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2 "Obesity" as Process: The Medicalization of Fatness by Canadian Researchers, 1971-2010

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Most people today see obesity as a public health crisis. Nationally representative Canadian data suggest that approximately two thirds of the population are "overweight," and one third "obese." "Experts" tell us that fat kills, that the current generation of children will not outlive their parents' generation, and that health care for "the fat of the land" will be extremely costly (Gard 2010). Some note how fat has become "Public Health Enemy Number One" (Thatcher 2004). This discourse has been analyzed sociologically as one of moral panic: a situation where a marginalised behaviour or group comes to be perceived as a threat to the morals, values or interests of society as a whole and stands as the reification of a generalised social anxiety (Cohen 1980 [1972]). But it can also be analyzed socio-historically within a construction of reality framework, which stresses the formation of "facts" through discourse (Hacking 1999; Berger and Luckmann 1989 [1966]; Latour 1987; Latour and Woolgar 1986 [1979]).

In this paper, I use methods inspired by the Stanford School of neo-institutionalism (Drori et al. 2003; Frank and Meyer 2007; Meyer et al. 1997; Meyer and Jepperson 2000; Ramírez, Suárez, and Meyer 2007a) to investigate the transformation of body fat in the Canadian medical literature. Among other things, neo-institutionalism is concerned with processes of legitimation and in the evolution of meaning at the macro or aggregate level. Herein I evaluate how fat has been medicalized (Conrad 1992, 2005; Sobal 1995; Zola 1983) by Canadian researchers through the study of their research output: medical publications.

This paper is organized as follows. First, I describe the theoretical framework that inspired this paper and Canadian perspectives on the medicalization of fat. Second, I describe the methodology of this paper. Results are divided into two parts. Part I provides a brief overview of Canadian weight trends and compares them to publication trends over the 1971 to 2008 time period. Part II analyses 6,889 Canada-specific obesity-related articles published between 1985 and 2010 in

light of previous research on the medicalization of fat in Western societies: medical language, medical diagnosis, medical solutions, social determinants of health and families. I conclude by reviewing the main findings from this paper and highlight several questions this research raises: the role of epidemiology's rise in the making of the obesity epidemic, the importance of BMI in the medicalization of body fat and, ultimately, who owns the meaning of body fat?

Constructing Illness & the Medicalization of Society

What is illness? What is health? Sociologists of medicine have built upon a long tradition in the sociology of knowledge that has from its very beginning seen ideas as "reflections of the specific historical and social environments in which they are produced" (Barker 2010, 147). The founding fathers of sociology – Durkheim, Marx and Weber – all recognized the connection between a society's beliefs and its material and social conditions. Manheim (1998 [1936]) and Merton (1937) both urged sociologists to study ideas and their socio-historical contexts; and Berger and Luckman (1967), in one of the most cited sociological texts in history, discussed the extent to which ideas shape individual behaviour and argued that these ideas strongly depend on historical, economic and social conditions.

Sociologists of medicine see health and illness as any other ideas: as something that is actively and socially constructed. They note how a disease does not officially exist until the cultural authority of medicine (Starr 1982) establishes it as a "real," legitimate disease and creates an associated disease category. For decades now obesity has figured in the pages of the International Classification of Diseases, a catalogue of all "officially" recognized diseases and the supreme authority that distinguishes "real" disease from the fake. For the medical and public health communities, then, obesity is a real disease.

Understanding health and illness as social and historical processes rather than merely biological entities makes them amenable to sociological inquiry (Hansen and Easthope 2007; Paradis, Webster, and Kuper forthcoming). One avenue taken by sociologists at the intersection of sociology of knowledge and sociology of medicine highlights the contingent and cultural nature of disease and maps the different factors that contribute to its "construction," what Brown (1995) calls the social construction of medical knowledge. Researchers ask: who were the main actors in the identification and naming of the disease, which steps enabled its reification, what trajectory (if any) the disease took in the public consciousness, what types of responses society developed, etc. Key studies include Fleck's (1979 [1935]) study of syphilis, Latour & Woolgar's (1986 [1979]) laboratory study of the

creation of the peptide thyrotropin-releasing factor or hormone **(**TRF(H), a molecule with several clinical applications), Brumberg's (2000 [1988]) study of anorexia nervosa and Epstein's (1998) study of HIV/AIDS.

The social construction of disease is often framed within the broader context of what sociologists have called "medicalization." Medicalization is "the expansion of medical jurisdiction, authority, and practices into new realms" (Clarke et al. 2003, 161) or, according to another definition, "a process by which nonmedical problems become defined and treated as medical problems, usually in terms of illnesses or disorders" (Conrad 1992, 209). To some, medicalization has enabled the dominance of medicine over all aspects of life and is a form of social control (Illich 1976; Zola 1972); to others, it also facilitated the foray of sociology into medicine (Strong 1979; Hansen and Easthope 2007). Here, medicalization is understood as the process whereby a previously non-medical issue – here, body fat – comes to be understood in medical terms, and upon which the medical gaze and its plethora of diagnostic tools and solutions come to be used in its evaluation and "treatment." Medicalization is also partly political, transforming power relations between the previously-healthy "sick" and medicine as an establishment (Moynihan 2002, 886). To study the medicalization of body fat through an analysis of publications on the subject, then, is to study the discursive making of obesity into a disease and is likely to shed light on the processes whereby fatness was constructed as the public health crisis number one today.

Previous Perspectives on the Medicalization of Fat

The literature on the medicalization of fat is large and growing. Given the historical focus of this paper, only studies pertaining to the medicalization process over time will be reviewed here in order to generate hypotheses about expected trends in the medical literature on fat over time.

Several historians and feminist scholars (see Ellison and Rice, both in this volume) have studied the evolution of what societies see as "ideal" bodies over time and this ideal's connection to medicine. Schwartz (1986) stresses the importance of medicine and medical approaches to the history of dieting, tracing back our cultural focus on weight to 1776, a year when angina pectoris was first connected to excess weight. The late 19th century was a turning point in the medicalization of fat (Schwartz 1986; Stearns 2002 [1997]). Fraser (2009) emphasizes the impact that food abundance, mediated by class standards, consumerism, religion and medicine, had on bodily standards: plumpness, once a sign of wealth and health, became a sign of indulgence, immorality and sickness.

One early sociological account of the medicalization of fat in the United States was written by Sobal (1995), who carefully dissects "obesity" using medicalization theory and a social problems perspective. He distinguishes between three main models of fatness: a moral/deviance model that condemned fatness as bad; an illness model that medicalized fat and positions medicine as the ultimate solution to fatness; and a demedicalized/political model of fatness, which rejects the medical claims of illness and focuses on the rights of fat people. In doing so Sobal identifies several key aspects of the medicalization of fat such as the growth of the risk discourse, the rise of organizational activity to fight obesity, the development of bariatric surgery and weight-loss medication, etc. (more below).

