last aspect of the wholes approach I discuss here is the notion of equifinality and multifinality. Hanson (1995) points out that when acting on a system, the same result can arise from a variety of stimuli (equifinality), or a variety of results from the same stimuli (multifinality). Hanson notes that the idea of multifinality, which she attributes to Norman Bell from University of Toronto, is actually an extension of equifinality, but it is an idea she had not encountered in other systems writing. The wholes approach directs analysis through awareness of equifinality and multifinality to a sophisticated view of change and non-change. Positive and negative feedback also focus on change and nonchange, but equifinality and multifinality add a sense of prediction in terms of starting conditions and results of the system at work. They are thus qualifications of the basic notions of feedback. Hanson concludes her discussion of all these related properties of the wholes approach by saying that the major message for research and accompanying intervention is to focus simultaneously on both time

and on process. As such, I consider the wholes approach to be an excellent theoretical framework for my research into how the internet-search for snoring contributes to medicalisation.

3.4 Why use a wholes approach rather than no theoretical framework at all?

As I discuss in later chapters, being able to visualise and analyse conception interactions occurring during each internet-search is important to get at medicalisation as a dynamic process – indeed, Conrad’s ‘engine’ needs to run and to be seen running. Analysing process is integral to the wholes approach. That the outcomes or effects of those interactions in any given iteration subsequently affect the start conditions of subsequent iterations requires a theoretical framework that has an appropriate terminology. Hanson’s wholes approach embraces process and provides a terminology for both analysing and discussing the constituent elements of process.

Time dimensions are also crucial for any investigation of cybernetic process (Hanson, 1995). In the wholes approach, both action and inaction are given equal attention, and fine detail can be discussed within the framework of aspects of the wholes approach such as co-emergence, and equifinality/multifinality. It is enough that the wholes approach provides an appropriate and applicable terminology for my analysis, and the absence of any framework at all would necessitate the invention of one, and inevitably one less easily defended.

3.5 Conclusion

The concepts contained within a wholes approach map onto my research incredibly well. The internet-search is at once both system and unit of analysis. Internet search engine ranking algorithms encode rules of feedback and cybernetic self-regulation. The wholes approach provides a readymade toolbox of analytical thought and concepts geared towards

picking apart those aspects of the internet-search system that are encoded in cloud-based software algorithms and those aspects which co-emerge from the relationships contained at all levels – micro, meso, and macro – which together enact ‘the internet-search’.

Furthermore, the wholes approach offers finesse of insight in terms of an emphasis on causal analysis. My research seeks to gain insight into shifts in conceptions, lying at the heart of medicalisation, and the wholes approach offers a theoretical framework that targets causality and process.

The wholes approach does not, however, provide a specific method of analysis. The importance of levels of analysis to medicalisation, even when contained in accordance with the wholes approach within the system of the internet-search, cannot be overlooked (Halfmann, 2012) and must not be discarded. My final analysis draws methodically on the cartographic approach at the heart of Situational Analysis. The next chapter describes that approach in more detail and explores the overlap with the wholes approach.

Chapter Four: Methodology – Situational Analysis and Perceptual Maps

4.1 Introduction

The internet-search portrays conceptions of how being well is done, how being ill is done, what constitutes disease, and how diagnoses can be enacted (Nettleton, 2004; Seale, 2005; Mager, 2009). But more than that, the internet-search is a whole system of conception interaction: conceptions held at the beginning of a search by the searcher are reinforced, refuted, or altered by encountering those conceptions portrayed on the web-pages contributing to the search. The online activities of the searcher in turn affect the search page ranking of the pages visited and not visited incrementally, thereby altering the likelihood of encounter by other searchers in subsequent search iterations. Each internet-search resonates with all the internet-searches for that search term that have gone before, and in turn is felt by (albeit in small part) all the internet-searches for that same term to come.

Social science researchers, particularly in science and technology studies, usefully represent digital phenomena as objects of research enquiry. Acknowledging the existence, effects, and power of the panoply of digital data objects encountered and enacted in everyday life is one of the cornerstones of the sociomaterialist perspective (Lupton, 2014) which draws attention to the interconnections between the social and the material. Within this paradigm, as described in the preceding chapter, the internet-search can be studied as a whole greater than the sum of its collective parts; an object of study comprised of both human and non-human actors, a social agent producing and shaping knowledge. In this chapter, I describe a novel development of the techniques of situational analysis (Clarke, 2003, 2005) and extend their application to understanding the role the internet-search plays in concept formation.

Situational analysis uses three cartographic schemas – situational maps, social worlds/arenas maps, and positional maps – to represent relationships between both human

and non-human elements of complex and heterogeneous social processes. Although Situational Analysis is built on Grounded Theory, it is the cartographic aspect rather than the theoretical underpinning of Grounded Theory that influenced me and upon which I built in turn. Situational maps show the largest picture of the relationships in the situation, social worlds/arenas maps show the relationships between collectives and groups, and positional maps represent positions embodied within a given situation. Situational analysis generates multiple positional maps of the various conceptual tensions existing within the situation under study, however each map is static and fixed at the point of mapping. In my extension of situational analysis, I introduce an additional time dimension to the positional map to capture movement through the conceptual space defined each map. This presents a data visualisation technique which I refer to as conception-tracking, since adding the time element allows the researcher to track the movement of concepts within the conception space defined by positional maps, and therefore to see interactive effects. It is particularly well suited to representation of interrelationships and interactions between different concepts, and also shifts in conceptualisations which occur during enactment of the internet-search. Dynamic phenomena such as concept formation, concept re-formation, and concept entrenchment – processes heretofore opaque to the social science researcher – can be seen in action through the addition of the time element.

Situational analysis places equal importance on both the human and non-human actors in a situation of enquiry, a feature shared with Actor-Network Theory (ANT) briefly mentioned earlier (Latour, 2005; Law & Hassard, 1999). However, unlike situational analysis, ANT places a further central importance on studying traces of action and interaction within the analysis. The method I describe in this chapter allowed me to not only define conception spaces bounded by positional tensions encountered during the internet-search, but also to track conceptual actions and interactions occurring within those conception spaces.

Since the advent of pictorial art and writing in pre-history, there have been four further major technological revolutions of communication over distance: print, wire, broadcast, and internet (Shirky, 2009). Each revolution has allowed for a mode change in the way concepts are transmitted between people separated by space or across time – either in a single direction or bi-directionally; from one-to-one or from one-to-many. The development of the internet has combined all these modes to create one-to-one, one-to-many, many-to-one, and many-to-many one-directional or bi-directional communications that can occur as quickly as telephone and broadcast but which, like print, also leave long-term traces. The bi-directional nature – in particular of transmission of concepts – through the internet sets up the conditions for an amplification effect common to feedback loops. Whenever the output of a system feeds back positively in to the input of a system, the effects of that system will be magnified. For example, a public address speaker in an empty room might still generate a small amount of background hum. In a positive feedback loop, that hum will feed back in to the system through the open microphone, which will make the output hum slightly louder. The slightly louder hum then feeds back in through the microphone again thereby creating an even louder output hum. This process continues, amplifying the effect until the system generates an overwhelmingly loud feed-back screech.

In the case of concept formation on the internet, the amplification effect is created through the use of search engines which have become obligatory points of passage when searching for information about health (Mager, 2012). Obligatory points of passage are the sites of nodes of power system through which other actors must proceed—for example, a doctor is an obligatory point of passage for a medical diagnosis (Law & Hassard, 1999; Latour, 2005). In the case of the internet, search engines rank web-pages at least in part based on popularity, or frequency of prior clicks in earlier searches. This means a page featuring early in a search engine listing will be more likely to be visited by any given searcher, and in

so visiting, the searcher increases the future ranking of that web page so that subsequent searchers for the same or similar terms are even more likely to encounter the same page.

Positive feedback and amplification.

This positive feedback phenomenon is not limited to web-page search engines such as Google or Yahoo or Bing. It is also at work in YouTube rankings and Facebook pages – anywhere encounters are tracked and fed-back to a ranked listing so that subsequent encounters are made more likely. The encounter of information by a user of the internet, be it web-pages, video clips, tweets, instagrams, face-book posts, or snapchats, is a rich encounter of concepts: those held by the user, those contained within the specific media item, and those contained within the structures surrounding the media item such as host sites, content providers, advertising, and cross-hyperlinkages to name a few. Therefore, the internet encounter as an object of study is of considerable interest to the social researcher (Seale, 2003).

The amplification effect of conception formation, re-formation, rehearsal, subversion, and entrenchment lends this particular medium to social science investigation, but the nature of the medium is such that it requires methodologies capable of encompassing movements and shifts of concepts with equal treatment of the human and non-human, physical and abstract, and a focus that can encompass the field itself rather than just the individual encounter. For example, a study which looks at health related web-sites in independence from the searcher would overlook the importance of encounter itself. Such a study could shed light on the web-site providers and the various linkages between sites, and the concepts portrayed on those sites. It could not, however, explore the way those concepts interact with the conceptions held by a searcher to shape new conceptions in them. Importantly, a study that did not use a visualisation of movement through the conception space would have difficulty

unpacking the feedback loop component that contributes to the amplification effect of the search engine ranking algorithm.

Clarke (2005) presents situational analysis as a post-modern revision of grounded theory which places an emphasis on the inclusion of both the human and non-human in situational maps:

This is one of the key ways in which grounded theory rooted in symbolic interactionism offers a distinctively materialist constructionism. Nonhuman actants structurally condition the interactions within the situation through their specific material properties and requirements and through our engagements with them. Their agency is everywhere. Situational analysis explicitly takes the non-human elements in the situation of inquiry into account both materially and discursively. (Clarke 2005, p 63)

The juxtaposition of human and non-human actors in the internet-search: – the searcher, the search engine provider, the individual search results, the web pages encountered, the web page providers, and the search trajectory itself – make the internet-search a particularly powerful engine of medicalisation. Modifying situational analysis's visualisation techniques to include a focus on dynamism within the whole system creates a powerful analytical technique for studying the internet-search as a sociotechnological object. But first a closer summary of SA itself in the unmodified form.

4.2 Situational Analysis

Situational analysis is both a methodology and a method which extends grounded theory by emphasising relational positions which are represented for analysis cartographically using a series of different maps: positional maps, social worlds/arenas maps, and situational

maps (Clarke, 2003, 2005). I did not choose to use grounded theory as my methodology, and in my analysis, I use only one of those maps – the positional map – which charts concepts within a spatial frame to assist analysis through visualisation. Nonetheless, the impulse described in SA to use visual analysis to explore data influenced me profoundly. The choice of axes for each map visually illustrate interactions between related concepts and each axis represents positions within the situation that are in tension (Clarke, 2005, p. 126). Following Clarke, the purpose of positional mapping is to define and analyse the positions within the situation, but not the positions taken by specific individuals or groups. Each map defines a conceptual space cartographically but is always a static representation.

The overarching aim of situational analysis is to retain the heterogeneity, complexity, and messiness of relationships and conceptualisations. It uses cartographic representations promoting exploration of the complexities that emerge from the analysis. Specifically, situational analysis uses maps to position the various actors, actants, and other elements within a conceptual space according to their relationships, thereby highlighting their interactions and exposing silent or missing positions hidden within the data. The cartographic approach to analysis plots the situational, relational, and positional elements of the data to create visual maps that provoke analysis and to highlight marginalised or missing positions. The positional maps in particular encourage the analyst to give thought to the positions themselves rather than the individuals or groups that hold them.

Clarke proposes that this approach takes account of data complexity and heterogeneity, in contrast to grounded theory's requirement for reductionist oversimplification seeking the underlying (and assumed) basic social process. Situational analysis seeks to retain multi-process outcomes and is intended to identify missing or under-represented data. It looks for contradictions and heterogeneities and requires the researcher to

identify positions within the overall situation that might otherwise be lost to analysis using reductionist approaches. For that reason, it is an ideal method for exploring contradictory, contentious, or marginalised positions that could be expected to be less amenable to detection when studying something as subject to manipulation or canalisation as the internet.

Situational analysis maps data using three main cartographic schemes (Clarke, 2005), and although I only employ one of those schemes in my own analysis, nonetheless I shall briefly summarise each of them in the next three sections.

4.2.1 Positional maps

Positional maps, as used in situational analysis lay out the major positions taken, and not taken, in the data vis-à-vis particular axes of difference, concern, and controversy around issues in the situation of inquiry. Critical to the overall approach of situational analysis is the extraction of positions from social worlds or individuals. Mapping the positions independently of persons, organisations, discursive material, technology, and so on provides a mechanism whereby later in the analysis the positions themselves can be situated, i.e. situated positions within a social and theoretical context.

Clarke explains that articulating positions independently of the situation, actors, actants, and other elements allows subsequent analysis to see situated positions more easily. This includes, as in another exemplar presented by Clarke, comparison of positions taken in data from two different sets of respondents (Clarke, 2005, p 131). I have incorporated a time component as a subsequent analysis step, i.e. 'before and after', or 'first then next' whereby the positional map can be used to track movement of concept interactions (change in position over time) encountered in a given conception space defined by the positional map

Situational maps and social worlds/arenas maps help the researcher identify the various human and non-human elements in a situation and to arrange their relationships

spatially to provoke analysis. Positional maps are different insofar as they help visualise the different points of view taken within the situation, with particular emphasis on points of view that are in tension. The issues do not need to be contentious or contested, but there must be differences. One of the most challenging aspects is to do so without regard for the individuals or groups when defining which positions to use for analysis, which explains why the positional maps are separated from situational and social worlds/arenas maps (Mathar, 2008). Clarke emphasises the importance of this aspect:

Positions are not correlated/associated with persons or groups or institutions. [...] I cannot emphasize the importance of not seeing these maps as “representing” individuals or groups. Positional maps do not seek to represent individual or collective voices or experiences “in their own terms” in depth. (Clarke, 2005, p. 126)

The separation of positions from individual representation achieves two things. One is to remove the positions from centralising tendencies and stereotyping inherent in social science analysis focussing on similarities rather than differences. Clarke’s emphasis is on the map, which makes it easier to see unexpected positions, to see positions which are not yet grasped or understood, and importantly, positions which are missing from the data, but revealed through mapping. Charting positions taken in isolation from the groups and entities within the situation enables the researcher to create spaces between actors and positions.

When constructing a positional map from situational analysis, the map should feature two axes; the description of extremes at each end of these axes defines the scope of the space in which positions can be articulated. The two axes represent the bounds of a conception space.

In the next chapter I extend the utility of the positional maps found in Clarke’s situational analysis by adding a time component to include movement through the conception

space. This is achieved by re-introducing the individual and/or groups into the analysis to track changing positions within the conception space defined by the positional map individuals or groups encounter sequentially over time (movement is defined by change in position over time). The addition of movement tracking enhances the analytical breadth of positional maps to include and give focus to actions such as conceptual formation, re-formation, or canalisation, a feature Clarke's maps are not designed nor meant to capture.

4.2.2 Social worlds/arenas maps

Although I do not use social worlds/arenas maps in my own analysis described in chapter six, nonetheless by following Halfmann's (2012) division of levels (micro, meso, and macro) I explore the same relational interactions as those described by Clarke (2005) as pertaining to the social worlds/arenas in the overall situation (or whole system). The social worlds/arenas part of the analysis allows meso-level interpretations of the situation that are rooted neither in examination of the individual, nor "macro-level grand theoretical abstractions", but instead in social collectives such as business groupings (insurance companies, government departments, hospital administration) or professional groupings (nurses, allied health professionals, patient advocates) (Clarke, 2005 p 110 - 117).

4.2.3 Situational maps

Similarly, although I do not make use of an overall situational map in my own analysis, nonetheless my exploration of the dynamic patterns of the internet-search as a whole system described in chapter seven remains alert to the important elements specific to this level at work within the internet-search whole system. The purpose of the situational map is to capture all the ontologically distinct elements in the study. It is described as an exercise in identifying elements that matter or make a difference. The situational map promotes a relational analysis so that each element is put into relationship with the others and the nature

of the relationship is considered, thereby creating a top-level map of the whole situation. It helps, as writes Clarke (2005) “to ‘see’ the range of positions.” (p. 25).

4.2.4 Situational Analysis and my research?

The cartographic analysis of Clarke’s approach inspired me. I immediately saw value in portraying abstractions like opinions in a spatial relationship. All three kinds of maps are intended as analytic exercises, fresh ways into social science data – from solely interview-based to multi-sited research – that are especially well-suited to contemporary studies. They are intended as supplemental approaches to traditional grounded theory analyses that centre on action—basic social processes. Instead, SA maps centre on the situation of inquiry. Through mapping, the analyst constructs the situation of inquiry empirically. The situation *per se* becomes the ultimate unit of analysis and understanding its elements and their relations are the primary goals. This is very much in accord with both Hanson’s (1997) whole-system approach, as well as Halfmann’s (2012) inter and intra-connected levels of analysis within the overall system both described earlier. In particular I felt I could make use of the micro-level positional maps, but I needed something more to capture the dynamism contained within systems. My reading of situational analysis gave me confidence that similar tools could be developed that would allow for a deep analysis of abstracts such as concept formation and interaction by treating the intangible as tangible and therefore locatable, not in physical space, but in conceptual space. However, it was a related tool I found in marketing research that finally gave me the practical model I could adapt for my research into the internet-search: perceptual maps.

4.3 Perceptual maps and Conception maps

Perceptual mapping is a technique used over many decades in marketing and in consumer-related fields to model both the basic attributes customers use to evaluate products,

and also the comparative positions of current and potential products with respect to these attributes (Sinclair & Stalling, 1990). Like Clarke's positional maps, perceptual maps are usually presented by assigning two attributes of interest to each of a horizontal and a vertical axis, and then plotting the position of individual products on the resultant perceptual map. A classic example often given in textbooks describing the technique is a comparison of products in the soft drink market. In that example, price is plotted on the horizontal axis, and sugar content on the vertical axis. Products are plotted so that each position reflects the relative price and relative sugar content of each product. On that map, different offerings such as Coke Zero, Sprite, Pepsi Max, Fanta etc are located according to their price and sugar content. Analysis centres around which areas of the map are densely populated which might reflect a large market share and/or a highly competitive combination of sugar-content and price point, whereas areas of the map that are less densely populated reflect either lack of customer uptake or a market opportunity waiting to be filled.

Perceptual maps can be intuitive to analyse and simple to construct. However, they can also gain complexity and analytical power through the addition of further dimensions to represent multiple attributes. Furthermore, the methods used to assign values to products for those variables can quickly become extremely complex through the use of multivariate statistical analysis such as preference regression, multi-dimensional scaling, factor analysis, discriminant analysis and other statistical techniques drawn from marketing, economics, and operations research (Schmalensee & Thisse, 1988).

The popularity and widespread use of perceptual mapping, however, stems from the intuitive interpretation and simplicity of construction afforded by the more traditional two-dimensional representation, very much like Clarke's maps in SA. Perceptual maps enable companies to capture both concrete attributes, but also, importantly for my own research,

intangible value-based attributes such as how customers perceive a business, not just manufactured products. Similarly, once a data collection method has been standardised and adopted for a given map, perceptual maps allow businesses to model how customers perceive other businesses and brands.

Perceptual maps need not come from a detailed study. Perceptual maps can be put together very quickly using intuition and best judgement ‘on the fly’ based on the marketers understanding of their own industry. Furthermore, perceptual maps are not limited to use in commercial applications. Non-commercial applications such as mapping concerns about unsafe driving behaviours (Vanlaar, Simpson, & Robertson, 2008) and doctors’ prescribing choices (Monteiro, Dibb, & Almeida, 2010) reflect the broad utility of perceptual mapping whenever analysis needs to centre around perceptions and relativity.

In chapter five I make use of a perceptual map as part of my micro-level analysis. At first glance the use of this marketing technique appears to be a departure from conventional SA. However, Clarke points out in Situational Analysis that:

Should you later [i.e. after positional mapping] decide to write about or otherwise articulate and represent the positions of individuals or groups, social worlds in an arena, on particular issues, this is of course completely legitimate (Clarke, 2005, p 127).

Therefore, it is not a departure from SA to bring other analytical techniques into play. Perceptual maps allow for the positioning of individuals within the positional space, however they don’t track movement *per se*.

For the moment I want to draw attention to the idea that the portrayal of snoring by actors in the network and perception of snoring by actors in the network sum together and

result in the overall ideation or conception of snoring permeating or infusing the internet-search as an overall actor-network. It is the conception of snoring that I wish to capture and represent visually since it is the shifting conception of snoring vis-à-vis medical jurisdiction that is medicalisation. I have therefore described my final modified version of cartographic representation as a ‘conception map’ to distinguish from the ‘perceptual map’ used in market research, and ‘positional map’ found in Situational Analysis.

My interest in medicalisation of snoring as a dynamic process – a shift over multiple levels in conceptions about snoring towards or away from medical definition and authority – necessarily involves capturing conceptions and tracking their shifts. To that end, I have been heavily influenced by the positional maps described in situation analysis and the focus on capturing present and missing attitudes and conceptions within the situation. In particular, the representation of those positions cartographically impressed me as a powerful yet flexible tool for analysis. I have also been influenced by perceptual mapping, a technique developed for market analysis, but one which allows me to position individuals and constituent elements from within the internet-search whole system. My synthesis of these visualisations will be explained in more detail in chapter five, but for the moment it is important to identify that I considered my modified version to be sufficiently novel to describe my maps as ‘conception maps’ since I used them to specifically create a ‘conception space’ within which elements of the internet-search whole search could be located and tracked. In the next section, I use the term conception maps to refer to the maps used in my analysis.

4.4 Case Study Design Frame

4.4.1 Study design

The research used a small-sample observational study design. The internet-search as the object of study was enacted for observation and sampling by volunteers recruited to

search for information about snoring on the internet. Each search was recorded using screen-capture software. The study introduced snoring as the search topic rather than the more inclusive concept of the hypotonic airway spectrum described earlier in chapter two. This is because snoring is ubiquitous in the sense that it is present in the full range of hypotonic airway epiphenomena, from mild airway resistance to full airway obstruction. Furthermore, obstructive sleep apnoea originated and largely remains in the medical purview, whereas snoring has been a commonplace occurrence which has only begun to be medicalised in recent years

4.4.2 Ethics

Researchers involving human participants are guided by various bodies and regulations depending on the location and nature of the research. Research involving human participants in particular should be aware of and guided by the tenets of principlism: autonomy, beneficence (and nonmaleficence), and justice (Beauchamp, 2003).

Autonomy-Informed Consent.

The principle of autonomy is represented in qualitative research by gaining informed consent from participants. Qualitative research relying on emergent concepts from iterative analysis techniques such as grounded theory will sometimes enter the field with little foreknowledge of the themes that might arise during the research (Goodwin, 2006). Richards & Schwartz advocate the importance of minimising the risk of exploitation and coercion in qualitative healthcare research by clearly informing the participants of the professional background of the participant, particularly whether or not he or she is a health professional (Richards & Schwartz, 2002). However, Richards & Emslie describe differing interactions between researcher and participants due to the participants knowledge of the different researchers' professional backgrounds: the 'doctor', or the 'girl from the university'

(Richards & Emslie, 2000). In my study I provided full written and oral disclosure regarding my professional role as a sleep medicine health provider to avoid ethical hazard that might arise should that role be kept secret. This raised another potential ethical hazard insofar as participation in the study might directly or indirectly have caused participants concern about themselves or other people which might not have otherwise occurred. I was prepared for such an eventuality and planned to provide the Pharmaceutical Society's "Self Help" information card about snoring and insomnia, which is publicly available throughout New Zealand, and if medical concerns were raised, I planned to give contact details for both of the Christchurch-based private sleep clinics, and also the contact details for the Canterbury Initiative outreach primary care sleep apnoea service. However, no such concerns were raised during or after the study.

Beneficence – Confidentiality – Anonymity.

Participants were given written and oral assurance of complete confidentiality and anonymity. Data was tracked using a reference number assigned to each participant at the outset of the study. Volunteers were provided with an information sheet introducing me and my primary supervisor (Appendix B). The information sheet also provided a summary of the study including the aims and the overall value of the study. The information sheet included an explanation of the role and likely impact of participation. A statement regarding anonymity and data handling was also given which included the possibility of subsequent contact regarding confidentiality and data handling after interviews. The information sheet included my contact details and also included the names and contact details of my primary academic supervisor to establish a clear line of communication should the participant need to communicate or address concerns with someone other than me.

Justice – Vulnerability

There is an inescapable power imbalance in the research relationship. Roles can easily become blurred when the researcher is also a health care provider. Participants might feel obligated to participate. To avoid this, I recruited from the general public rather than from a sleep clinic, a medical practice, or any setting where the idea of seeking care might have been at the foreground of a participant's mind. The moral complexities of conducting qualitative research in an ethically robust manner have contributed to lively debate in the literature, but with few clear guidelines on how to navigate those complexities. Ethical research is a process of negotiation, rather than an outcome of compliance.

4.4.3 Recruitment

Once I received final ethics approval from the VUW ethics committee, convenience sampling was used to recruit 10 healthy volunteers from the Christchurch general public. I also asked a sleep specialist from the Sleep Well Clinic if he might volunteer as a comparison to the other volunteers who were all lay-people. I placed flyers in a local café and also in several sports clubs throughout the city. The flyer asked for participants in a research study investigating how people search the internet for information about snoring. To participate they needed to snore or have someone in their life who snored, and they needed to know how to search on the internet (see Appendix B). One volunteer was recruited from the café, and he approached me as I posted the notice. The interview and internet-search recording took place immediately in the café which was otherwise empty at the time. The remaining volunteers were recruited from four sports clubs throughout Christchurch. In each training space I was permitted to put my flyer on notice boards. Participants approached me after the classes and a time was made to conduct the research the following weeks after class in each venue.

Participants were recruited on a first come basis until five people were recruited, and then purposive sampling was used to enrich the data and to recruit a range of build, age, and gender. I did not intend the study to be representative but wanted a variety of types of people who might have a variety of experiences relating to snoring. Atypical snorers were purposively approached for inclusion in the study: skinny people rather than only overweight people, younger people rather than all middle-aged people, and women as well as men (Sandelowski, 1995). A sleep specialist doctor was also asked to take part for comparative purposes.

At the time of recruitment each participant was given oral and written explanations about the goals of the study (i.e. to explore how people find out and decide what to do about snoring) and how the study would be conducted. I provided full disclosure about my role as a sleep physiologist, explaining that I work for a private sleep clinic, and also manage a public health funded DHB sleep service contract. Participants were informed that although I am a practicing sleep disorders clinician, the study involves neither assessment nor remedies for snoring. Furthermore, it was also pointed out that I would not be able to offer medical advice or treatments while they were participants in the study.

4.4.4 Data Collection

After obtaining informed consent, I met with the participants at the place of their choosing, and I conducted an initial short semi-structured interview with each participant. All the interviews were recorded using Camtasia v8.14 (TechSmith) screen capture software running on a HP Pavillion laptop computer with Microsoft Wireless Mobile Mouse 1000 connected to the internet via Telecom 3G mobile hotspot hosted on an iPhone 5s mobile phone. During the interview, each volunteer was asked:

- What types of people do you think are most likely to snore?

- Do you think snoring can be a problem? If so what sort of problems do you think might be related to snoring?
- Do you think snoring can be stopped?
 - (If yes)
 - What things can stop snoring?
 - Are some ways of stopping snoring more suited to some people? If so, what ways are most suitable for which people?

Each participant was then instructed: “Now find out a little more about snoring using the internet. You have up to 20 minutes.” The participant then chose the web browser with which they were most familiar. All web browsers were cache-cleared and cleaned between participants to ensure prior searches did not influence subsequent searches. Each search session was recorded using screen-capture software (Camtasia Recorder v8.0). I removed myself from the immediate vicinity of the participant during the search so as not to influence or distract them. At the end of the search session, I conducted a second semi-structured interview using the same questions as those used for the interview conducted before their web-search.

Demographic information including height, weight, gender, age, and ethnicity were recorded for each participant, and they were also asked a five-point snoring status questionnaire which classifies snoring according to self-reported frequency: never, rarely, sometimes, often, or always. (Zieliński et al., 1999). Participants were also asked whether or not they had ever sought treatment for snoring (and if so what type, and what was the outcome). The demographic information was recorded after the internet search to avoid casting a ‘medical’ or ‘non-medical’ influence on the participant prior to their search by

asking about treatment for snoring. Following the post-search interview each participant was asked if they would like to ask any questions or discuss anything they had come across during their internet-search in more detail. They were also encouraged to contact me if any further questions regarding the study or the information they had encountered occurred to them subsequently.

Each participant's two interviews (pre- and post-search) were transcribed by me from the screen capture recording into a Microsoft note document to strip out hidden html coding and formatting, then into a Microsoft Word (v2013) document for analysis. I analysed each transcript line by line looking specifically for the proportional use of medical language in terms of jargon or medical concepts using the content analysis approach described below

The internet-search screen capture was reviewed, and all the pages visited in a search were downloaded into a separate local digital folder for each search. Each page was then converted to text where possible (some pages were entirely images, and some were mainly video content) and analysed for proportional use of medical language in terms of jargon or medical concepts.

4.4.5 Data Analysis

The interview transcripts and web page transcripts were each subjected to content analysis and hypothesis coding consisting of a simple frequency count of sentences containing language representing one or the other of each of the positions used to construct the corresponding conception map for that internet-search. For each transcript the relative proportion of the number of sentences referencing 'snoring', as opposed to 'OSA', expressed as a fraction between 0 and 1 was used to generate an x-axis co-ordinate on each conception map. Similarly, the relative proportion of sentences using medical language to refer to snoring or OSA, as opposed to lay language, expressed as a fraction between 0 and 1 was

used to generate a y-axis co-ordinate on each conception map. The relative use of snoring vs OSA in any given transcript was calculated through a simple frequency count of occurrences of 'snore' (e.g., snore, snorer, snoring, snored) expressed as a ratio of the total count of references to snoring and obstructive sleep apnoea (e.g. OSA, apnoea, sleep apnoea) combined. The relative use of medical vs lay language was calculated through a simple frequency count of occurrences of medical language referring to snoring or OSA (explanations, processes, procedures, treatments) expressed as a ratio of the total count of references to snoring and obstructive sleep apnoea using medical language and lay language combined. Hypothesis coding was chosen for the primary cycle of coding (Saldaña, 2013). In that coding scheme, researcher generated codes are developed a priori on the assumption that they would be found in the data. Thus, the codes used for the primary cycle were: 'snoring'; 'OSA'; 'medical language'; and 'lay language'. Hypothesis coding also allows statistical applications to be applied and in the case of the present research, a simple frequency count was used. The data were encoded further for analysis by converting count frequencies to ratios within each coding category pair. Conception mapping and conception-tracking therefore formed a secondary coding cycle insofar as the location of the interviews and web pages within each search became the minimum coding units. Within the secondary cycle, analysis was thereby conducted not on the level of individual sentences, but on the relative positioning of the search elements from which the position co-ordinates were derived. Even further aggregation led to a tertiary level of coding through averaging the positions of entire individual searches for analysis of whole searches and their relation to each other.

A coding guide was assembled to provide reproducible coding instructions for identification of whether a given sentence could be counted as referring to 'snoring' or 'OSA' on the one hand, and/or representing 'medical' vs 'lay' language on the other, for inclusion in the total lay vs medical count. Coding units for each element (pre-search interview, each web

page, and post-search interview) were defined in the coding instructions as ‘sentences related to snoring or OSA but not specifically including either of those two terms’. To be included, sentences could be descriptions of any of the hypotonic airway spectrum epiphenomena such as noise, airway collapse, or breathing irregularity. Additionally, sentences could be included in the count if they related to explanations of snoring or OSA, or related phenomena, processes, or procedures.

Medical language was defined as such if a sentence contained medical jargon², anatomical or physiological terminology, or language relating to medical processes such as diagnosis or treatment which would require access to a medical professional such as a surgeon, doctor, or allied health professional.

The ratio for each concept pair formed the x-axis and y-axis co-ordinates for location on the snoring/OSA vs lay/medical conception map for each of the constituent elements of each internet-search (pre-search interview, each web page, and post-search interview). The size of the circles used to plot locations on the positional map was determined by the length of time spent at each location during the search (see chapter five and appendix A).

Secondary analysis consisted of grouping all the web pages from all of the internet-searches into a single conception map to represent the relative attention-capture of all the pages and underlying domains (chapter six). Standard SA positional maps were assembled to examine how positions held by searchers compared to position portrayed by web pages.

² The language, especially the vocabulary, peculiar to a particular trade, profession, or group: medical jargon (from dictionary.com).

Further exploration of those sites found to capture a disproportionate share of the collective attention across all the internet-searches was also conducted and helped inform the discussion regarding the dynamic pattern of medicalisation presented in chapter eight.

4.4.6 Reliability

Klaus Krippendorff observed that the validity of a study can only be gauged by its use and application after publication. Reliability, on the other hand, is an attribute of the data from which analysis has been drawn. Whereas reliability cannot guarantee validity, nonetheless unreliability can certainly limit validity (Krippendorff & Bock, 2008). In my research, it was important to determine reliability not so much from the perspective of measurement theory since the various elements of the search were recorded in their entirety, but rather very much from the perspective of interpretation theory. The key to reliable content analysis is reproducible coding.

Coding instructions are usually developed through an iterative process: initial formulation; application on a small sample; tests of reliability; review with other coders; reformulation; etc. until the coding instructions produce reliable decoding and recoding of the data (Krippendorff & Bock, 2008; Saldaña, 2013). Even though in the present study there were only two pairs of categories in the primary coding and the coder's task was simply to determine whether the sentence met the criteria to be counted as representative of one or the other of each pair (or neither), nonetheless it was important to describe the reliability of those coding decisions by looking at both intra-scorer agreement and inter-scorer agreement.

Intra-scorer and inter-scorer agreement were determined by coding all the longest web-page transcript twice by me to assess intra-scorer agreement, and once each by two other coders to assess intra-scorer agreement. From the perspective of measurement theory, systemic differences such as outliers, should stand out through visual inspection of the coding

matrix, however we observed no such systemic disagreement. From the perspective of interpretation theory, however, it was assumed that the main contribution to differences would likely arise from disagreement between interpretations of individual coding units. The interpretation of reliability therefore is left to the researcher and his or her audience.

4.5 Conclusion

In this chapter I reviewed two different cartographic techniques – positional mapping from Situational Analysis, and perceptual mapping as used in marketing and business studies. I also noted that despite SA being an extension of Grounded Theory, I was not adopting Grounded Theory as an overall methodology.

The positional maps described in SA plot the situational, relational, and positional elements of the data to create visual maps that provoke analysis and to highlight marginalised or missing positions. The positional maps in particular encourage the analyst to give thought to the positions themselves rather than the individuals or groups that hold them.

In contrast, perceptual maps include individuals and locate them within a perceptual space created by selection of axes representing dimensions of interest. In my own analysis I make use of both those distinct mapping techniques to explore positions isolated from the individual elements within the system on the one hand, and then to locate individual elements within an overall positional space on the other.

As described in 4.3 above, I then added a sequential element to track the relative positions of individual elements within the whole system of the internet-search, and movements of conceptions within the spaces defined by the positional axes.

Finally, I described the social worlds and situational higher-level mapping of SA and pointed out that I did not use those maps within my own analysis. However, I did adopt the

underlying SA analytical framework of examining the meso level and macro level elements of the whole system cartographically, albeit with my own conception mapping technique.

Chapter Five: The Search for Snoring

5.1 Introduction and terms of analysis

How does the internet-search contribute to the medicalisation of snoring? Chapters five through seven describe the results of the research grouped according to analytical techniques and component actors collectively comprising the internet-search. Although each chapter shifts focus and the accompanying discussion follows suit it is important to remember that the internet-search is being considered as a whole system, and the next three chapters should be read in that light. Accordingly, the introductory section in the current chapter makes reference to all three of the following chapters and serves therefore as a brief introduction to the whole.

The main objective of this research is to explore how the internet-search contributes to the medicalisation of snoring. The terms of the analysis were built around Halfmann's (2012) dynamic model of medicalisation consisting of multiple simultaneous levels operating within Hanson's (1997) whole system, in this case the internet-search for snoring. Therefore, the analysis was broken into three stages. The first is the preparation of positional maps and conception maps some of which are presented later in this chapter and all of which are presented in their entirety in Appendix A. These maps, along with the searcher-based positional maps, centre around the individual or micro-level of action within the search and are most closely based on the empirical data collected during the field research. Is there evidence that conceptions shift through participation in the whole system? If so, in what direction and with what consistency across multiple examples of the internet-search. The main analysis is visual and comparative between cases and designed to provoke discussion around the internet-search and medicalisation of snoring.

The secondary analysis described in chapter six was suggested by those initial findings and cartographic analysis. A further positional analysis of all the web pages encountered in the entirety of the field research treated as a group, along with a conception map focussing on capture of attention share by those pages focussed the secondary analysis on the aggregated or meso-level of action at work in the internet-search for snoring. Are some pages encountered more frequently than others, and if so, why those pages? At all times the analysis remained cognizant of the internet-search as the unit of study.

The final analysis was opportunistic. As I will show in the following sections of this chapter, the Wikipedia page on snoring featured prominently in my primary analysis. I therefore took advantage of an archiving feature of Wikipedia allowing a user to view the page across all previous changes to sample three instances of those archived versions of the page to construct a conception map of the Wikipedia page over time. I argue in chapter seven that this reflects a macro-level view of the medicalisation of snoring, albeit one that is represented in a single internet page over time. Once again, the analysis was visual and designed to provoke discussion relating back to the internet-search and the medicalisation of snoring.

5.1.1 The field research

I recruited people to participate as the human actors in a series of screen-recorded internet-searches for information about snoring. A total of 12 participants (table 1) were recruited over two months from six recruitment sites; one café, one sleep clinic, and four sports clubs. The study design did not specifically demand an a priori minimum number of participants, so approached the question of sample size by considering each internet-search to be like a focus group on snoring with only a single human participant each, but also several different web-pages also acting as ‘participants’. A broad range of valid sample sizes are

reported possible in the literature (Carleson & Glenton, 2011), so I analysed data from each internet-search in turn and stopped recruiting once I reached saturation in terms of the positions represented in the data and the conception shifts tracked within each internet-search. Although the number of recruited human participants appears small, each search generated a rich and expanded dataset made up of the interview transcripts, the web sites, and the individual web pages encountered at those sites – i.e. the ‘internet-search’ considered and analysed as a whole system.

Before conducting their search, each participant was interviewed about their conceptions surrounding snoring – what makes the noise of snoring, what type of person is most likely to snore, whether it might be problematic, and what might be done to stop it if it were a problem. The participants were then asked to conduct a search for information about snoring on the internet. After their search, each participant was given the same interview questions again. The raw data for the research therefore consisted of the interview transcripts and the text from all the encountered web pages, along with the screen recordings of the searches.

5.1.2 Dynamic patterns of change along and also between Levels of Medicalisation

Rather than thinking of medicalisation as an all-or-nothing state, it is more nuanced to think of medicalisation as having horizontal dynamism arising from sequential change over time towards or away from medical jurisdiction, and vertical dynamism arising from those changes happening at different rates (or even different directions) at different levels (Halfmann, 2012). That the levels are not isolated from each other gives rise to further dynamism than just towards or away from ‘medicalness’ along any given micro, meso, or macro level in isolation. If the levels are in communication with each other, then the rate of change can be sped up or slowed down or even reversed depending on the direction and rate

of the communicant level(s) and the strength of communication between the levels. This is particularly important when considering the role of the internet-search on medicalisation since there appears to be strong communication between the micro-level of individuals conducting searches, and the meso-level of the various companies and agencies hosting web sites who are involved in financial transactions that turn attention itself (eye on screens) into both a commodity and a currency. In that context, medicalisation of snoring could be viewed as a form of re-branding from the mundane into either the sensational or the significant, through attribution of medical authority. But before those ideas can be developed, it is important to first look at what is actually happening at the level of the individual – the micro-level – within the internet-search for snoring.

5.2 The actors in the internet-search for 'snoring'

5.2.1 The human actors

A total of 12 participants (table 1) were recruited over two months from six recruitment sites; one café, one sleep clinic, and four sports clubs. Each recruit was assigned an arbitrary two-letter case designation used throughout this thesis to preserve anonymity. The sports clubs allowed for membership starting at age six with roughly equal numbers of children and adults, and men and women. Most age ranges were represented in the clubs who agreed to allow me to recruit, although none had elderly members (i.e. older than 70). I chose clubs from a wide range of locations throughout Christchurch city to qualitatively increase the likelihood of socio-economic diversity in the sample. Once again, this was not to be representative, but rather to increase the variety of participants in terms of experience of snoring and also experience with medical authority. However, I did not use any specific tool to ascertain or capture the socio-economic status of each of the individual recruits, and nor did I recruit to reach a specific statistical power for socio-economic representation.

The single participant (AQ) recruited at the café responded to a flyer I left in the café asking for volunteers. Most of the participants recruited from the school halls and gyms also responded to the same flyer that I placed on the respective club notice boards. Of those recruits, four were members, two were instructors, and three were parents of members.

I purposively recruited three of the participants so as to provide a mix of genders, and a range of ages and builds. I approached NF and specifically asked him if he would participate because of his skinnier build (BMI 25). I asked CB to participate to increase the number of women, and I asked GS to participate since she was a ‘skinny young woman’. These selections were not for statistical purposes, but merely to qualitatively broaden the participation base to include people other than the middle aged overweight male stereotype of snorers discussed in earlier chapters.

Lastly, I approached one of the sleep specialist doctors (HK) at the Sleep Well Clinic where I am employed as Senior Sleep Physiologist. I thought it would be an interesting comparison to look at a conception map generated by a medical professional to see if there were differences in the type of language used by the sites he chose to visit compared to the otherwise lay status of the other participants. Furthermore, I wanted to see if the conception map vector which had shown similar shifts in language in each of the lay participants might behave differently when applied to a medical professional whom I expected to start with considerably more use of medical language even before conducting an internet-search. In the following results sections and chapters, HK’s data is only shown in the form of his individual conception map. Since he is a sleep specialist and was only included for comparative purposes against the lay participants at the micro-level, none of his data is included in any of the secondary analyses that aggregate data into group charts or representations of individual effects grouped together for analysis.

Seven men and five women aged from 18 to 69 agreed to take part in the study. One participant was not included in analysis since the recording of her internet navigation failed due to technical error. The single participant recruited from the cafe (AQ) conducted his internet search at the recruiting café. The sleep specialist (HK) conducted his internet search in his own consulting room at the sleep clinic in Christchurch where he practices. Three participants (TT, CS, and LV) conducted their searches in their own homes. The other six all conducted their searches at the club facilities from which they were each recruited. The searches were performed after class to minimise distractions, except for CB who asked to do her search sitting to one side of a class while the class was in session.

Table 1 summarises the profiles for the 11 human participants. Demographic data were collected for each participant including age, gender, and BMI as these three categories are often used to stereotype snorers and people with sleep apnoea. Participants were also asked to self-rate their own snoring status (five-point scale from never to always, 0-4), daytime sleepiness on the same scale, and the likelihood of actually falling asleep in a variety of situations (Epworth Sleepiness Scale, 0-24). The Epworth Sleepiness Scale (Johns, 1991) is a common assessment tool for excessive daytime sleepiness used by many sleep clinics internationally (Appendix D). It asks for the likelihood of falling asleep in a range of situations with some more appropriate than others. The scores for all the situations are added to give a total ETT value ranging from 0 to 24, with any value greater than 10 considered to be excessive, and a value greater than 15 considered to be clinically suggestive of a major sleep disorder such as obstructive sleep apnoea or narcolepsy. Finally, each participant was asked if either they or a family member had ever tried ways to stop snoring.

	Age (years)	Gender	BMI ³	Co-habiting bedroom	Snore (0-4)	Sleepy (0-4)	ESS ⁴ (0-24)	Rx ⁵ self	Rx ⁶ family
TT	48	male	30	yes	0	2	0	yes	no
QA	56	female	39	no	3	2	9	no	no
NF	55	male	25	yes	0	1	2	no	no
AQ	57	male	34	yes	3	2	7	no	no
KO	40	male	32	yes	2	2	3	no	no
CB	48	female	26	yes	3	0	0	no	no
GS	18	female	23	no	0	0	0	no	no
CS	47	female	30	yes	4	3	3	no	yes
LV	42	male	28	yes	0	0	0	no	yes
LM	51	male	34	yes	4	2	6	no	no
HK	69	male	27	yes	2	2	6	yes	no

Table 1 - Demographics for all participants

Most of the participants shared a bedroom with someone else and roughly two-thirds reported themselves snoring ‘sometimes’, ‘often’, or ‘always’ (Snore score ≥ 2), but only two had ever tried ‘treatment’ for snoring. Two other participants reported having a family member who had been ‘treated’ for snoring. None reported excessive daytime sleepiness (ESS >10), but roughly two thirds reported feeling sleepy during the day ‘sometimes’ or ‘often’ (Sleepy score ≥ 2).

5.2.2 The non-human actors

All participants (including HK the sleep specialist) were each asked to participate in a pre-search interview asking about snoring, and then to conduct a screen-captured internet-search wherein they encountered various web pages while searching for information about snoring. Finally, each participant was given the same interview questions after their search. The interviews and screen capture of the searches comprised the raw data from the field

³ Body Mass Index

⁴ Epworth Sleepiness Score

⁵ Treatment for snoring (themselves)

⁶ Treatment for snoring (family member)

research. Transcripts of the interviews were prepared and the text (but not images) from the web pages was saved as text files for analysis.

The web pages comprised most of the non-human actors ‘recruited’ by the human actors during each search. For the micro-level analysis in the current chapter, it is sufficient to consider just the pages themselves as the non-human participants in the internet-search.

However, there was one other participant in each of the searches also recruited by the human actors themselves: the search service. There are many different search engines that could be used to navigate the internet such as Bing, Yahoo, DuckDuckGo, and others. However, all the participants chose to use Google.

The screen-capture recordings and accompanying interviews were analysed using individual conception maps, examples of which are presented in section 5.5 below. The individual conception maps should be thought of as representing discrete units of study – i.e. they are ‘internet-searches’. As such, I include mention of them in this participants’ section since it is the internet-searches that were the true participants in the study rather the individual human actors that helped enact each one. All the individual conception maps shown later each represent a ‘participant’ in the form of an internet-search. All of the individual conception maps are presented as figures in Appendix A along with a brief accompanying narrative of the salient features.

Across all the searches 93 unique web pages were visited including Google search pages (some pages were encountered multiple times) providing a cross-sectional sample of web pages encountered when searching on the internet for information about snoring. Along with the 27 Google search results, 20 other pages were not plotted on any of the maps due to not attracting any attention from the encountering searcher (i.e. a click-through to a page and then an immediate back-click), or due to lack of content pertaining to snoring and/or sleep

apnoea (one participant in particular struggled with navigation of her web-browser and ended up spending quite some time in completely unrelated pages she visited by pure accident). The 45 remaining pages from 17 sites were all included in the analysis to help generate the various individual conception maps.

In the following sections I present a series of maps. This does not follow the strict chronological first-to-last sequence of data collection, but rather an outward-to-inward spiral from the static to the dynamic. I have chosen to present the findings in this manner so as to build from the simple to the more complex, bearing in mind that each of the three types of maps I present – positional maps, perceptual maps, and conception maps – each represent different facets of the same internet-search ‘whole system’.

5.3 Positional maps – positions in the data (searchers)

Before looking at the conception maps showing shifts in conceptions regarding snoring within any given individual, it is useful to look at the conceptions that exist in the whole system. What sorts of ideas are held by people before their search or after their search? The positional maps used in Situational Analysis are conceptually very simple on the one hand but require complex and iterative analysis of the data on the other.

To determine this, I first had to array the basic issues in the situation of enquiry within two-dimensional maps put together in pairs of issues selected from the data. I then laid out the axes in terms of ‘more versus less’ if possible. Clarke (2005) points out that the most important (and ‘radical’) aspect of positional maps is that the positions ‘are not correlated/associated with persons or groups or institutions’ and therefore do not ‘represent’ individuals or groups (Clarke, 2005). The positions can be given clear consideration without the potential distraction of knowing who or how many gave voice to each position.

It should be noted that a vast number of different positional maps could have been elicited from the coding and memo-writing process of data analysis. The two I chose to develop were selected so as to explore the preconceptions surrounding snoring discussed in chapter one: that snoring is associated with weight and/or gender; and that snoring can (or cannot) be ‘cured’ (figures 4 and 5). By placing emphasis on the map and not (at this stage) positioning individuals within the map, the positions are considered on their own terms. Related positions which are possible but not held within the data are also be given ‘voice’ by dint of being mapped along with the positions that are represented in the data, and in that sense an element of relativism is conferred to the analysis.

The positional maps presented in this section detach ideas from the individuals that hold them, and also detach them from the burden of proportional representation. An idea just needs to be in the data once for it to be included on the positional map with the same emphasis as a position held by more individuals in the study. The following position maps represent issues arising from within the data and are used to note which positions out of all the possible combinations are represented in the data (at all), and also which positions are not (at all).

The complexity of positional mapping stems from the process of eliciting meaningful axes from the data in the first place and deciding which issues to pair together to form the positional maps. I went through a reflexive period of iteration, trial and error before settling on a set of particularly relevant axes and resultant maps. I was not looking for data representation in terms of the most common positions, but rather that the positions are present and can be paired up meaningfully.

For the first positional maps, I only used human-generated data in the form of pre-search and post-search interview transcripts and the internet search terms rather than

including at this stage the transcripts from the web pages encountered during the searches. My rationale was that the conceptions of the person beginning a search and the conceptions held by the person after the search are the conceptions most relevant to the process of medicalisation because the micro-medicalisation event occurs at the level of the individual human actor, whether or not the positions represented by the non-human actors have any influence. The later conception maps incorporate the positions represented by the non-human actors and seek to create a unified process of shift and change (i.e. medicalisation). However, for this first analysis the focus is on which ideas and positions are in the human mix in the actor-network.

The positional analysis included not just the transcripts from the interviews, but also the various search terms and keywords used by the searchers since those terms also give insight into the positions or issues or ideas of most interest to the human actors before, during, and after the search process (table 4). By only selecting the human actor positions from which to construct these first positional maps, I subvert to an extent the SA aspiration to decouple the positions from the actors who hold them if considered in the broadest sense, however for the reason outlined above I chose to only look at the purely human-generated data in this first analysis.

The interview data was analysed looking at those sections of the interviews relating to the prompts “who can snore” and “do you think snoring can be a problem”, and also data from the prompt “do you think snoring can be stopped”. If the participants answered that they think snoring can be stopped, I also included the data from the prompt “what are some of the ways you think snoring can be stopped”.

5.3.1 Positional map (searchers) – what type of person snores?

The first positional map was based on data arising from the “who can snore” and “do you think snoring can be a problem” interview prompts both before and after the internet searches. Surprisingly, prior to conducting a search, only two participants mentioned age as a factor in who might be more likely to snore, even though age arguably plays one of the biggest roles in the development of snoring through person’s life history (Deary et al., 2014). LV was very direct. “Overweight people. Pregnant people. Older people.” TT was equally as confident that “certainly the, the older you get the more likely it [snoring] is.” TT did not self-identify as a snorer but spoke passionately about his wife whom he assured me did.

After searching, however, age was mentioned by more people as being a factor in likelihood of snoring. CB, who self-identified as an ‘often’ snorer also self-identified with at least one of the types of person more likely to snore which she described as “us old buggers.” She added “as you get older, it’s the looseness” and gestured at her neck. In his post-search interview, TT elaborated further on the mechanism whereby age made it more likely to snore by explaining that ... as you get older, your muscles relax therefore that soft palate relaxes as well.” LM explained the age relatedness by saying: “one that I did discover was as you get older, more middle-aged to older people as well because you start losing tone – toning in your muscles in your throat and stuff like that.”

TT’s and LM’s post-search explanations mirror the current epidemiological understanding of the progression of snoring due to age effects as being partly due to changes in morphology and partly to changes in muscle tone (see the earlier chapter on the hypotonic airway spectrum physical model of snoring). However, despite age being one of the most likely mechanisms for the development of snoring, by far the more commonly mentioned attribute linked to snoring discussed by the participants was weight. Every participant

mentioned at least once that being overweight was a significant indicator of a higher likelihood to snore.

TT, one of the more enthusiastic participants, gave very fulsome answers to the prompts. As well as age, TT said, “and also if you’re more overweight then you’re more likely to snore, than if you’re not.” And after his search, he expanded by saying “similarly, putting on weight because of course that restricts the amount of space there.”

CB also included weight alongside age as a type associated with snoring. Before her search she made the point that men were more likely to snore than women, but then said that women were more likely to snore as well if they were overweight. “Males, and overweight people – that’s females.” After her search she explained to me that the most likely people to snore were “there’s slightly overweight – well – overweight people. And sleeping on your back. As you get older, it’s the looseness [this is where she gestured at her neck] and putting on weight more from around here [she gestured more to the front of her neck and face] it’s your face muscles which drop as you get old.”

One participant, NF, thought that being overweight was the only “type” of person likely to snore. Before his search he said “people who are overweight. That’s the only... there.” And even after his search, “still people that are overweight, because of fat constriction around the throat.”

Similarly, KO after his search said “Yeah, overweight people. Yeah, more likely.” AQ caused his wife to laugh in the background when he said “Probably me, overweight males” once again mentioning gender and weight together (although with slightly different emphasis than CB). AQ, himself an overweight middle-aged man, was emphatic: “obese people. Overweight people.” Whereas GS, a slightly build young woman, framed it as a

(polite) question: “People who have weight issues?” And of course, not to overlook LV’s very emphatic description: “Overweight people. Pregnant people. Older people.”

That being overweight was so universally offered as a ‘type’ more likely to snore is less surprising given the pervasive snoring stereotype in popular culture mentioned in chapter two.

Alongside age and weight, gender was also mentioned in the transcript data from the interviews and was also one of the more common keyword terms used in the searches themselves. The question of women snoring, and the relative likelihood compared to men was explored by more than one searcher. TT was interested in the issue of gender and explained to me that it was because he suffered from insomnia which was aggravated by his wife’s snoring. Part of his answer regarding what type of people snore before his search was that “well, normally you’d say males, but from... just from past experience, it’s females equally as likely as males.” After his search (during which he specifically looked up ‘Why are men more likely to snore than women’), he noted that “I found the interesting thing about the difference why men are more susceptible [to snoring] than women is because of the position of things like the vocal chords in their throat. Being lower means there’s actually more of a gap or a space there which means that there’s more chance of it vibrating.”

It was common for people to link weight and gender. AQ thought that the more likely snorers were people like himself “Probably me, overweight males” although after conducting his search, he didn’t include gender as a ‘type’. Similarly, although CB thought that being overweight was a requirement for women to be likely to snore, after her search she didn’t include gender. CS also linked weight gain to gender before her search: “Well I used to think it was mainly overweight male people but... it turns out it’s not, because I recently found out I snore. I’m thinking that I’ve actually put a bit of weight on in the last few years and I’m

wondering if it's related to weight. I wonder about that. I really don't think that I did used to snore, but then I probably didn't have anyone around that was going to tell me." However, after her search despite her personal experience, the stereotypical picture was re-established: "anyone could snore, but it's most likely overweight men. And... women, but mostly men."

Not everyone responded with the stereotype though. AQ probably stated it best: "Oh, I think anybody. Anybody can snore."

For the first positional map I thought it important to capture those elements which appeared to be of importance to the human actors in the internet-search for snoring and which, from my background literature discussed in chapter two, I knew had real-world implications with regard to the medicalisation of snoring. Consequently, I chose the horizontal axis of the first positional map to include the issue of weight by ranging from weight not being an important factor in snoring at the left-hand side of the axis, through to weight being the most important contributor to snoring on the far right-hand side. For the vertical axis, I chose to include the question of gender, and set the lower limit to be that gender is not an important factor in snoring, through to gender being the most important factor in snoring at the top of the axis (figure 3).

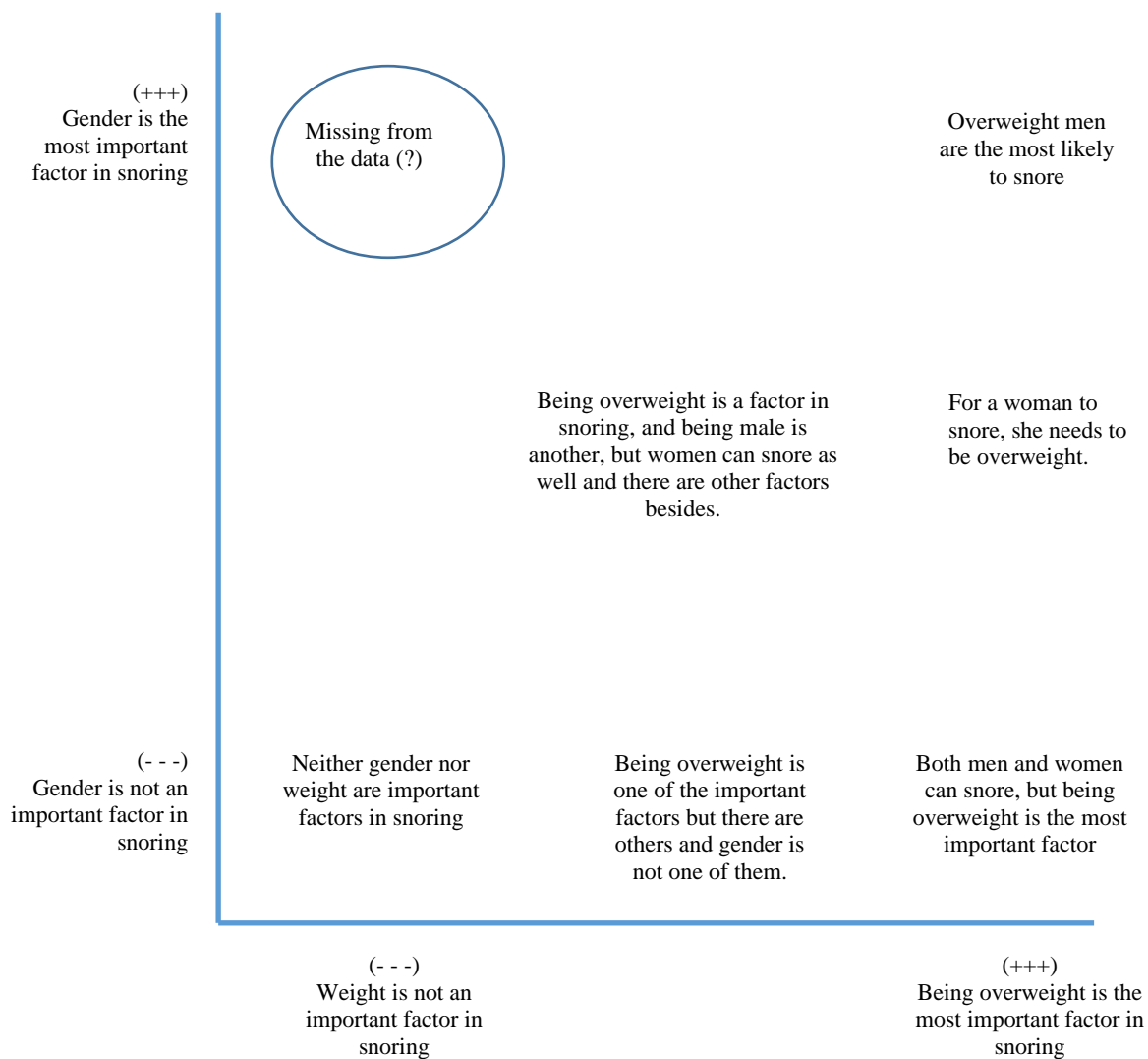


Figure 3 - Positional map of who can snore in terms of gender vs weight

The combination of the two positions relating to gender and weight, suggest different combinational positions. Going back through the transcripts, the position that gender is the most important factor in snoring and that weight is not an important factor was not fully expressed in any of the interviews. Arguably(hence the question mark on the map), CB was perhaps leaning towards that position when she said “males” but she then went on to talk about women needing to be overweight and so didn’t particularly elaborate.

The conception that neither weight nor gender played important roles was certainly expressed.

I plotted a middle position which was possibly the most commonly held although expressed in a variety of ways. That is, that being overweight and being male were both contributing factors but not necessarily the most important, and that women could indeed snore. Other factors brought up in the interviews included alcohol consumption, sleeping position, and a variety of anatomical structures relating to either the nose, or the oropharyngeal structures (notably the palate and uvula, but also tonsils and tongue base), or both. That the various other factors could again be broadly divided into two groups consisting of behaviours (alcohol consumption and sleeping position) versus anatomy and is explored in more detail using the second positional map (figure 4).

Another commonly expressed position was that weight is the most important factor irrespective of whether the snorer is a man or a woman (although note I have included on the map the position that for a woman to snore, she needs to be overweight). The position that weight is the most important factor seemed to carry the most blame/guilt depending on whether the interviewee was relating to themselves as being the snorer (guilt) or their bedpartner (blame). In particular the older female participants talked about the relationship between snoring and weight, and one participant (CS) spent a considerable part of her search following links about obesity and how to calculate BMI. The relationship between “weight” rather than “obesity” and gender concerns and medical marketing will be re-visited and discussed in more detail in the next chapter which looks more closely at the web pages and hidden actors operating behind them.

Finally, the position that overweight men are most likely to snore, was well represented in the data and certainly in keeping with the stereotypical depictions of snorers as

middle-aged overweight men presented and discussed earlier. Importantly, the positional map shows that most of the positions that could be expressed or held regarding weight and gender in relation to snoring were given expression in the interviews either before or after the internet-searches. This suggests that although there are clearly stereotypes, that those stereotypes might be at odds with the lived experience and lay understanding of what is actually happening with snoring, thereby allowing other non-stereotypical conceptions to if not flourish, then certainly to exist alongside the stereotypes.

5.4.2 Positional map (searchers) – what type of problem is snoring and how can snoring be stopped?

Analysis of the transcription data showed that although two participants initially thought that nothing could be done to stop snoring (or more specifically that they did not know of any ways to stop snoring), the rest of the searchers all had some ideas before their searches. For example, TT said that he “used to snore just mildly when I was younger, and I trained myself not to sleep on my back. So, I actually sleep on my side all the time which means, um, I don’t tend to snore at all.” He also mentioned laser surgery, and CPAP therapy.

After TT’s search he expanded the suggested methods for stopping snoring to include many self-help type approaches such as weight-loss, exercise, and alcohol restriction. He went into considerably more detail regarding surgical approaches: “where both laser surgery as well as a number of different procedures that involve making incisions into the palate and so on and putting stitches and various other things in there. Other types of surgery, there’s stuff to do with widening the... they were showing there was some stuff on there on exploratory surgery to actually put endoscopes and so on down your throat to see if there’s issues there at all. There’s a number of different standard procedures, they all basically just involved surgery with cutting and burning, and other bits of nice things.”

TT was typical of all the participants who expanded on the various methods after searching by either giving more detail or by adding new methods. To help focus on medicalisation, I grouped the various methods described by the participants into either non-medical ways to stop snoring or medical ways to stop snoring (table 3 below).

<u>Non-medical ways to stop snoring</u>	<u>Medical ways to stop snoring</u>
losing weight elbow in the ribs tennis ball sewn to back of pyjamas cutting down (or out) alcohol changing diet change sleep position being hydrated hot shower before bed cool the bedroom down humidifying the bedroom getting more sleep not smoking playing didgeridoo exercising nothing can be done	CPAP machines nasal splints surgery changing medication addressing allergies mouth splints laser surgery medical sprays stents in the soft palate medications hypnotherapy

Table 2 - Ways to stop snoring

I used very broad interpretations when constructing those two categories insofar as I limited “medical” to those involving medication, medical procedures, or devices that can only be procured from some type of medical facility or service. NF talked after his search exclusively about methods that had a definite “medical” slant: “There appear to be several ways of doing this including something that moves your jaw forward, which brings the tongue forward, which relieves the pressure at the back of the throat. And constant pressure (cups hand over nose), airways – that’s the mask. You can put something that’s akin to stents in the top of the soft palate to stiffen it. FDA indicated them in 2004. Those are the ones that I remember.”

On the other hand, I included “lifestyle” changes in the non-medical group even if some of those changes might be received under medical advice or the current wave of ‘healthisation’ described in chapter two. CS spoke about “losing weight. The tennis ball thing came up, I thought I was just making that up. But actually, I wasn’t. Not drinking alcohol or caffeine too close to bedtime and not doing too much. Especially not mixing them with any sleeping pills or medication. Just being hydrated. So, not being dehydrated. [...] So if you’re blocked then having a hot shower before you go to bed.”

The point of the grouping was to note that in terms of constructing the positional maps, all the different methods could be broadly divided along medical vs non-medical lines. Choosing to use the “medicalness” of methods to stop snoring as the horizontal axis for a positional map, however, would not necessarily lead to “non-medical” ways to stop snoring being appointed the left-most “least” position on the axis. I thought it important to also include the position “that snoring cannot be treated” as the least position since it was mentioned in the transcripts. Therefore, the position that non-medical (including life-style or behavioural) methods of stopping snoring could be used was placed as a mid-point on the horizontal axis.

Selection of the vertical axis arose from noting the various solutions for snoring could also be linked to some extent with conceptions around the type of problem snoring represents when asked if snoring could be problematic. The types of problems could once again be very loosely grouped into social problems vs health-related problems. TT described his own situation with his snoring wife with a rueful grimace: “if one partner snores and the other person doesn’t, then there can be problems arising for this and various other things that go on [he inhales deeply and rolls his eyes] because quite often when people are tired they get really ratty if they don’t get a good night’s sleep and especially if it’s the other person

causing their issues.”. Similarly, AQ noted that “ there’s marital disputes. Couples sleeping in separate beds, because of snoring issues.” and AQ said much the same thing “ you’re gonna have partner problems ’cause they’re not gonna like your... you know.”

On the other hand, there also seemed to be widespread conception that snoring could be a health problem. Not just from NF’s description of “getting poked and getting bruising in your ribs and being poked” but also more serious problems such as KO’s “lack of energy... you use a lot of energy if you’re snoring” and GS’s description of “that thing that happens where... your heart stops working when you sleep.” LV talked about “high blood pressure and the medical problems that come as a result of that” and after doing their searches, most participants mentioned obstructive sleep apnoea in some form or another. And ultimately, as KO described it after his search, snoring could be problematic because “ from what I know you can actually stop breathing altogether which obviously can create death and whatnot.” However, he concluded by adding “ Oh, the disturbance, yeah, ah is causing relationship issues.” Therefore, for the vertical axis I chose to use the position that snoring is primarily a health-related problem as the most extreme (uppermost) position on the axis. Again, as with the horizontal axis, I chose to have a least position that snoring is not actually a problem at all, which meant that the position that snoring is primarily a social problem was placed at themed-point of the vertical axis.

Bringing the two axes together then, I prepared a second positional map charting the type of problem snoring might be on the vertical axis (Health vs social vs not a problem), and the ways snoring might be stopped on the horizontal axis (medical methods, vs lifestyle/behavioural methods vs no methods) (figure 4).

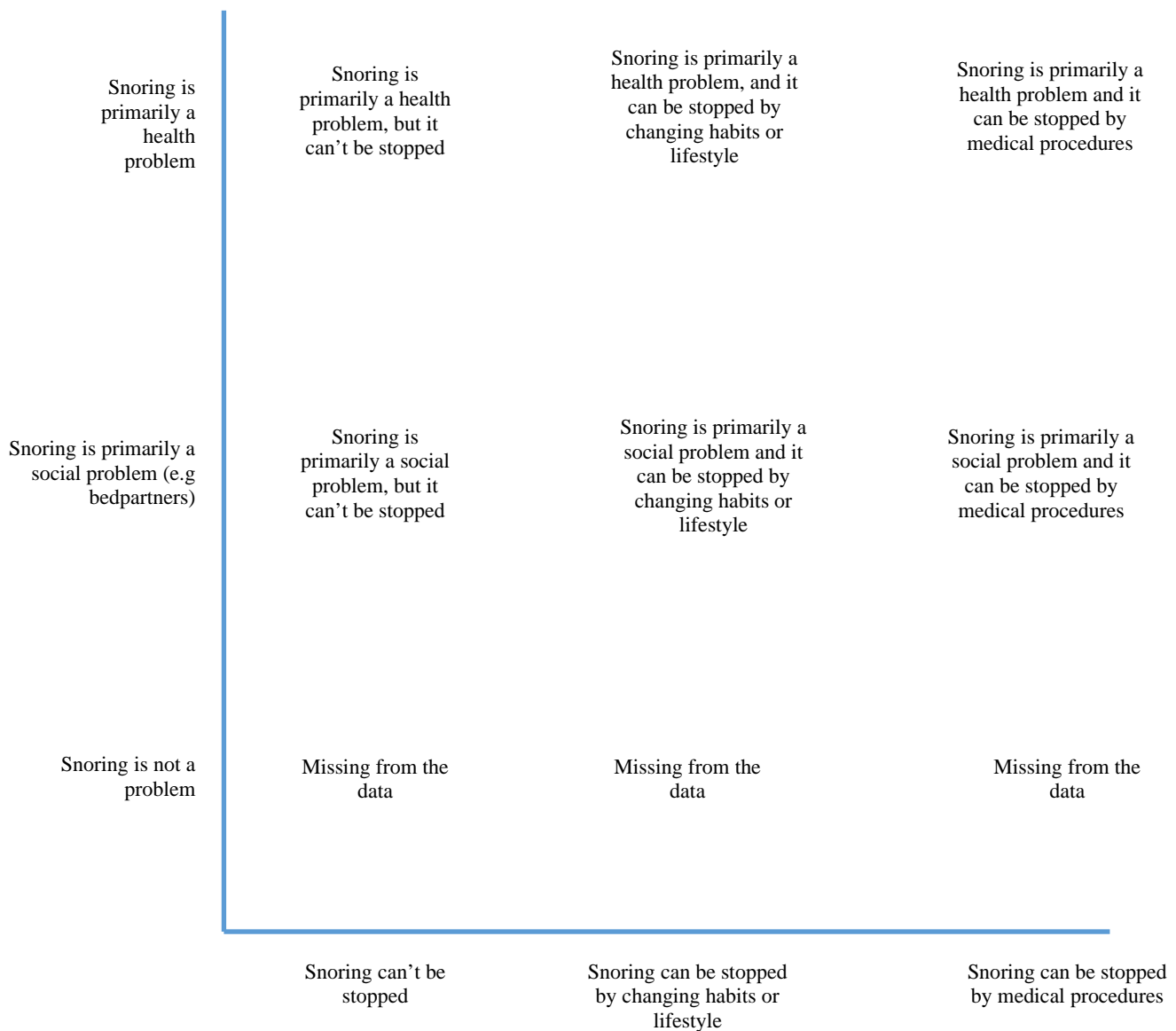


Figure 4 - Positional map of types of problems and types of solutions for snoring

The resultant positional map is more complex than the first with three categories on each axis that do not strictly correspond to “more-so and less-so” as suggested by Clarke in Situational Analysis (2005).

The position that snoring is fundamentally a social problem affecting bed-partners rather than the snorer was interesting insofar as it was more commonly held before the

internet-search – for example, KO said “annoying your partner... which can cause issues.” – which very much captures the tenor of most of the participants.

The position that snoring is a health risk to the snorer appeared more frequently after the internet-search. In this, the first hint of medicalisation as a micro-level process can be detected as evidenced by the various excerpts given earlier in this section. Interestingly medical intervention was not specifically or necessarily linked to snoring being a health problem rather than a social problem. Participants were comfortable in some cases with representing their bed-partners’ snoring as mainly a social problem for themselves but that the solution might be for the snoring partner to undergo invasive surgery to stop the snoring. TT, for example, after his search said “ an article in there was about the fact that after surgical treatment, and so on, that relationships between husbands and wives... things significantly improved and that the majority of people that actually take that course - getting one person to go to the doctor – is actually usually the partner, not the person who needs the help.”

Although a case could be made for it, none of the participants expressed the position that snoring was not a problem in any of the positional configurations irrespective of how it might be stopped.

The various positions represented by the two positional maps provides insight into the motivations that might lie behind an individual deciding that problematic snoring rightly belongs in the medical domain, particularly if looking for a solution to the problem. However, the maps alone do not capture the overall conception of “medical-ness” and are also missing the non-human actors taking part in the situation of analysis, i.e. the internet-search.

5.4 Perceptual maps – situating individuals within the positions

Having explored relevant positions within the data decoupled from individuals, I next followed the inward spiral down towards the dynamic heart of the internet-search whole system by turning my attention to the individual actors involved in the micro-level process. To better show the relative positions of individuals (human and non-human) with a focus on the medical vs lay tension at the heart of medicalisation, I used the cartographic analysis called perceptual mapping (Sinclair & Stalling, 1990).

In my perceptual maps, I used the relative use of medical language and references to obstructive sleep apnoea or snoring as my two axes (figure 5). The choice of axes was slightly different than for the positional maps described earlier in the preceding section. The perceptual space of medical-ness needed to be defined not from the data, but for the data. As Nikolas Rose pointed out in his 2007 *Lancet* essay “Beyond Medicalisation”, medicine is a heterogenous concept and not easily pinned down. However, in all cases, medicine is inextricably intertwined with the ways we assign meaning to the world through language, literature, art, and in imagination (Rose, 2007). Halfmann expanded on Rose’s point in his own discussion wherein he linked an increase in medicalisation with an increase in the prevalence of biomedical vocabularies, models, and definitions in discourses about social problems (Halfmann, 2012). At the micro level, Halfmann suggests that such discourses occur in face-to-face interaction between healthcare providers such as doctors and their clients, and that the clients also use these discourses in their own self-management. I extrapolated those definitions to approach the research with the idea that an individual who decides to seek medical help for a given problem, has taken an individual micro-level step of medicalisation within themselves, shifting their own conception of the problem from “not-

medical” to “possibly-medical” and that the direction of that shift is neither necessarily with great conviction, nor irreversible, but is nonetheless an instance of medicalisation.

An example from the research is given by BG who initially described snoring as being problematic because “probably the night’s sleep isn’t the best that you’re ever going to have” and he didn’t know of any way snoring might be stopped. After his internet-search, BG used more medical language to describe the problems associated with snoring – “I would say there’s a cardiac issue?” – for which one might consider “surgery” as a way to stop snoring.

To create the landscape of medical vs non-medical conceptualisation, I decided to focus on language use. Capturing the Google search terms and keywords used in the searches themselves served as a preliminary organising tool for identifying issues of relevance to the participants (both human and non-human) and also the broader medicalisation focus of the research. It was useful that the participants were being asked to use a search engine since I could look to the keywords and search terms to provide insight into the issues of importance to them. Note that the searchers were asked “what do you know about snoring” for their pre-search interview, and then instructed to “use the internet to find out more information about snoring”. This was deliberately done to minimise any medical “push” from me in my role as interviewer and researcher. They were not asked to pretend snoring was a problem or a worry to them, nor were they asked to look for a “cure” or to find out “medical” knowledge about snoring.

Some searchers used a single search term for the entire search, whereas others used multiple search iterations, changing the search terms each time. Several keywords and search phrases appeared multiple times across all searchers. Separating out repetitions, the searchers used a total of 18 unique search terms between them all. Broadly, the search terms could be divided into two groups: those that are related to general information about snoring without invoking the medical domain, and those that already cast snoring in a medical frame (table 4).

<u>Information based search terms</u>	<u>Healthcare based search terms</u>
snoring	snoring treatments
why are men more likely to snore than women?	is snoring harmful to your health?
why do men snore?	how does the CPAP machine work to stop snoring?
what causes snoring?	how to get better sleep with sleep apnea?
snoring most common causes	what does obese mean?
snoring and throat	who do I see to stop snoring?
how do I stop snoring?	laser surgery to stop snoring
collar size measurement	is there a permanent cure to snoring
why do I snore?	snoring remedies

Table 3 - Search terms (divided into information-based queries vs healthcare-based queries)

The groupings were based on language use, and therefore a focus on language use seemed likely to be helpful when choosing the axes to define the perceptual space relating to medicalisation in the micro-level discourses occurring before, during, and after each internet-search for snoring.

5.4.1 Perceptual map – lay versus medical language and snoring versus OSA

I chose to use the same axes for both the perceptual map of the individual web pages represented in figure 5, and also for the maps representing the entire internet-search shown in section 5.5 and used subsequently throughout the remainder of the thesis. For both types of map, I defined the space for the maps by using two axes looking at slightly different aspects of language pertaining to the medicalisation of snoring. The vertical axis represents the relative proportion of medical language versus lay language used by either the human actors

in their interviews, or the language used in the text for each of the web-pages encountered in each search. For example, CB talked about snoring being caused by: “I think it’s something to do with when you breathe in – the air hits the back of your throat and causes a vibration of some sort.” For the purposes of mapping positions, this would be considered as largely using lay language and concepts, whereas NF’s description – “it’s either the vibration of the soft palate or the uvula at the back of the throat that causes the noise.” – was considered to be using more medical language by comparison. Similarly TT’s pre-search reference to problematic snoring in terms such as “disrupting your sleep and making you feel rubbish” was considered to be using less medical language and concepts than his post-search response to the same prompt describing problems such as “if you are prone to snoring, [...] because you’re breathing so good at night then the amount of oxygen getting to your brain is not as much, which is obviously not a good thing. Both children as well as adults can have it, so for children it could be quite serious, because I’m assuming it will probably cause issues with growth and development.”