Studying the medicalization of fat over time, Saguy and Riley (2005) showed how the medical literature as recorded in the PubMed database preceded the media in positioning obesity as a topic of interest. Starting in the early 1990s, the media coverage of obesity ballooned, along with scientific articles. Both lay and scientific articles blamed individuals for their obesity (rather than the environment or genetics), pushed for individual-level solutions (rather than policy changes) and advocated surgery.

Several studies have shown the importance of social context in shaping attitudes – lay and medical – toward body fat (Saguy, Gruys, and Gong 2010; Stearns 2002 [1997]), comparing the French and American attitudes toward dieting and weight. Stearns, in his pioneering work, argues that while the French have an esthetic/health approach to weight, Americans have a moralistic/health approach to weight. Both cultures have internalized that fatness is bad for your health; for the French, fatness is also seen as ugly; for Americans, fatness is an indication of moral failure and badness. Saguy, Gruys and Gong (2010) argue based on another comparative study of France and the United States that financial and cultural dominance are distinct forces that shape national beliefs about obesity and thus the representation of obesity in the media. We can thus expect the Canadian experience to differ from the American and French experiences: Canada can't pretend to be either financially or culturally dominant; and the protestant, individualistic ethic of the United States isn't as omnipresent in Canada (Fetner and Sanders 2012).

The Canadian Experience

Canada, as a member of the United Nations and of the World Health Organization (WHO), has been responsive to the 1998 WHO report "Obesity: preventing and managing the global epidemic," a report where obesity rates were shown to have increased for men, but not for women,

between 1978 and 1988 (World Health Organization Expert Committee 2000 [1998], 22). Canada started collecting systematic data on nutrition, weight and height in 2001, as part of its Canadian Community Health Survey. As illustrated by Gard in this volume, Canada was comparatively late in the global drive to collect population-level height and weight data. Importantly, Gard notes that "the impulse to systematically collect population-scale data on the size, shape and capacities of human bodies flares haphazardly through time and space," pointing to the deeply historical, sociological and political aspects of the recent Canadian obsession with fatness.

Arguably, the Canadian discourse has considered the social and economic factors that underpin rising obesity rates to a greater extent than the American discourse. Jutel (2001, 292), for instance, pointed that a 1988 document by Health and Welfare Canada (1988) pushed for concern with weight in general rather than overweight and obesity specifically, emphasizing the wide range of acceptable weights and the importance of a positive body image. The Canadian evaluation of materials later evaluated by the (American) National Institutes of Health (1998) also had less fatalistic conclusions about the negative impact of weight and emphasized health rather than weight loss.

In recent years, the pressure to make obesity into a priority area for Canadian policy in research has grown; and as we will see, publication rates have followed. Katzmarzyk (2002) reified the "Canadian obesity epidemic" in the title of his oft-cited epidemiological paper, noting the importance of making obesity a "public health priority" (p. 673). In 2004, the Quebec *Groupe de travail provincial sur la problématique du poids* published a report inviting immediate action. The causes behind obesity are described as a "causal web of factors" that include international, national/regional, community and individual factors (Groupe de travail provincial sur la problématique du poids 2004). Similarly, Thatcher (2004, 30) notes that while controlling weight can be seen as a "personal issue, it is, more fundamentally, a matter of politics and economics." A report by Starky (2005, 13) for the Library of Parliament, while uncritically positioning obesity as an epidemic and a large economic burden, concludes with an invitation to consider and address "[s]ocial, economic, physical and environmental factors" to "support Canadians in making healthy choices." Statistics Canada (2006) reported on obesity rates as part of its Health Reports, the same year as the founding of the Canadian Obesity Network, a leading anti-obesity advocacy group in Canada. Two years later, Health Canada (2008) discussed obesity trends as part of its Healthy Canadians 2008 Federal Report and obesity was clearly on the Canadian health agenda.

In line with the findings above, Jennings (2009) studied the websites of four Canadian provincial governments and found a general absence of policies targeting fat people individually. She also found that Quebec mentioned the sociocultural and economic factors behind fatness more often than Ontario, British Columbia and Alberta. Furthermore, Holmes' (2009) analysis of Canadian media portrayals of the obesity epidemic suggests trends that break from those found by other scholars in the United States (Oliver 2006; Saguy & Almeling 2008), the UK and Australia (Gard and Wright 2005). She found that the obesity epidemic largely remains unquestioned, but that the discourse on Western decadence and decline wasn't present in news articles. Similarly, Canadians emphasized individual agency and strength rather than weakness and individual failure to exercise weight control. Canadian scholars have been developing alternatives to the mainstream biomedical model of obesity for decades. The work of Polivy and colleagues on the harms of dieting (c.f. McFarlane, Polivy, and McCabe 1999; Polivy and Herman 1987), that of Ciliska (1990) on non-dieting approaches to care for obese women and the Health At Every Size work of Gingras (2005) are only a few such examples.

Methodology

This paper uses a methodology inspired by the macro-sociological approach of John Meyer, Francisco Ramirez and colleagues at Stanford University. Meyer and Ramirez study processes of legitimation: how certain ideas, inspired by a modernist ideology, come to spread around the world and come to be taken for granted. Among other things, they studied the historical growth of higher education (Frank and Meyer 2007; Schofer and Meyer 2005), the growing importance of science worldwide (Drori et al. 2003) and the rise of the human rights movement (Ramírez, Suárez, and Meyer 2007b; Meyer, Bromley, and Ramirez 2010). This longitudinal, comparative approach has recently been applied to obesity research by Paradis (2011), whose analysis of obesity-related publications from 1950 to 2010 established a timeline where fat as merely fat became "obesity" in the early 1970s, an epidemic in the mid-1990s, and morphed into general anxiety about the future since 2000 with the turn to childhood obesity. Skolbekken (1995) conducted a similar study of risk using aggregate trends among scientific publications, but limits on data availability and information analysis techniques at the time limited his ability to control for the expansion of medical knowledge.

In this paper I investigate different aspects of the medicalization of fat in Canada through a study of aggregate trends among the titles of medical publications focusing on body fat. Comparing the literature on body fat (the medicalized, *i.e.* publications on obesity) with secular trends on obesity

(the medical) yields a vivid portrait of the process; so does a closer reading of the medicalized (*i.e.* obesity rates in the population) over time.