Transcripts of interviews and web pages encountered by searchers were both analysed the same way. The text was coded sentence by sentence as “lay” or “medical” (see 4.4.5 above) to calculate a percentage of medical language which was used as the co-ordinate on the vertical axis.

In the same way that both snoring and obstructive sleep apnoea can be considered as two ends of a single hypotonic airway spectrum as described in chapter two, for the horizontal axis I chose to use language as an indicator of how the conception of “snoring” might be intertwined conceptually with “obstructive sleep apnoea”. Specifically, the horizontal axis in the perceptual map (figure 5) plots the relative proportion of references to obstructive sleep apnoea (OSA) versus snoring through a simple count of the use of the words “apnoea” or

“OSA” and “snoring”. The horizontal co-ordinate was therefore the proportion of references to OSA.

In the perceptual map shown in figure 5 then, the positions of all the web sites encountered across all the searches are plotted as individual data points within the perceptual space defined by the proportional use of medical versus lay language, and proportional references to OSA versus snoring.

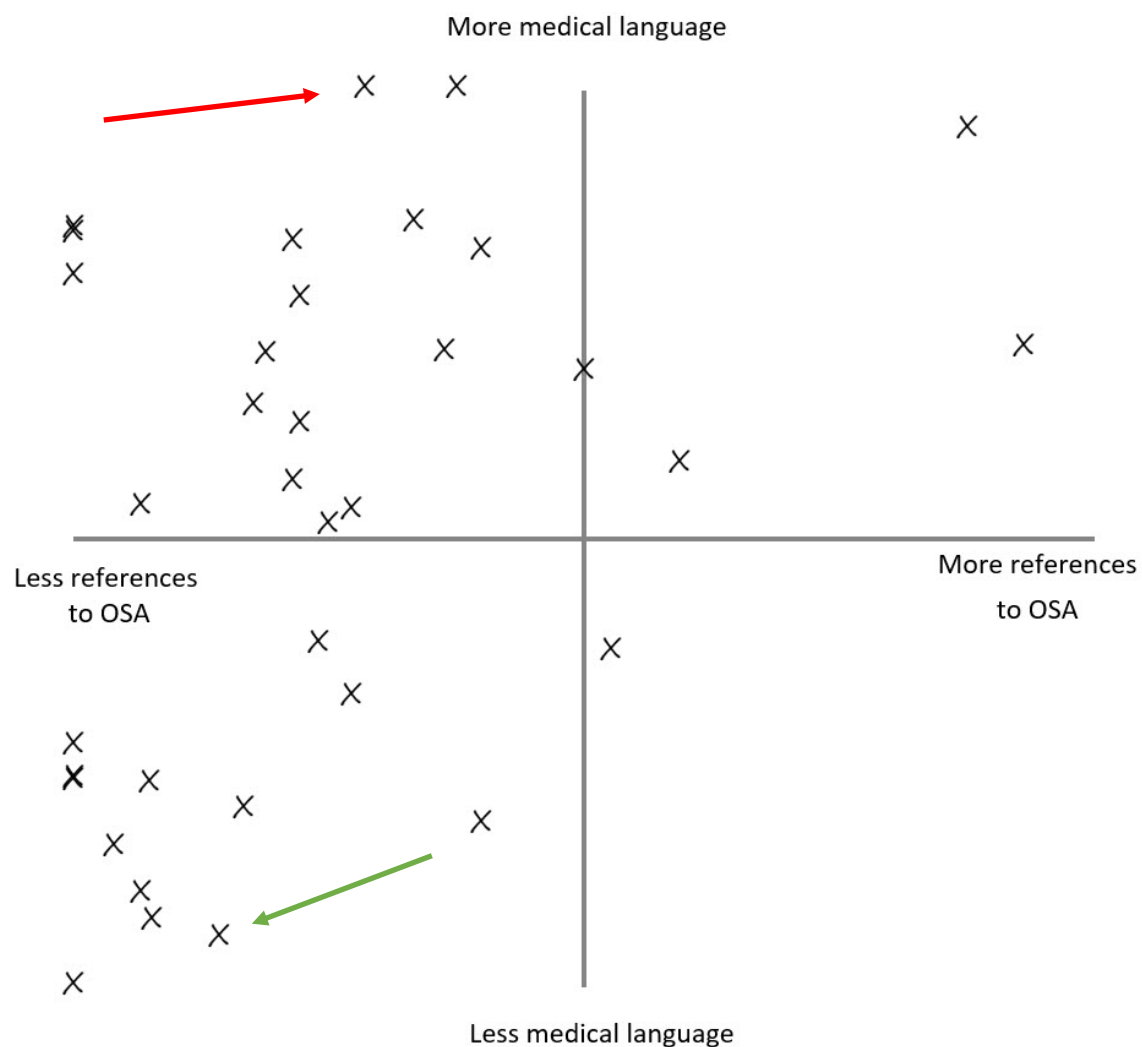


Figure 5 - Perceptual map of web pages within the medicalisation perceptual space

When constructing perceptual maps, it is more conventional to cross the axes at the centre of the map (figure 5) as opposed to crossing at the bottom left corner as seen in the Situational Analysis positional maps used earlier in this chapter.

The central crossing point creates four broad quadrants roughly analogous to the positions mapped when using SA positional maps. In the case of the map used to analyse the medicalisation of snoring and the internet-search shown in figure 5, the quadrants are: more medical language and more references to OSA forms the upper right quadrant; less medical language but more references to OSA forms the bottom right; less medical language and less references to OSA forms the bottom left; and more medical language but less references to OSA forms the top left quadrant (figure 5). The interview transcripts and the text elements from all the web pages are plotted on the map (indicated by the symbol “x”). Co-ordinates for the vertical axis are the relative proportion of medical language versus lay language, and the horizontal co-ordinates are derived from the relative proportion of references to “snoring” versus references to “OSA” or “obstructive sleep apnoea”.

The position indicated with the red arrow on the map in figure 5 represents the Scientific American page on “Why do People Snore”. It was an article written by an American Sleep Specialist, and it used only about half as many references to OSA compared to references to snoring placing it horizontally in the middle of the left half of the map. However, the article used almost entirely medical language, which is represented by a vertical position near the top of the map. The opening paragraph from the article references anatomical structures such as “membranous [...] airway lacking cartilaginous support”, and “uvula, tonsillar pillars, and pharyngeal walls”. It also refers to physiological function such as “hypotonic” muscle tone and “turbulent airflow” and “airflow limitation”. The article

concludes with the statement that Snoring is not an illness, but it is a symptom.” Medical language and concepts indeed.

By contrast, the description of snoring given on the Snorex FAQ page indicated by the green arrow on the positional map uses significantly more lay language to describe the same phenomenon; “the jaw and throat” are like a “pipe organ”, and “air speeds up” to vibrate the airway and make the noise of snoring. Snorex is a bespoke splint-manufacturing service speaking directly to a lay audience using everyday terminology. Both the Scientific American page and the Snorex page are talking about the same structures but the language register and terminology is quite different. Arguably, although not necessarily deliberately, the one conveys a sense of medical jurisdiction through precise anatomical terminology and use of words such as “symptom”, whereas the other is trying to sell a “treatment” for snoring but uses more lay terminology such as “muscles relax” versus “hypotonic”. Again, this choice of language is not necessarily deliberate, but nonetheless comparing snoring to a pipe organ rather than referring to “symptoms” is arguably using less medical language.

Moving beyond the insights of the positional maps shown in section 5.2, the perceptual map locates all the participants within the perceptual space of “medicalness vs layness” defined by the language of the transcripts and web-page texts. The map also shows that there is a gap in the perceptual space occupied by web pages encountered during the search for snoring. Although pages that talk about snoring in both lay and medical language are well represented, and there are also some pages that talk about OSA using mainly medical language, there were actually no pages encountered that talked predominantly about OSA using predominantly lay language. This finding supports the premise that a vocabulary discussing the hypotonic airway in terms of OSA could be considered to be intrinsically more medicalised. This might seem to be self-evident since OSA is a diagnosable condition and is

therefore by definition already in the medical domain. However, one could also imagine that there might be web pages that discuss OSA with a lay language slant not least for clarity and education purposes, but in fact the searchers did not encounter any such pages.

The perceptual map also shows that although (again perhaps self-evidently) Google searches for ‘snoring’ tend to be populated by web pages discussing snoring more than they discuss OSA, there were few pages that did not mention OSA at all. Furthermore, the use of lay language compared to medical language was split roughly evenly between the predominantly medical and predominantly lay quadrants.

These insights are useful, but still do not capture shift in how snoring is perceived, and it is shift that is at the heart of medicalisation since it is a process. Furthermore, the perceptual map does not help in terms of tracking influence of the web pages, to which Conrad implicitly referred when describing the internet as an “Engine of medicalisation” (Conrad, 2005) since an engine elicits a sense of movement, or pulling, and/or pushing.

Therefore, I needed to add a means to track movement and influence through the otherwise static positional/perceptual map models, and this need led to the development of conception maps and conception-tracking.

5.5 Conception maps and conception-tracking – adding sequence

Perceptual maps allow for the positioning of individuals within the perceptual space, however they don’t track movement. I have described earlier how web pages don’t ‘perceive’, they ‘portray’ and have therefore chosen to present the combined interaction between perception and portrayal as a ‘con’-ception space (rather than the ‘per’-ception space of perceptual mapping) of medicalised snoring. The searcher perceives snoring in a particular way, and web pages portray snoring in a particular way and both the perception and portrayal

interact to create the overall conception of snoring permeating or infusing the internet-search as an overall actor-network. It is a shift or movement in the conception of snoring that I wish to capture since it is the shifting or moving conception of snoring vis-à-vis medical jurisdiction that is medicalisation. As Conrad (2008) points out, medicalisation is definitional (Conrad, 2008).

I refer to the following maps which attempt to capture the movement of conceptions as ‘conception maps’ to distinguish from the ‘perceptual maps’ and ‘positional maps’ described earlier in this chapter.

Movement, particularly movement through a non-physical space such as a conception space, can be more difficult to capture meaningfully than one might initially expect. The important point, as discussed later in chapter seven looking at dynamic patterns, is that movement can fall into an infinite regression of progressively smaller divisions if considered in part rather than in whole.

To plot the location of the pre-search and post-search interviews in the conception space defined by the proportion of medical language vs lay language, and relative use of OSA vs snoring in the conception maps below, I plotted the position representing the use of medical language (vertical co-ordinate) and relative proportion of references to OSA (horizontal co-ordinate) from the pre-search interview using an open red circle on each map. The size of the open circle represents the amount of text. I used an open red circle to represent the position of the post-search interview. Comparing the positions of the pre and post search, then, captures the shift in conceptions.

However, in considering the internet-search as a whole system, it was important to plot the positions within the conception space of all the pages encountered during the search. The position of the individual web pages is represented by filled spheres or ‘bubbles’.

However, not all interactions within the search are equal. Encountering a page for 10 seconds is arguably less likely to have a meaningful interaction of conceptions (portrayal and perception) than an encounter lasting ten minutes. Although a crude proxy of possible influence, nonetheless as I will discuss in chapter six there is a great deal of research and discussion about the contest for attention within the internet and I thought it important to capture that element of the internet-search in the conception maps. I therefore chose to use the length of time of an encounter as a marker of attention. The length of time (in seconds) each participant spent at any given web page is represented in the conception maps by the size of the bubble with larger bubbles representing more time spent viewing the page than smaller bubbles. Finally, that Google acts as a gateway or mediator in the actor-network of the internet-search cannot be overlooked (Mager, 2009). Therefore, I colour-coded the bubbles representing pages in the map so as to group pages found using the same Google search term.

The sequence of sites visited in the order they were visited is represented by a dashed blue curved arrow starting with the first page visited and ending with the last. The blue line represents the pathway taken through the conception space by the searcher and in that respect, represents the search itself.

The effect of the search in terms of medicalisation, is represented on each conception map as a red arrow or vector linking the open red circle of the pre-search interview and the open red circle representing the post-search interview. This vector is a graphical representation of the shift towards or away from a more (or less) medical conception of snoring. However, the unity of the movement and interactions through the space are captured by the dashed blue line.

In the following sections I present three conception maps as representative examples. I have included the entire series of conception maps in Appendix A since I consider each to be individual cases of internet-search objects analysed collectively here in the main body of the thesis.

5.5.1 Conception map – Case LV

Case LV (figure 6) is a 42-year-old European married male of medium build who has been told he never snores, although he noted his wife has started to snore occasionally. LV's mother has been treated for sleep apnoea in the past.

LV is employed as a telecommunications engineer and describes himself as extremely comfortable with using the internet. As with all the other participants, the only search engine LV used was Google. LV used the greatest number of search terms and eight unique pages during his search.

Prior to the search, LV knew that there was surgery of some type suitable for stopping snoring, and that a person could sleep on their front. He also thought there was a breathing device, however he did not elaborate particularly, and his answer was quite brief. LV's post-search interview used 11.0% more medical language than his pre-search interview, and most of that change came from his answer to the question "do you think there are ways to stop snoring?"

LV said after the search that he was particularly interested in the anti-snoring laser he read about on the "DailyMail UK" website. After his search, when asked if he thought snoring could be stopped, LV talked about "the laser surgery, which I didn't know they could do with lasers, and I didn't know how they did it. I didn't know how expensive it was, so I chased all that down. So that was really interesting. It was a UK [page] that I was reading

- it was seven hundred pounds, and it was successful in half the cases. In all those that were capable of having it ... it only worked on half of them. It was only 50% and that wasn't a total fix. Yeah, that was crazy."

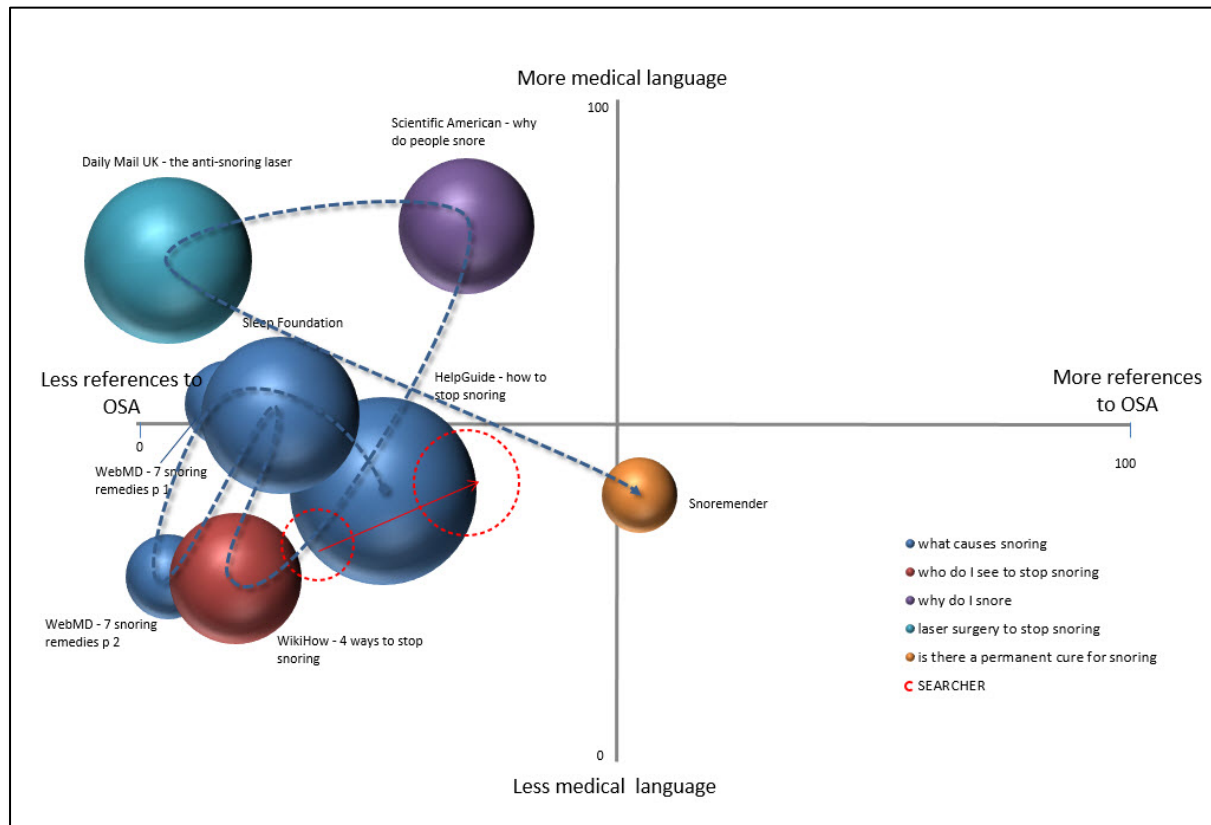


Figure 6 - Conception map of Case LV

The nature of the various webpages will be discussed in more detail in the next chapter. LV started his search by asking “what causes snoring”. He visited the HelpGuide page on how to stop snoring, then visited the Sleep Foundation page, the WebMD page on snoring remedies, and finally a second page of the WebMD article on snoring remedies. He spent the most time on the first page and successively less time on the subsequent pages.

He then searched for “who do I see to stop snoring” and visited a single page on WikiHow – 4 ways to stop snoring. Similarly, after searching “why do I snore”, he visited

only a single page. The Scientific American page on “why do people snore” used the most medical language of any of the pages in LV’s search. LV then searched for “laser surgery to stop snoring” which he had read about on the Scientific American page, a neat example of the inter-relatedness of the various pages that a person encounters on an internet-search, and not immediately obvious since the connection is only through the conceptual linkage of that particular searcher at that particular time.

Finally, LV finished his search with the search term “is there a permanent cure for snoring” which was the page that had the most references to OSA.

The two dashed red line circles show LV’s start position and end position as evidenced by his answers to the questionnaire, and the vector of change marked by the red arrow shows both the direction and amplitude of conception shift effected during this search. The search itself, the movement through interactions at different locations, is captured by the blue dashed line. The search path never strays fully into the realm of OSA but does move up into the more medical than lay language space for a time. The search terms and keywords also reflect a process of enquiry that leads from the less medical to more: “What causes snoring”, “who do I see to stop snoring”, “why do I snore”, “laser surgery to stop snoring”, and finally “is there a permanent cure for snoring”.

After the search, LV spoke at length about the laser surgery and the time spent on the site he found after searching specifically for information about laser surgery reflected that interest. He also gave many more treatment possibilities including humidification, positional therapy, CPAP therapy and splints. He also spoke more about OSA in terms of the problems that could arise from snoring. Before the search he knew that sleep apnoea could be a problem arising from snoring, and also waking up the bedpartner: “Sleep apnoea. Waking up the person sleeping next to you. That’s probably it.” After the search, LV mentioned the same

two potential problems, but added specifically: “well, I got from it high blood pressure and the medical problems that come as a result of that.”

Overall, LV made more references to OSA and used more medical language in his post-search interview. In that respect, the micro-level process at work in this internet-search for information about snoring was one of medicalisation rather than demedicalisation.

5.5.2 Conception map - Case HK (*The Sleep Specialist*)

Case HK (figure 7) is a 69 year old male sleep specialist who was purposively recruited to help investigate whether the internet-search interacts with people who use predominantly lay language prior to searching differently than people who use predominantly medical language prior to searching. Since he is a medical doctor, it was my presumption that he was likely to use medicalised language and concepts as his point of departure.

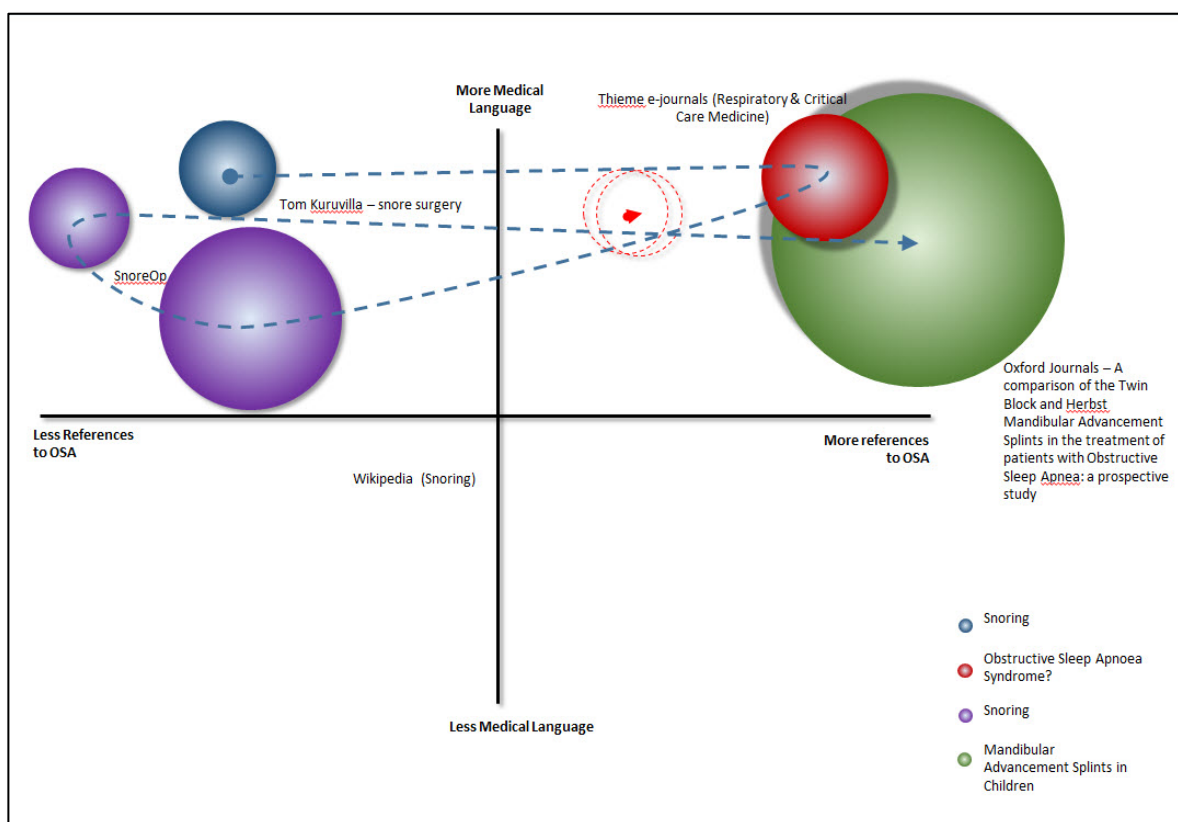


Figure 7 - Conception map of Case HK (*the Sleep Specialist*)

HK gave an almost scripted sounding description of snoring before the search with no hesitation or reflective pause, and unsurprisingly his post-search description of snoring was virtually identical. He explained later that he has to describe various aspects of snoring several times a day in his routine clinical practice. Therefore, his vector of change (red arrow) was essentially nil.

After the interview, HK explained that since he routinely explains the mechanics, consequences, and treatments for snoring in his clinical practice to his patients several times a day that he can do so almost without thinking about it, and that he does so very much from a medical perspective since it is a medical service he offers. He also noted that he mentions obstructive sleep apnoea along with snoring as a matter of course since that is where snoring enters fully into the medical sphere and is often the part he can contribute most to his patients' knowledge of themselves.

HK, as with the lay searchers, used Google as his sole search engine. He, like a number of the others, encountered the Wikipedia page on snoring and spent some time reading through that entry. He also looked at two web pages describing surgical procedures, which he noted were amongst the treatments for snoring not offered in his own clinic. He then spent the remainder of the time reading a medical paper that caught his attention available online through Oxford Journals discussing in detail a particular type of mandibular advancement splint for the treatment of obstructive sleep apnoea.

Unsurprisingly HK showed almost no shift in his already highly medicalised description of his conception of snoring, and thus had the smallest vector of change in the entire study. HK's vector was not included in the overall analysis of effects described in the next section.

5.5.3 Conception map - Case NF

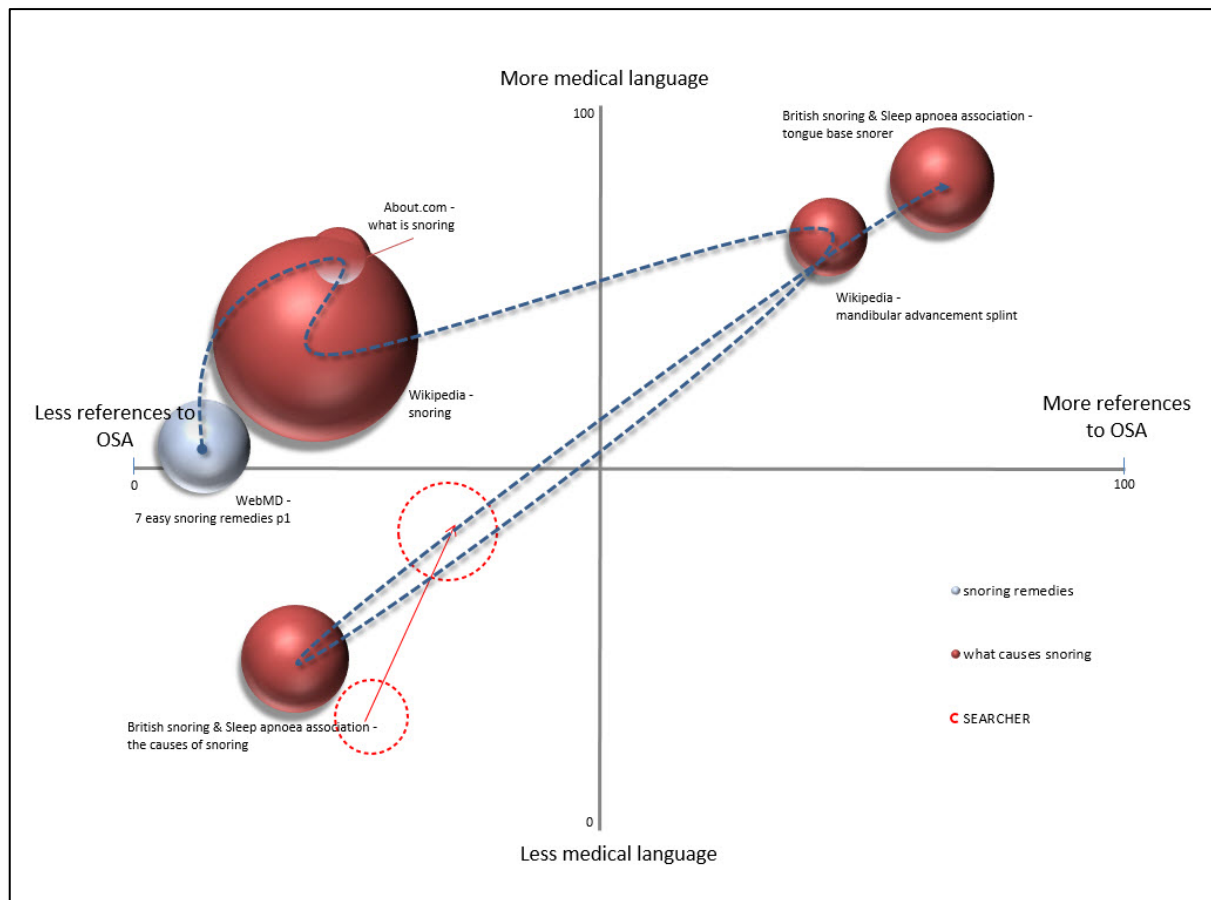


Figure 8 - Conception map of Case NF

Case NF (figure 8) is a 55 year old European male of average build who is married, has never been told he snores, and who does not personally know anyone who has been treated for snoring or obstructive sleep apnoea. NF did not volunteer his occupation but said he has a PhD in English. It was interesting to see if having a good vocabulary would lead to the use of more anatomical or medical terms in the pre-search interview. However, as it turned out NF's pre-search interview mostly used lay language to relate what he already knew about snoring. For example, before the search NF described snoring as "Well, I get the impression it's flappy bits in your sinuses that fall over the passageways and as you're breathing in and out it oscillates." Whereas afterwards he described snoring as: "it's either

the vibration of the soft palate or the uvula at the back of the throat. That causes the noise.”

Note “flappy bits” has become “soft palate” and “uvula”, formal anatomical descriptions more consistent with the medical domain than the lay.

However, the use of correct anatomical terms alone does not necessarily represent a shift towards medicalisation. More compelling, perhaps, is NF’s response to the interview prompt “Do you think snoring can be stopped?” “I think it can, yeah. Well if it is something that’s sort of falling down inside your sinuses or blocking the cavities, then removing it, or pushing it to one side or doing something that keeps your passageways clear.” After the search he was more specific “There appear to be several ways of doing this. Including something that moves your jaw forward, which brings the tongue forward, which relieves the pressure at the back of the throat and constant pressure (cups hand over nose), airways – that’s the mask. You can put something that’s akin to stents in the top of the soft palate to stiffen it. FDA indicated them in 2004.” NF initially described a non-specific conception that snoring could be controlled using possibly some apparatus or surgical procedure, so he might have been inclined to put snoring into the medical arena to at least some degree. After having conducted his search, however, he described the same types of treatment but now more clearly described mandibular advancement, continuous positive airway pressure therapy, and a specific surgical technique, the pillar technique – even citing the fact that it is “FDA approved”.

NF only used two search terms. The first, “snoring remedies” led him to a single page – “WebMD – 7 easy snoring remedies”. The page made slightly less reference to OSA than NF had himself in his pre-search interview, but the language on the page was considerably more medical. NF spent some time reading that page, and then searched a new term: “what causes snoring?” All the pages NF subsequently visited were from the second search term. He briefly visited “about.com – what is snoring” which made more reference to OSA than the

previous page and used considerably more medical language. He then spent the most time on Wikipedia's page about snoring. His next page was the Wikipedia page on mandibular advancement splints which used more medical language and made considerably more mention of OSA. The next page was the British snoring and sleep apnoea association page on the causes of snoring, which made less reference to OSA than he had himself, but then finished his search at the "tongue base snorer" page off the same website, which was the most medical of all and also made the most mention of OSA.

NF was typical of most of the other participants insofar as he visited six pages from two search terms. NF was the only participant who did not use his full twenty minutes of search time but seemed very direct and purposeful in his searching.

After his search, NF used 29.4% more medical language, but only made slightly more references to OSA.

It is useful while still focussing on the micro-level individual process to reflect on what the conception maps are actually representing. They are visual models of the search – engine/searcher actor network object, a dynamic enacted object that includes a sequential or temporal dimension. They represent 'the internet-search', which includes the search engine and web pages, and includes the searcher, but is more than the search engine and web pages and more than the searcher – it is an inter-active object-that-exists-through-time. It is through the capture of sequence and movement that suits conception mapping to the task of analysing shifts in concepts and also the pathway that led to those shifts.

As with LV the micro-level process at work in NF's internet-search for information about snoring was one of medicalisation rather than demedicalisation. Indeed, as seen in the next section, all the participants used more medical language in their post-search interviews than they did prior to searching.

5.6 Medicalisation at the micro level

Keeping in mind that the main analysis focusses on the individual cases, nonetheless by treating the internet-search as a whole system (of medicalisation/demedicalisation), an analysis of the output of each of those instances of that system is justified. Figure 9 combines all the vectors from all the searches giving them a common point of origin. It shows that in these case studies, searching on the internet for information about snoring appeared to have a consistent medicalising influence on the language used by the participants when talking about snoring. The individual maps each provide a trail to follow to theorize as to why and how the internet appears to exercise that influence which will be explored further in the following chapters.

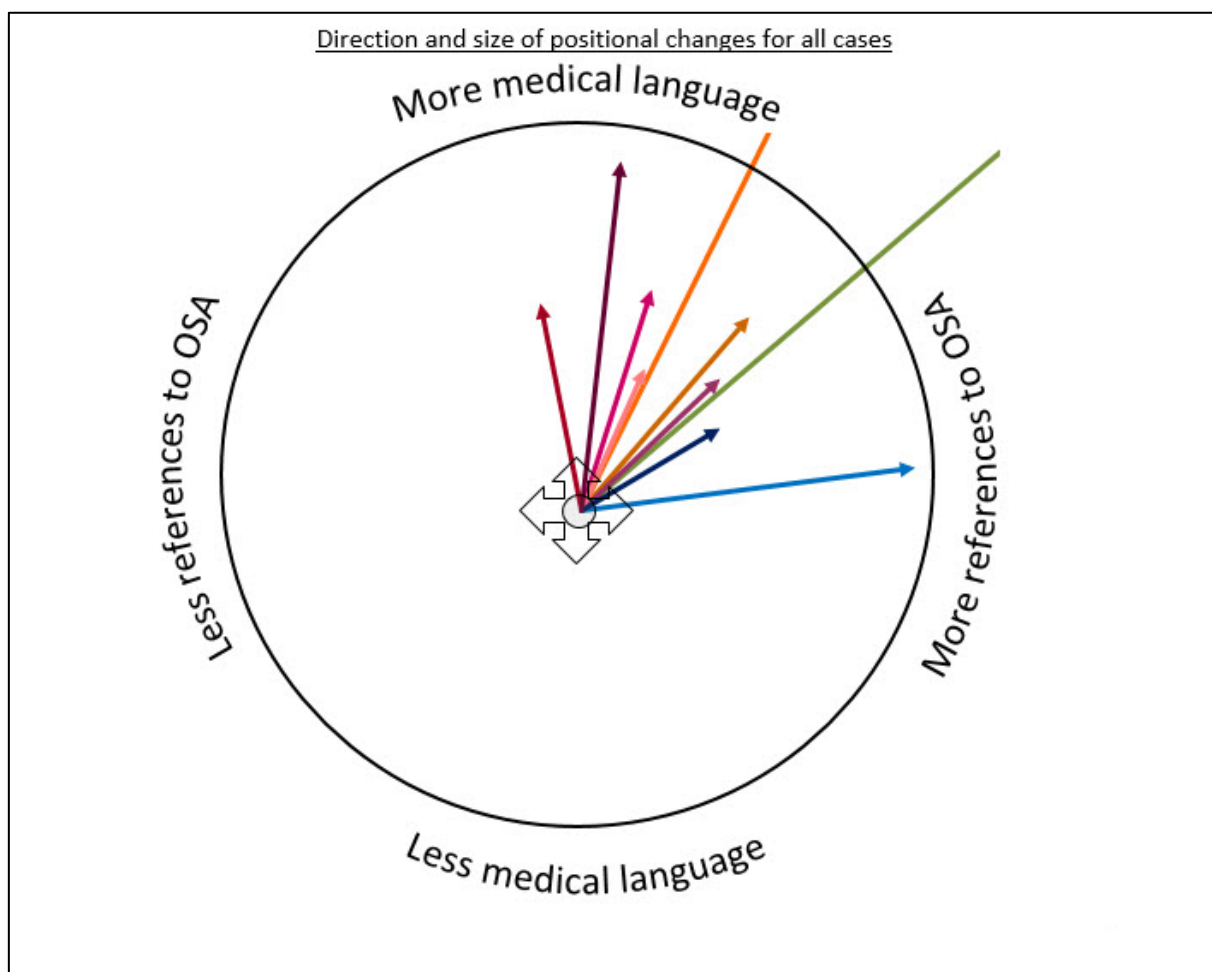


Figure 9 - Vector of change (all cases)

For the moment, figure 9 acts as a summary diagram of all the individual micro-level instances of medicalisation – the medicalisation effect – which arose from following those pathways (figure 9).

Academic discussion of medicalisation tends to focus on medical jurisdiction operating at the macro level of institutions and companies, or professional or regulatory bodies, and therefore often overlooks the micro level processes. Yet it is at the micro level that the process leading to medical treatment through diagnosis occurs for any given individual, and likewise at the micro level that the forces opposing access to medical treatment and diagnosis come into play. It is at the micro-scale situation of action that an individual might engage in self-medication and therefore also “self-medicalisation” (Fainzang, 2013) .

Following that line of reasoning, it could be that when a person decides a phenomenon or problem they are experiencing should most rightly be brought to the attention of a medical professional of some sort, that the shift in thinking leading to that decision is each time, an instance of medicalisation occurring at the level of the individual. Sometimes, this can occur even when doctors do not believe the problem to be medical in nature, and in the case of snoring one can imagine that this might be more likely to occur when a non-stereotypical snorer presents to a family doctor for help. As shown in the positional map in figure 3 participants in my research linked the likelihood of snoring to physical attributes such as age, weight, and gender. If the resultant stereotypes were held strongly enough, and were also held widely enough, anyone falling outside that type might find it harder to make the medical shift in conception that this problem might be, for them, a medical problem than if they did fit the stereotype.

In other cases, self-medication (and therefore self-medicalisation) can sometimes be seen to be an attempt by individuals to find social acceptability for an aspect of their lives

that seems to them to otherwise socially unacceptable if the somatic problems were perceived by others to be caused by something other than a medical condition (Fainzang, 2013). Once again, in the case of snoring one could imagine that a person might find a conception of snoring that attributed its development to a diagnosable condition more attractive than an alternative explanation that snoring might be a product of poor lifestyle decisions with associated personal culpability. Sometimes it is more socially acceptable to be diagnosed with a condition (Jutel, 2011). This is certainly a possibility in the case of snoring given the conflict that can arise from sharing a bedroom with a snorer who does not perceive the acoustic distress they are visiting on their bed-partner, an idea that re-occurred often in my field research as summarised in figure 4. A diagnosis might convert the snorer from being a blame-worthy perpetrator of distress victimising their partner, into a blame-less victim of a medical condition that more closely matches their own perception of being blamed for something over which they might feel they have no control. Whatever the motivation, an initial step in that process is one of individual self-medicalisation – i.e. the conceptual shift that this phenomenon previously thought to be non-medical, might actually be medical in nature.

The field work for my research sought to simulate some aspect of that self-medicalisation process of shifting conceptions – a person troubled by snoring, seeking information on the internet to find out something more about the problem and what might be done about it. They start the search with a conception of snoring that might or might not place snoring within medical jurisdiction. They then conduct the search and are exposed to information with which they engage to a greater or lesser degree. At the end of the search, they come away and any one of three possibilities exist: 1) they conceive of snoring more strongly as being a medical problem; or 2) they conceive of snoring less strongly as being a medical problem; or 3) their conception of snoring as being (or not being) a medical problem

remains unchanged. Figure 9 shows that in all cases, participating in the internet-search shifted conceptions of snoring towards being more medical.

I have mentioned already the importance of examining the different levels of interaction in the situation of action, namely the macro, meso, and micro levels. It is the micro level which typically receives the least attention in medicalisation literature, but I believe it to be arguably the most important. Collins (1988) makes the “ practical claim that micro-sociology – the principles of how people interact as human bodies in sight, sound and smell of each other – is the solidest part of what we know about the social world, and that we understand the larger and more long-term patterns when we see how they are composed of such micro-situations. [...] the most important attraction [of micro-sociology] is: this is where we live. Our lives are micro.”