Data Sources

Weight trends

Different types of data about weight and height in the Canadian population are available: self-reported and measured. Because self-reported weight and height tend to be systematically distorted (Shields et al. 2011; Shields, Connor Gorber, and Tremblay 2008), the data used in this paper come strictly from nationally-representative studies where researchers measured them directly. Data were taken from several sources and provide 6 different time points over the 1971-2008 time period (see Table 1). As noted by Gard in this volume, Canadian data are far from perfect and haven't been systematic; they are however sufficiently precise here given our comparative emphasis.

Table 1: Sources of Data, Canadian Obesity Trends

Year	Survey	Source
1971	Nutrition Canada Survey, 1970-1972	Katzmarzyk (2002)
1979	Canada Health Survey, 1978-1979	Tjepkema (2006)
1989	Canadian Heart Health Surveys, 1986-1992	Shields (2006)
2004	Canadian Community Health Survey, Nutrition, 2004	Tjepkema (2005)
2005	Canadian Community Health Survey, 2005	Shields (2011)
2008	*Calculated Average from:*	
	Canadian Community Health Survey, 2008	Shields (2011)
	Canadian Health Measures Survey, 2007-2009	Shields (2011)

Publication trends

Data were collected from the PubMed database on April 16, 2012 using queries of the following form: ((keyword) AND (Canada)) AND ("1950"[Date - Publication] : "3000"[Date - Publication]). The 15 different "keywords" were: acoria, bariatrics, bariatric surgery, corpulence, gastroplasty, hyperorexia, obese, obesity, obesogenic, polycsarcia, weight gain and weight loss. PubMed / MEDLINE is the largest medical database in the world, and is maintained by the United States based National Library of Medicine (NCBI 2013). Although it doesn't cover all the medical literature published every year, it is the most comprehensive medical database available. 1950 was initially chosen as a start date given the rise in scientific enterprise after World War II. Meta-data obtained from these queries were then merged by PubMed ID to keep one record per publication, for a total of 8,283 articles over the 1950-2012 time period. Data were the left and right censored to cover either the 1971-2008 time period (for comparison with weight trends; n=5,511) or the 1985-2010

time period (for longitudinal analyses of titles; n=6,889). Left censoring was done for data before 1985 given the major shift seen that year in the numbers of publications: from 1950 to 1984, publications range from 1-12 per year (mean = 3; S.D. = 2.8); after 1985 they explode to reach 782 in 2010, with a mean of 273 publications per year (S.D. = 196.1). Right censoring was done to guarantee a full year's worth of data, as data input into PubMed lags actual publication.

Analysis

In order to analyze publication trends, different aspects of the medicalization of fat were identified and hypotheses generated inductively from the literature (see below). A coding scheme of 190 keywords (see Appendix I) was thus developed. Coding of the titles of the 6,889 publications identified was done using Python Version 3.2.3 for Mac OS X; the coding scheme covered 78.6% of all article titles. Both weight and publication data were normalized using 1989 rates to enable comparison of growth. All data was analyzed using R version R 2.15.0 for Mac OS X Leopard. Although coding the 6889 titles between 1985-2010 does not give us access to the language and meanings used in the full-text articles, the importance of titles in summarizing the content of the article and as a strategy to attract the attention of readers suggests that coding titles yields an impressionistic portrait of the evolution of the literature. Titles are purposive choices made my researchers to convey meaning and situate their research within the current scientific debates of the day.

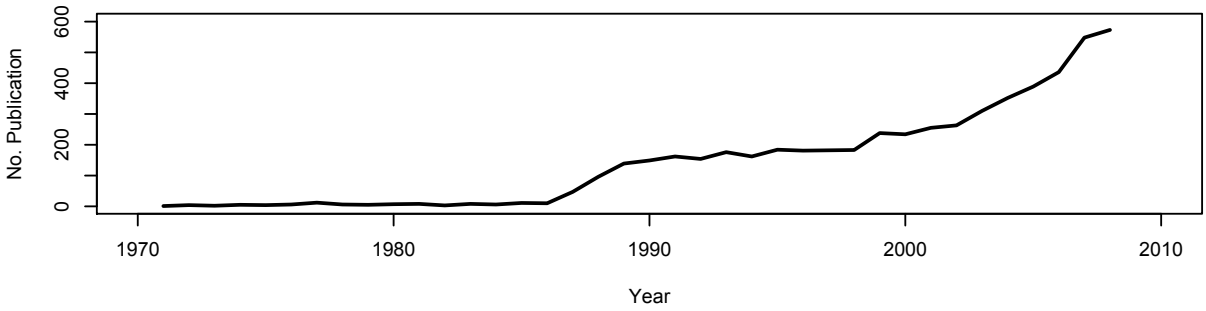
Results

Part I. Weight trends vs. publication trends, 1971-2008.

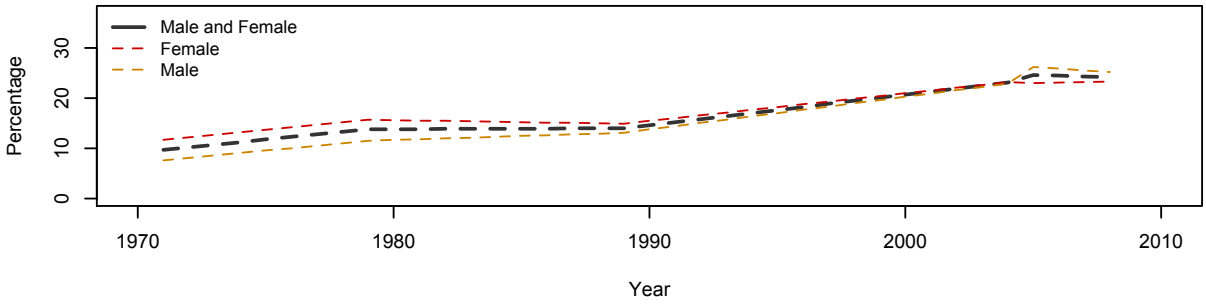
Figure 1 shows three different longitudinal graphs representing growth in publications on obesity as defined above (Panel A), growth of obesity rates in the Canadian population (Panel B) and comparison between both, put on the same scale (with frequencies normalized for 1989 = 100; Panel C). Panel A shows a first dramatic rise of publications in the late 1980s, followed by a linear increasing in articles until the late 1990s, where we find a second inflection point. Major growth, however, happened after 2002, when the graph gets almost vertical, peaking at 788 articles in 2010. Panel B shows increased prevalence in the 1970s, a plateau in the 1980s, followed by a linear rise since the early 1990s. The trend for the average of both sexes peaks at 24.6% in 2005. Comparing Panels A and B shows no obvious connection between obesity rates and the surge in publications in the late 1980s: the first publication growth spur happened in a period where weights were stable, maybe as a response to the growth seen in the previous decade; similarly the second publication

growth spur, also lagged behind increasing weights. Panel C shows the magnitude of the gap between normalized publication trends and weight trends: the weight trends look almost flat when compared to publications. Growth among publications was 382 times greater than growth of weight trends (149.5% vs. 57,200%). Similarly, publications in 2008 are 4.1 times more frequent than they were in 1989 while, obesity rates were only 1.7 times greater over the time period.