Collins goes on to point out that macro-social structure is formed out of a myriad of micro-social events, and every micro-social event is informed by the macro-social structures within which it occurs (Collins, 1988). Once again, the idea of communication and influence not just along levels of social structure but also between those levels is articulated. In the case of the internet-search, nothing could be truer. The advent of machine intelligence (search algorithms and responsive big data) have amplified the macro-micro bi-directional exchange as I will explore in more detail over the next chapter. But before I can discuss the importance of the macro-micro entanglement, I must first spend the rest of the current chapter drawing together in more detail the micro-level interactions of the internet-search for snoring.

5.6.1 Discourses

The various cartographic analytical techniques in this micro-level analysis are based on examination of the discourses collected during the field work.

The first position map (figure 3) looked at what type of person characterises a ‘snorer’. Age was not included as an axis on the map since it did not appear in the data. The focus then, was on gender and weight. A variety of positions were represented in the data with only some positions missing. Gender alone being the most important factor in snoring was not represented, but weight alone being the most important factor was. The position that both gender and weight together were important was represented in the form of the overweight male snorer stereotype.

The middle position that weight is an important factor in snoring and gender is also an important factor in snoring, but that both men and women can snore and that there are other important factors (notably anatomical structures and various lifestyle behaviours) was by far the most common position in the pre and post-search interviews. That this was a common starting position foreshadowed and overlapped to a certain extent with the analysis of the second positional map looking at the type of problem snoring represents and what might be done to stop snoring.

The second positional map (figure 4) showed that a variety of positions are taken regarding the type of problem snoring represents. Positions held ranged from conceptions that snoring arises purely from anatomy, through to it being a consequence of lifestyle and behaviours (with a focus on ‘bad’ behaviours such as excessive alcohol or eating, or lack of ‘good’ behaviours such as exercise), and even further, that snoring is rightfully a medical condition or disease.

The position that snoring is not a problem at all, although theoretically possible since snoring is sometimes represented in literature as a sign merely of deep sleep, was not found in the data. One could easily imagine a situation wherein quiet snoring could be a reassuring indication both a partner’s presence, and also that they are restfully asleep. Nonetheless this

benign representation of snoring did not appear in the searches. However, the position that snoring is fundamentally a social problem affecting bed-partners rather than the snorer was more commonly held before the internet-search. The position that snoring is a health risk to the snorer appeared more frequently after the internet-search. In both cases, however, the conception that snoring can be stopped by making lifestyle changes but also through medical intervention irrespective of whether snoring is conceived of as primarily a social or health problem was represented. In other words, interviewees might think of snoring as primarily a health problem, or they might think of snoring as primarily a social problem, but in both cases lifestyle changes AND medical treatments were represented as valid ways to stop snoring. Medical intervention was not specifically linked to snoring being a health problem.

The position revealed in the first positional map (figure 3), that snoring arises from behaviours or lifestyle, and the one revealed in the second positional map (figure 4) that snoring can be stopped by making changes to behaviour or lifestyle, seemed to reflect popular culture conceptions entangling diet and exercise with commodified health and wellbeing. Interestingly, as will be seen later, very few of the web pages visited in the searches were of that type specifically, yet those sentiments appeared to be brought to the search by the searchers themselves.

The perceptual map of the web pages in isolation (figure 5) showed that although Google searches for 'snoring' tend to be populated by web pages discussing snoring more than they discuss OSA, there were few pages that did not mention OSA at all. Furthermore, the use of lay language compared to medical language was split roughly evenly between the predominantly medical and predominantly lay quadrants. The perceptual map also identified a lack of representation of pages that talked about OSA in lay language which supports the premise that a vocabulary discussing the hypotonic airway in terms of OSA is intrinsically

more medicalised. Therefore, both those findings suggesting the internet-search for snoring is more likely than not to direct searchers to web pages representing a more medicalised representation of snoring as opposed to a more lay representation of snoring.

5.6.2 Practices

All the participants used Google as the primary search engine. The universal reliance on Google has enormous implications regarding the landscape through which a searcher will travel the conception space. Most of the internet-searches were built using fewer than three search terms, but nonetheless all participants except one still tended to use the Google page as a ‘switch-board’ for their ongoing search, returning to it between pages rather than linking from one page directly to the next. This observation is consistent with other studies that have found that Google ‘subverts’ the intrinsic architecture of a web site by linking to internal pages rather than the intended ‘landing page’ (Mager, 2009).

In that sense then, Google constructs a dynamic ‘website’ made up of all the pages ranked for that specific search. That the Wikipedia page on snoring is encountered, and then the Southern Cross Healthcare page on snoring, and then a page talking about a medical device, was not the intention of the designers of the websites to which those pages belong. Nonetheless, they are neither entirely haphazard nor random – they are selected according to Google’s search engine page ranking algorithm so although they aren’t necessarily linked by design, they are linked by a selection process working behind the scenes. Therefore, to understand how the conceptual landscape encountered by any given searcher comes into being, it was clear that I needed to be aware of the rules of Google’s page rank system.

The implications of those rules will be explored in more detail in the next chapter looking at the web sites themselves, and the meso-level action of the internet-search.

5.6.3 Identities

Self-identification as a snorer seemed to be linked with discussion of weight or age. Identification as a partner of a snorer also led to discussion of problems around partner disturbance and marital stress.

The positional maps in section 5. 3 show that overweight people featured in the conceptions held by the participants both before and after their internet-searches. Gender was also strongly represented. Not unexpectedly, men were described by many of the searchers as being typical of snorers. Importantly women also had a strong presence in the interviews of many of the participants but when that occurred it was linked to weight. In other words, men might snore because they were men, but women would snore if they were also overweight. The relationship between gender and snoring also helped shape some of the searches, even specifically asking: ‘why do men snore’ and ‘why do men snore more than women’.

5.6.4 Conclusion - *How does the Internet-Search contribute to Medicalisation at the micro level?*

In each case when asked about snoring after their internet-search participants demonstrated a shift in language from less medical to more medical and less references to OSA to more references to OSA. Therefore, when considered as a whole system, the internet-search appears to contribute to a more medicalised conception of snoring among lay people. On that basis one overall medicalization effect within general society might be an ever-growing accumulation of all such conceptual shifts. However, it is beyond the scope of the current chapter to argue that broader conclusion in more detail. At this point it is sufficient to note that lay-people conducting an internet-search for snoring encounter a more medical representation of snoring than they hold themselves, and that after conducting the search it is likely their own conception will shift towards one more medical.

This finding speaks to the output or effect of the internet-search when considered as a whole system, but it still begs the question of which behind-the-scenes workings contribute to how this comes about and indeed, what the implications of those workings might be for medicalisation on a larger social scale.

Chapter Six: Snoring and the Attention Economy

6.1 Introduction and terms of analysis

The main objective of this research is to explore how the internet-search contributes to the medicalisation of snoring. In the previous chapter I showed that at the micro-level of individual interaction, the internet-search for snoring in all cases was consistently associated with shifts in the language used by each searcher from less medical to more medical. I argued that one of the outputs of the internet-search whole system important to medicalisation, is that the internet-search produces language shifts. Insofar as language can be used to signify conceptions, the internet-search therefore appears to shift conceptions of lay searchers from less medical to more medical – in other words, the internet-search can be confirmed as ‘an engine of medicalisation’ (Conrad, 2005). Indeed, it can be seen to be operating as a whole system of medicalisation. By this I mean that it needn’t be considered as part of a larger social system (although of course it is) for overall medicalising effect, but rather that the internet-search produces medicalisation as a discrete social system.

The secondary analysis described in this chapter is informed by and built upon those findings and cartographic analysis. Why those pages? What’s in them, and why are they encountered rather than any others? A further positional analysis of all the web pages encountered in the entirety of the field research treated as a group is presented, along with a conception map focussing on capture of attention share by those pages. The focus of this chapter is on the group or meso-level of action at work in the internet-search for snoring. At all times the analysis remained cognizant of the internet-search as the unit of study, and although I explore out into the deeper workings of the internet struggle for audience and attention, I consistently refer back to the internet-search throughout.

Firstly, I unravel some of the important mechanisms at work within the internet-search when considered as a system of medicalisation by initially turning attention away from the human actors and looking more closely at the web pages themselves. I begin by giving a brief overview of the pages encountered across the cases, and then provide a profile of those pages which were encountered most often. I then give thought to how it happens to be those particular pages that appeared in the searches rather than any others. This line of enquiry directs the discussion towards Google and the search engine algorithms that present some pages and not others for any given search.

I expand the discussion by introducing the concept of the Attention Economy (Davenport & Beck, 2001) within which the internet-search operates. In particular, I discuss search-engine optimisation strategies employed by companies and industrial interests competing within the Attention Economy for audience attention, and the elements of Google's page ranking system which those strategies are intended to exploit. I argue that the interaction between those two elements of the internet-search whole system help explain why searchers are more likely to encounter web pages that portray snoring using more medical language than they initially use themselves. Importantly, the mechanics of the economy rather the political or geo-technical hegemony of countries such as the United States that are given agency in this analysis. That is not to say that the political elements do not play a part, but rather that the system mechanics are at the centre of the following analysis.

I finish the chapter by discussing the Matthew Effect (Merton, 1968) which neatly describes the idea of cumulative advantage and feedback within a social context. Although an old concept, nonetheless the Matthew Effect has very real and powerful implications for medicalisation when applied to the new digital environment of the internet-search. Here again, the focus of the analysis will be on the algorithmic mechanisms of the system, since it

is in this area I believe my insight has the most to contribute. Finally, I conclude that by participating in the internet-search, the searchers themselves contribute incrementally to the medicalised (and medicalising) portrayal of snoring on the internet through the entrenchment of those pages most likely to be selected by Google, and why that might be important when thinking about communication of medicalisation between different levels of action.

6.2 Not all sites are equal in the internet-search.

At the time of writing, a search on Google for the term ‘snoring’ returns links to approximately thirty-six and a half million individual web pages. If all web pages were equally likely to be presented by Google in response to a search, then chance alone would suggest that the 75 pages visited collectively by the ten lay participants should have been 75 completely different pages.

However, they weren’t. There was considerable overlap of pages and sites encountered in my research. Several sites were seen by three or more searchers and one site was visited in six of the internet-searches.

Of course, Google doesn’t serve up links to pages on a random basis, it ranks them according to a proprietary ever-evolving algorithm the details of which are a tightly held commercial secret (Levy, 2011). But that this should be so has not always been so obvious. Early proponents of the ‘Information Superhighway’ imagined a world wherein all the information on the internet would be equally available and serve as an egalitarian information utopia. Indeed, sociologists spoke of an emancipation of healthcare knowledge in the digital environment (Nettleton, 2004; Seale, 2003) wherein personal accounts and non-mainstream perspectives of health and healthcare would have equal voice. That could only have happened, though, if all web pages were equally likely to be presented by a search service – i.e. one could imagine a random-generation search engine that selects solely based on a page

containing the search term of interest, but in all other respect selected pages are presented to the searcher in random non-ranked order. However, in the current environment web-pages are ranked rather than selected at random from all possible web-pages pertaining to our search term of interest. Therefore, instead of the first page of a search presenting an unbiased selection of pages from which we can choose to visit, we see pages selected and ranked as 'relevant' by the Google search engine ranking algorithm (Mager, 2009; Berman & Katona, 2013; Levy, 2011; Egri & Bayrak, 2014; Ziakis, et al, 2019).

It should be noted that there are of course many other search services that might have been used and they would have returned similar numbers of returns in terms of orders of magnitude. However, according to NetMarketshare.com, an internet watchdog service offered by US internet consultancy firm Net Applications founded in 1999, Google holds 74.06% of the desktop/laptop search engine market as at February 2018, compared with the Chinese language Baidu which holds 10.94%, and then Bing which holds 8.06% despite being the default browser shipped with all Microsoft Windows enabled operating systems ('Search engine market share', n.d.). It should be of little surprise then, that all the participants in my research chose Google as their search engine (especially when considering that Baidu is largely only used in China), and although the discussion in the remainder of this chapter centres on Google, the principles apply equally to any search service that uses a ranking algorithm based on factors not intrinsic to the searchers themselves.

It is also important to know that although the specific proportions are reported differently, nonetheless it is the case that people conducting web searches are relatively more likely to follow links from the first page of results than from subsequent pages, and that they are most likely to follow links from the first part of the first page (Mager, 2009; Levy, 2011). This sets up a situation wherein those web pages that best fit the criteria used by the search

services to rank candidate sites during any given search will form a vastly smaller subset of sites than all possible sites related to (in this case) ‘snoring’. Some details of Google’s ranking criteria important to medicalisation will be discussed later in this chapter. For the moment, however I will focus on the idea that all of this sorting and ranking serves one single purpose: to capture an audience’s attention. Furthermore, attention is sought not just by the web pages for the instance of any given search, but also by Google for future searches as well. In this we see the attention of an individual is directed by Google towards those pages deemed most relevant which is a micro-level transaction, however if it is done so with perceived relevance often enough, each satisfying transaction reinforces the use of Google for future searches as opposed to competing search services. By serving pages to people and people to pages, Google is positioned not just as an incredibly powerful gatekeeper of information, but also as a broker of attention (Levy, 2011). A site must first be visited if it is to be effective in any other purpose.

I was interested in interactions between pages and people within the internet-search, and the changes in conceptions arising from exposure to information on those pages and made an a priori assumption that time spent looking at a web page could be used to approximate amount of attention captured by that page. By representing the time spent looking at each web page, I therefore incorporated attention into each conception map. Furthermore, by plotting the positions within the conception space of each page along with the attention, I incorporated not only how much attention was paid within each internet-search, but also situated where in the conception-space that attention was directed.

6.2.1 Situated positions of individual pages across all searches

The following conception map (figure 10) was constructed by using the proportion of references to OSA vs snoring on the horizontal axis, and the proportion of medical language

versus lay language used when referring to OSA or snoring on the vertical axis. Recall that the colours of bubbles in the maps in chapter five indicated web pages encountered from a shared Google search term in that person's overall search. Also, In the previous chapter, each conception map represented individual internet-searches.

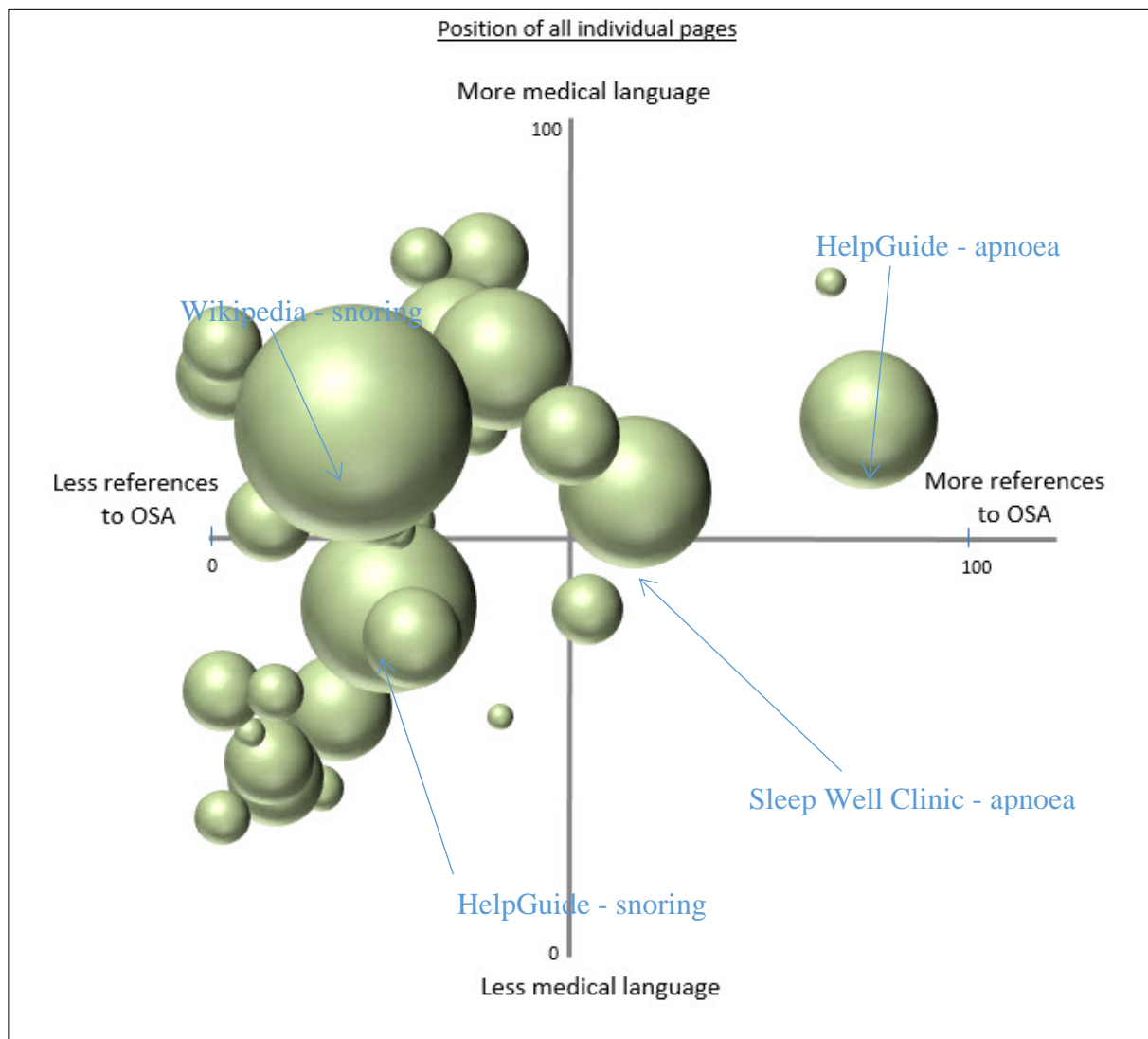


Figure 10 Position map of all pages (size of bubble proportional to total attention across all searches)

Figure 10 sums the attention for each encountered site summed across all the searches. However, the individual search terms and keywords are not included in the analysis presented in figure 10. I therefore use a single colour for all the bubbles. The bubble size, however, still represents attention in the form of the amount of time all searchers spent with

that site open. Figure 10 shows all the web pages encountered across all the searches, positioned on a single conception-map.

Note that there appear to be no pages representing OSA in predominantly lay terms. It is important to remember that this does not mean such pages do not exist, but that they were not encountered by the participants in my research. We cannot necessarily know whether such pages actually do exist and are just not deemed worthy of high rank by the Google search rank algorithm, or whether no such pages actually exist out of the 75+ million possible pages relevant to the search term snoring. It has the same practical effect: searchers were not offered such pages among the first page of results returned by Google, so even if they do exist, in terms of the internet-search for snoring they may as well not. If they are out there, they have not attracted attention, and therefore have no direct effect within the internet-search for snoring whole system.

However, even among those sites which were visited, some sites are represented with considerably larger bubbles on the group conception map than others, and therefore intuitively have relatively greater opportunity to interact with searcher conceptions. This conclusion is based on the assumption that greater attention means greater opportunity to interact, and therefore higher likelihood that interaction will take place. In that reading of the situation, certain sites that were encountered more often and/or were visited for longer collectively accounted for more interaction than others. Since the output of all the instances of the internet-search for snoring was a shift in language and therefore conception of snoring towards the more medical, then in that regard Conrad's (2005) metaphor can be extended even further than at the end of the previous chapter. If the internet is indeed an engine of medicalisation then some sites appear to be running on higher octane fuel.

6.2.2 *Whole sites and relative attention*

Figure 10 in the preceding section shows all the pages encountered by the searchers. Many of the pages were not stand-alone pages existing in isolation, but instead were part of broader domains or web-sites. When considering the internet-search as a whole system, it is important to remember that elements of the system are operating at different social levels simultaneously. Domains (e.g. wikipedia.com, or southerncross.co.nz, or mayoclinic.com for example) represent meso-level elements of the whole system of the internet-search for snoring, insofar as that behind those sites lie various companies and organisations speaking about snoring through their websites. Furthermore, the domains themselves are considered here in terms of their interaction across multiple individual instances of internet-search. In the conception map shown in figure 10, pages belonging to a single domain were aggregated and the average positions of the different pages belonging to each domain were plotted. The real-world motivations and group-level interactions of those domains and the companies and organisations they represent are not necessarily immediately scrutable. However, by publishing websites we know at least that all of them aspire to capture an audience. In other words, they are all vying with each other for the finite resource of audience attention, so once again I use attention as an indicator of base-level motivation. Focussing solely on attention is not uncommon when researching internet search behaviour and interactions as a way of analysing online positioning strategies, without having to take account of specific details of a particular organisation's actual offerings (Berman & Katona, 2013).

Figure 11 charts the relative attention share captured by each site. As mentioned earlier, the first foundational battle for attention must be won before any other factor can come into play. A site must first be visited if it is to be effective in any other purpose.

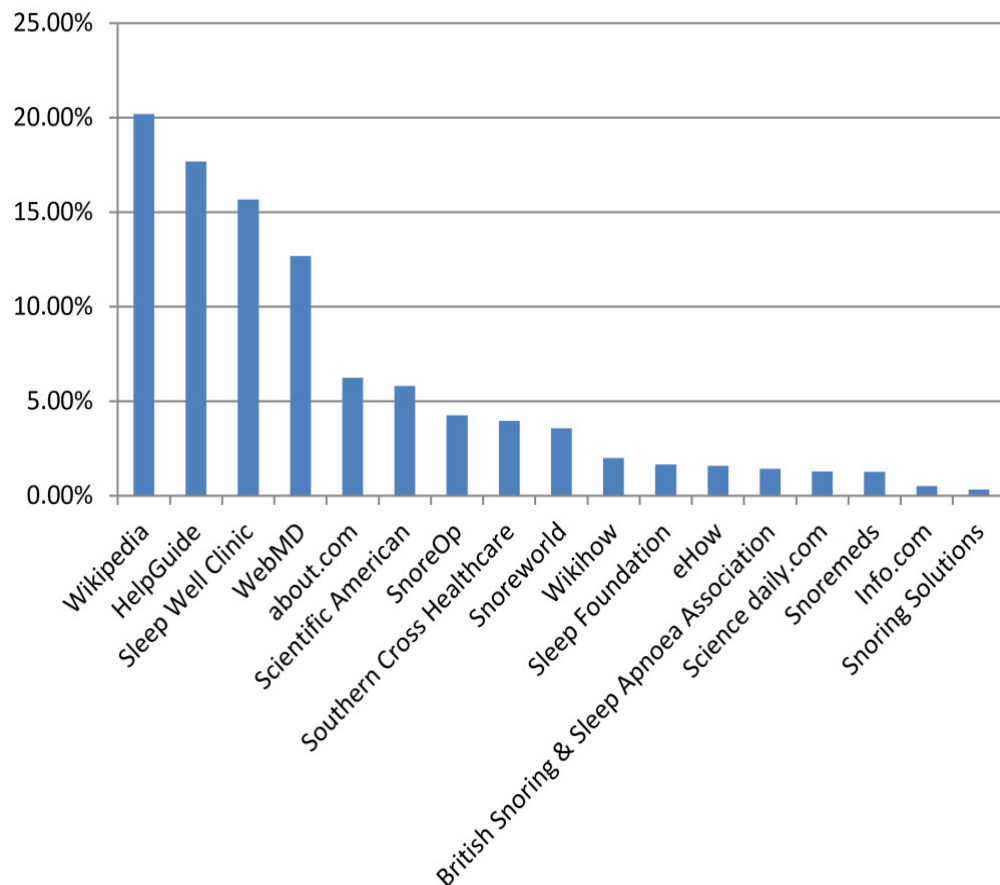


Figure 11 Relative attention share of whole sites

Figure 11 groups the pages into their parent domains and ranks them according to the total time spent by searchers on each site. The battle for attention was dominated by four domains collectively accounting for more than two-thirds of the attention across all the searches: WebMD, Sleep Well Clinic, HelpGuide, and Wikipedia. Interestingly those four sites can be broadly divided into two types – medical providers, and information providers – which will be discussed later in the chapter.

6.2.3 Whole sites, number of visitors, and cumulative attention

Across all the searches some of the pages were visited only briefly, and others were visited only once. However, some pages were visited by multiple searchers and some more

persistently held the attention of those visiting them than others. Across all searches all the encountered pages came from just 17 domains. However, some sites were encountered by a single searcher and held their attention for longer than other sites which were encountered by multiple searchers but consistently caught little attention from any of them. Table 2

TIME	Number of searches	Percentage of total time	Cumulative percentage of time	Site
999	4	20.19%	20.19%	Wikipedia
874	5	17.67%	37.86%	HelpGuide
775	6	15.67%	53.53%	Sleep Well Clinic
627	5	12.67%	66.20%	WebMD
309	2	6.25%	72.45%	about.com
287	2	5.80%	78.25%	Scientific American
210	2	4.24%	82.49%	SnoreOp
196	1	3.96%	86.46%	Southern Cross Healthcare
176	3	3.56%	90.01%	Snoreworld
99	1	2.00%	92.02%	Wikipedia
81	1	1.64%	93.65%	Sleep Foundation
78	1	1.58%	95.23%	eHow
70	1	1.41%	96.64%	British Snoring & Sleep Apnoea Association
63	1	1.27%	97.92%	Science daily.com
62	1	1.25%	99.17%	Snoremeds
25	3	0.51%	99.68%	Info.com
16	1	0.32%	100.00%	Snoring Solutions
4947		100.00%		

Table 4 - Web sites encountered across all searches including time spent (seconds)

summarises the cumulative attention of all the pages within any given domain, and also lists the number of searchers who visited each of those sites site across all the searches comprising my research.

Table 2 shows that neither the number of searches alone, nor the relative percentage of attention when considered in isolation, rank sites the same in terms of attention and should therefore be taken together for a richer interpretation of how the searchers interacted with the pages comprising those sites. For example, the domain webMD.com included three different pages in that domain encountered for different lengths of time by five different searchers, but collectively accounted for 12.67% of the attention across all searches in the study. Wikipedia

included two pages (snoring and obstructive sleep apnoea), and although was only encountered by four different searchers, nonetheless accounted for 20.19% of the attention across all searches. Contrast again with Info.com, which was encountered by three searchers but had a fast bounce rate accounting for only 0.51% of the attention across all searches in the study. Of course, fast bounce could be caused by the volume of content on a page, but again – if the page contains a smaller volume of content it has less opportunity to affect a searcher. In that sense time is a reasonable marker of effective attention.

These findings show that although a site might be successful in terms of capturing a visit, it might not hold the attention of the visitor and therefore has less potential impact in terms of shifting conceptions simply in terms of opportunity. Importantly, when considering the working parts of the internet-search whole system in terms of attention, there are four possible types of interaction within the system.

1. A site appears in several variations of keyword search and is therefore encountered by multiple searchers and is of sufficient relevance to hold visitor attention. Wikipedia, HelpGuide, Sleep Well Clinic, and WebMD, are all examples of this type of interaction.
2. A site appears in only a few variations of keyword search and is therefore less likely to be encountered by multiple searchers but is of sufficient relevance that it holds the attention of those who visit it. Scientific American is an example of this type of interaction. Even though only two searchers visited the Scientific American page about snoring, the average attention share per visitor was 2.9%. Compare that with HelpGuide which averaged 3.5% per visitor, and Sleep Well Clinic which although encountered by 6 visitors, averaged 2.6% attention share per visitor.

3. A site appears in only a few variations of keyword search and is therefore less likely to be encountered by multiple searchers and is of low relevance therefore not holding the attention of those few visitors. Snoring Solutions, for example, was only visited by a single searcher and only captured 0.32% of the total attention across all searches. This type of encounter is costly to the searcher in terms of poor use of their attention, but not costly to Google as a broker of the attention-relevancy transaction between searcher and site.
4. A site appears in several variations of keyword search and is therefore more likely to be encountered by multiple searchers but is of low relevance and therefore does not hold the attention of those visitors for long. Info.com is an example in Table 2 with three visitors, but only capturing 0.17% of the total attention. This type of transaction is costly for Google as a broker of the attention-relevancy transaction since it undermines the searcher's trust in Google's ranking system for future transactions. However, it is typical of the sponsored-link paid advertising from which Google draws direct revenue, which will be discussed in regard to the Attention Economy in section 6.5 below.

6.3 The sites with the most attention in the internet-search for snoring

So why these sites? What about them pushes them ahead of the other 75 million+ pages about snoring? How is it that these pages won the battle for attention during the internet-searches conducted by my participants?

I have chosen to discuss in more detail the four domains that together captured more than two-thirds of the total attention across all the internet-searches. The following descriptions serve to compare and contrast features that are relevant to the high rankings they

received in the Google search engine rank page. I will also describe them in terms of their potential roles within the internet-search for snoring and medicalisation.

One of the ranking criteria used by Google is 'locality' (Levy, 2011), whereby higher prominence is given to web pages that share location with the searcher. Even when the web-browser is cache-cleared and logged in anonymously as was the protocol for my research, locality can be determined by the IP address of the internet provider. Therefore, given that Sleep Well Clinic is one of the more prominent sleep clinics in Christchurch where the research took place, it was likely from the outset that the associated web site would be encountered when searching for information about snoring. That it should command the attention that it did was not necessarily so predictable, but also not surprising. In the descriptions below, I give the location of each site and also the date of registration age of domain is also known to have an impact on google page rank.

However, within the group of top four sites in terms of attention capture, the three other sites were all US based. Of those three, WebMD (like Sleep Well Clinic) is a medical service provider presenting information about snoring as a medical authority along with information about other sleep conditions such as obstructive sleep apnoea. In contrast, the other two sites – Wikipedia and HelpGuide – are general information providers without claim to any intrinsic medical authority (although both cite medical authorities in their articles). Whereas HelpGuide is commercially driven generating revenue through sale of advertising in the form of sponsored links, Wikipedia is entirely not-for-profit funded entirely through donations. Each of these four domains are examined in summary description below to give some sense of background before describing how their pages portray snoring.

6.3.1 *Sleep Well Clinic*

As previously disclosed, but elaborated upon here, I conducted this research while employed by the Sleep Well Clinic as Senior Sleep Physiologist and Managing Director. I also hold shares in the Sleep Well Clinic. My knowledge of the company was not used as part of the language analysis for positioning the pages from the Sleep Well Clinic site within the conception-space. There was no commercial or personal advantage to me for the site to be positioned in any particular quadrant. The determination of medical vs lay language was coded in the same sentence-by-sentence manner as all the other web pages in the analysis.

The domain for Sleep Well Clinic, sleepwellclinic.co.nz, was registered on the 5th of April, 2002. As such it is a relatively early domain especially given that in 2002, only 36% of the general population in America used the internet to search for information (in (Peterson & Merino, 2003), and although equivalent statistics for New Zealand are unavailable, it is unlikely the figure would be higher given the US early adoption of internet technology. Google is known to give higher rank to older sites (Levy, 2011). As mentioned earlier, Google also gives preference to sites with a local server IP and country specific domain name extension (.nz) (Dean, 2013). The web site for the clinic has a specific page dedicated to snoring and another page dedicated to OSA, both of which were encountered by searchers. The web site discusses both in terms of diagnosis, testing, and treatment and also uses language suitable for a medical service provider such as ‘diagnose’ and ‘treatment’.

Snoring can always be treated, but different people are more suited to particular treatments. The Sleep Well Clinic will take a comprehensive history and use a home sleep study to find the right snoring treatment for you.
(www.sleepwellclinic.co.nz/snoring)

The site is using second person register to direct statements at an intended audience, with the obvious intention of triggering contact by people encountering the site. Even descriptions of non-medical aspects of snoring such as the noise that is made are couched in language evocative of the medical authority:

A medical study in Sweden investigating wives of snoring men found the wives suffered symptoms of sleep disturbance such as poor short-term memory and difficulty concentrating on tasks.
(www.sleepwellclinic.co.nz/snoring)

Conceptually, the Sleep Well Clinic page pushes a medical perspective, noting that “It’s not just the noise...” but also OSA, weight gain, bladder problems, and libido problems.

6.3.2 *WebMD*

WebMD.com was registered even earlier than the sleepwellclinic.co.nz with first listing dated 6th April 1998. Even though WebMD, like Sleep Well Clinic, implicitly claims the mana of ‘medical authority’ on its web page by including doctor’s credentials on web content and articles, it differs in many other respects. Rather than being the front end of a medical clinic, WebMD is the site of an American corporation operating as an internet publisher of news and information pertaining to human health and well-being. It was founded in 1996 under a different name but quickly settled down as WebMD.

WebMD is primarily a health information service with content pertaining to health care topics, including symptom checklists, information about pharmaceuticals, special interest blogs written by various medical professionals, personal medical information storage. It boasts enormous traffic figures. In 2015, WebMD attracted more unique visitors than any other private or government healthcare website in the United States reaching staggering

figures in 2016 when it was recording an average of 179.5 million unique users per month, and over 12 billion page views in the year. In the war for attention, WebMD is a juggernaut. Google rewards ‘deep’ sites (Levy, 2011), i.e. sites with multiple pages on a range of non-repeating topics with higher page ranking, and WebMD has a huge library of medical content aimed squarely at healthcare consumers.

The WebMD page on snoring portrays snoring similarly to Sleep Well Clinic, describing the phenomenon as a “common condition” occurring more frequently in men and people who are overweight. The page links snoring with OSA, and through that cites a causal relationship with the development of high blood pressure, enlarged heart, heart attacks and stroke. The page has a citation-like note at the bottom of the article noting the page has been reviewed by a medical doctor. Unlike Sleep Well Clinic, the page is also peppered with links to other articles about other unrelated medical conditions such as cancer, psoriasis, and sexual dysfunction (note that these links are dynamic and change on subsequent viewings). However, it is hard to navigate the snoring article without being aware at some level that this is a site that is deeply steeped in a medical paradigm due to discussion of diagnosis and treatment and sleep medicine clinics. Furthermore, there are also several ‘sponsored ads’ for links to other WebMD articles geared more towards products and services. The source of the sponsorship is not easily discernible for these links, but they are related to snoring and obstructive sleep apnoea and refer to “treatment” such as mandibular splints and “cures” such as surgery. And finally, there are also actual advertisements in the side-bars and footer sections for unrelated products, although they are geo-located so that a person searching from an IP address in New Zealand might see advertisements from Spark, or TrustPower for example, both New Zealand service providers for general services (respectively, telephone and electric companies).

A reading of the freely available transcript of the WebMD earnings conference⁷ shows that WebMD receives most of its considerable revenue through advertising on the site. The site is very motivated, then to gather as much attention as possible to itself to then sell that attention back to advertisers. If it were not a successful strategy in terms of attracting and holding attention to use medical language, WebMD would be motivated to change. For example, in the same transcript it is reported that until 2013, the major source of revenue was from pharmaceutical companies. However, with reduced marketing budgets when major pharmaceuticals went off patent, WebMD was reported by the Chicago Tribune to have invested in changes to its site to entice users “who use its site seeking specific information, to linger on the site reviewing other material” (‘UPDATE 2-WebMD CEO Redmond leaving; company reports narrower loss’, 2013). This shows there is a flexibility and willingness to step away from ‘medical’ when needed if it offers an opportunity for diversification of revenue. But the language and overall conceptions on the site are still largely medical – it is the core of the site to be a source of medical information for lay people, to gather people in on the basis of being a source of medical information. The transcript of the Q4 2016 earnings press release also notes that while WebMD also offers services to physicians and private clients and owns several similar medicine-based web sites, the Q4 2016 earnings press release reported full year earnings of over US\$700 million largely arising from Biopharma advertising, with a much smaller fraction contributed from providing health services and information services.

But the bulk of revenue came not from the lay people ‘consuming’ medical information about various phenomena of interest to them, but rather from selling the attention of those people attracted to the site to the biopharmaceutical industry. Buying and selling

⁷ Transcript of Q4 2016 WebMD earnings conference call and press release – Feb. 16, 2017

attention, is big business. By thinking about the flow of revenue, however it would appear that on the WebMD site medical information is not the product, but rather the bait in the trap. WebMD doesn't sell pharmaceuticals, it sells the attention of the audience to the pharmaceutical industry, and delivers it through content-linked advertising embedded throughout each page.

6.3.3 HelpGuide

HelpGuide was registered on 10 August 1999. Unlike Sleep Well Clinic, which hosts a site providing information about snoring essentially drawing attention to its own clinical services, and WebMD which overtly sells advertising, the organisation behind the site HELPGUIDEORG INTERNATIONAL was established in 2012 as a California non-profit public benefit corporation dedicated to charitable and educational purposes. According to its own web site, the goal of the organisation is guide visitors to the site to “mental health and wellness” and “to empower you with the knowledge and support you need to take charge of your life and start feeling better.” Indeed, HelpGuide says of itself “ we don't accept advertising, thus allowing us complete editorial independence.” HelpGuide relies instead on donations.

HelpGuide used clear lay language when describing snoring, but consistently made statements that linked it with health problems. On the one hand the snoring page opens with “Just about everyone snores occasionally, and it's usually not something to worry about.” But then goes on the very next sentence to say snoring can lead to “ health problems”. The second half of the snoring page talks about “medical treatments for snoring”, saying that “your physician or otolaryngologist may recommend a medical device or surgical procedure” and then lists several medical devices and procedures.

The HelpGuide article is authored by non-medical editorial staff listed as authors. It ranks highly with Google by meeting several of the page ranking elements of the Google page ranking algorithm. In particular, the HelpGuide has high value out-links to authoritative sites such as the American Academy of Sleep Medicine, the British Snoring & Sleep Apnoea Association, and the American Academy of Sleep medicine. Examination of the site shows the language is of consistent style across the site with clear headings, sub-headings, and images with appropriate keywords all of which not only make good content for users, but also are valued by the Google page rank algorithm (Dean, 2013).

6.3.4 Wikipedia

The present-day online communal encyclopaedia web service offered by Wikipedia is a microcosm of the idealised version of the Internet that was being discussed around the advent of the millennium. The knowledge on Wikipedia is freely accessible, crowd-sourced and crowd-regulated and unranked or sorted. In 2005, Nature published a review comparing science articles from Wikipedia and Encyclopaedia Britannica noting similar levels of accuracy.

According to Wikipedia's own site, Wikipedia was launched on 15 January 2001 with the stated aim of being a "free-as-in-freedom online encyclopedia". Crucially the initial concept was that no central organization should control editing so that knowledge could be developed and regulated by the users themselves to draw on the collective editorial power of the community being served. In direct contrast to HelpGuide, Wikipedia was set up to maintain not just editorial freedom, but to turn it into a collective. Despite the difference in editorial policy, Wikipedia shares with HelpGuide a not-for-profit organisational structure and internal policies to remain free of advertising and sponsored links, as evidenced by donation drives and background information on both sites.

Wikipedia quickly became a global project in multiple languages and in 2015 was reported on WikiWikiWeb, the original communal internet site featuring user editable content to be the world's fifth-most-popular website in terms of overall visitor traffic (Borra et al., 2015; 'Wiki Wiki Web', n.d.). At that time, Wikipedia's worldwide monthly readership was reported to be approximately 495 million. In August 2015, WMF Labs tallied 18 billion page-views for the month.