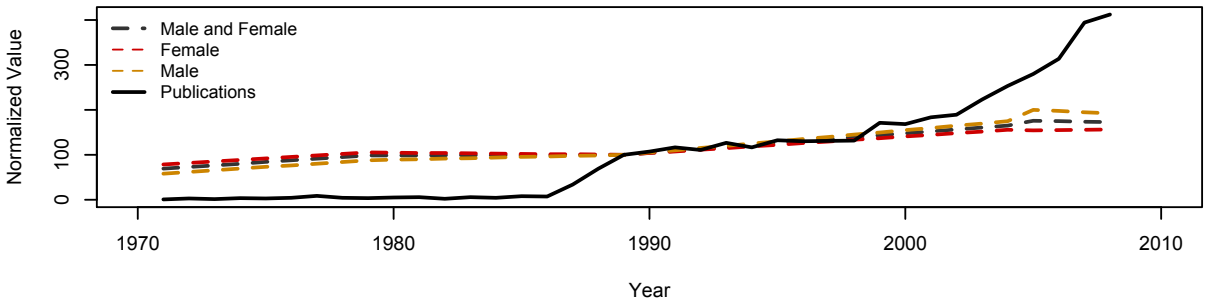
Figure 1. Publication vs. Weight Trends in Canada, 1971-2008
Panel A. Obesity-Related Canadian Publications



Panel B. Obesity Rates in the Canadian Population



Panel C. Publications vs. Weight Trends (Normalized: 1989=100)



Part II. Aspects of the Medicalization of Fat in the Literature, 1985-2010.
In this section, I review the literature on three main aspects of the medicalization of fat – medical language, medical diagnosis and medical solutions – to develop and test hypotheses relating to the

medicalization of fat in Canadian medical publications. Sobal's (1995) article on the medicalization of fat is used as a starting point. As will be clear from Figure 1 (Panel A), publications were comparatively scarce before 1985. Data analysis thus focuses on articles published in or after 1985.

Medical Language

Medicalization often leads to the creation and adoption of a medical-sounding vocabulary to describe the object being medicalized and give the pursuit of its study a scientific veneer. Sobal (1995, 71) notes the popularization of the term "obesity" in the 1970s and the associated decline of "corpulence" in the medical literature. He also points to the creation in 1973 of the neologism of "bariatric" and to the development of the medical specialty of bariatrics.

In 2000 the World Health Organization released a report titled "Obesity: preventing and managing the global epidemic. Report of a WHO consultation" (World Health Organization Expert Committee 2000 [1998]). This report constructed obesity as a *global* epidemic, a global public health crisis.. Its massive growth has been described by Saguy and Riley (2005) as well as Paradis (2011) as , starting in the early 2000s.

Finally, since the early 1990s, scholars have noted the prominence of risk discourse and defined our contemporary societies as "risk societies" (Beck 1992; Mythen and Walklate 2006), particularly in the public health domain (Lupton 1993; Lupton, McCarthy, and Chapman 1995; Skolbekken 1995; McDermott 2007). The rise of epidemiology over the course of the 20th century has transformed our understanding health and illness, and was instrumental in the development of the obesity epidemic discourse (Oliver 2006; see also the papers by Gard, by Ward, and by McNaughton and Smith in this volume).

Based on these studies we can make the following hypotheses with respect to the Canadian medical literature:

Hypothesis 1: Obesity and overweight should take an increasingly large part of the literature. Codes: obesity, overweight.

Hypothesis 2: The growth of medicalized fat-related terms should be greater than that of lay terms over time. Codes: high medicalization: adipocyte, adipose, lipid, bariatrics, polyphagia; medium: obese, obesity, obesogenic, overweight; low: corpulence, fat, weight.

Hypothesis 3: A stark growth in the use of the term "epidemic" should be seen starting in the early 2000s. Code: epidemic.

Hypothesis 4: The use of "risk" among titles should rise starting in the late 1980s and escalate rapidly over time. Code: risk.

Figure 2 shows publication trends for "obesity" and "overweight" as a percentage of the sample. Obese/obesity (4,328 articles or 62.8% of sample) and overweight (3,075 articles or 44.6%

of the sample) follow similar trends: a slight decline in the late 1980s before a continued slow growth, rather than unmediated growth. Obesity is more frequent in the literature throughout the time period. Thus hypothesis #1 has been confirmed.