Although Wikipedia was not the most visited site in my research, with 20.9% of the total, it nonetheless captured the most attention across all searches. Wikipedia used approximately 50% medical language and only 25% references to OSA as opposed to snoring. Like HelpGuide, the Wikipedia page on snoring featured clear lay language when describing snoring such as "Snoring is the vibration of respiratory structures and the resulting sound due to obstructed air movement during breathing while sleeping." However, the page also contained many statements that linked it with health problems and the medical domain throughout the page. Snoring is linked in the first few paragraphs with "significant psychological and social damage to sufferers" and point out a "positive correlation between loud snoring and risk of heart attack and stroke". The same treatment options as those described by HelpGuide are given on the Wikipedia page, although with far more detail with a generally higher proportion of medical language.

Wikipedia is designed to allow free collaborative access to editing functions and offers tools that allow a visitor to explore the editing history and evolution any given article. The level of detail is extraordinary and conveys an unprecedented degree of transparency for the interested viewer. In that sense each Wikipedia article represents a collaborative effort that is a collection point for broader interest groups (and individuals) participating on the internet. To get a sense of the collaboration, in Figure 12 below I present a screenshot of the

editorial history of the Wikipedia snoring page taken in early 2016 when I was analysing the Wikipedia component of my data. At that time, there had been a total of 684 editors who had made over a thousand revisions since the page was first posted in 2003.

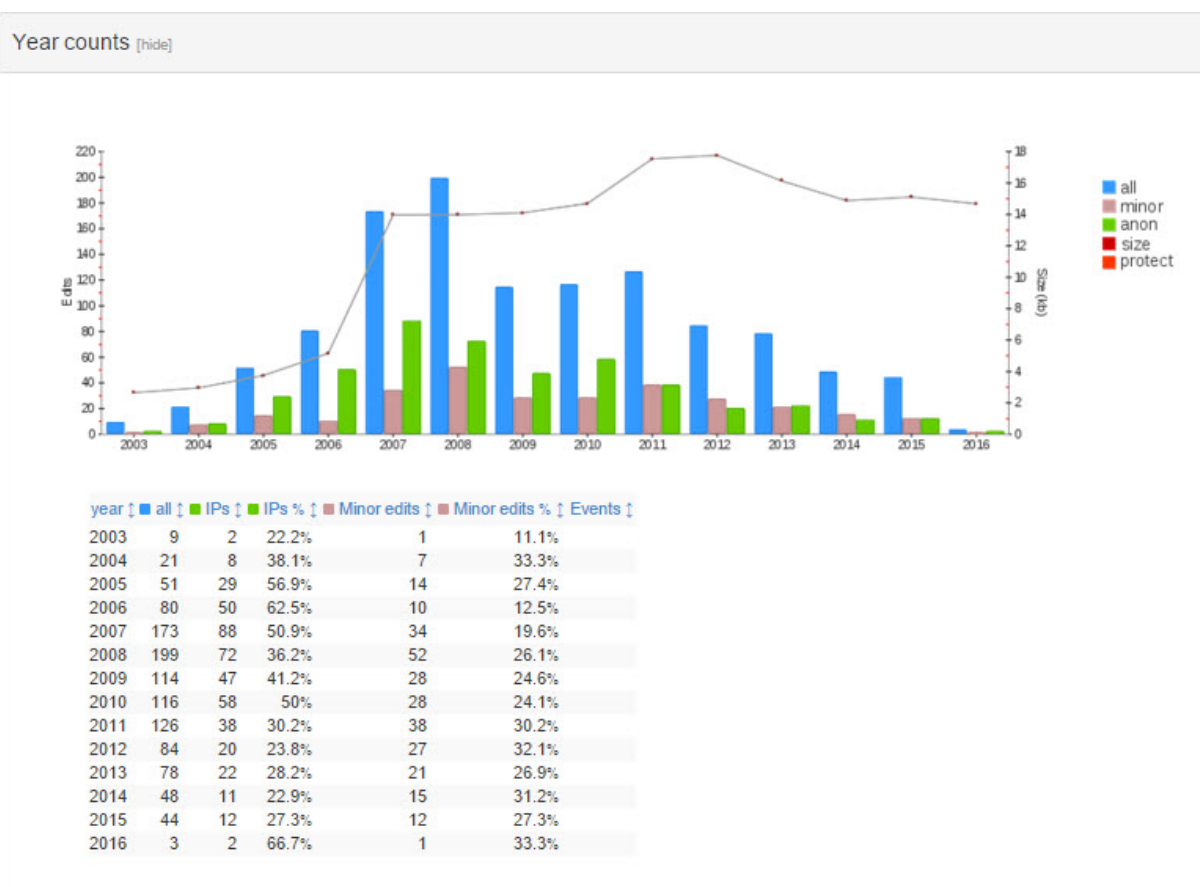
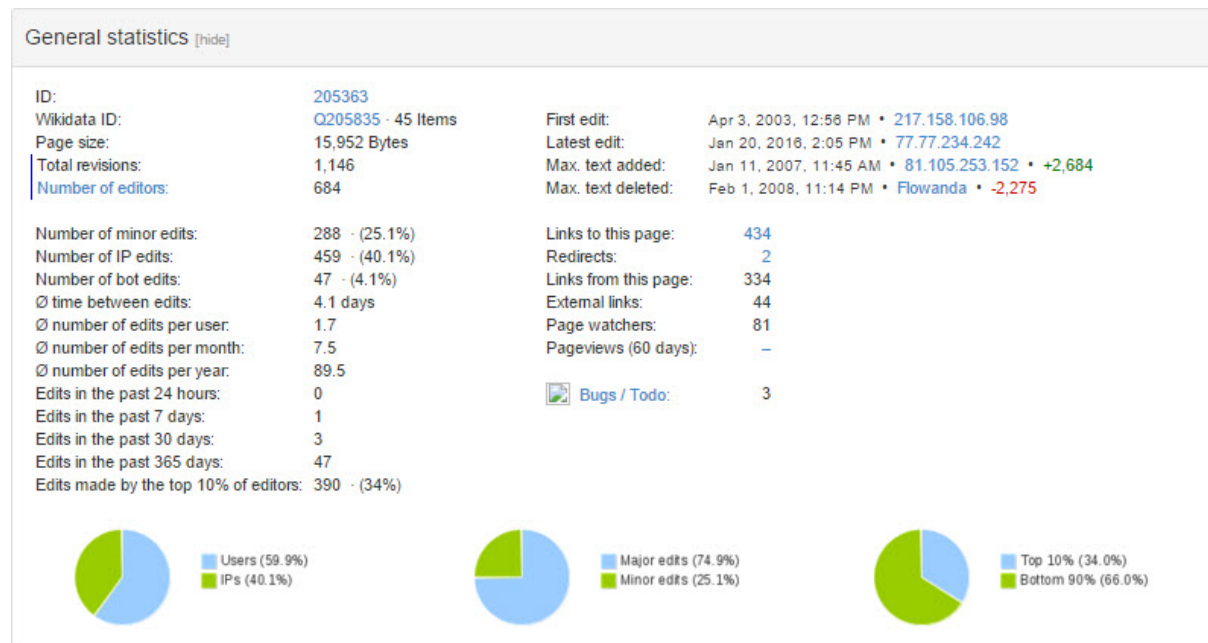


Figure 12 - Screenshot of Wikipedia editing history for article on snoring

Furthermore, the individual edits can be viewed, and information on the identity and other Wikipedia activities of each editor can also be tracked since the page history function allows access to all the previous versions of each page. For example, the earliest Wikipedia article on snoring was a ‘stub’ article, i.e. an article deemed to be too short to provide encyclopaedic coverage of a topic. It was generated from a 1913 Webster public domain dictionary definition:

Snoring is the act of breathing through the open mouth in such a way as to cause a vibration of the uvula and soft palate, thus giving rise to a sound which may vary from a soft noise to a loud unpleasant sound.

Snoring is usually an involuntary act during sleep, but may also be produced voluntarily.

On 3 April that same year the first revisions were made by an anonymous wiki user. I traced their IP address (an internet identification unique to each connection) using WHOIS (an internet IP search service) and found it was based in the UK. Throughout the month of April 2003, the wiki user was actively editing an eclectic range of Wikipedia pages including articles on topics including pubic hair, railguns, and snoring . The anonymous editor added external hyperlinks leading to The American Academy of Otolaryngology–Head and Neck Surgery page on snoring, the British Snoring and Sleep apnoea association web page, and the “snoringadvices” page which is a domain for marketing commercial anti-snoring devices: a special interest surgeon’s website, a site run by snorers who had already entered the medical system, and a commercial ‘medical’ product advertiser.

Most of the original text was replaced to describe snoring in terms of the problems with which it is often associated. Snoring was thus described by the anonymous first editor as “some kind of blockage in the breathing passages” and even at that very early stage, the editor introduced the idea that “surgery is one option to cure snoring” and that “if serious it can become a life threatening sickness” and “it can cause the snorer’s spouse lack of sleep. Being sleepy all day long can also be life threatening for the person and the people around them”.

The next major edit was later that year. In August 2003, wikiuser “Kristjan” added more text to the snoring article (3 edits), and over the next few days went on to edit the Wikipedia article on soft palate, male ejaculation, and penis enlargement. Kristjan’s additions to the snoring article offered further medical explanations on the causes of snoring such as mispositioned jaw and “throat weakness”. In the space of four months, snoring had gone from being presented as an involuntary palatal vibration that causes a noise ranging from soft to loud, to a highly prevalent potentially life-threatening sickness involving blockage of the airway and endangering the snorer and the snorer’s spouse, unless treated by surgery, dental implants, or jaw mechanics.

As can be seen in Figure 12, the size of the article grew steadily for the first three years but experienced a sudden increase in 2006, quadrupling with one edit before resuming steadier growth until 2012. Most edits occurred between 2006 and 2011, which is a time during which medical research had started to explore snoring in more detail linking it with various adverse outcomes such as hypertension and risk of stroke which had previously been considered to be more related to obstructive sleep apnoea (Yeboah et al., 2011). Since 2011, the annual rate of edits and revisions has followed a diminishing trend. In 2017, the bones of

the original 2003 entry can still be discerned, but they are buried within several layers of medical language.

The foregoing deep-dive into the Wikipedia snoring page archive serves to illustrate two points important for my research. First, the example of the first edit in 2003 shows how an individual who found the snoring page on Wikipedia changed the language to add content volume and medical authority to an article that started as a brief dictionary definition. The next individual added further medical language and significantly more content and links to other medical sites. As I will show in the next chapter, the cumulative effect of all these individual edits on the Wikipedia page has shifted the entire article towards an increasingly medical portrayal of snoring.

In my own research, the Wikipedia page was the most successful page in terms of attention share. In other words, an accumulation of micro-level interactions has contributed to the medicalisation of the Wikipedia page on snoring – one of the meso-level components of the internet-search. In turn, the Wikipedia page on snoring contributes to the micro-level conception shifting described in the last chapter. Furthermore, it is one of the more likely pages to be encountered in an internet-search for snoring. This serves to illustrate the mechanism of communication and inter-action between the individual micro-level and the group meso-level contained within the internet-search for snoring. Although the page edits were not directly conducted within or through the internet-search, nonetheless the page as it currently exists has been constructed through accumulated micro-interactions, and as I have shown – it will be found through the internet-search.

The second important point for my research is that the example above graphically illustrates the dynamic nature of the internet – it changes over time. Hence the mechanics of the internet-search as a whole system are more important than the specific motivations of any

contributing element (such as a specific web page) within that system, since those contributing elements can wax and wane in form and influence over time. The mechanics of the system, however, are intrinsic to the system and therefore have more permanence. I will discuss further implications of the dynamism revealed above in the next chapter.

6.4 Language, Attention Share, and Shifting Conceptions.

I have emphasised the importance of attention in both the individual conception maps in the previous chapter, and also in terms of my selection and discussion of the major sites earlier in the current chapter. When thinking about the meso-level elements of the internet-search for snoring considered as a whole system, the domains serve as markers of the “real world” interests and organisations operating behind the scenes and have thus formed the basis of the preceding discussion in this chapter. In figure 13 below however, I have approached the meso-level activity in a different way so as to better visualise the interaction between attention and language (and therefore conceptions). On this conception map I have derived an average position of all pages in each search, weighted according to the attention share of each page in that search, which is plotted in figure 15 as a red bubble. In that sense, the red bubbles represent the non-human actors within the system in terms of an interaction between attention and location in the conception-space.

The blue bubbles represent the individual start positions of each searcher, and the green bubbles represent the post-search positions of each searcher.

Clearly the weighted average page positions (red) are in a more medical region of the overall conception space than the pre-search searchers (blue). The post-search positions (green) have much greater overlap with the weighted page positions. So why is there a difference? Why has Google served up links to pages that use fundamentally more medical language than lay people use themselves? Why this disconnect?

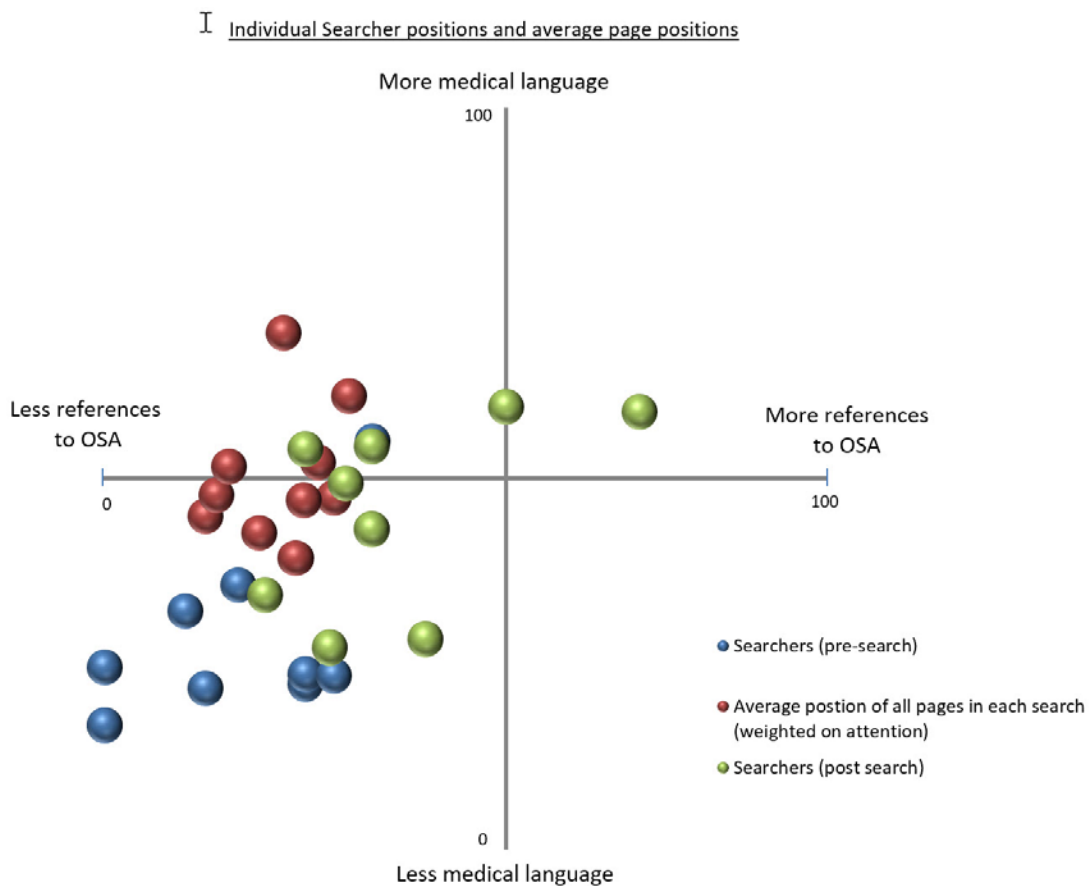


Figure 13 Individual searcher positions and weighted average page positions

6.5 The Attention Economy

The key to understanding might lie in the fact that as previously discussed, the pages are not encountered at random out of all possible pages on snoring. Instead they are ranked and presented by Google in the anticipation of the fact that they are more likely to be of interest to that specific searcher than other pages ranked lower (Levy, 2011; Berman &

Katona, 2013). Remember that WebMD does not generate revenue directly by providing information to people, but instead by selling the attention of those people to other companies which it delivers through sponsored links and direct advertising. In the same way, Google does not generate revenue directly by serving up pages of relevance to people, but instead sells the attention of those people to other companies through sponsored links and direct advertising. Indeed, the discovery of how to monetise internet activity through customised advertising linked to search was the key development in Google's transition from struggling Silicon Valley start-up to multi-billion dollar architect of the world's digital experience (Levy, 2011).

But to sell the attention, it must first be gathered, and Google does that by providing searches of more algorithmically calculated relevance on a larger scale and faster than any competitor before or since (Schmidt & Rosenberg, 2017). Having been served pages of relevance once, a searcher is more likely to return to use Google again for future searches, and if served well again, even more likely to return again and so on. In that way a relationship of trust is built between the searcher and the search provider. As the engineers and executives at Google realised extremely early in the development of the search service, if Google's page rank algorithm were consistently prone to error, people would stop using the service and Google would quickly have no attention left to sell (Levy, 2011).

The importance of attention when studying the mechanism of the internet and in particular Google, cannot be overstated. Herbert A. Simon (1971) was perhaps the first person to articulate the concept of attention economics when he wrote:

In an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes.

What information consumes is rather obvious: it consumes the attention of its

recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it (Simon, 1971).

Simon later observed that designers of information systems such as the internet or even individual web pages incorrectly think of their design problem as information scarcity rather than attention scarcity. A result of that paradigm is that information systems have exploded to the point that more information is provided to more people in ever-increasing ways, when in fact what is needed are systems that filter out unimportant or irrelevant information (Simon, 1996).

Simon's characterization of information overload being a problem that can be modelled as an economic problem has gained popularity. This environment of attracting, retaining, trading, and monetising attention is sometimes referred to in the literature as The Attention Economy (Goldhaber, 1997; Davenport & Beck, 2001; Webster, 2016; Bueno, 2016; Milington, 2017) which is a term I employ in this thesis particularly when referring to those aspects that pertain to the internet. It is not within the scope of this research to explore the entirety of the Attention Economy, but it is important for my research to understand the key idea: in an environment of freely accessible and limitless information such as the modern searchable internet (post-Google), the constrained resource is attention and therefore it is attention that becomes the commodity of value and the basis for trade and transaction. And the internet-search is at the very centre of this most modern of social environments. It is the internet-search that made the vastness of the information accessible to lay people 24/7.

In an Attention Economy, then, there are two possibilities as to why the pages describing snoring encountered during the internet-search use predominantly more medical language than lay:

1. Either it is because snoring is most correctly described and discussed within a medical language framework,
2. or it is because the use of medical language is in some way associated with attention attraction and retention on the internet.

The first 2003 article on the Wikipedia snoring page described earlier drew from a 1913 dictionary definition and used mostly lay language. I conducted a casual search of the National Library online database Papers Past (<https://paperspast.natlib.govt.nz/>) using the keyword “snoring” (the equivalent of an Edwardian internet search perhaps) returned several articles from New Zealand newspapers of the era. Apart from mention of “cures” for snoring offered in the same vein as “cures for laziness”, there were no immediately obvious examples of discussions of snoring within a medical context. Two articles referred to death in relation to snoring, but the first⁸ was from a dental plate becoming dislodged during snoring whereby the plate cut blood vessels in the person’s throat. The second⁹ was from an article commenting on a recent court case wherein a person was tried (and acquitted) for regularly disturbing the congregation in his church. The author of the article was commenting on the outcome of the trial and went on to describe:

We constantly read in the newspapers of men who, while in a state of somnambulism, have walked off from the rear platforms of sleeping cars while in motion and have been instantly killed. The real truth is that in nine cases out of ten, these so-called somnambulists are simply snorers who have been seized by their fellow-passengers,

⁸ “Snoring Causes Death”, *The Press*, 11 February 1903, p7

⁹ “Snorers”, *South Canterbury Times*, 5 August 1882, p3

and thrown off the train, care being taken to stun them with the poker in order to save them the pain of the fall.

Darkly humorous articles and cartoons were common, but I could find no articles speaking about snoring in a predominantly medical context. Furthermore, that all of the lay searchers in my research started their search using consistently less medical language than the web pages they encountered suggests that there is nothing intrinsic about snoring that it needs to be discussed using medical language.

The second possibility requires some picking apart. It is not proposing that all pages on the internet related to snoring are using more medical language than lay language, but that those that do are associated with characteristics that translate to increased likelihood of higher page ranking than others who don't. That the sites more likely to be encountered were also more likely to have more medical language might be related causally but it would be difficult to tease causality out from this research in isolation. 'Medicalness' might add to the overall attention 'stickiness' of a site (everyone wants to slow down at the car crash) as opposed to a page with a more mundane description of snoring. Alternatively, despite the mana of the medical professional dissipating in more recent times, nonetheless there might be a degree of authority that stems from association with the profession that conveys a sense of authority which is attractive to a lay person seeking explanations or information about snoring.

Is it the case then that there are popular sites that describe snoring which happen to use medical language, or is it instead that there are sites that describe snoring which are popular because they use medical language? This is an important question insofar as the earlier analysis has shown that page encounter has a medicalising effect on the conceptions of each searcher. It would be tempting to conclude that whatever forces are at play behind the

pages, they have the effect on the otherwise passive searcher of shifting their conceptions in a more medicalised direction. The hidden forces, then, are the true engines of medicalisation.

On the other hand, it could be that those pages which contain more medical language are more attractive to searchers due to the attention-grabbing nature of the medical portrayal of snoring, and that because of this those sites using medical language are more likely to be encountered because of the language they use. On this reading of the findings, it could be argued that in the case of snoring at least, there is an intrinsic attractiveness to a medical representation of snoring rather than a lay representation. Alternatively, a person looking for information about snoring might be attracted to a medical ‘authority’ providing permission in the form of a medical explanation that absolves the problematic snorer of personal responsibility for disturbing their bed-partner every night. There are many possibilities.

Therefore, the medicalisation of snoring might not be driven by hidden powers communicating the medical representation via the internet, but instead the internet representation of snoring might just be a filter through which sensationalistic representations are more likely to be encountered than mundane. If we consider ‘medical’ to be more sensational than ‘lay’, then the engine of medicalisation seen here might not be the internet, but rather the internet might be pointing to the true engine: the intrinsic sensationalism of medicine. Medical dramas on television are made because they are popular. In the case of this research, however, the distinction is of note but does not detract from the finding that all the participants of the study came away from their searches expressing a more medical conception of snoring. That the pages they encountered came to be there through the inherent sensationalism of medicine itself or through the interests of the actors behind are two possibilities of several, but because they both rely on an isolated search have little direct impact on understanding the system.

However, there is a further possibility that has more immediate impact on a consideration of the internet-search as a whole system. Those pages that tend to use more medical language might also tend to be more likely to employ a higher proportion of the Google page rank criteria well than pages that tend to use more lay language. A professional medical clinic might also have the funds, for example, to employ professional web developers who can optimise a site for ranking highly on Google search – a process called Search Engine Optimisation (SEO). Google page ranking is based on a secret ever-evolving formula known to few, but search engine optimisation experts constantly attempt to reverse engineer rankings to determine which factors have the greatest influence, or indeed any influence, on how Google ranks pages (Peterson & Merino, 2003; Mager, 2009; Levy, 2011; Dean, 2013; Berman & Katona, 2013; Egri & Bayrak, 2014; Ziakis et al., 2019).

6.6 Search Engine Rank Position

The terms ‘PageRank’ and ‘search rank’ are related but distinct, even though sometimes used interchangeably. PageRank is the name of a score Google calculates for each web page based on many factors, but originally based on the number of hyperlinks to that page from other pages on the internet. Each link is given a weight based on the PageRank of the linking page. The insight that relevance to humans could be calculated algorithmically based on linking (or not linking) decisions was revolutionary. The term refers not to the web pages, but rather to the name of the engineer who developed it: Larry Page, one of the two co-founders of Google. The algorithm is a set of machine code rules, but it captures and summarises human-based decisions and values surrounding the importance of sites and it does so on a massive constantly updating scale (Levy, 2011; Schmidt & Rosenberg, 2017).

However, the PageRank of a page is only one factor that is taken into account in a modern internet search to determine a given page’s position on the search engine results page

(SERP) which we are all accustomed to see whenever we use Google. The ‘search rank’ is the position a given page takes on a given search engine result page and it is derived in large part on the PageRank, a value determined by the proprietary Google search algorithm.

To simplify, Google gauges the trustworthiness or importance a site through counting how many other sites considered the site in question valuable enough to link to, and the value assigned to those links is itself based on the PageRank (or trustiness) of the linking site.

Incidentally, this mechanical principle might also speak to one of the other possibilities behind why the internet pages encountered during the internet-search for snoring portrayed snoring in more medical terms than the searchers. I mentioned the possibility of pages using more medical language being popular due to the sensationalist nature of the medical, but it might also be a matter of trust. Medical authority is still considered to be trustworthy in society, and the Google PageRank assigns more value to trustworthy sites.

But as I have already mentioned, there are many other factors also at work. Wikipedia, for example, tends to have a very high search rank for most topics because it has a specific page for many niche topics (Dean, 2013). There are over 200 other factors generally considered to be at work in the algorithm. Many of them are extremely technical and to do with how a site is put together and coded. However, one group in particular is very important to the research – user behaviour.

Google detects which sites an individual searcher ‘clicks’. It also detects whether the searcher departs for a long time before returning (a ‘long’ click) or if they come back quickly (a ‘short’ click) or if they click forward and back repeatedly while searching for... something (pogo-ing). The most important thing to understand is that Google uses the search algorithm to find pages it calculates as being relevant to a given searcher based on their

search term. The calculation includes prior searchers reactions to those results when using the same or similar search terms. In turn, if the current searcher performs a long click, the algorithm is reinforced. If the current searcher performs a short click, the algorithm is weakened. If the searcher pogoes the algorithm is weakened even more strongly (Levy, 2011). There is also thought that site traffic (number of visits) can be tracked and is taken into account in a page's search rank. In at least one and possibly more ways, then searcher activity is fed back into the ranking algorithm thereby incrementally influencing the pages that will rank highly in subsequent searches. This is another powerful example of how the aggregated micro-level actions of individuals accumulate powerfully to influence the meso-level of domains and organisational groups interacting in the internet environment through the search engine ranking algorithm.

It is time, then, to talk about the amplification effects that arise from the feedback mechanisms described above which are built into the internet-search.

6.7 The Mathew Effect

As discussed in the preceding section, a factor consistently identified as important for high page ranking is page clicks and page visit duration or dwell time (Levy, 2011; Dean, 2013). In other words, the more attention a site can attract, the higher Google will rank that page in subsequent searches, thereby making it more likely for subsequent searchers to encounter (and visit) that same page again. The positive feedback loop created by this application of page ranking is an example of the Mathew Effect, a process of accumulated advantage first discussed in sociological research by Robert Merton (Merton, 1968). Of importance here, is to understand that a page that successfully captures a searcher's attention has an incrementally higher chance of being ranked even higher since traffic to a site as measured through link-clicking from a search, is one of the ranking criteria. Any given visit

might not add much to the rank in isolation, but when the volume of traffic reported by WebMD and Wikipedia are taken into account this could be a major factor in a page's likelihood of high visibility in subsequent searches. Any given click of a high-ranking page is fed back into the ranking algorithm for that page making the subsequent ranking ever so slightly higher. Similarly, a page that is ranked in a search and not clicked incrementally lowers that pages subsequent rank by just a little bit each time (Dean, 2013; Levy, 2011). Furthermore, 'dwell time' or the length of time spent on a site once visited also feeds back into subsequent rankings both positively and also negatively (think of the high volume but fast bounce rate of info.com discussed earlier in this chapter). In other words, highly visited sites are more likely to be visited subsequently, and non-visited sites are likely to receive fewer visits.

As already mentioned, Google is motivated to rank 'successfully' to ensure searchers return for future searches (Levy, 2011). Capturing attention feeds back to the Google page rank index thereby increasing the likelihood of gaining an even greater share of internet user attention in future. In this way, the Mathew Effect is a part of the Attention Economy of particular relevance to this research insofar as it adds a circularity to the searcher's actions within the internet-search. The whole system of the internet-search for snoring outputs not just changes in conceptions from less medical to more medical, but in so doing infinitesimally but incrementally increases the likelihood that subsequent searchers are more likely to find exactly those pages that effect that shift. Feedback loops are commonly seen in a specific type of system that is self-steering, sometimes called 'cybernetic' systems from the Greek root word 'cyber' or steering-paddle (Hanson, 1995).

Importantly, feedback loops set up dynamic patterns, and the patterns themselves have implications for medicalisation. That particular web pages using more medical language

become increasingly likely to be encountered by subsequent searchers means that the medicalisation shift itself becomes entrenched through the mechanism of the feedback itself. However, the Matthew Effect leads to entrenchment of the conceptions contained in those pages benefitting from the cumulative advantage. This includes not only the use of language that contributes to medicalisation, as discussed in this chapter, but also any of the conceptions linked to snoring found on those pages. Once established, they will become increasingly entrenched through the mechanism of increased likelihood of encounter. The feedback mechanism can therefore contribute not only to medicalisation, but also to the entrenchment of related conceptions including those that might contribute to stereotypes.

6.8 Positional maps – positions in the data (web pages)

In Chapter Five I used positional maps to show the positions held by human actors regarding who snores (figure 3), and whether snoring might be a problem (figure 4). In the following positional map I show the positions regarding who snores found in the content analysis from the four main web page domains identified in section 6.3 (figure 14).

In the previous chapter I discussed the interaction between searchers and web pages in terms of differences in language used to describe snoring. In section 6.4 above, I also looked at the difference in language use between searchers and web pages they encountered by plotting those positions on a conception-map (figure 14). In contrast to those analyses, the positional map shown in figure 14 below looks behind the use of medical or lay language to explore the broader conceptions held regarding who might snore and what aspects are thought to be important. The positional map for the web pages is constructed using the same axes as the positional map for the searchers. The relative importance of gender defines the vertical axis, and the relative importance of weight defines the horizontal axis to create four quadrants: i.e. that weight and gender both equally define the typical snorer, or that weight is

the most important factor, or that gender is the most important factor, or that neither gender nor weight define the typical snorer.

I have used red ovals to indicate the positions which appeared on the corresponding positional map for the searchers (figure 3) for comparative purposes.

6.8.1 Positional map (searchers) – what type of person snores?

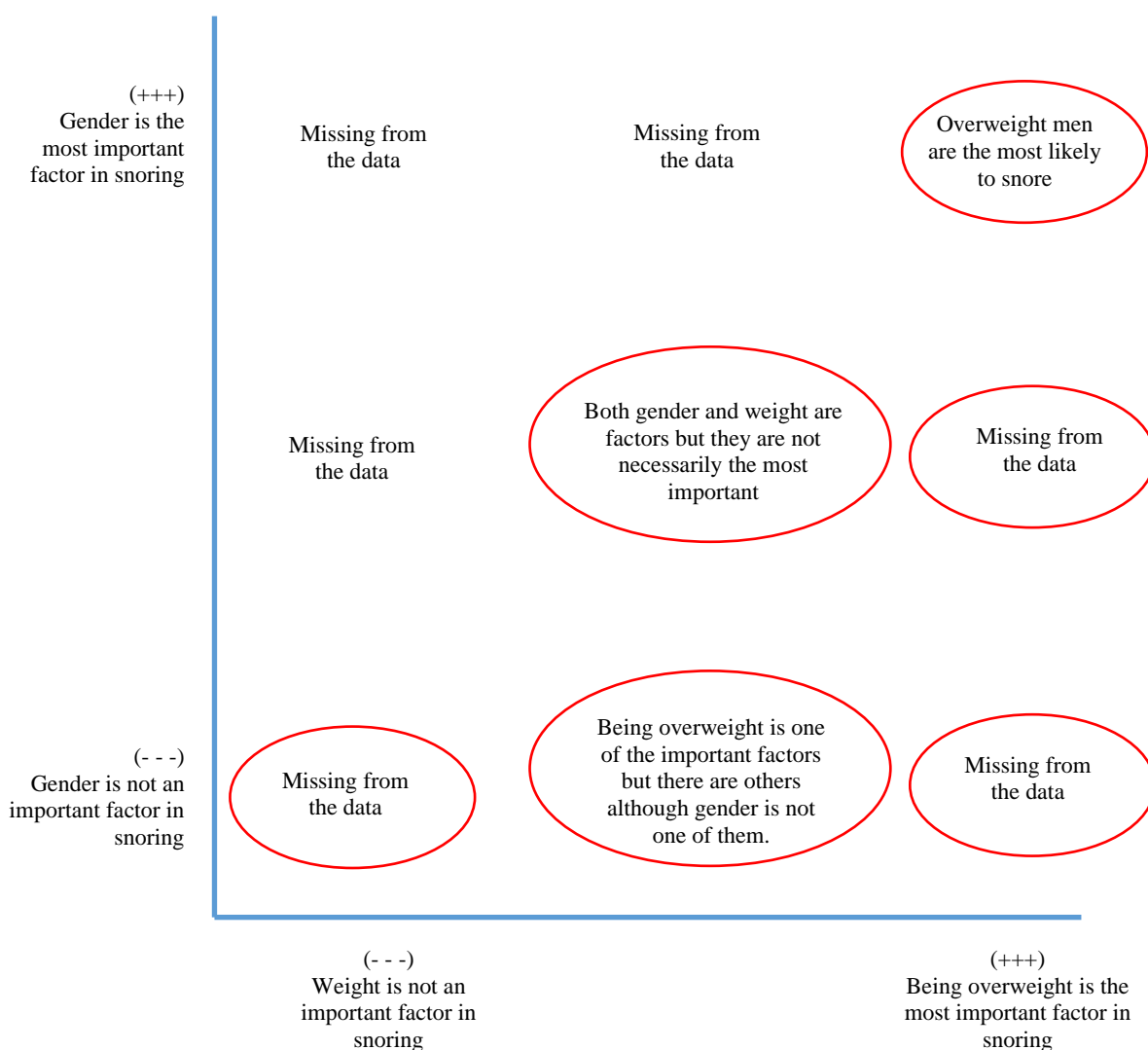


Figure 14 – Web pages positional map of who can snore in terms of gender vs weight

The Sleep Well Clinic page on snoring doesn't describe a typical snorer specifically, and the text is gender-neutral for the most part. This may not be surprising given my own interest in the company. However, there is an oblique reference to gender when discussing a medical study: "in Sweden investigating wives of snoring men found the wives suffered symptoms of sleep disturbance such as poor short-term memory and difficulty concentrating on tasks." The inference is that men are the more typical snorer. Being overweight is mentioned as a consequence of snoring rather than a cause. However, a relationship between weight and snoring is made.

The WebMD page on snoring opens with paragraph that snoring: "occurs more frequently in men and people who are overweight.", whereas HelpGuide opens with: "Just about everyone snores occasionally" but then goes on to say that common causes of snoring include: "being overweight or out of shape", and that "men have narrower air passages than women and are more likely to snore."

The Wikipedia page on snoring makes no mention of gender as a cause of snoring. The focus is predominantly on the structural and physiological mechanisms insofar as snoring is described as being: "the result of the relaxation of the uvula and soft palate." Obesity is mentioned as one of eight different causal factors but is given no particular priority over any of the others.

There is considerable overlap between the positions appearing on the positional map for searchers (figure 3) and the positional map for the web pages encountered during the internet searches (figure 14). No positions occurred on the web page map that did not also occur on the searcher map, but three positions occurred on the searcher map that did not occur on the web page map: 1) that neither weight nor gender are important; 2) that being

overweight is the most important and gender is not important; and 3) that being overweight is the most important causal factor in snoring but there are others and gender is one of them.

The comparison between these positional maps is interesting insofar as it shows that just as there are differences between the searchers and web pages they encounter in terms of use of medical language, there are also differences in some of the conceptions about who might be more likely to snore. The set of conceptions relating to gender and weight as causal factors for snoring should be less likely to be necessarily linked to medicalisation than ‘use of medical language’. However, they are conceptions represented on pages that enjoy a cumulative advantage in the Attention Economy via the feedback mechanisms of the Mathew Effect. This means that these additional concepts, along with the use of more medical language which I have argued contributes to medicalisation, are also more likely to be transmitted to subsequent searchers through collateral association. These additional concepts and stereotypes are along for the ride.

6.9 Medicalisation at the meso level

Following Halfmann’s analytical schema introduced in the previous chapter, it is useful to focus on the meso-level of medicalisation within the internet-search whole system as revealed by the analysis thus far. Indeed, it is at this level that the micro-level effect of conception shifting described in Chapter Five is not just identified, but in some part explained and given legacy. Any given searcher encounters pages, but they are not a random assortment of all pages relating to snoring, they are ranked and sorted and served up. The ranking process is a complex enactment of information/attention transactions between Google and various page hosts, advertisers, and sponsors on the one hand, and the searcher on the other. But not just individual searchers – any searcher using that keyword is the target of the ranking system and in that sense ‘searchers’ form one of the meso-level groupings in the

whole system. Furthermore, the pages that are presented are influenced in part by all the previous searches for those specific key words. The selection of a sub-set of those offerings in the current search go on to influence subsequent searchers and, in that sense, the meso-level groupings in the system need to include ‘past-searchers’, and ‘future-searchers’ as well.

6.9.1 Discourses

As discussed in the previous chapter, the obvious discourses particularly at the micro-level of individual experience, are between the page providers and the searchers encountering their web sites. However, the discourses of greatest relevance at the group-level are not those texts presented by the pages per se, but rather the multi-layered dialogue between the search provider service on the one hand, the various organisations represented by domains who host candidate pages on the other, and the searchers (as a group) on yet another. It is a complicated and multi-faceted communication with different motivations on the part of the various participants, and sometimes conflicting (but other times harmonious) intended outcomes assigning different meanings to the same texts and images comprising the web pages themselves. For example, Google needs to be perceived by searchers as a reliable source of relevant rankings so as to retain them for future searches. Without a captive audience, Google would have no attention to sell to web site providers in the form of their multi-billion dollar AdWord product (Levy, 2011). Therefore, Google needs to discern what searchers will deem relevant, not through their stated preferences, but as displayed by their actual search behaviour and the aggregated search behaviour of everyone who has ever used Google search. So, a web page to a searcher acts as a source of information which has been presented by Google as being relevant. However, if the searcher deems it to be of low relevance they will click away, even though it met all the criteria for high relevancy based on the initial search term. Google is constantly modifying and adapting the ranking algorithm in

response to such behavioural cues – the discourse between searchers and the search provider, leading to ever more elements affecting the ranking of pages. For example, since the searchers in my research were using search terms for snoring, including causes and ways to stop snoring, several of them were offered up the web site of a local sleep clinic not because they specifically asked for one, but because of the aggregated behaviours of previous searchers using similar search terms.