Figure 2. Obesity and Overweight as % of Sample

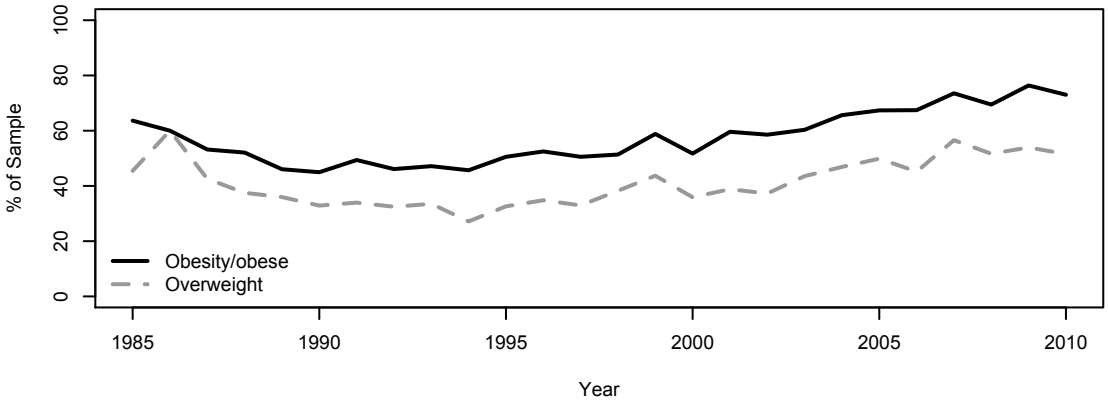


Figure 3. Fat-related Terms by Degree of Medicalization as % of Sample

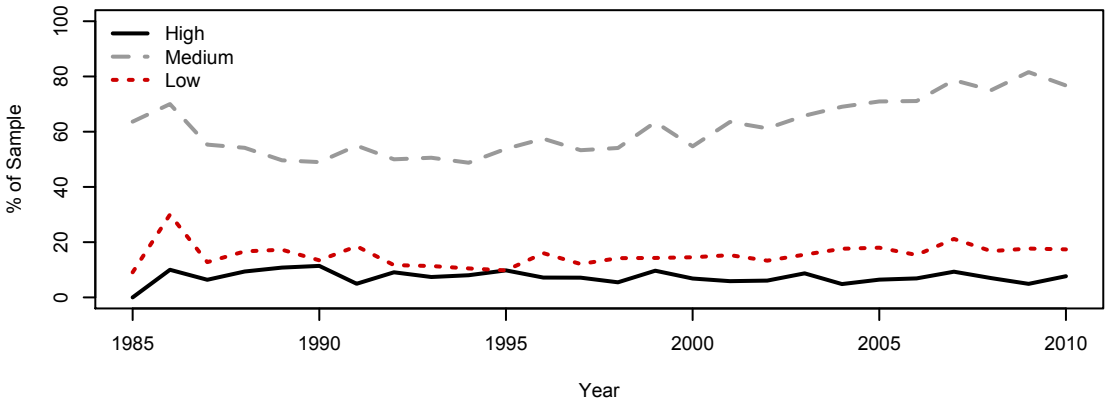


Figure 4. Number of 'Epidemic' and 'Risk' Publications over Time

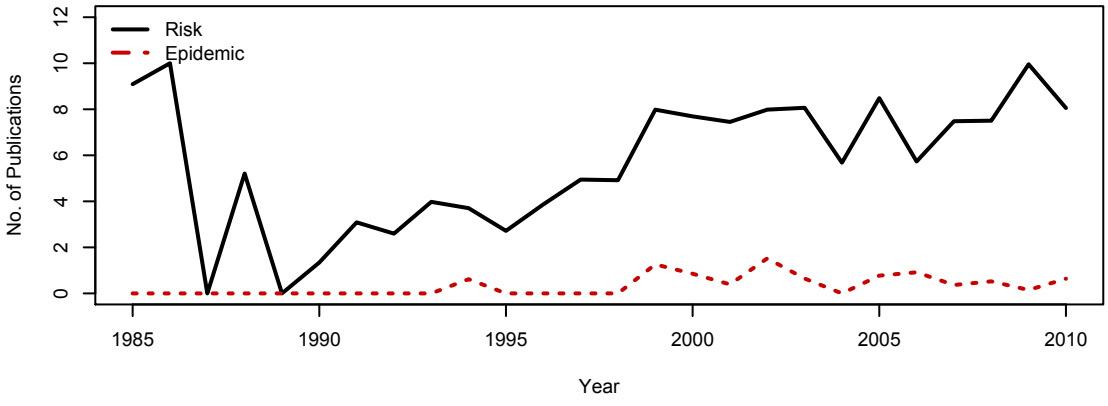


Figure 3 shows publication trends on fat-related language, broken down by level of medicalization. The literature is dominated by obesity, obese and overweight, which were coded in the middle category of medicalization. This category first declined as a proportion of the sample until the 1990s and has been growing since. Lay language (corpulence, fat, weight) oscillated over most of the time period, but has been on a slow rise since the early 1990s. Meanwhile, high-medicalization language has been on the decline since the late 1980s. We cannot confirm Hypothesis 2; rather, it is mid-level medicalization terms that have come to dominate the medical discourse.

The use of the word "epidemic" in publication titles is not as prevalent in the Canadian literature as in the American literature, with a count of merely 31 articles over the time period (or 0.45%; see Figure 4). The earliest article was published in 1994; the late 1990s and early 2000s saw several new publications but peaked at merely 5 per annum in 2010. Overall, then, the count of publications is too low for us to confirm Hypothesis 3. Figure 4 also shows how the use of the term "risk" (455 articles, 6.6%) has been on a steep upward trend since the early 1990s, after a sharp decline in the late 1980s. It peaked at 10.0% of the sample in 2009. The use of risk in the Canadian literature lagged our expectations with Hypothesis 4 by ten years; the growth has been sustained since the early 1990s.

Medical Diagnosis: Body Mass Index

The use of the body mass index (BMI) as a diagnostic tool for obesity is a recent but very important phenomenon (Anderson 2012). Indeed, it is only in 1985 that BMI was advocated as a reliable indicator of pathological levels of body fat in a National Institutes of Health (1985) report. Ten years later, a World Health Organization Report (1995, 312) written by an "Expert Committee" proposed "classification of BMI with the cut-off points 25, 30, and 40 for the three degrees of overweight," namely grade 1, 2 and 3 overweight. Today these categories are called overweight, obesity and morbid obesity, respectively. Among children, it is only in 2000 that BMI standards were established (Cole et al. 2000), enabling epidemiological research on childhood obesity.

From these reports we can make the following hypotheses:

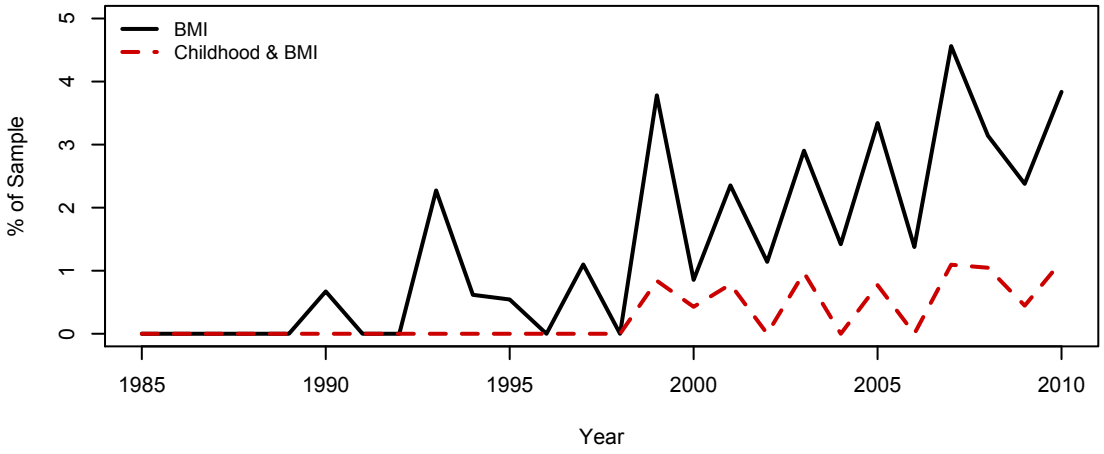
Hypothesis 5: The use of BMI among titles should rise in the late 1980s and see increased growth after 1995. Codes: BMI, body mass index.