There is another discourse between those organisations wishing to attract traffic who need to conform to Google's page ranking, but who don't know exactly what the ranking criteria are at any given time. The language spoken by Google is of course the outcome of the page ranking system in the form of live rankings for specific search terms of perceived interest to the organisations hosting the pages. The language spoken by the page providers is the specific tunings they incorporate into their pages to increase their ranking through SEO activities. The complex interplay between page providers, search providers, and searchers takes place not just overtly through the visitation of pages displayed during a search, but also beneath the surface as page content and design is modified in response to and in anticipation of the real-time sorting and ordering of information on the one hand, and audience attention on the other. This has an impact on the type of site most likely to be presented to any given searcher, and as discussed in the next section, in the case of snoring might provide some explanation as to why pages ranking highly in the internet-search for snoring use more medical language than the lay people encountering them in their search.

6.9.2 Practices

The practice of search engine optimisation might have important implications for medicalisation of snoring. It is entirely possible that organisations wealthy enough to pay for professionally designed and maintained sites are also those that are most likely to use

professional language. The professions in society likely to talk about snoring are also generally medical in nature – there are not a lot of non-medical professions related to snoring.

Some pages such as WebMD are designed to attract attention to sell advertising, and others such as HelpGuide and Wikipedia attract attention and therefore could sell advertising but chose not to. Still others, such as Sleep Well Clinic, wish to attract attention to sell their own services. Search engine optimisation is the unifying criteria against which all those providers of web sites must contest for attention. The specific motivation for wanting to attract attention is in many respects irrelevant when considering the whole-system of the internet-search for information about snoring.

That there is an Attention Economy at work means that there is a constant arms race between different providers trying to improve search ranking on the one hand, and between Google and the providers trying to discern the specifics of the ranking system for exploitation on the other (Davenport & Beck, 2001). That this results in sites with high attention ‘stickiness’ is arguably of benefit to the searchers, but that it might also contribute to a disconnect in terms of language use between sites and searchers which in turn sets up a situation wherein medicalisation in the form of conception-shifting might occur not because of an intrinsic desire to claim snoring for medicine, but rather as an accidental by-product of the battle for attention in the internet’s Attention Economy.

Furthermore, since the Google page-ranking system seems to include criteria based on searcher activity in terms of clicking some links and not others, and their overall dwell time once they have followed a link, a feed-back system is created which rewards some successful sites with incremental increases in ranking increasing the likelihood of success for future searches, and punishes other unsuccessful sites with a reduced ranking and associated reduction in the likelihood of success in future searches. This process of cumulative

advantage, the Mathew Effect, closes the loop and links any given instance of the internet-search and associated medicalisation effect, with both future searches and past searches. The actions of the individual searcher as an element of the system extends outward and becomes an emergent contributor to perpetuating the medicalisation effect of the system at the group level.

6.9.3 Identities

The identities of the meso-level groupings contributing to the internet-search are dominated by one player – Google. It is through Google that people encounter the various pages of interest, and without which they might as well not exist. It is interesting that such diverse organisations as the wholly not-for-profit information provider sites such as Wikipedia, and HelpGuide on the one hand featured just as prominently in the research internet-searches as the advertising funded marketing vehicles of the biopharmaceutical industry such as WebMd. Furthermore, a comparatively infinitesimally small local medical practice was able to feature just as highly shows that the specific identities appear to play a small part in the whole system workings of the internet-search. It is important, however, that all those organisations, albeit for differing reasons, each have reasons to be using medical language to talk about snoring on their respective sites.

The page-rank of the pages themselves is of greater importance than the underlying organisation insofar as the aspects of those various organisations lend them to high ranking and therefore wider exposure of that medical language with the concomitant contribution to the medicalising effect described in chapter five.

6.10 Conclusion

Analysis of the pages encountered across all searches in my research in terms of background, language use, and positions showed that as a group they generally contained more medical language than lay language. It was rare to encounter a page that exclusively used lay terminology to describe snoring. I analysed the average positions of all the individual web-pages in each search weighted according to proportion of captured attention to produce an overall page position for each search incorporating both attention and location within the conception-space. I compared those overall page positions to the pre-search and post-search positions of the individual searchers and showed the ages were grouped in a more medical region of the conception space than the pre-search positions of the searchers, but that the searches moved into that region after their search. This confirmed the finding in the previous chapter, but also highlighted that the pages were using a fundamentally different degree of medical language than the lay people encountering them.

Four domains captured the majority of the attention across all the searches – Wikipedia and Helpguide which are both not-for-profit information providers reliant on donations for revenue, and WebMD which sells visitor attention mainly to the biopharmaceutical industry, and Sleep Well Clinic which is a local medical clinic specialising in treating snoring, OSA, and insomnia. All these sites had different reasons for using medical language, but nonetheless they all shared that feature in common.

Investigating why this might be so drew attention to the role of Google in the so-called Attention Economy as a broker of searcher attention on the one hand, and web-page relevance in the form of page rank on the other. The sometimes competing and sometimes synergistic dynamic within that transaction, coupled with the interactions with the Google page ranking algorithm provides a possible explanation as to why pages with higher medical

language feature so prominently in the internet-search for snoring. By participating in this way, I further conclude that Google, the page ranking algorithm and the Search Engine Optimisation industry are all important actors in the internet-search for snoring and therefore contributory elements in the medicalisation of snoring.

Finally, I discussed how the inclusion of searcher responses to a given search are fed back by way of the ranking algorithm to have an impact on the likelihood of pages being re-encountered in subsequent searches. This feedback loop, a common feature of cybernetic or self-steering systems, confers cumulative advantage, and is known as the Mathew Effect. In the next chapter, I will explore the impact and implications of the Mathew Effect further in a discussion of the macro-level components of the internet-search for snoring when considered as a whole system.

Chapter Seven: Dynamic Patterns of Medicalisation on the Internet

7.1 Introduction

In chapter Seven, I will discuss some of the implications for medicalisation and the internet-search suggested by the findings of the two previous chapters. In particular, I will pay close attention to the dynamic aspect of medicalisation – i.e. that any process (such as medicalisation) necessarily contains the idea of change-over-time (or ‘process’) and is therefore dynamic. Is there anything then about the dynamism of medicalisation that can be explored further when considering the internet-search for snoring as a whole system?

7.2 Horizontal dynamism: changes in time along levels

The internet-search for snoring provides insight into the multi-level interactions of the process, and dynamism, of medicalisation since as a whole system it contains micro, meso, and macro-level interactions. At any given social level medicalisation is a process that can either strengthen the conception that a phenomenon belongs under medical authority, or it can run in the opposite direction and weaken that conception. ‘De-medicalisation’ is sometimes referred to in the literature (Clarke & Shim, 2011) as distinct from medicalisation, but Conrad and others include demedicalisation within the overall theory of medicalisation (Conrad, 2005; Halfmann, 2012) and even more recently, re-medicalisation (Correia, 2017).

Whether the process strengthens or weakens medical authority over a phenomenon, medicalisation can be thought of as having horizontal dynamism insofar as it produces change-over-time occurs along any of those social levels. However, since medicalisation can run as a process at different levels of social organisation within whole systems, it is possible that medicalisation could be strengthening the medical conception in one of those levels, and simultaneously weakening it in another. Conception-shifting activity at the level of individual

interaction might strengthen the medical authority over a phenomenon, whereas simultaneously at a group level it might be being weakened within the same whole system (Halfmann, 2012).

As discussed earlier, in the case of the internet-search for snoring I found that at the micro-level of individual interaction through the time-course of each internet-search, the horizontal dynamism was in the direction of increased medicalisation. Figure 9 in section 5.6 summarised the micro-level medicalisation effect by representing the language shift of each searcher as a vector. That all the vectors were towards the upper right quadrant further supports the finding that the horizontal dynamic of the internet-search at the micro-level is to strengthen the medical conception of snoring.

However, the straight lines representing the vectors in figure 9 are a simplification of each searcher's journey through the conception-space. Zeno's famous arrow paradox from antiquity illustrates the difficulty of representing movement wherein he points out that for an arrow to arrive at a target, it must first cross half the distance from the archer towards the target. However, to cover half the distance, it must first cover a quarter and to cover that, it must first cover an eighth, and so on dividing ever smaller divisions of time into smaller and smaller sections each one requiring first, some prior movement however small. In this description, the arrow can never actually leave the bow and therefore all movement must necessarily be an illusion of infinitely small moments of stasis. And yet patently our senses tell us that movement is more than illusion, since there the arrow sits quivering in the bull's-eye.

Pertinent to this thesis is the work of French philosopher Henri Bergson, cited in Massumi (2002), wherein it is noted that it is only after the arrow hits its mark that the real trajectory might be plotted (Massumi, 2002). The points or positions appear retrospectively

working backwards from the movement's end, and the arrow is not in fact immobile so long as we consider the movement as a unity rather than as divisible. One division, according to Bergson, and the entirety of the movement is challenged. This philosophy sits well within the whole-system theoretical framework of my research and can be related to the movement of conceptions just as appropriately as it is to the movement of physical objects. If we try to divide a conception shift into a specific moment, it turns out to be infinitely divisible *ad absurdum* and therefore any sense of actual movement is rendered static. On the other hand, if only the start and stop points are considered in isolation, the richness of the movement itself is also lost. It is only when the conception has shifted, and the end-point reached, that one can examine the trajectory in its unity and richness. By adding sequence to the individuals plotted within the conception space pertaining to medicalisation of snoring, I sought to capture something of that unity of movement and therefore capture the dynamic of the medicalisation process at any given level. In other words, the horizontal dynamism at the micro-level is not represented so much by the arrow or vector shown in the individual conception maps, which instead represents the cumulative direction, but rather by the individual paths which capture the tug and pull of different individual interactions at different sequential points in the whole-system of each internet-search.

7.2.1 Conception-tracking the individual paths – horizontal dynamic patterns at the micro-level

As Halfmann (2012) pointed out, even within an individual, the conception that a phenomenon belongs in the medical domain can wax and wane – sometimes stronger, and sometimes weaker and sometimes reversing direction. The individual pathways through the web-pages comprising each search can be thought of as representing that dynamic, sometimes moving towards a more medical conception and other times further away. Of

course, the conception space is two-dimensional, and not one-dimensional. Therefore, the visualisation technique I described as conception-mapping allows us to see not just the pendulum motion described by Halfmann, but instead a rich and wandering path through the conceptual landscape. Everyone takes a different road.

For example, in figure 15 below, the pathway followed through the conception space by TT (blue) differs from the pathway followed by GS (red). TT moved between widely different levels of medical vs lay language as represented by vertical movement, whereas GS stayed relatively constant as represented by less vertical movement (figure 15).

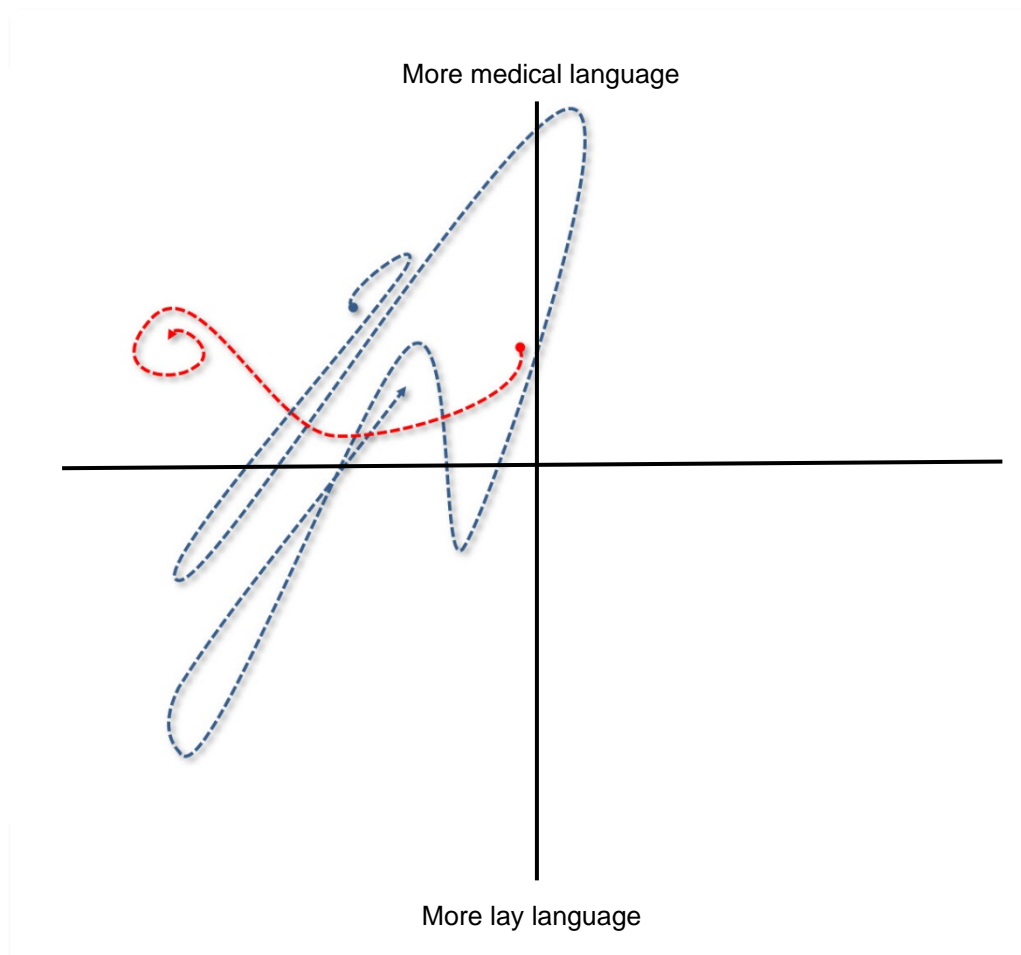


Figure 15 - Individual paths for TT and GS

Although both internet-searches ended with a medicalisation shift at the individual level of interaction, each had a different dynamic within the search. The establishment of a two-dimensional conception space provides further nuance than just waxing and waning influence, but also how much variation in exposure to pages with more or less reference to OSA or use of medical language. Was it consistent, or wildly varying? Was it mainly medical language, or linkage to OSA that was involved in the shift? Again, it is the pathway revealed, not merely Halfmann's pendulum of influence.

In the example above (figure 15) GS was exposed to a consistent level of medical language throughout the search, whereas TT was exposed to varying levels of medical language. Both were exposed to similar use of OSA, but the combination of medical language and OSA references was a far more variable and wandering path for TT than for GS.

The medicalisation dynamic, therefore, was different for each searcher even though in both cases the overall result was largely the same i.e. a shift towards a more medical conception of snoring. This visualisation supports Halfmann's description of medicalisation being a process that occurs with various strengths and sometimes even in different directions simultaneously within a given level of interaction but goes further – it adds a richness that reinforces the individuality of micro-level processes within the internet-search whole system. At any moment, there will be an overall net movement towards or away from a more medical conception. Even in the case of the internet-search for snoring, the moments immediately after the search are captured by the vectors in figure 9 which can be thought of therefore as representing the net effect, but even then, it must be remembered that the effect might fade over time, or even reverse. I made no measure of persistence of effect, but given the feedback mechanism intrinsic to the search engine algorithm discussed in the preceding chapter, for the purposes of my own investigation an assessment of effect persistence at the level of the

individuals is not critical since the feedback has already taken place as soon as a searcher clicks a link (or not). Although important and inarguably interesting, exploring the persistence of the effect at the level of the individual is beyond the scope of this research.

Of immediate interest, however, is whether further insights can be gained by looking at the horizontal dynamism operating at the meso or group-level of the web pages comprising the internet-search for snoring. At the group level, is there any evidence to suggest change over time? Fortunately, as discussed in the preceding chapter, the entire history of changes to the Wikipedia page on snoring (identified in Chapter Six as one of the four top page domains in the Attention Economy pertaining to the internet-search for snoring, as experienced by my participants) can be viewed and analysed. I therefore used the Wikipedia page on snoring as a case study of medicalisation over time through as indicated through the same language analysis and conception mapping as I used for the individual searchers described in chapter five.

7.2.1 Medicalisation of Snoring on Wikipedia –horizontal dynamic patterns at the meso-level

The conception-mapping method used in my research combined with the history viewing feature of Wikipedia provides insights that go beyond the number of edits over time. It allows me to position the Wikipedia page on snoring not just as it was encountered during the several internet-searches conducted during the data gathering stage of my research, but also as it has been situated within the conception space over time.

I took three samples of the Wikipedia page on snoring from the page archive and plotted the position of each page using the same conception mapping technique I used for the internet-searches described earlier. In figure 16 I show the resultant conception map for the archived Wikipedia pages. It shows the movement of the information on the Wikipedia page for snoring through the conception-space of lay versus medical language, and references to

OSA versus references to snoring. On this map, the size of each bubble is proportional not to attention, but to the size of the article at that time. It is important to not confuse the horizontal position with equal increments of time. This is a conception-space, and although sequence is retained it is not against a fixed time axis.

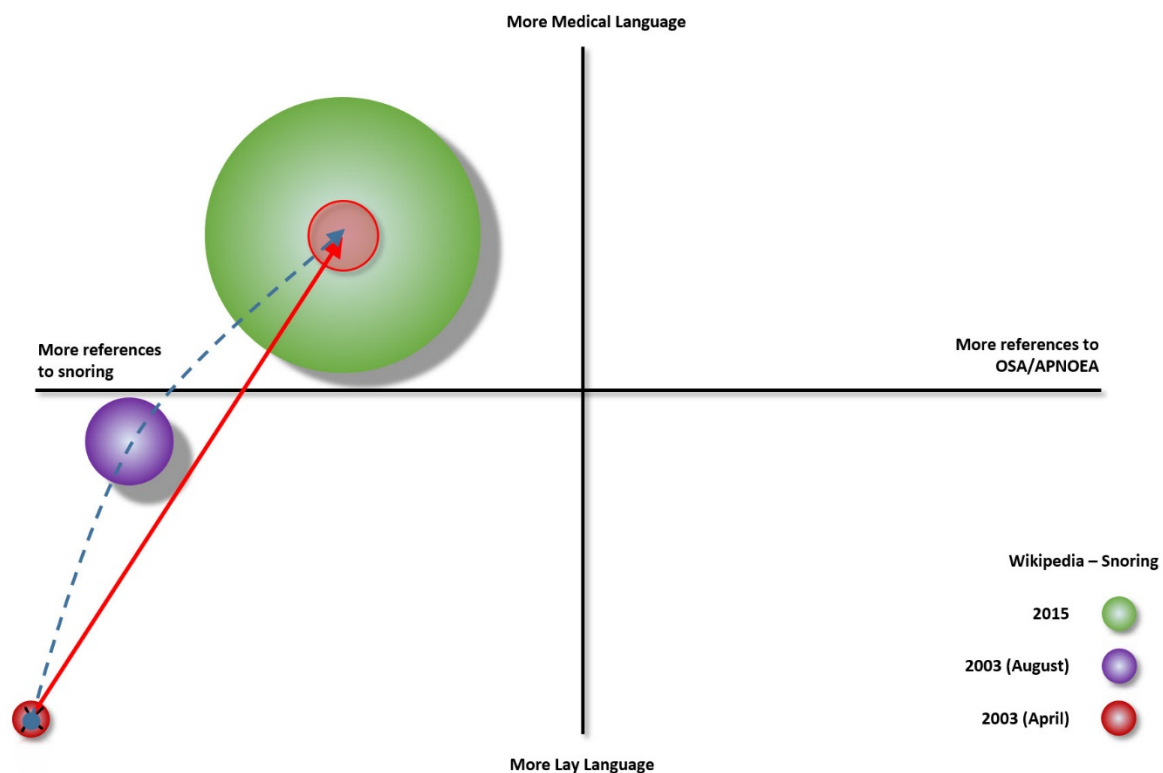


Figure 16 - Conception map for three Wikipedia:snoring revisions (size of bubble denotes content size of each revised page)

In this case I used just three samples, April 2003, August 2003, and June 2015, so temporally the first movement happened extremely quickly and then the third occurred subsequently over more than a decade. Although showing three points in time, it would be a mistake to confuse the conception map with a traditional time series. Movement on the x-axis shows a shift in location within the conception space defined by the map, just as three locations on a geographical map would show places a traveller had been, but not when they had been there without using an additional schema. In this case, the time is indicated by the

colour of each bubble. It is the movement through the conception space that is of particular interest to the scholar of medicalisation as it is movement through the space that represents shifts in conception, i.e. (by definition) medicalisation itself.

On the conception map shown in figure 16, the blue dotted line represents the trajectory of medical language used on the site as it changes with each revision (more points could be added for greater detail or resolution of those changes). The red solid line represents the vector of change and can be thought of as the cumulative effect of all 1,210 revisions over 12 years. For both lines, the arrowhead indicates the overall direction of each movement. That the red vector is to the right of the start position shows that more references to OSA are contained in the 2015 version than the original entry in 2003. That the vector is upwards shows that more medical language is now used.

In chapter six I have already described the earliest changes to the Wikipedia page. The entirety of the initial 2003 entry for snoring drawn from the 1913 edition of Webster's Dictionary uses formal language but is not overtly medical. Compare with the 2015 entry which states in the opening paragraph that: "snoring during sleep may be a sign, or first alarm, of obstructive sleep apnea (OSA). Researchers say that snoring is a factor of sleep deprivation" and goes immediately on to list "signs and symptoms" and "treatments". The vector revealed by plotting the locations of each revision on the conception map therefore, cartographically represents the medicalisation of conceptions of snoring, as expressed by Wikipedia, over twelve years.

Given the underlying mechanism of open public access and crowd-sourced editing and constant revision of Wikipedia articles, it is tempting to suggest that the Wikipedia portrayal of snoring and the vector of medicalisation I have described might also represent the medicalisation of snoring in wider society over the same time period. However, it must be

remembered that the starting point on this conception-map is the first Wikipedia article which was itself taken from the 1913 Webster's dictionary, and that a shift in society might be likely not just over the most recent twelve years, but rather over the last century from an entirely non-medical conception in 1913 through to a heavily medicalised conception in 2015.

Remember the newspaper articles on snoring from the same era I described in chapter six would add further evidence to support the shift suggested by my analysis of the Wikipedia archive. Of importance, note that the very first revision (April 2003) shown on the conception map introduced a large shift towards a more medical representation straight away, which suggests that if this map reflects movement in conceptions in an arena outside of the internet-search, the concept shift actually occurred throughout the period between 1913 and 2003. However, a deeper analysis of the relationship between a dictionary entry in 1913 copied to Wikipedia in 2003, and how subsequent changes in the Wikipedia entry on snoring might reflect a wider societal shift in conceptions is not possible here.

The conception map shown in figure 16 is, however, a visualisation of the horizontal dynamism occurring at a higher level than the meso or group-level of the web pages within the whole system of the internet-search for snoring since it represents an aggregated conception that might reach beyond the site itself. In that sense, I offer figure 16 as a conception map tracing a macro-level change within the context of the internet-search for snoring. The relationship to the search is through the dominance of Wikipedia within the Attention Economy of the internet-search for snoring, as enacted by my participants. I am aware that the term 'macro' can mean many things depending on academic discipline, and I use it here only by way of suggestion. It does, however, represent the highest level of analysis within the internet-search whole system as I have examined it here.

Analytical nomenclature notwithstanding, the Wikipedia conception map in figure 16 shows that at the highest level of analysis there is still an overall shift towards a more medical portrayal of snoring. Importantly, it also shows that the shift was initially rapid, and has since slowed.

Having discussed horizontal dynamism along each of three different levels within the whole system of the internet-search for snoring, I now turn attention to the interaction between those levels. How might micro-level individual effects interact with meso-level group effects in terms of strengthening or weakening the medicalisation effect of the whole system? How might either of those levels communicate with the macro-level? Again, a detailed exploration of these larger issues is beyond the scope of this research, but some further ideas are suggested by the findings describe thus far, starting with vertical dynamism.

7.3 Vertical dynamism of Medicalisation: levels interacting with levels

By vertical dynamism, I am referring to the way micro-medicalisation might influence meso-level medicalisation (or macro-medicalisation) within the internet-search whole system. How might an individual movement towards a more medical conception of snoring (brought about by participating in an internet-search) affect the higher level of web pages and site domains through the mechanisms of the internet-search whole system?

At the meso-level of group interaction discussed in Chapter Six, I found that the pages with the greatest share of attention used more medical language. I concluded that over time, Google's search-rank criteria preferentially selects for pages using more medical language. The horizontal dynamism at the meso-level as described in the previous section looking at the Wikipedia page for snoring suggests increased medicalisation. However, interaction between levels adds an element of complexity typical of whole systems.

7.3.1 Mandibular Advancement Splint – an example of vertical dynamism

Internet pages describing snoring treatment devices such as Mandibular Advancement Splints (MAS) provide opportunity for vertical dynamism. In this section, I will describe an example drawn from my research.

Four of the searchers encountered web pages specifically dedicated to oral splints (mouth guards) designed to advance the lower mandible to stop snoring. Most of the participants mentioned oral devices in their post-search discussions. A prominent Google advertisement that appeared in searches with keywords related to mouth splints in New Zealand came from Harvey Norman, a chain of retail stores selling furniture and household appliances, although also in recent years, personal healthcare products. The Harvey Norman Google ad in New Zealand promotes an anti-snoring mouth splint for sale directly to the public via their online catalogue. On the web page linked to the advertisement the device is described as being a “Class 1 medical device designed to treat mild to moderate sleep apnea[sic]” and that it enjoys “Clinically Proven Results” having undergone “extensive clinical studies” “proven to treat mild to moderate Sleep Apnea and reduce symptoms”(https://www.harveynorman.co.nz/personal-care-and-health/health-and-beauty/apnearx-sleep-apnea-snoring-aid.html).

On the one hand in this example, the device is being described using medical language and terminology such as “treat” and “symptom” and “clinical studies”. On the other, it is being offered for sale through an online sales portal from which a person can also purchase everyday household items. The advertising strengthens the medicalisation of snoring at the micro-level of the individual encounter by using medical language and concepts to describe snoring, but simultaneously weakens it at the meso-level of organisation due to the distancing of the product from any medical process or authority for access and

moving it into the realm of household appliances. An appliance store is not a medical clinic. The individual will perhaps think of snoring in more medical terms given the language and concepts they encounter on the site, but at the same time a device that was once only accessible through oral specialist services is being accessed and promoted online through an appliance chain not normally associated with delivery of medical care thereby potentially weakening the medical authority over snoring. Different tensions and directions for any given individual encounter, but also an effect at the level of groups and organisations.

Further complexity is added when the interaction is considered in the context of the Attention Economy and the Mathew Effect. In this example, individual encounters that shift an individual's conception of snoring towards a more medical conception also create an interaction between the levels. The act of 'finding' that site during an internet-search, for whatever initial reason, nonetheless adds incrementally to the overall page ranking for the site thereby increasing the likelihood of subsequent encounters with that site, and simultaneously suppressing other sites. The individual action has an impact on the group level of all the possible web pages involved in the internet-search for snoring. This feedback through Google page ranking factors has already been discussed earlier, but I mention it again here as an example of vertical dynamism within the internet-search whole system.

However, when there is an online shopping cart involved, even further multi-level interactional complexity enters the system. In the act of clicking 'add to shopping cart', an individual provides positive feedback to the organisation in the form of a successful sale that reinforces the company's decision to continue to advertise in this way and to allocate financial resources accordingly. So, in this example where there is a medicalising effect of placing the mandibular advancement splint (and therefore snoring) in the arena of medical concern, simultaneously there is a demedicalising effect of a non-medical appliance store

being the sales outlet. But the individual encounters are reinforcing the status quo through maintaining high search ranking on the one hand, but simultaneously also providing reinforcement through sales to the outlet chain thereby encouraging them to continue advertising in the same vein. Of course, not finding the site, or finding the site but not making an online purchase are also both entirely possible forms of negative feedback operating between levels that are also occurring simultaneously with the others.

Therefore, any given encounter, and particularly those that lead to an online sale, are part of a dynamic process operating vertically between the levels to strengthen the medicalising effect on individuals, but at the same time strengthening the demedicalising effect of an appliance chain selling ‘treatment’ devices previously only accessed through specialist medical services. Remember also that this is one example of encounter, but every individual encounter between a searcher and a web page within the whole-system of the internet-search for snoring will be equally complex in terms of the vertical dynamic patterns collectively contributing to the horizontal dynamic patterns at each level. It is the aggregation of all those patterns that sum together to produce the overall medicalising effect of the internet-search for snoring when considered as output of a whole-system. Do these insights provide any sense of what that output might be in the case of snoring?

7.4 The Dynamic Pattern of the Medicalisation of Snoring – the macro-level output of the internet-search as a whole-system.

In the beginning, information and concepts regarding snoring appeared in piecemeal on the internet. Preconceptions, stereotypes, special interests - all competed equally for attention. However, any factor that conferred even a marginal advantage to a web site in terms of page ranking would start to have an effect in terms of the Attention Economy, and the Mathew Effect would start to amplify the success of some sites over others.

The factors conferring advantage could be as diverse as the use of eye-catching imagery, or the effective financing of design, or funding of paid advertising, or association with ‘trusted’ institutions and authorities. Whatever other factors might be at work to confer attention-grabbing success, included amongst them was the ranking success of those pages presenting information about snoring using more medical language than that used by lay-people. I do not here suggest that the higher ranking was necessarily because of the use of more medical language, but that use of more medical language was associated with pages performing well in the Attention Economy. The evidence for this suggestion is that still the pages performing best at capturing attention in my research used more medical language.

Once the advantage began to take effect, there would have been a relatively rapid period within which out of the millions of possible pages that discuss snoring in some form, a subset of successful pages came to dominate the search engine rankings through the mechanism of cumulative advantage. At this point two alternative patterns might have established. In the first, the cumulative advantage might have applied to a type of page and hence, the appearance of different pages with ever increasing use of medical jargon would continue without end so that eventually the top ten Google sites encountered in the internet-search for snoring would become dominated exclusively by medical journal articles. That this is not the case suggests the alternative path was followed.

The alternative path would have led to the use of increased medical language, but that the use would at some point stabilise since the successful specific pages would become ever increasingly successful relative to all the other pages through the feedback loops of the Mathew Effect. Therefore, the language used on those pages would become entrenched and ever more likely to be encountered. At this point, the success of the pages themselves would become the dominant factor in subsequent encounter rather than the specific content,

although of course the pages would be delivery vehicles for that content and encounter with searching individuals. This period would represent a steady-state during which any conceptions on the pages would perpetuate and persist. It would become increasingly difficult over time for change to be introduced or to take hold, unless through some profound step-change that was of sufficient impact to overcome the entrenching inertia conferred through the relentless feedback of the search engine ranking algorithms discussed earlier in this thesis.

This model of the macro-level medicalising effect of the internet-search for snoring is offered as one possible interpretation derived from my analysis. The pattern of the Wikipedia page on snoring (figure 16) happens to follow the pattern I have described in this section but cannot be offered as evidence since it only maps the single Wikipedia snoring page. However, given Wikipedia's constant (albeit biased) 'sampling' of knowledge as reflected on the internet, it is certainly suggestive.

The model does suggest potential pitfalls and offers warnings as to where mistakes and irregularities in the collective application of conceptions of snoring might present problems at a group level, and certainly at the micro level of the individual.

7.5 Consequences of the patterns

There are some consequences suggested by the proposed model of the dynamic pattern of medicalisation. Although tempting to project beyond the confines of the internet, however, I must do so cautiously. An important consequence would be that mistakes and irregularities can easily be encoded in the conceptions at the early stage. But once conceptions start to shift, the associated mistakes would also become increasingly difficult to change even in the face of evidence providing alternative views, due to the entrenching power of the Mathew Effect. In other words, once an idea took hold it would be hard to get rid of it, even if it were socially advantageous to do so. This could have real world effects.

In the case of snoring, once the medicalisation process got under way, the early conceptions associating snoring and OSA with middle-aged overweight men went with it. Those early stereotypes were still evident in my own research as shown by the positional maps describing who was likely to snore (figure 3 in chapter five). Despite nearly thirty years of evidence to suggest women can snore, and young people, and skinny people as discussed in chapter two, the stereotype has become entrenched.

This is true in broader society, but equally true on the internet. Recall the situation I described in the introduction of overweight pilots and drivers being compelled to test for obstructive sleep apnoea for no other reason than that they are overweight (a contentious concept in itself). Contrast with the skinny young woman who can't access treatment as easily as a man, even if she suffers all the same symptoms and risk factors for obstructive sleep apnoea (Lindberg et al., 2017)

Although these entrenched stereotypes are not themselves brought about by the internet-search, nonetheless the internet-search and the dynamic patterns of medicalisation arising from the intrinsic mechanisms of search contribute to the process insofar as the internet models the society from which it is generated and sustained (Levy, 2011), The real people participating daily in the internet-search for snoring are changed by the search, but importantly, their enactment of the search also changes the search itself for future searchers.

7.8 Conclusion

For this research, I adopted a deconstructed heuristic whereby medicalisation – the movement of everyday phenomenon between lay and medical domains of authority – is broken down into two inter-related component levels: micro-level shifting of conceptions held by individuals within society on the one hand, and meso-level shifting of conceptions held by organisations and institutions within society on the other. I suggested in this chapter

that the interaction between those two levels contribute to an overall medicalising effect through feedback loops contained within the internet-search and Google's page ranking algorithms. I showed a conception map charting changes in the Wikipedia page for snoring, and suggested this might constitute some evidence of an overarching medicalisation in society, reflected in the Wikipedia page itself.

In the deconstructed paradigm, bi-directional shifting away from or towards a medical conceptualisation of a given phenomenon rather than a lay conceptualisation, is understood to occur continuously within and between both those component levels. But further, the additional dimensions of the conception maps added further richness by revealing not just a sliding pendulum of medicalisation but rather pathways through the conceptual landscape.

The gestalt of all those possible shifts contributes to the macro-level dynamic social process of medicalisation. Sometimes the medicalised conception will strengthen on one level whilst simultaneously weakening at the other or at other times both levels moving in the same direction. Finally, I suggested that an implication of the overall dynamism might be a rapid onset of medical conception along with errancies and 'baggage' which subsequently become entrenched and difficult to discard. Real world consequences of the entrenchment phase might include stereotyping such as those associated with snoring and obstructive sleep apnoea.

Chapter Eight: Conclusion

8.1 Introduction

There is a decision-making process whereby individuals and/or society determine under which jurisdictional authority snoring properly resides. Should snoring be considered a simple everyday phenomenon enjoyed by some or suffered by others but about which nothing really can, nor need be done? Or is snoring instead a risk-factor for diseases such as diabetes or congestive heart failure? Is snoring merely a noise made by some people during sleep, or is it a life-threatening condition on the spectrum of disease which also includes upper airway resistance syndrome and obstructive sleep apnoea? In the first case, snoring belongs in the lay domain, and in the second it belongs in the medical domain. That snoring has been shifting over the last several years from the lay domain into the medical is not in dispute. However, understanding some of the mechanisms and implications arising from the medicalisation of snoring are important especially in the face of social responses such as mandatory medical screening based on body-mass index (BMI) in industry sensitive to the perceived risk of untreated obstructive sleep apnoea.

Medicalisation – the shift of everyday phenomena into the medical domain – is usually discussed as a macro-level social process but can also be thought of as occurring on the micro-level in the pre-diagnostic decision making performed by individuals considering whether they should go to a medical expert for a given problem, or to a non-medical expert instead. I chose to focus my research on individuals who were each asked in a pre-search interview what they already knew about snoring, and then recorded while they searched the internet for information about snoring, and then finally re-interviewed after the search wherein they were asked what they knew about snoring having just completed an internet-search.

The internet-search itself was the subject of my study, but I considered the internet-search as a whole system with several human and non-human actors including the searcher, the web pages they encountered, and the search algorithms and search engine services they used to enact the search. I developed a novel method, conception mapping, to track movements of individuals through a conceptual space over time. I recruited volunteers to enact internet-searches for analysis using conception mapping and recorded their searches for information on the internet about snoring. I analysed the recorded internet searches using the modified cartographic technique described above. Specifically, the conception maps I used for my field research visualised the relative use of lay versus medical language used by web pages encountered during a search for information about snoring. The resultant conception maps also visually represent the start and finish concepts held by each searcher, thereby tracking the path each one took through their specific search, and the attention spent on each of the pages they encountered therein. In later chapters, I refer to the plotting of movement in conception maps as ‘conception-tracking’. Each individual conception map therefore represents the direction and magnitude of any shift towards (or away from) a relatively more medical concept of snoring as a vector specific to each participant. This exploration of the process of medicalisation as a micro-level individual phenomenon provides insights into the role the internet might play in pre-diagnostic ideation and concept formation which can be thought of as an individual-level form of self-medicalisation, a term used by Fainzang, (2013), although not quite as I use it here.

My research showed that people searching the internet for information about snoring each came away from their search with a more medicalised conception of snoring than that held when they began the search. They used more medical jargon such as anatomical terminology to describe snoring after the search than they had beforehand and described problems of a medical nature such as cardiac disease and obstructive sleep apnoea being

attributable to snoring rather than social problems such as disturbing a bed partner.

Furthermore, non-medical methods to prevent snoring given during the pre-search interview such as weight loss, modification of alcohol intake, or elbows in the ribs shifted from non-medical suggestions to various surgical procedures and a variety of medical devices such as mandibular advancement splints and long-term positive airway pressure therapy. The consistent post-search shift in the conception of snoring from less medical to more medical demonstrated in this research strongly suggests that the internet-search is an active agent of micro-scale medicalisation of snoring – i.e. medicalisation at the level of the individual.

The individual conception maps from the initial field research were then compiled into a single collective conception map showing the relative share of attention captured by each of the pages encountered by all the internet searches comprising the study. Secondary analysis centred on the meso-level organisations behind the most encountered pages. Consideration was given to the forces motivating those organisations and institutions to publish their pages and a description of the attention economy thus revealed (Davenport & Beck, 2001; Bueno, 2016) was developed.

Subsequent secondary analysis focussed on the non-human actors in the internet-search as a whole system – the web pages, domains, and the search engine algorithms used by Google. Discussion centred on possible mechanisms for why those particular pages appeared in the searches rather than others. I advanced the Mathew Effect and cumulative advantage arising from the feedback mechanisms built into Google's page ranking algorithms as a potential explanation.

Finally, I looked at archives of the Wikipedia page for snoring to gain insight into the dynamic patterns of medicalisation and theorised about potential implications arising from initial dynamism followed by periods of entrenchment.

8.2 Limitations

There are several limitations to the research presented in this thesis that should be acknowledged. The specific challenges and limitations can be broadly grouped into two kinds – conceptual, and methodological.