Hypothesis 6: The number of childhood obesity articles should increase dramatically after 2000.

Figure 5 shows publication trends for BMI and for child-associated BMI publications. A total of 151 articles contained BMI in their titles (2.2% of the sample). The first publication on BMI came

in 1990; BMI articles have seen a staggered growth as a proportion of the sample since 2000. The growth lagged about five years from what Hypothesis 5 expected. As for childhood and BMI, we see the first publications in the late 1990s and oscillating interest since then, for a total of 35 publications (0.5% of the sample). There has been no dramatic increase in childhood BMI mentions among titles and we have to reject Hypothesis 6.

Figure 5. BMI-Related Publications Per Year as % of Sample



Medical Solutions

Sobal (1995) argues that one aspect of the medicalization of obesity has been the development of medicine-specific "solutions" or "treatments" such as medically supervised dieting, surgery, medication and psychiatry. Histories of dieting have shown continued interest with medically-supervised diets (Schwartz 1986; Taubes 2007).

According to Sobal (1995), the glory days of bariatric surgery were in the 1970s. Recent interest in bariatric surgery in the social science literature (Salant and Santry 2006; Throsby 2012; Saguy and Almeling 2008) suggests resurgence since the 2000s. Germov and Williams (1996) have suggested that the current public health messages about the problem of overweight combined with cultural imperatives for women to be slim has lead to what they call an "epidemic of dieting women." Recent scholarship has highlighted how men and children now also suffer from slimness imperatives (Bell and McNaughton 2007; Dworkin and Wachs 2009; Evans et al. 2002; Schwartz 1986; Isono, Watkins, and Lian 2009).

Oliver (2006, 617-8) traces the history of the "diseasing" of obesity to "changes in the supply and demand of medicine" as an institution and the rising importance of the "health-industrial

complex," both of which conspired to exert pressure on regulatory bodies to officially medicalize obesity, enable the flow of money from taxpayers and consumers to insurance and pharmaceutical companies and give food corporations a free pass. Accordingly, he sees the pharmaceutical industry as one of the main drivers behind the medicalization of fat.

Rasmussen (2012) argues that psychiatry was a major factor in the medicalization of fatness in the 1940s and 50s, turning fatness into not only a physical illness but also the sign of psychiatric illness (see also Rasmussen 2008). Reviews of the literature (Rosengren and Lissner 2008; McElroy et al. 2004) and population-level data (McIntyre et al. 2006) however suggest that stigmatization – not actual body size – may be a key contributor to mental health problems among obese patients, and some have noted that mood medication may have contributed to increasing weights in the population (Devlin, Yanovski, and Wilson 2000; Caplan 2012). Psychiatry is still very much involved in the treatment of obesity and hopes to be further involved in its treatment, as the obesity-themed January 2012 issue of the *Canadian Journal of Psychiatry* attests. Similarly, a sizable (American) literature now deals with the health consequences of stigma (Major and O'Brien 2005; Puhl and Brownell 2006; Puhl and Latner 2007; Bayer 2008a; Puhl and Heuer 2009, 2010; Bell et al. 2010b; Scambler 2009).

Based on these studies we can make the following hypotheses:

Hypothesis 7: Dieting should hold a prominent place among articles throughout the time period. Codes: diet, dietary, dieting, food, nutrition.

Hypothesis 8: Surgery-related terms should increase in the 1970s, and again in the 2000s. Codes: surgery, bariatric surgery, gastroplasty, surgical.

Hypothesis 9: Medication-related terms should increase over time. Codes: Anorexiant, appetite suppressant, drug, medication, pharmaceutical, pharmacy, pharmacology, pill.

Hypothesis 10: Mental health-related terms should increase throughout the time period. Codes: Anorexi, addiction, behavior, bingeing, bulimi, compulsive, eating disorder, emotion, mental, mental health, personality, psychiatry, psychology, psychotherapy, stigma, stress.

Figure 6 shows rates of publications on diet, surgery, medication, and mental health over time. Diet dominates (1,118 articles, 16.2% of the sample). Second most prevalent is mental health (432 articles, 6.3% of the sample), which saw a small decline from the early 1990s to the early 2000s (see Rasmussen 2008, 2012 on the involvement of psychiatry in obesity treatment). Surgery covered about 3.7% of the sample and medication 1.7%. A slight increase in publications on medication can be seen since the late 1990s. Hypothesis 7 is confirmed; Hypothesis 8 and 9 are not, as surgery and medication remained low-interest solutions throughout the time period (with an outlier year in 1987

for surgery, when the total number of articles in the sample (denominator) was quite small). Hypothesis 10 cannot be confirmed, as the trend is mostly flat throughout the time period.

Figure 6. Medical Solutions as % of Sample

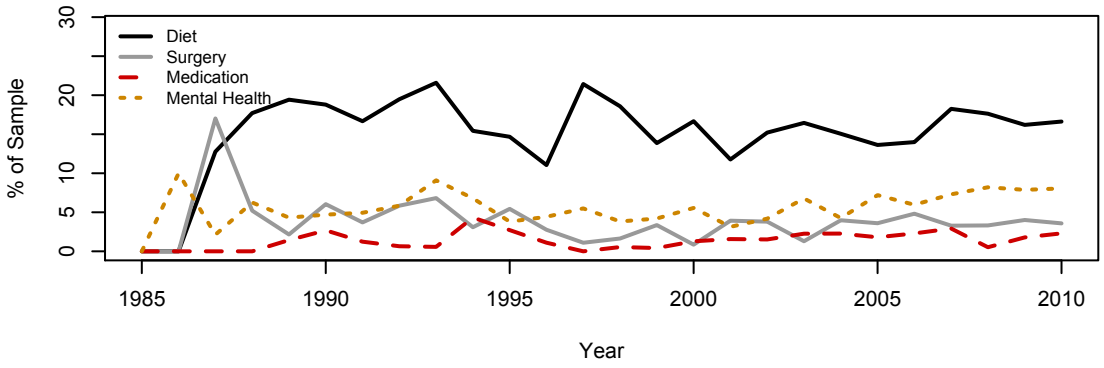
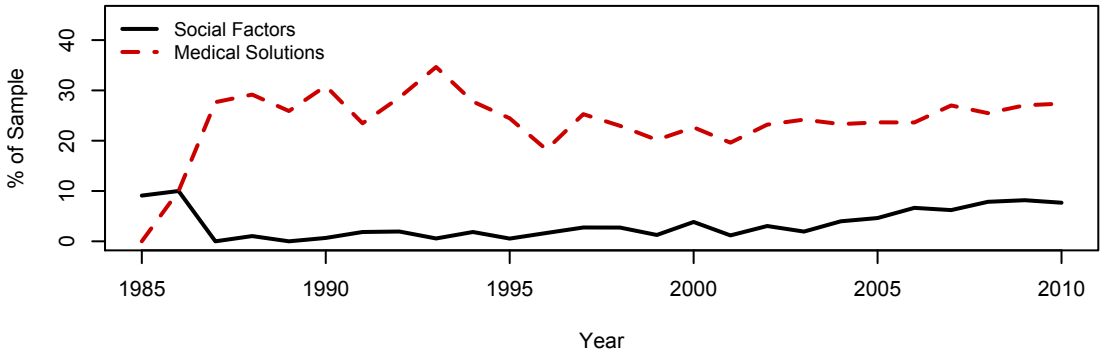


Figure 7. Social Factors and Medical Solutions as % of Sample



Social Determinants of Health and Families

The biomedical model only reluctantly acknowledges the importance of the social determinants of health. The rise of epidemiological research in the late 20th century has facilitated their study (Hansen and Easthope 2007), leading to the emergence of the risk society mentioned above. Similarly, as noted by Strong (1979), the sociological critique of medicine has partly transformed the way medicine studies health. Tensions between the medical model and the acknowledgement of broader forces remain.

Indeed, as noted earlier, Saguy and Almeling (2008) found rising mentions of individual-level solution over time; in contrast, Chang and Christakis (2002) argued based on a longitudinal analysis of medical textbooks that the medicalization of fatness lead to the shifting perception of the obese and increasing mentions of social and material factors. Solutions to the "obesity problem" are

however mostly individual (e.g. dieting, surgery, medication) and will likely outweigh broader solutions such as policy or community-based interventions. We make the following hypothesis:

> *Hypothesis 11*: Mentions of social factors should be rare, confirming the individualistic bias of medicine. Codes for social factors: community, environment, geography, neighborhood, obesogenic, policy, poverty, race, school, social, societal, socio-economic; codes for individual-level factors: above codes about diets, medication, mental health and surgery.

Figure 7 enables a comparison of trends in mentions of social factors with the medical solutions explored with Figure 6. A total of 312 articles (4.5% of the sample) mentioned factors beyond the individual in their titles (e.g. economic, community, politics, race, school, social, societal, etc.); meanwhile a total of 1,732 articles (25.1%) were written about the medical solutions discussed above: diet, medication, surgery and psychiatry. The share of medical solutions declined until 2000, before picking up again; that of social factors has increased slightly since the early 2000. We can confirm Hypothesis 11.

Families and the Future

Anxiety about the future and the inability of medicine to solve all social problems persist. McDermott (2007) notes that while the concept of at-risk children has long roots in the medical and public health traditions, the focus on children as at risk of sedentarity and obesity lagged behind concerns with adult obesity, a fact confirmed by Paradis (2011). Despite early interest in childhood obesity, with a first Canadian publication in 1935 and Hilde Bruch's crusade in the 1940s, broader interest in childhood obesity only emerged in the 1980s (Schwartz 1986). Paradis (2011) found a growth rate of 1,651% in the number of articles about childhood obesity published and recorded in the PubMed database between 1989 and 2009. She argued that the recent emphasis on childhood obesity reflects anxieties about the financial viability of medical systems and an acknowledgement of the failure of medicine to "solve" the "problem" of obesity.

Blaming mothers for the weight of their children has a long history (Schwartz 1986; Mitchinson in this volume), but the proselytizing work of psychiatrist Hilde Bruch, who saw fault in mother's feeding practices and emotional imbalance, was critical to the involvement of psychiatry in obesity care (Rasmussen 2012). Several authors have noted the medicalization of childhood obesity and the tendency to blame mothers for the trend (Moffat 2010; Boero 2009; Bell, McNaughton, and Salmon 2009). In Boero's (2009) analysis, the news media are shown to be complicit in disseminating and reproducing the idea that careless, negligent or overly permissive mothers are partly responsible for the obesity epidemic. "Mother blame" lies more or less explicitly behind both the scientific and

common sense solutions to the obesity epidemic. "The weight of one's children," she writes, "has increasingly become a litmus test of good mothering" (p. 113). Bell et al. (2009) go further and argue that childhood overnutrition and obesity have been both medicalized and criminalized over the past decade. They also point out that while mothers are often accused of overnutrition, fathers are "conspicuously absent" from the literature (p. 162).

Based on these studies we can make the following hypotheses:

Hypothesis 12: Children should be increasingly present in the literature over time, particularly after 2000. Codes: Child, fetal, fetus, infant, juvenile, kid, pediatric, teen, youth.

Hypothesis 13: Mothers should be mentioned regularly throughout the time period, but increasingly so after 2000. Codes: gestational, maternal, maternity, pregnancy, mother, wife.

Hypothesis 14: Fathers should be mostly absent from the literature. Codes: father, husband, paternal, paternity.

Figure 8. Children and Mothers as % of Sample

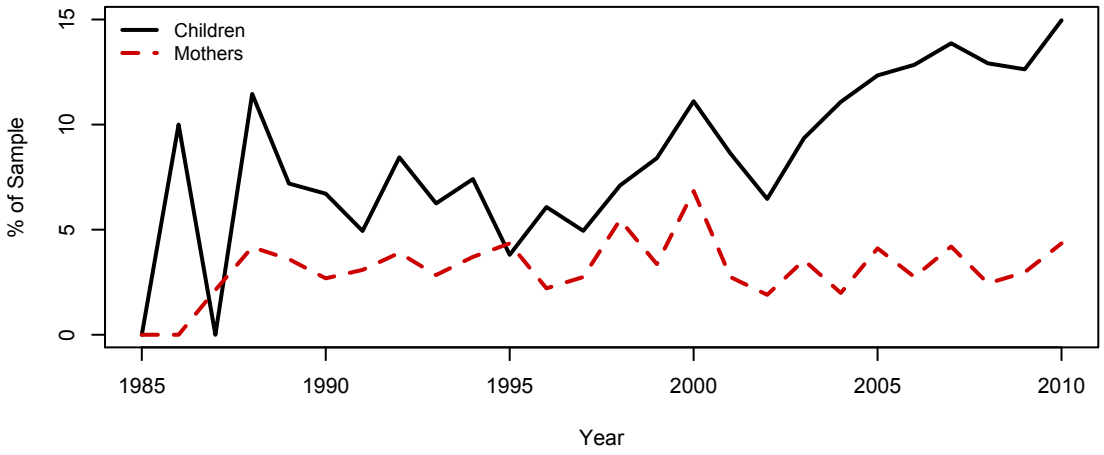


Figure 8 compares rates of publications on children, mothers, fathers and families. Publications on children (725 publications, 10.5%) have been rising throughout the time period, but most importantly after 2002, and reached 15.0% of the sample in 2010. Mentions of mothers and mothering (236 articles, 3.4%) have been relatively stable throughout, with a maximum of 6.6% in 2000. We cannot confirm that mothers have been mentioned increasingly often after 2000, as suggested by Hypothesis 13. Not a single article in the sample mentioned fathers, confirming Hypothesis 14.