Conceptual limitations

The aim of the research is to investigate how the internet-search contributes to medicalisation. Contained within the research question are two important concepts: the internet-search, and medicalisation. I have described earlier how I have defined the internet-search within this research and have included many elements within the definition including the human searcher, the web pages they encounter, the web-sites to which those pages belong, the hosting sites, the organisations behind those and so on. Also, and of course most importantly, the search engine itself – in this case, Google. But of course, the interactions and powers at work within the internet-search extend ever further outwards to include the industries behind the companies and organisations paying to put up content on the web, the designers who coded the sites, and the marketing firms who inform the search engine optimisation efforts to boost exposure to this website over another. The funding organisations behind those industries, and the government structures limiting or facilitating what information pertaining to those industries might be portrayed on the internet and in what way. The connections are as endless and complex as society itself but not surprisingly so when one considers that Larry Page, one of the co-founders of Google, claimed his objective was for the internet to be a faithful mirror of non-digital reality, and that the Google web page index should be a point-for-point real-time copy of the entire internet (Levy, 2011). An ambitious but increasingly realisable ambition for the internet-search.

The practical limitation imposed on this research, however, is that an arbitrary demarcation had to be made of where the constituent elements of the internet-search begin and end. I chose to limit my research by defining my unit of analysis primarily around the individual micro-level of search when considered as a session beginning with the first search term and ending with the closing of the web browser. Therefore, I only included the searcher, the search engine page ranking (and underlying algorithm by extension), and those pages encountered during the individual (micro-level) instances of search for snoring in the analysis. A necessary limitation, but a limitation, nonetheless.

The second conceptual limitation is around my interpretation of medicalisation. I have chosen to use the broadest definition of “any shift in conceptions of a given phenomenon towards (or away from) a conception that is more medical”. I have specifically embraced the idea that this can occur on any level of action, including the level of the individual, however that is not a universally accepted understanding of the concept. I have argued in later chapters that an accumulation of individual shifts can add up to movement at higher levels of social organisation but have designed no mechanism into this study to test that argument. However, I do point out a potential mechanism of accumulation that exists in the known feedback mechanisms built into search ranking algorithms and shall have to hope that insight sufficiently serves to strengthen the argument offered later in chapter seven.

Lastly, I have chosen to view the use of medical language as a marker of conception so as to track shifts and movements and interactions of conceptions. However, it is not necessarily the case that language maps directly to conceptions, nor that a shift in language use maps directly to shifts in conceptions. Nonetheless, that each internet-search was involved with measurable movement in language is at the very least suggestive of a useful relationship between language and conceptions.

Methodological limitations

There were also a number of methodological limitations I acknowledge here. Firstly, the sample size is small – 10 lay volunteers, and a single sleep specialist. However, it should be noted that this only represents the human actors in a more complex whole as described earlier. Indeed, the internet-search is so complex, an entire research project could be built around fully analysing one instance of a single search – albeit, a very different looking project. The sample size was large enough that the sampling generated a wealth of data in the form of over a hundred web pages with all the associated connections and content only some of which was included in the primary and secondary analyses. The singling out and deeper analysis of the Wikipedia page on snoring described in chapter seven was opportunistic but is indicative of the type of additional data already contained in the existing study should all the threads have been followed to exhaustion, which of course they were not.

I also acknowledge that the majority of volunteers were recruited through karate clubs from various locations throughout Christchurch. This was also an opportunistic decision since I had easy and regular access to all the clubs. The sites were not chosen because they were sports clubs, but rather because members included a wide range of ages (from primary school to retirement) and a roughly equal mix of genders, employment status, and occupations. As it eventuated, volunteers also included parents of youth members not just karate practitioners. The choice of recruitment sites was a source of some discussion in the planning stage, but once the initial recruitment eventuated, my supervisors and I were all satisfied that it was unlikely any associated selection bias would have affected the results given the unrelated nature of the enquiry.

I also recognise that the shift in language used by searchers could be explained by other mechanisms than that their conceptions shifted. For example, they might have been

motivated to describe snoring using clinical terminology since they were all aware that I work at a medical sleep clinic. The internet search may have merely ‘filled a gap’ for them supplying language they initially lacked, but not necessarily reflecting a change in conception. Nonetheless, the shift in language and interaction with future searches through the feedback mechanisms described earlier would still apply to the overall conclusion.

Finally, I should point out that although my research is investigating shifting conceptions, I made no measure of the durability of shifts following the search. Therefore, the changes I discuss in the analysis chapters to follow could conceivably be limited to just that moment in time immediately following the internet-search, or at the very least to a short number of days thereafter. However, as I will discuss in more detail later, in some respects the durability of the shift at the micro-level of the individual need only be transmitted to the meso and macro level for the permanence of the individual shift to lose primacy in terms of overall medicalisation. My instinct is that the individual-level shift would indeed persist to some degree – once the seed is planted, it will surely take root – but as I will discuss later in chapter six and chapter seven the capture of ‘clicks’ in the internet-search is itself a mechanism of inter-level transmission of conceptions.

8.3 Thesis summary

In chapter one I introduced the research question How does the internet-search contribute to the medicalisation of snoring? I discussed the history of snoring in relation to medicalisation and describe the way medicalisation can be thought of as a shift in conceptions. I

also introduced some elements of the internet-search as an agent of social process expanded in later chapters.

In chapter two I explored the concepts contained within the research question and introduced the idea of the Hypotonic Airway Spectrum as a single continuum with a shared underlying physical mechanism, upon which snoring and OSA are polar ends. I also discussed how language might be used as a marker of conceptions, and by tracking changes in language use I might infer a change in conceptions, which lies at the heart of a definition of medicalisation as a process. I also discussed the importance of snoring as a case study of medicalisation insofar as snoring can be seen as being in the midst of transition from being thought of as a purely lay phenomenon to being increasingly thought of as a medical or potential health problem.

In chapter three I discussed the macro/micro dilemma as it pertained to my research and introduced Barbara Hansom's (1997) General Systems Theory wholes theoretical approach as a guiding framework. I described that the suitability of this approach lay in the way it allowed the internet-search to be considered as a dynamic system of unitary relevance and an object of study. I also described Drew Halfmann's (2012) typology of medicalisation wherein he describes medicalisation as continuous and dynamic value as opposed to the more typical discussion of medicalisation as a category or state.

In chapter four I reviewed two different cartographic techniques – positional mapping from Situational Analysis, and perceptual mapping as used in marketing and business. The positional maps plot the situational, relational, and positional elements of the data to create visual maps that provoke analysis and to highlight marginalised or missing positions. The positional maps in particular encourage the analyst to give thought to the positions themselves rather than the individuals or groups that hold them. Perceptual maps, on the other

hand, include individuals and locate them within a perceptual space created by selection of axes representing dimensions of interest. I described the method of the study and concluded with a brief discussion of limitations.

In chapter five I focussed on the field research and the micro-level analysis of data. I presented summary tables of the data, but the main focus of the chapter was on the positional maps, perceptual maps, and conception maps all showing different aspects of the data generated by the 11 participants as they conducted their internet-searches. The chapter concluded with a summary chart combining all the language shifts which suggested that the internet-search for snoring consistently produced a change towards more medical language and therefore, I argued, a more medical conception of snoring than that held before searching.

Chapter six presented a secondary analysis looking at the meso or group level of the web pages encountered across all the searches. It showed that some pages were encountered more often than others and explored the mechanisms of the page ranking algorithms used by Google as a possible explanatory factor. In particular, I discussed the Attention Economy of the internet, and the amplification and entrenchment that could arise through feedback mechanisms linking the behaviour of individuals operating incrementally but in aggregation to influence future internet-searches. I concluded by suggesting that the Mathew Effect might be a hitherto unrecognised but powerful mechanism affecting the way the internet-search contributes to the medicalisation of snoring.

Finally, in chapter seven I took advantage of the Wikipedia page archive to map versions of the page on snoring over time on the same conception map I used for analysing the individual searches in chapter five. I speculated that the dynamic pattern shown on the map might reflect a larger pattern in society, but noted it was beyond my research to make such an extension with conviction. Nonetheless, the analysis enabled me to discuss some of

the implications of the feedback mechanisms of the internet-search when considered as a whole system, and I hypothesised that the dynamic pattern might have real world consequences in terms of perpetuation and entrenchment of stereotypes.

8.4 Key findings, implications, and conclusions.

Medicalisation remains an important area of academic investigation in the rapidly evolving era of massification of digital media, and snoring provides a rich case-study of how the internet-search contributes to medicalisation. My cartographic analysis of 10 internet-searches for snoring revealed that searchers re-presented snoring as more medicalised after conducting their searches. This first main finding suggested there is a micro-level medicalising effect contained within the whole-system of the internet-search for snoring that is evidenced by the change in the proportion of medical language used by searchers after searching.

Further analysis revealed that the internet-searches resulted in non-random samples of recurring sites related to snoring, and that encountered sites tended to present snoring as more medicalised than the searchers did prior to searching. This second main finding suggested that the sorting mechanism ranking web sites within a search appears to preferentially expose searchers to more medical language than they use themselves.

Furthermore, since (specifically) the Google search-engine algorithm tracks user responses, there is an intrinsic feed-back loop at work within the internet-search whole system. The feed-back loop provides a mechanism whereby 'successful' rankings become amplified and therefore entrenched - an example of the Matthew Effect and cumulative advantage. Since high ranking pages (and the language they use and conceptions they portray) appear near the top of organic search engine results pages they are more likely to be selected by a searcher. The successful selection is detected and fed back into the search

algorithm thereby increasing the successful page's ranking incrementally higher, making it even more likely to be seen and selected by subsequent searchers using the same term.

I conclude that it is this interaction between individual-level processes and group-level processes at both the micro and meso levels within the internet-search whole system that contributes to an overall dynamic pattern of increased medicalisation of snoring.

8.4.1 The contribution to Social Theory.

The study of medicalisation has transformed from the early concerns around social control (Zola, 1972) through considerations of medical jurisdiction and extension of power and influence over a passive population in the 1980's and then further to a more complex and less intrinsically negative theory of a process that is not static, but which is interactive and bi-directional (Conrad, 2008; Halfmann, 2012; Busfield, 2017; Correia, 2017). The concept of medicalisation has not been without detractors but is still considered to be a crucial and productive area of study in modern sociological analysis, not least due to the pervasive reach and shifting influences of medicine and the medico-legal industry (Busfield, 2017). My own research, presented here, seeks to add to the theory of medicalisation by unpacking some of the value-free mechanisms at work in the internet-search that might provide further insight into this pervasive and powerful social process.

8.4.2 Conception-tracking

I wanted to investigate the role the internet-search plays in the ongoing medicalisation of snoring. During my investigation I adapted Clarke's position maps (Clarke, 2005) to develop conception-tracking, a cartographic tool particularly suited to visualising conceptions held by people or portrayed in a variety of media, in a way that highlights and tracks relative

movement of positions within the conception space delimited by the axes of the conception map. The technique introduces scope for additional dimensions of interest to be added to the visualisation, and I hope it will prove as useful to other social researchers as I found it to be in my own research presented in this thesis.

8.4.3 Medicalisation.

How does the internet-search contribute to the medicalisation of snoring?

Medicalisation is an important area of academic investigation because of the wide-ranging and pervasive impact medical social structures have on every-day life beyond those directly involved in healthcare delivery. The medical sphere of influence is vast, embracing such institutions as the insurance industry (health insurance premiums, health insurance cover, and employer workplace cover), regulatory bodies policing health, safety, and fitness to work; the transport industry, risk-management and risk mitigation industries, financial sectors, and of course government departments and agencies involved with policy driven allocation of government resources for healthcare delivery and research. There are many more areas of society within which the medical gaze turns its attention, but the point is clear: for a phenomenon to shift out of the lay and into the medical is to say that the social context of almost every aspect of the particular phenomenon will be re-cast.

Academic discussion of medicalisation tends to focus on medical jurisdiction operating at the macro level of institutions and companies, or professional or regulatory bodies, thereby ignoring or overlooking the multiple levels of analysis at which medicalisation occurs including the micro level of the individual. Furthermore, medicalisation is often presented as an all-or-nothing state rather than a continuum of process i.e. a given phenomenon is discussed as having been medicalised or not, rather than being in

the process of medicalisation (or demedicalisation) with some actors contributing to a move towards the medical, and simultaneously others pulling the phenomenon away.

By overlooking the continuous nature of medicalisation which operates as a transformative process that strengthens or weakens over time, scholars are faced with inherent problems that are also, as Halfmann (2012) points out, not widely addressed. First, treating medicalisation as a category requires researchers to define a threshold beyond which medicalisation has occurred, and before which it has not. Second, the all-or-nothing consideration of medicalisation minimises the contributions from shifts towards or away from a medical interpretation of the phenomena if those changes are insufficient to produce an overall categorical change. Third, it obscures the simultaneity of medicalisation and demedicalisation agencies at work within a given phenomenon, and that those agencies can be occurring at different levels and in different directions at those levels. This is of particular importance to this thesis which is concerned with the internet as an engine of medicalisation operating as a whole system, but also containing action across multiple levels of scale.

In this thesis I have provided evidence that the internet-search for snoring contributes to micro-level medicalisation in the form of changing conceptions held by individuals. I have also shown that the Google page ranking algorithm gives a high rank to pages which, when analysed as a group, present snoring as a more medical phenomenon.

I have also shown that some pages appear more often than others and have explored mechanisms intrinsic to the internet-search that might contribute to that disparity. I have discussed how the interaction between individual-level action and group-level action sets up a feedback mechanism that appears to help power the dynamism of the medicalising process of the internet-search.

Medicalisation of snoring on the internet then, is the summation of a multitude of forces and levels of action sometimes working in tandem and sometimes working against each other, but which appear to collectively shift snoring towards a more medical jurisdiction.

Within the New Zealand context public health services have assumed a burden of care whereby hospitals now routinely test thousands of snoring New Zealanders each year to assess cardiometabolic risk arising from untreated obstructive sleep apnoea. Where that risk is deemed to be sufficiently high, long-term therapy is also provided through those services. Furthermore, regulatory bodies such as the New Zealand Transport Authority and the Civil Aviation Authority already have legislation in place supporting licence restrictions being imposed on people on the basis of being overweight and therefore under suspicion of having OSA until they can be cleared (or not) with a formal sleep study costing several hundreds of dollars.

That the conception of snoring as a medical problem might slowly increase not necessarily through purposeful planning, but rather as a consequence of algorithmic implacability is a sobering thought for an already overburdened public health system and hypervigilant licencing authority.

Appendices

Appendix A – The Conception maps

Case TT

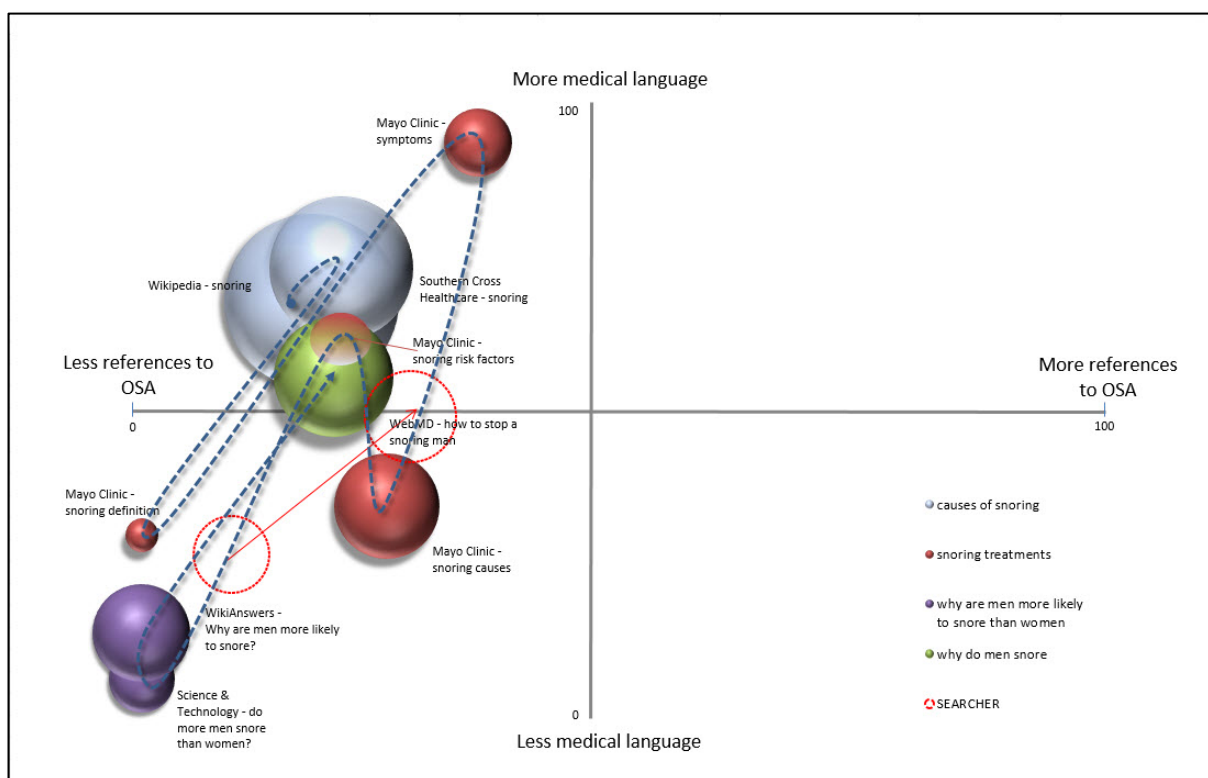


Figure 17 - Conception map of Case TT

Case TT (figure 2) is a 46-year-old European male of average build who has been divorced but is now in a six-year long term relationship with a partner CS who snores regularly and loudly enough that TT attributes his own poor sleep pattern at least in part to her snoring. TT himself used to snore, but has “trained [himself] not to sleep on [his] back” and feels he no longer snores. TT is employed as an IT worker for a large corporation and appeared to be very comfortable with using the internet. The only search engine TT used was

Google, and he used three different search terms: “causes of snoring”, “snoring treatments”, “why are men more likely to snore than women”, and “why do men snore”. TT used the full twenty minutes allocated to searching, and visited nine pages in his search. None of the pages had a higher proportion of references to OSA than snoring. TT’s post-search interview contained a higher proportion of references to OSA rather than snoring, and his language was 25.7% more medical than his pre-search interview.

None of the pages TT visited talked more about OSA than snoring, but nonetheless TT’s post-search language made twice as many references to OSA as his pre-search language. In particular, when asked “Do you think snoring can be a problem?” TT initially focussed on partner disruption (note that he identifies himself as a ‘suffering partner’) whereas after the internet-search, OSA took centre stage:

Pre-search: “Ah, definitely it [snoring] can be a problem. Um, besides disrupting your sleep and making you feel rubbish ah the other thing is if one partner snores and the other person doesn’t, then there’s a, can be problems arising for this and various other things that go on [deep inhale] ahh cause quite often when people are tired they get really ratty if they don’t get a good night’s sleep and especially if it’s the other person causing their issues.”

Post-search: “I did a bit of looking up on sleep apnoea as well... I tended to go to sites that didn’t just give one bit of information... they’d give a good variety like Wikipedia and so on. So for...so for that there was a lot of related... things, so with um..... if you are prone to snoring, then of course there’s a possibility that you have sleep apnoea which means you will be an awful lot more tired during the daytime...ahh... that, you know, because you’re breathing not... not so good at night, and so on, then the amount of oxygen getting to your brain is... is... it’s not as much,

which is obviously not a good thing. Ahhh... that you can... ah it [OSA] can be both children as well as adults can have it, so for children it could be quite serious, because umm... I'm assuming it will probably cause issues with growth and development ah with adults, um, it's interest an article in there about um the fact that after surgical treatment, and so on, that ah relationships between husbands and wives things significantly improved and that the majority of people that actually take, ah, that cause one person to go – get to go the doctor is actually usually the partner, not the person who needs the help. [laughs nervously]. So obviously um... relationship things are a big issue, and ah personal health or the health of the person involved, or both people involved actually.”

Case QA

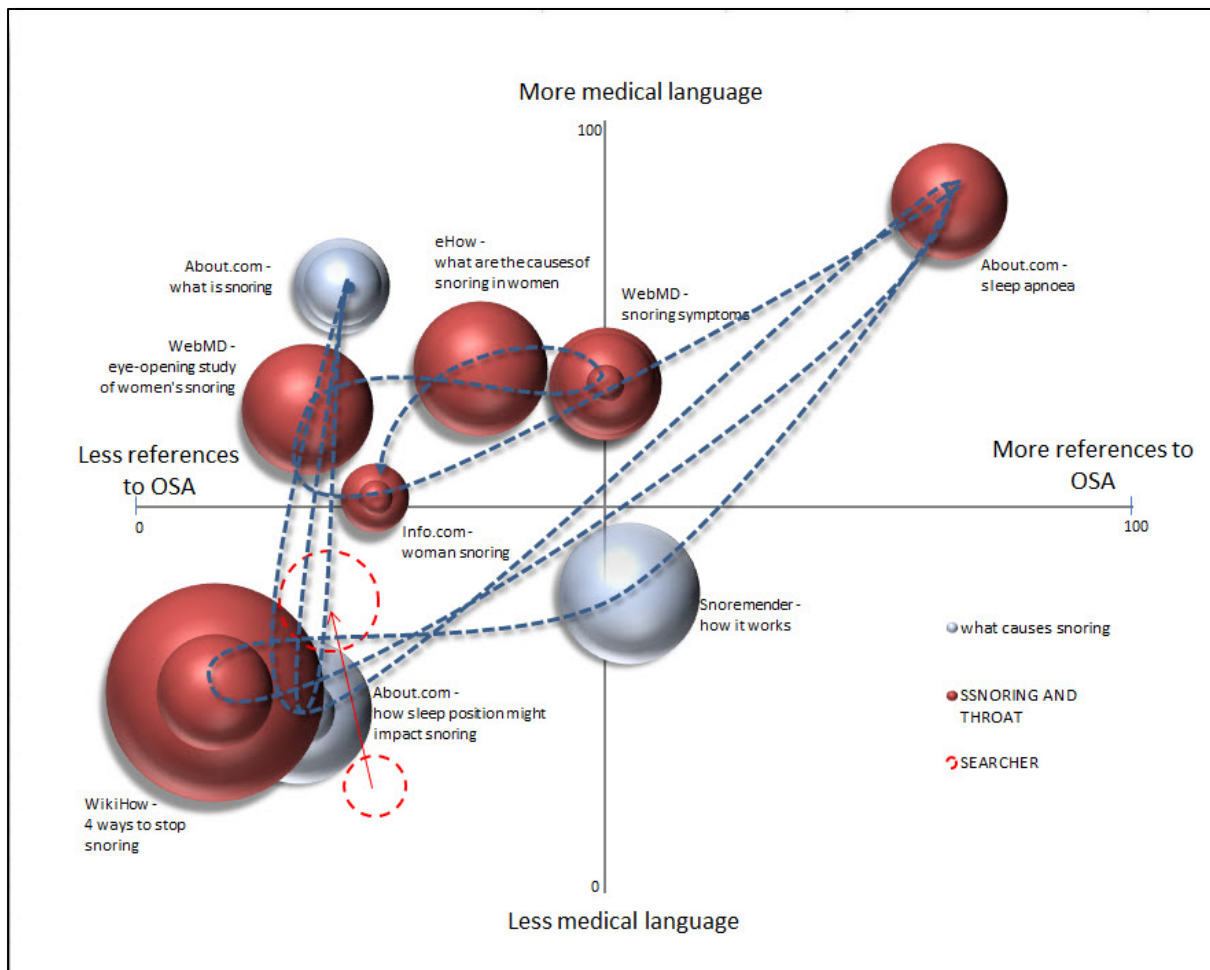


Figure 18 - Conception map of Case QA

Case QA (figure 3) is a 56-year-old European female with a heavy build who has previously been married but now lives alone. QA has been told she snores when away on trips with friends but has never felt the need to find a way to sleep without snoring. TT is employed as a rehabilitation occupational therapist at a local hospital. QA uses a computer in her work but described herself as “not that good with computers”. The only search engine TT used was Google, although one of the first pages she visited was about.com which indexes multiple pages through its own site specific search function, and QA appeared to have difficulty getting back to Google. She would ‘bounce’ between two pages and seemed to be

slightly frustrated that she was not getting back to Google itself. Consequently, she only used two search terms during the search: “what causes snoring”, and “TTNORING [sic] AND THROAT]. Nonetheless, QA visited more pages than any other participant. Of the fifteen pages in her search, nine were unique (six were visited more than once in the search), including the about.com page on sleep apnoea which was one of the pages in the whole research with considerably more references to OSA than snoring.

QA’s post-search interview was particularly interesting insofar as hers was the only case wherein she made proportionally less reference to OSA after the search. It should be noted however that the change was one reference in three in the pre-search interview, versus one reference in four in the post-search interview, but that she only had three and four references respectively, in total. Importantly, although her language contained a lower proportion of references to OSA rather than snoring, her language was 27.5% more medical than her pre-search interview. The biggest shift was in QA’s post-search answer when asked “do you think snoring can be stopped?” Pre-search she did not offer any mechanisms and seemed genuinely surprised that there might be ways to stop snoring. After her search she volunteered several approaches, which included exercises such as playing digeridoo, but also surgical or medical techniques:

Pre-search: [Do you think snoring can be stopped] “MMmmmmmmmm, I’m not so sure about that.

Post-search: “The amount of advertisers I saw on line... thought [snoring] it it can be... There was a umm, there was a thing that you stick over a thing that lifts the nasal... um... (tsk)... the ummm... nasal passage... [gesturing at bridge of the nose, pulling open on either side] I guess to the... and um... opens, perhaps the... tightens the septum and opens the ummm... it sort of pulls your nose up... so it stops

the...There was a umm ahh like a [gestures at mouth] ... palate thing... you put - you put in your mouth that made you breathe through your nose and kept your tongue your tongue in one position. Apparently there's medications, but I don't, that – that relax the muscles? Around the the neck? Ummm and that's what really I was looking at.”

Case NF

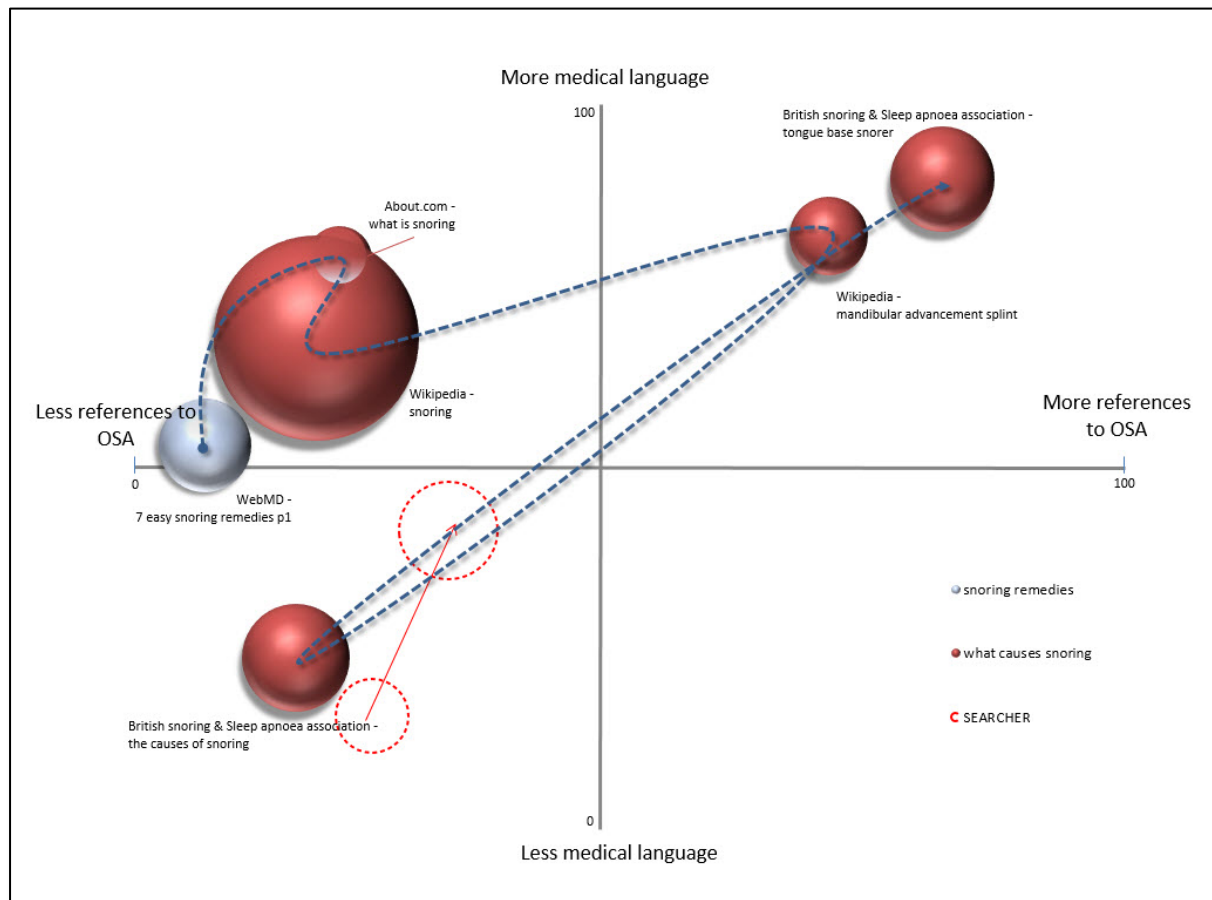


Figure 19 - Conception map of Case NF

Case NF (figure 4) is a 55 year old European male of average build who is married, has never been told he snores, and who has does not personally know anyone who has been treated for snoring or obstructive sleep apnoea. NF did not volunteer his occupation, but did note has a PhD in English. NF's pre-search interview mostly used lay language to relate what he already knew about snoring. He then typed "snoring remedies" as a search term for Google and visited a single page from that search – "WebMD – 7 easy snoring remedies". That page made slightly less reference to OSA than NF had himself in his pre-search interview, but the language on the page was considerably more medical. NF spent some time reading that page, and then searched a new term: "what causes snoring?" All the pages NF

subsequently visited were from the second search term. He briefly visited “about.com – what is snoring” which made more reference to OSA than the previous page but used considerably more medical language. He then spent the most time of any of the pages encountered during his search, on Wikipedia’s page about “snoring”. His next page was the Wikipedia page on mandibular advancement splints which used more medical language and also made considerably more mention of OSA. The next page was the British snoring and sleep apnoea association page on the causes of snoring, which made less reference to OSA than he had himself, but then finished his search at the “tongue base snorer” page off the same website, which was the most medical of all and also made the most mention of OSA. NF was typical of most of the other participants insofar as he visited six pages from two search terms. NF did not use his full twenty minutes of search time, but seemed very directed in his searching. His delivery post-search was evocative of a person answering a quiz or oral test.

After his search, NF used 29.4% more medical language, but only made slightly more references to OSA. An example of the shift in language can be seen by NF’s answers to the question: “What is snoring? What makes the noise?”

Pre-search: “Well, ummm – I get the impression [snoring] it’s flappy bits in your sinuses that fall over the passageways (gestures) and as you’re breathing in and out it. oscillates.”

Post-search: “Ah, [snoring] it’s either the vibration of the soft palate or the uvula at the back of the throat. Uh – that causes the noise.”

Note “flappy bits” has become “soft palate” and “uvula”, formal anatomical descriptions more consistent with the medical domain than the lay. However, the use of

correct anatomical terms alone does not necessarily represent a shift towards medicalisation. More compelling, perhaps, is his answers to the question: “Do you think snoring can be stopped?”

Pre-search: “I think it can, yeah. Well if it is something that’s sort of falling down inside your sinuses or blocking the cavities, removing it, or pushing it to one side or doing something that keeps your passageways clear, so you don’t make the noise? [BS: Yeah. So do you think that, um, that’s – that’s a broad sort of thing, how would you achieve that do you think?] Oh. Well I’m not a surgeon. [BS: So, so you think surgery is a - is a way of achieving that?] Possibly. There’s some sort of mask you can get, or – or some sort of thing you can poke up your nose or like I’m not really... or something that could basically stop that physical reaction, whatever that may be.”

Post-search: “There appear to be several ways of doing this. Including something that moves your jaw forward, which brings the tongue forward, which relieves the pressure at the back of the throat and constant pressure (cups hand over nose), airways – that’s the mask. You can put something that’s akin to stents in the top of the soft palate to.. uh... stiffen it. FDA indicated them in 2004. Ah. And there was... ah those are the ones that I remember.”

For this question NF originally had a somewhat vague notion that snoring could be controlled through the use of apparatus or possibly some sort of surgical procedure, so he was clearly inclined to put it into the medical arena to at least some degree. After having conducted his search, however, he described fundamentally the same types of

treatment, but now more clearly described mandibular advancement, continuous positive airway therapy, and a specific surgical technique, the pillar technique – even citing the fact that it is “FDA approved”.

Case KO

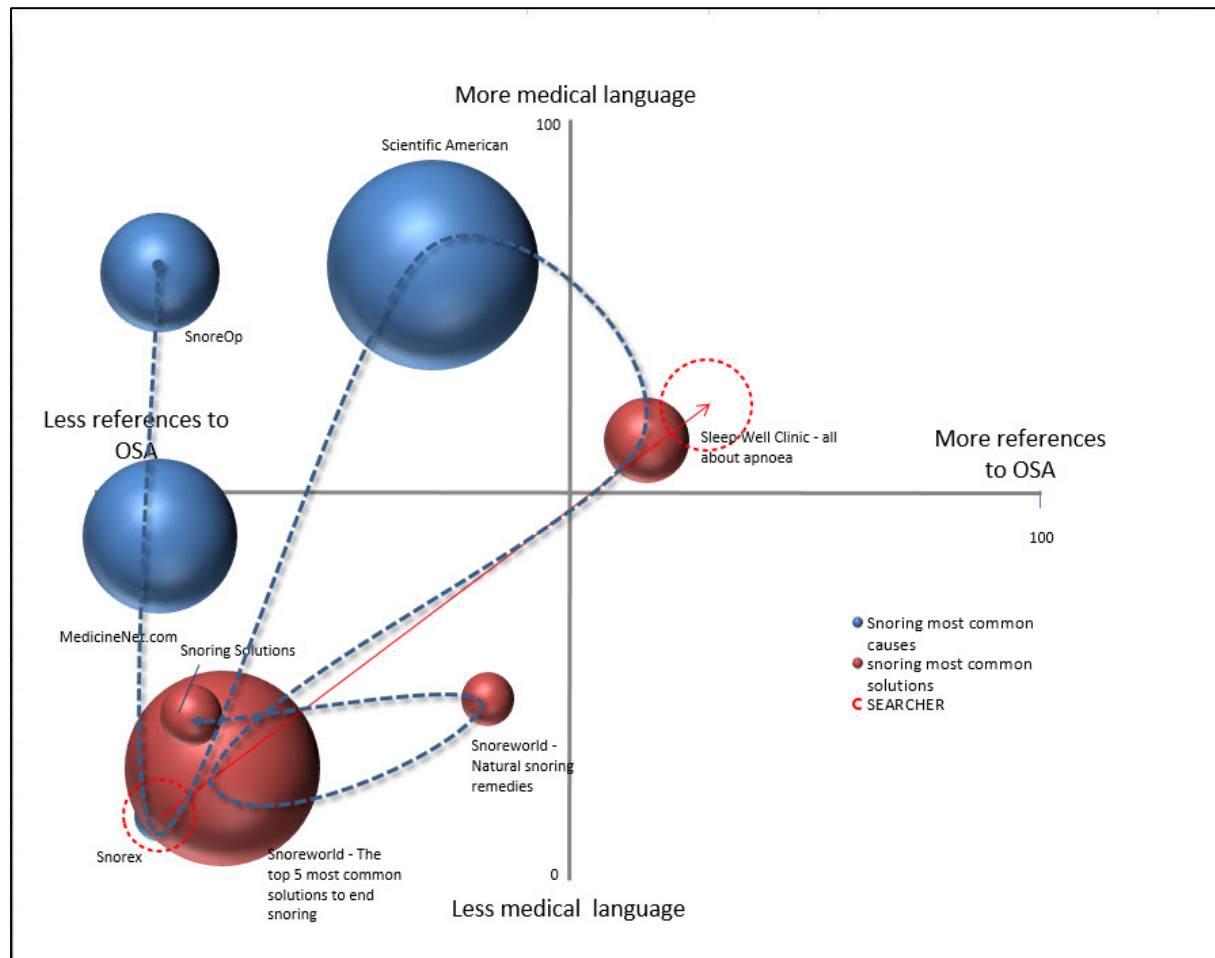


Figure 20 - Conception map of Case KO

Case KO (figure 5) is a 40-year-old European married male with a medium build who has been told he snores occasionally but has never felt the need to find a way to stop snoring. KO is employed as a manager and describes himself as comfortable with using the internet. As with all the other participants, the only search engine KO used was Google. KO visited four pages from his first search term “snoring most common causes” and three pages from his second term: “snoring most common solutions”. Much of KO’s attention was taken with two sites from the reached through the Google page for the first search term (Scientific American,

and MedicineNet) and one from the second (Snoreworld – the 5 most common solutions to end snoring).

KO was the case which showed the largest proportional shift towards more medical language and more references to OSA. Partly the degree of proportional change arose from his pre-search interview containing no references to OSA, and no medical language at all. His absolute shift was an increase from no mention of OSA and no medical language in the pre-search interview to two (out of three) references to OSA and 63.4% medical language in the post-search interview. The largest shift in language came from KO's post-search answer when asked "Do you think snoring can be a problem?" and "Do you think some of the ways of stopping snoring are more suited to some people than others?" In his pre-search response to the question of snoring-related problems, KO noted lack of energy and bedroom noise, but in his post-search interview he spoke about serious conditions which could ultimately lead to death:

Pre-search: [Do you think snoring can be a problem?] "Ah, lack of energy... you use a lot of energy if you're snoring. Ummmm waking with a sore throat and... if you're a very strong snorer, and uh... annoying your partner... which can cause issues."

Post-search: "Yes, it can lead to more serious ah conditions. Ah, sleep apnoea, yeah, yeah, stuff like that, so... Well, sleep apnoea, I didn't go into the details of that but um from what I know it can um you can actually stop breathing altogether which obviously can create death and whatnot. Oh, the disturbance, yeah, ah is causing relationship issues."

When asked if some ways of stopping snoring are more suited to some sorts of people than others, KO initially offered no opinion, but then after his internet-search he talked about medical intervention (including oxygen) until a person was able to loose weight.

Pre-search: “ Ummmm – I don’t know.”

Post-search: “Yeah, yeah. People that are.. uh.. overweight would need, you know, having oxygen and such... some.. some medical intervention till they can lose some weight.”

Case AQ

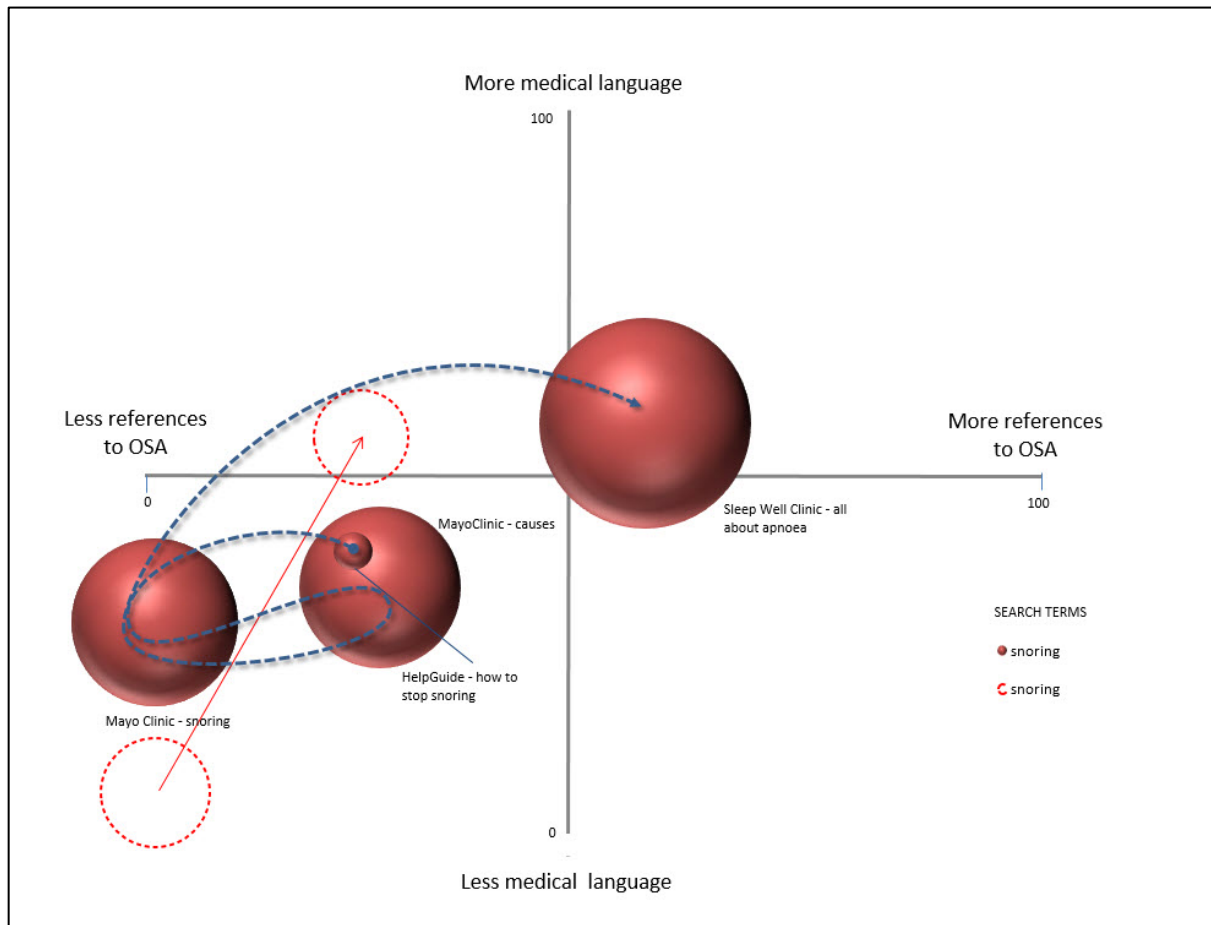


Figure 21- Conception map of Case AQ

Case AQ (figure 6) is a 56-year-old European married male with a heavy build who has been told he snores but has never felt the need to find a way to stop snoring. AQ co-owns a café within which he works as a barista. AQ's recording was the most difficult to transcribe as the café environment included interruptions and background noise. The only search engine AQ used was Google. AQ visited just three pages from a single search term, "snoring", which was the least number of pages out of any of the searches and also one of the shortest overall. AQ finished his search looking at the "Sleep Well Clinic – all about apnoea" page, but spent nearly equal time looking at "HelpGuide – how to stop snoring", and the "Mayo Clinic – snoring" page.

AQ made more reference to OSA and increased his use of medical language from 0% in the pre-search interview to 56% in the post-search interview – the second largest increase after KO. AQ's largest shift in language came when asked "do you think snoring can be stopped?" Pre-search he didn't offer any mechanisms, but in the post-search he brought up CPAP therapy and also surgical or medical techniques:

Pre-search: "Ahhhh.... Well.... Don't know."

Post-search: " Well I reckon it can. There are three options, I think. If I remember rightly. Lie on your side... Don't have any alcohol... [unintelligible word] And ah.... [phone ringing] ... I better answer that phone. [answers phone then returns] Yeah yeah, ah... that... that machinery that that pump... pumps air into your system? Surgery? Umm... nothing else. That's the lot[?] [unintelligible] – doesn't matter."

Case CB

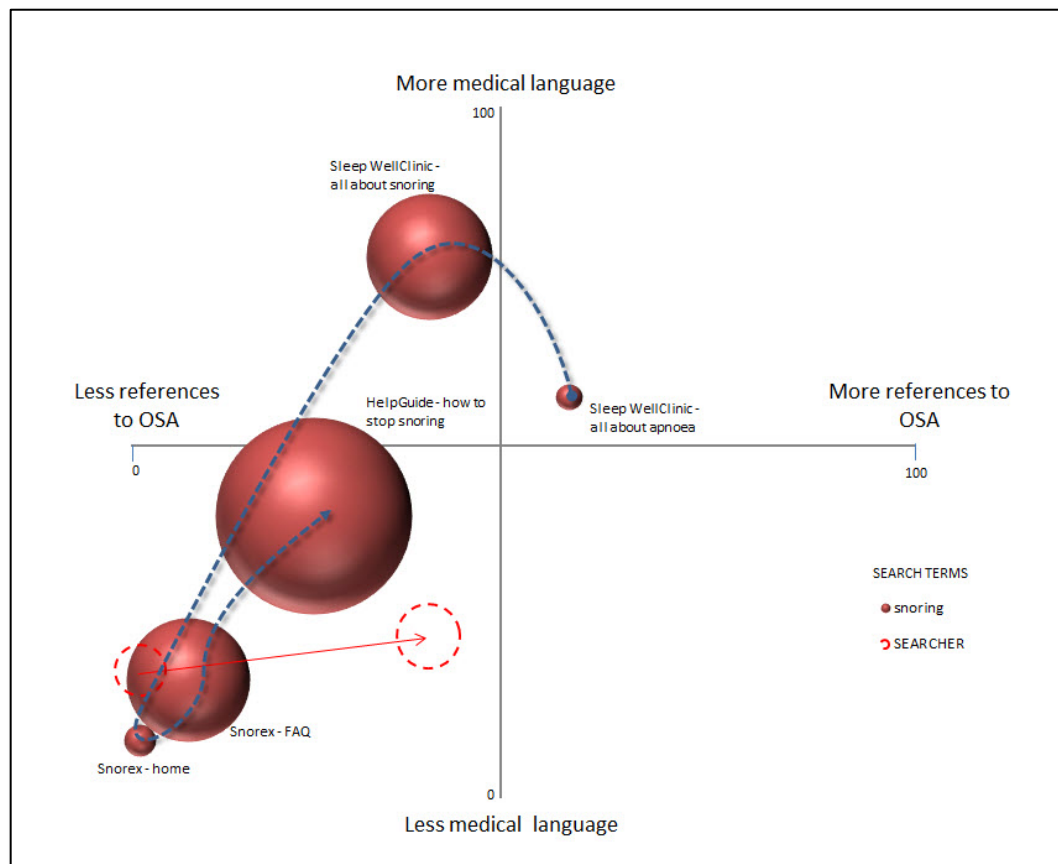


Figure 22 - Conception map of Case CB

Case CB (figure 7) is a 48-year-old European married female with a medium build who has been told she often snores but has never felt the need to find a way to stop snoring. CB is self-employed as a dog groomer and describes herself as “OK” with using the internet. As with all the other participants, the only search engine CB used was Google. CB visited five pages from her only search term: “snoring”. Most of CB’s attention was taken with HelpGuide – how to stop snoring. CB showed the smallest change in post-search language, only increasing medical language by 5.7% following her search, although she did make 40% more references to OSA.

Case GS

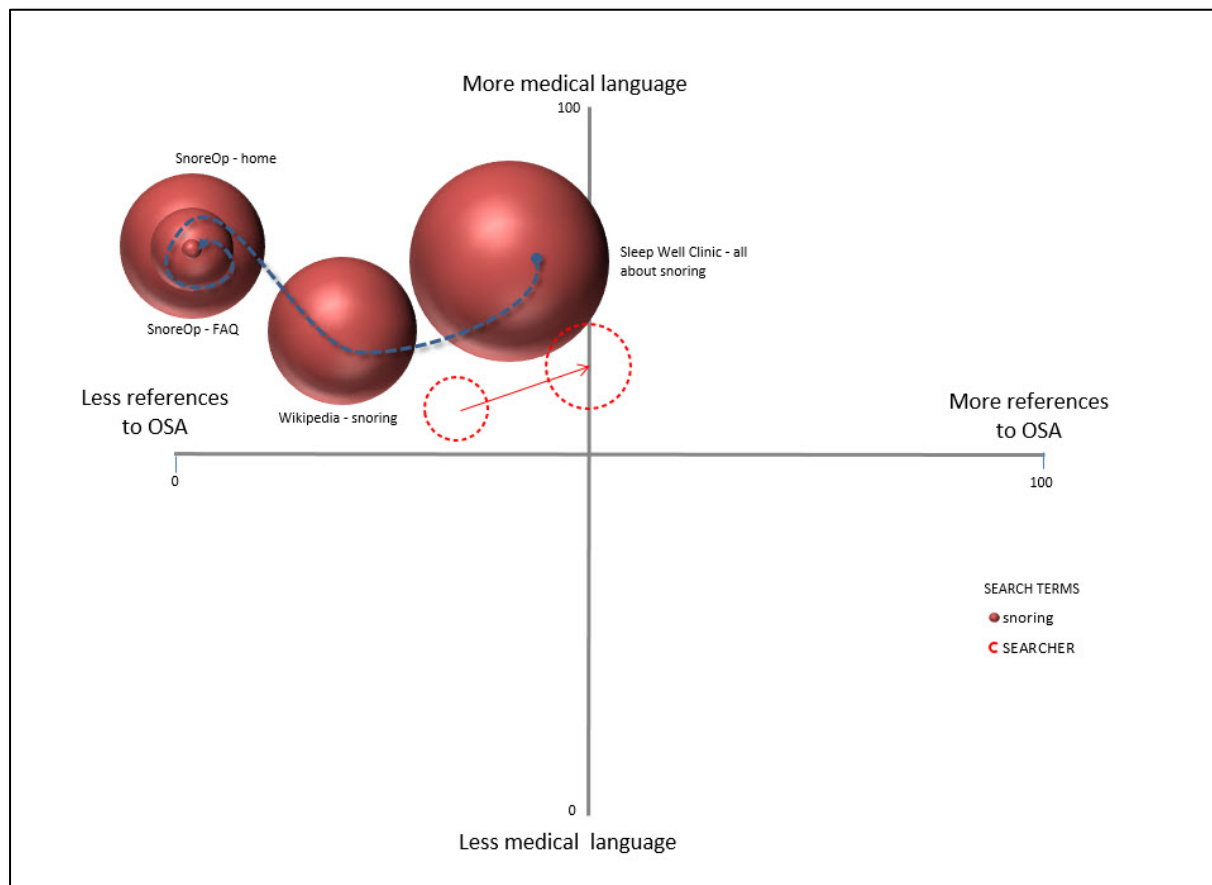


Figure 23 - Conception map of Case GS

Case GS (figure 8) is an 18-year-old European single female with a slim build who does not report any snoring. GS is a university student in her first year at university and describes herself as very comfortable with using the internet. As with all the other participants, the only search engine GS used was Google. GS divided most of her time fairly evenly between “Sleep Well Clinic – all about snoring”, “Wikipedia – snoring”, and “SnoreOp – FAQ”. Of particular interest, all of the sites GS visited used a higher proportion of medical language than lay language. The only other participant to visit pages exclusively with more medical language than lay was HK, the Sleep Specialist (figure 13). Furthermore,

GS was the only person other than the Sleep Specialist to have a pre-search interview that had a higher proportional use of medical language than lay.

GS's post-search interview contained a higher proportion of references to OSA rather than snoring, and her language was 17.8% more medical than her pre-search interview. There was no one question that stood out particularly as being different in kind, but rather she was more fulsome in her answers. For example, her answer to "do you think snoring can be a problem?" did not so much contain different types of problems as it did a broader range of information:

Pre-search: "ummm... insomnia... or.. that thing that happens where your heart stops working when you sleep. I forgot what that is. [laughs] ... yeah... Ummm... annoying anyone who's sleeping next to you [laughs]."

Post-search: "Yeah. It was interesting to see that not only the sleep apnoea causes problems, but also the tiredness can cause weight gain and then frequently being disturbed in the night can increase you needing to go to the bathroom. Yeah, and also... there was one more. I can't remember. But it wasn't good because it causes weight gain as well, that was the other one. Ummm... so it causes all the other things due to being disrupted in the night from snoring. Yeah the weight gain and the not being able to go... oh, more frequently needing to go to the bathroom.

[BS: OK, so... so at the moment we're just saying there are two things, two problems that snoring can cause, but are there other problems?]

Yes. I can't remember them though."

Case CS

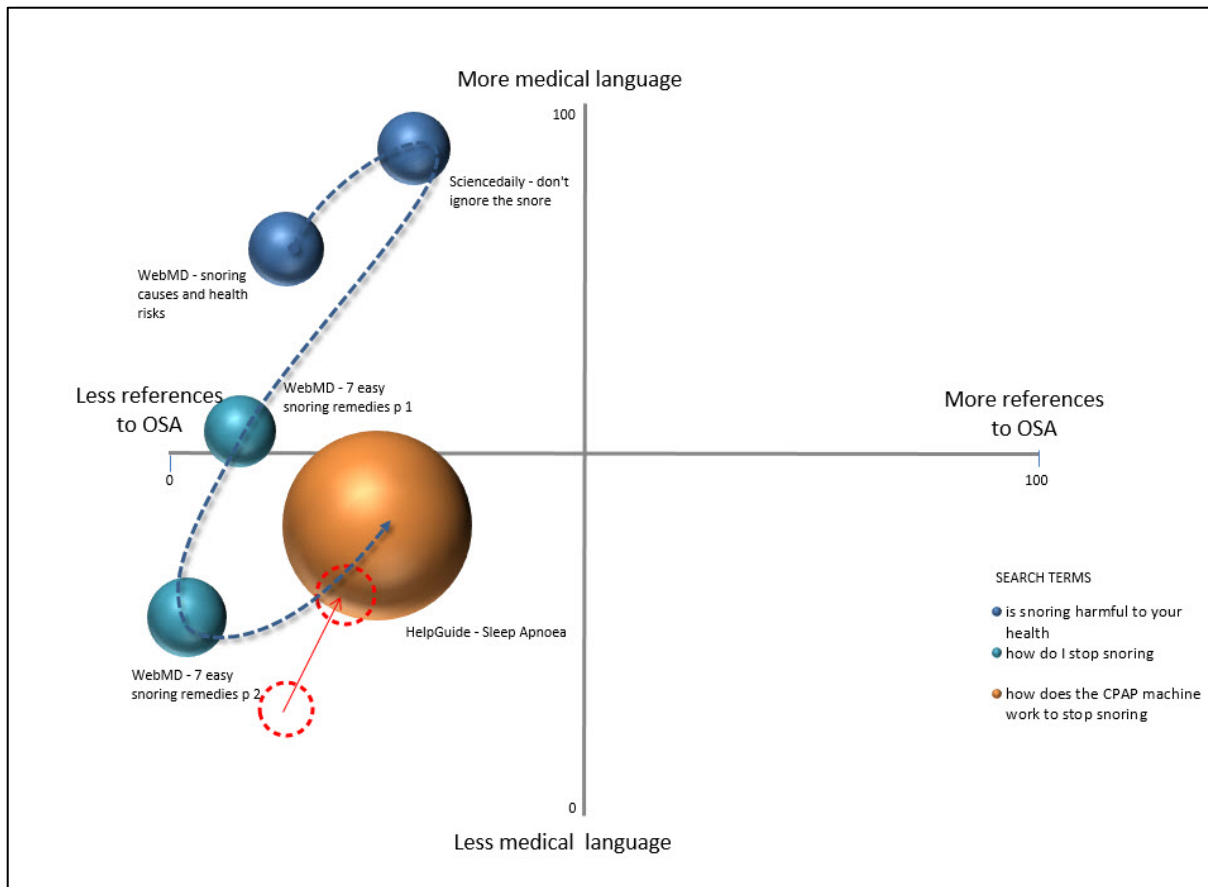


Figure 24 - Conception map of Case CS

Case CS (figure 9) is a 47-year-old European female with a medium build who is in a long-term cohabiting relationship with a male partner who complains of light sleep which he attributes in part to CS's snoring. She has been told she snores every night by TT but has never felt the need to find a way to stop snoring. She volunteered that she felt her snoring might contribute to TT's own poor sleep pattern. TT is a self-employed party planner and author. She describes herself as extremely comfortable with using the internet. As with all the other participants, the only search engine CS used was Google. CS visited five pages from three search terms: "is snoring harmful to your health", "how do I stop snoring", and "how does the CPAP machine work to stop snoring". CS visited several other pages not included in the

positional maps as they had no content related to snoring or OSA. CS spent most of her search time looking at the “HelpGuide – sleep apnoea” page.

CS focussed on partner issues in both her pre-search and post-search interviews. Her use of medical language increased by 18.8% which was similar to GS. and as with GS, was related more to the breadth of answers rather than a substantial difference in kind. For example, CS’s post-search answer to the question “do you think snoring can be stopped?” is very similar to her pre-search answer, other than the addition of allergies and dust mites or other health issues:

Pre-search: [Do you think snoring can be stopped?] “Ummmm yes. Umm.... Well ummm... I don’t know if this is true, but umm losing weight? Losing weight, umm... the CPAP machines that I’ve heard of, but never tried. Ah an elbow in the ribs? I’ve heard a tennis ball tied to the back of your pyjamas? [laughs]. But it’s not... that’s not stopping it, that’s just umm interrupting it. Ummmm maybe a healthy diet. Because when people drink a lot they snore and I’m wondering if that’s one. [...] I’ve heard of a sort of nose clip thing. As well. Umm.”

Post-search: “Yes. Losing weight. Ummm the tennis ball thing came up, I thought I was just making that up. But actually, I wasn’t. Ummm... ahhhh.. not drinking alcohol or caffeine to close to bedtime and not doing too much. Especially not mixing them with any sleeping pills... umm ... medication. Ummmm just being hydrated. So, not being dehydrated. Umm CPAP machine. Ummmmmm oh taking care of allergies...there could be dust mites in your pillow or you could have a cold. Ummm so if you’re blocked then having a hot shower before you go to bed. Never sleep? Ummmm apparently I snore worse when I’m too hot. And that’s not from the internet, but that was just”

Case LV

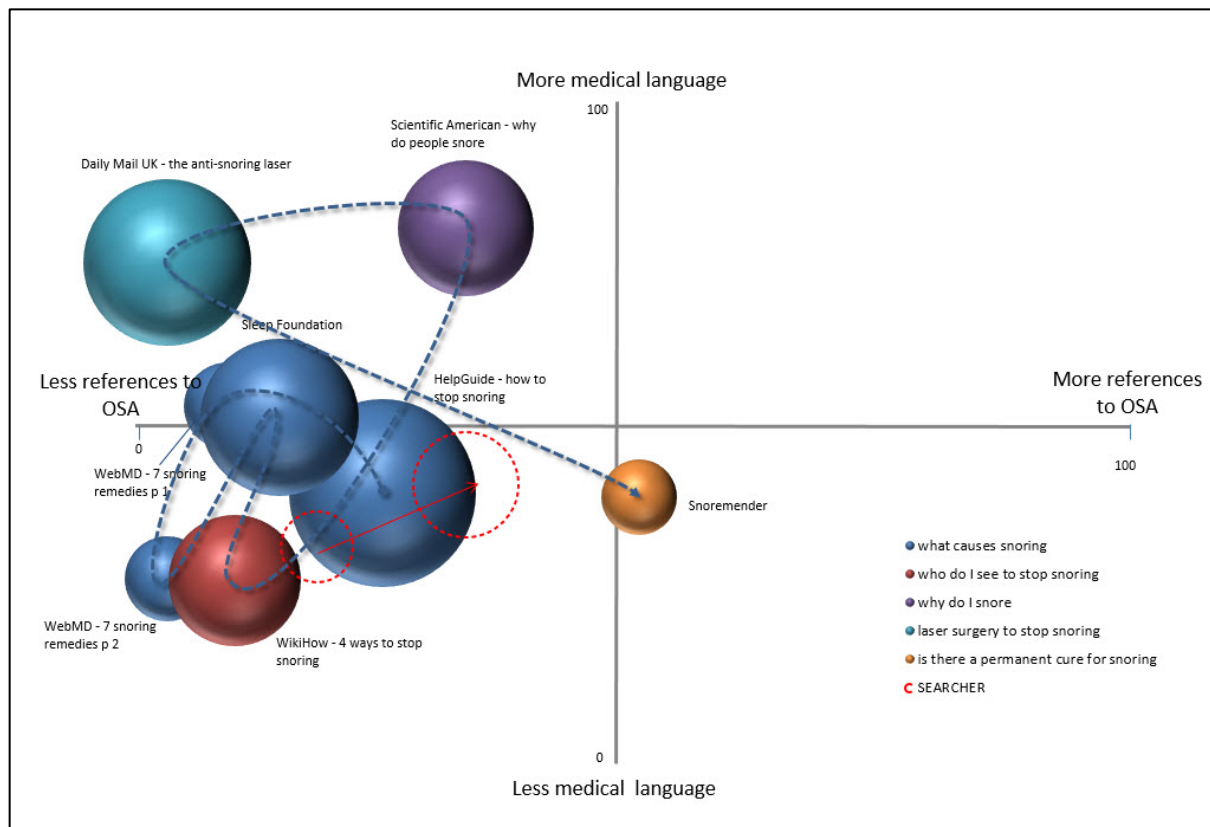


Figure 25 - Conception map of Case LV

Case LV (figure 10) is a 42-year-old European married male with a medium build who has been told he never snores, although he noted his wife has started to snore occasionally. LV's mother has been treated for sleep apnoea in the past. LV is employed as a telecommunications engineer and describes himself as extremely comfortable with using the internet. As with all the other participants, the only search engine LV used was Google. LV used the most number of search terms and eight unique pages during his search. LV said after the interview he was particularly interested in the anti-snoring laser he read about on the "DailyMail UK" website.

LV's post-search interview used 11.0% more medical language than his pre-search interview, and most of that change came from his answer to the question "do you think there are ways to stop snoring?":

Pre-search: "Yes. So there's a mouth guard. You can be operated on. You can do the breathing thing. The breathing device. You can sleep on your front."

Post-search: "Yessss... what ... what I was interested was, 'cause I looked... because it went through all the different things you could do the mouthguard and the ah um the laser surgery, which I didn't know they could do with lasers, and I didn't know how they did it, I didn't know how expensive it was, so I chased all that down. So that was really interesting so I mean it was a UK one that I was reading, it was seven hundred pounds, and it - it was successful in - no no, in half the cases, in all those that were capable of having it, sorry all those people that were suitable for it only 50% - it only worked on half of them. It was like... only it was only 50% and that wasn't a total fix, that was like a fifth it was like a longer term fix. Yeah, that was crazy. Umm, yeah, so... so there was the mouthguard... ummmm well actually there was a whole bunch of - of home remedies that I didn't think about either, you know I said sleeping on your... [BS: ... front...] ... yeah, or your side, and all that sort of stuff, you can use pillows, you can use - there was a whole lot of people talking about taping tennis balls to the back of your pyjamas. Umm, so there was all that sort of stuff to sort of make you sleep, not smoking, losing weight, ummm sleeping on your front obviously, ummm getting laser surgery. It talked about other surgery, but I didn't find anything on that. Using the CPAP machine...Ummm - there was a lot of stuff about like rinsing your nose out before going to bed, and humidifying the room, and all that sort of stuff."

Case LM

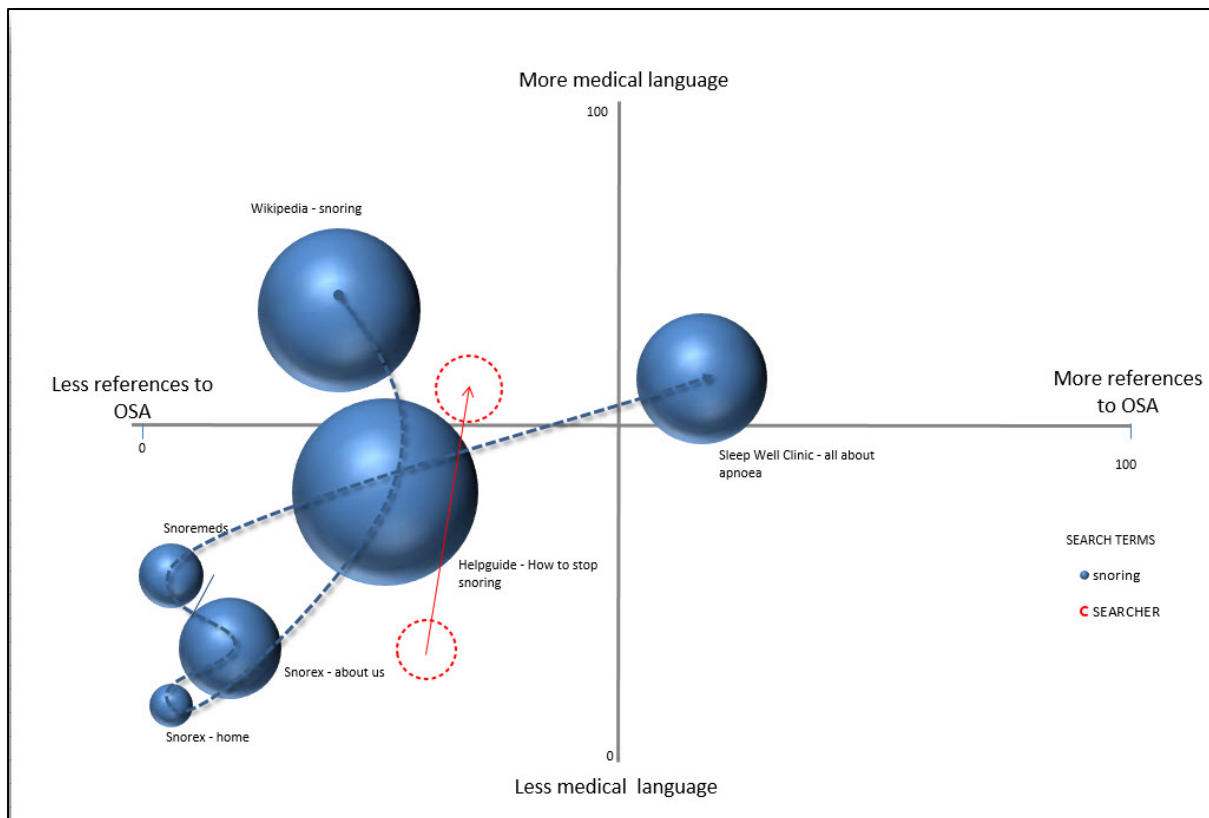


Figure 26 - Conception map of Case LM

Case LM (figure 11) is a married 51-year-old European male with a medium build who has been told he always snores but has never felt the need to find a way to stop snoring. LM is employed as an airport security officer and describes himself as comfortable with using the internet. As with all the other participants, the only search engine LM used was Google. LM visited six pages from his only search term “snoring”. Much of LM’s attention was taken with three sites, “Wikipedia – snoring”, “HelpGuide – how to stop snoring”, and “Sleep Well Clinic – all about apnoea”.

LM’s pre-search interview referred to OSA, so his post-search interview contained roughly the same proportion of references. Although his use of medical language increased 46.7%, his use of anatomical language wasn’t the major contributor to that change. Rather,

LM became considerably more confident linking snoring with OSA, particularly when it came to describing possible ways to stop snoring:

Pre-search: “Yes. Yeah. Well maybe because I’ve heard of all types of things. I mean there’s people who claim all kinds of things related to snoring. You buy those things you spray down your throat, so so I guess, yes it can be. At least to some extent.”

Post-search: “Yeah. Yeah, there was a couple of umm... there seemed to be you know it ranged in um ah – from really limited type stuff ah that you can try yourself by turning on your side, right from the real low end of what you can do, to taking nasal sprays and there was some kind of um tabs or something you could fit in your mouth somewhere, up near the palate, um through to there were a couple of different sites I went to... um, snorex or something was one of them, and then there was another one, which basically almost looked like a mouthguard you were putting in – one - one was only, seemed to be one part of the mouth the other one was both um – ah, I think essentially what was they were designed to do was bring the lower jaw forward a little bit to open – open it up further down, and I think the – it was the snorex one which was the double one, which was designed to keep the ah mouth open and to actually open up the airways a lot more, ummm ah right through to the next one was the old CPAP machine... umm for basically forcing the airway ah open to force the air down it to keep it going, so ah yeah, so. I think I think [there] might be something else but I think they insert or it might be something I might be getting it confused with something else, but I think they inserted it in the palate as well which can make the palate a little bit more rigid, yeah. Umm, there was surgery as well – was the very far end of the thing as well. But ah, they said the problem with surgery is

you can't even... you'll be left with some kind of scaring and even the doctors beforehand can't decide how much scaring you're going to have, and you could actually be worse off than you were."

Case HK - The Sleep Specialist

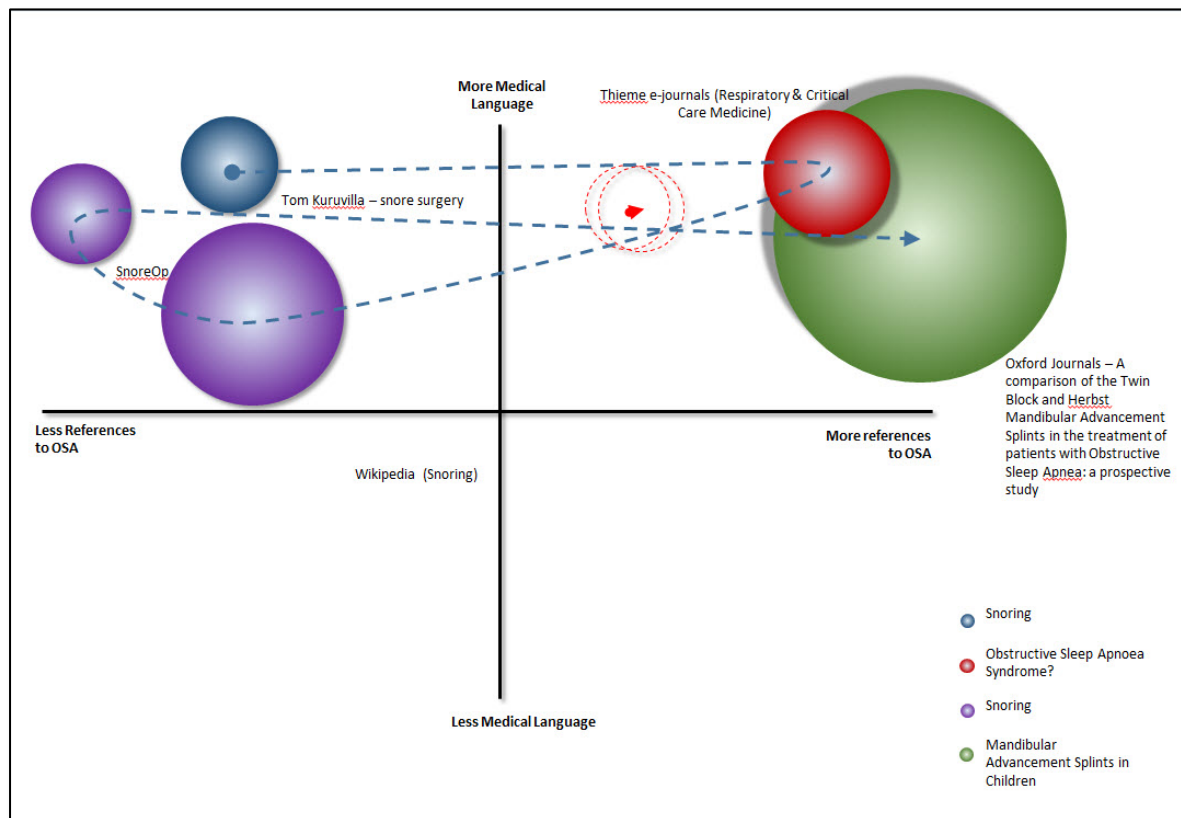


Figure 27 - Conception map of Case HK

Case HK (figure 12) is a 69 year old male Sleep Specialist who was purposively recruited to help investigate whether the internet-search affects people who use predominantly lay language prior to searching differently than people who use predominantly medical language prior to searching. HK gave an almost scripted description of snoring before the search, and unsurprisingly his post-search description of snoring was virtually identical. He explained that since he routinely explains the mechanics, consequences, and treatments for snoring in his clinical practice to his patients several times a day that he can do so almost without thinking about it, and that he does so very much from a medical perspective since it is a medical service he offers. He also noted that he mentions obstructive sleep apnoea also as a matter of course since that is where snoring enters fully into the medical sphere.

HK, as with the lay searchers, used Google as his sole search engine. He, like a number of the others, encountered the Wikipedia page on snoring and spent some time reading through that entry. He also looked at two web pages describing surgical procedures, which he noted were amongst the treatments for snoring not offered in his own clinic. He then spent the remainder of the time reading a medical paper that caught his attention available online through Oxford Journals discussing in detail a particular type of mandibular advancement splint for the treatment of obstructive sleep apnoea.

Unsurprisingly HK showed almost no shift in his already highly medicalised description of his conception of snoring, and thus had the smallest vector of change in the entire study.

Appendix B - Information Sheet

Sorting Snorers: Straight Path to Treatment?

Thank you for expressing interest in my study. This research is investigating how people search the internet for information about snoring. It is our goal and responsibility to use the information that you have shared in an ethically sound manner. We will not disclose your name or contact details to anyone else unless you specifically ask us to do so.

If you agree to take part in the study I will contact you to make a time that suits you for us both to get together for no more than an hour in a location that suits you. During the visit, I will start by answering any questions you might have before we begin the study itself. I will then ask you a few short questions about snoring. I will then give you a computer to use, and ask you to find out a little more about snoring using the internet.

You will have 20 minutes access to a computer and I'll be away from you while you do your search. The computer will record your search using screen-capture software which records everything that happens on the screen. At the end of the search session I'll ask a couple more questions, and answer any that you might have thought of during the study. My analysis will be of the information you might come across about snoring, and I hope to contribute to our understanding of the way social media such as the internet contribute to the way society views issues such as snoring.

My name is Bryn Sparks, and I am a Sleep Physiologist working for the Sleep Well Clinic, which is a private sleep disorder clinic. I also provide sleep services to the Nelson Marlborough District Health Board which are funded through public health. I am also a PhD candidate at Victoria University, and it is for my PhD research that I am conducting this study. You may contact me at any time after the study has completed if you have any questions or concerns which occur to you after we have finished.

My primary supervisor is Associate Professor Annemarie Jutel, whom you may contact directly if you have any concerns arising from my conduct of the study with you.

Bryn Sparks

Associate Professor Annemarie Jutel

Sleep Well Clinic

Graduate School of Nursing, Midwifery and Health

0800 476673

Phone: 04 463 6140

Appendix C - Consent Form**Sorting Snorers: Straight Path to Treatment?****CONSENT FORM**

I have read the information sheet for volunteers taking part in the study designed to find out more about how people search the internet for information about snoring.

I have had the opportunity to discuss this study.

I am satisfied with the answers I have been given.

I have had the opportunity to have aiga/kaiga/Whanau support or a friend to help me ask questions and understand the study.

I understand that taking part in this study is voluntary (my choice), and that I may change my mind and stop taking part in the study at any time, and this will in no way affect my continuing health care.

I have had this project explained to me by Bryn Sparks, the primary researcher, and I have had time to consider whether I'd like to take part in this study.

I understand that my taking part in this study is confidential and that no material that could identify me will be used in any reports on this study.

I have had time to consider whether to take part in the study.

I know who to contact if I have any questions about the study in general.

I (full name) hereby consent to take part in this study.

Date:

Signature:

Appendix D – Snore score, Sleepiness score, and Epworth Sleepiness Score

According to what others have told you, how often do you think you snore?

- 4 ☐ = Always snore
 3 ☐ = Often snore
 2 ☐ = Sometimes snore
 1 ☐ = Rarely snore
 0 ☐ = Never snore

How often do you feel sleepy and want to fall asleep in the daytime?

- 4 ☐ = Always sleepy
 3 ☐ = Often sleepy
 2 ☐ = Sometimes sleepy
 1 ☐ = Rarely sleepy
 0 ☐ = Never sleepy

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your usual way of life in recent times. Even if you have not done some of these things recently try to work out how they would have affected you.

Use the following scale to choose *the most appropriate number* for each situation:

- 0 = would **never** doze
 1 = **slight** chance of dozing
 2 = **moderate** chance of dozing
 3 = **high** chance of dozing

Chance of Dozing

- Sitting and reading: _____
- Watching Television: _____
- Sitting inactive in a public place (e.g. theatre, meeting): _____
- As a passenger in a car for an hour without a break: _____
- Lying down to rest in the afternoon when circumstances permit: _____
- Sitting and talking to someone: _____
- Sitting quietly after lunch without alcohol: _____
- In a car, while stopped for a few minutes in the traffic: _____

Epworth Sleepiness Score = _____ / 24

Appendix E – Ethics Approval



Phone 0-4-463 5676
Fax 0-4-463 5209
Email Allison.kirkman@vuw.ac.nz

MEMORANDUM

TO	Christopher Bryn Sparks
COPY TO	Annemarie Jutel Catherine Trundle
FROM	Dr Allison Kirkman, Convener, Human Ethics Committee
DATE	24 November 2013
PAGES	1
SUBJECT	Ethics Approval: 20158 Sorting Snorers: Straight Path to Treatment?

Thank you for your application for ethical approval, which has now been considered by the Standing Committee of the Human Ethics Committee.

Your application has been approved from the above date and this approval continues until 31 October 2015. If your data collection is not completed by this date you should apply to the Human Ethics Committee for an extension to this approval.

Best wishes with the research.

Allison Kirkman
Human Ethics Committee



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