Discussion

Part I of this paper showed the extent to which the medical (i.e. obesity rates in the population) has been dwarfed by the medicalized (*i.e.* publications on obesity) over the time period. The growth of the two is incommensurable even when we take the least conservative estimates of population weight gain available – measured obesity rates. The research community's response has dramatically outgrown the actual phenomenon, which is alarming given the highly debatable effects of obesity on health outcomes (Bacon and Aphramor 2011; Campos et al. 2006a; Flegal et al. 2013; Padwal et al. 2011; Wildman et al. 2008). This gap is, however, much less prominent in the Canadian literature than it was in the American literature (cf. Paradis 2011), suggesting a more moderate response from the Canadian research community.

Part II of this paper investigated several aspects of the medicalization of fat in Canadian publications: medical language, medical diagnosis, medical solutions, social determinants of health and the role of families. With regards to language, we can confirm that obesity and overweight have indeed accrued a larger share of publications over time; corpulence is clearly not part of medical parlance today. Contrary to our hypothesis, highly-specialized terms did not increase over time; rather, it is medium-level terms that dominated the discourse, with obesity and overweight dwarfing all other terms. One could argue that the medical connotation of overweight and obesity, combined with their familiarity to most North Americans, has facilitated their inclusion into lay discourse, thus enabling the broadening cultural purchase of body fat as a medical problem.

Another hint that the Canadian take on obesity as a public health crisis was more moderate than the American one can be found in the fact that the word "epidemic" has not permeated the Canadian literature deeply. Risk, on the other hand, has established itself as an important part of the medical discourse, with close to 10% of articles by the end of the time period. This suggests two things: first, that epidemiology and its risk discourse has made serious inroads into Canadian obesity research; and second, that obesity is conceptualized both as a risk factor for disease (such as diabetes and cardiovascular disease), and as a disease in itself (obesity).

Turning to body mass index as the main diagnostic tool for obesity, its prevalence has indeed increased over time among titles, although trends on childhood BMI are not as clear, given their low occurrence. Closer analysis of publication texts would be needed to investigate the prevalence of BMI and its impact on obesity research.

Different medical solutions take unequal but nonetheless important places in the literature. Dieting is the main emphasis, followed by mental health. In the aggregate, it was found that medical, individual-level concerns or solutions (such as drugs and surgery) dominate public-health oriented concerns or solutions (such as community initiatives and policy). The slow rise of the latter, however, shows shifting interests within the medical community to consider the social determinants of health, as expected given the rise of epidemiology and the recognition of the psychosocial bases of health and illness (Hansen and Easthope 2007). Surgery and medication did not experience the expected growth yet remain of substantial concern in the literature. This is unsurprising in a country with a more collectivist orientation to health care delivery and cost sharing than the United States. Stigma, a hot topic in the United States (e.g. Puhl and Heuer 2009, 2010), was noticeably and unexpectedly under-represented in the literature (MacLean et al. 2009). Given that stigma is relatively new as a concern among obesity researchers (c.f. Puhl and Brownell 2006; Puhl and Latner 2007; Puhl and Heuer 2009), we could still see a literature on stigma emerge in Canada over the coming years. Paradis, Kuper and Reznick (2012) is one such example.

Finally, as expected, mothers were mentioned in a large subset of articles throughout the time period (3.4% of the sample), and fathers were altogether absent. The expected rise after 2000 in studies mentioning mothers was not seen, however. This may be partly due to comparatively lower emphasis on childhood obesity in Canada, compared to the United States.

Conclusion

The extent to which and in which amount fat is a medical problem is still highly debated, but the medicalization of fat is now beyond question. This paper has shown that Canadian researchers have indeed medicalized fat over the past three decades, although it appears that this medicalization has lagged behind the medicalization of fat as seen in the United States. Canadian researchers have been writing about fat as a medical condition – as obesity or overweight – in as many as 6,889 articles since 1985, and in recent years they have become ever more prolific. These publications have increasingly made an appeal to a language of risk, appealed to medical solutions to the obesity "problem," and expanded their jurisdiction over new populations, most notably children. By association and because they are typically but culturally the closest individual to kids, mothers and their pregnancies have also been medicalized.

This paper also raised questions about the role of BMI in enabling the medicalization of fat and the ensuing moral panics discussed by other scholars (Boero 2009; Campos et al. 2006a; Gard

and Wright 2005), and about the seemingly irreconcilable tensions between medicine and its emphasis on individual solutions and the one-on-one care relationship on the one hand, and public health imperatives on the other. The rising share taken by population-level, risk and epidemiological language over the past ten years (see Figure 7) suggests that things may be changing in favour of diminished individual responsibility. In the Canadian context, where collective solutions are more frequent than in the United States (Jutel 2001), this will not come as much of a surprise. Similarly, the role of "big pharma," of for-profit health care and of the food and diet industries is not as clear in Canada as in the United States, and the analysis provided here suggests a still marginal role for drugs and surgery among academic publications. Food and diet, however, are critical components of the scholarship. The impact of these industries has on policy and care provision remains to be investigated.

Several of the trends identified above lag behind the hypothesized trends by 5 years to a decade (e.g. BMI; childhood); several others are dampened (e.g. surgery, epidemic). The fact noted by Gard in this volume that Canadian population-level data were historically scarce and unreliable probably has something to do with this lag; yet I would like to argue that both universal health care and the relatively small size of the Canadian scientific research apparatus are factors that probably contributed to this lag and that dampening of the language used by Canadian researchers. The "rhetorical virus" (Gard 2010, 7) of obesity as an epidemic has not caught on among Canadian researchers.

Ultimately, the medicalization of fat raises the fundamental question: who owns the meaning of body fat? Is it the medical establishment, governments, or the fat and not-so-fat people who suffer in a culture that despises it and condemns it as a death sentence? As I have tried to show in this paper through a longitudinal analysis of medical publications is that the transformation of fatness into a disease has been a process. Language played a critical role in the definition and transformation of our perception of body fat – as it plays in the construction of any other reality. In this case as in other medicalization cases, this transformation is political, and its future dependent upon the continued critical analysis of our discursive environment and its impacts on our lives.

Chapter in Ellison J, McPhail D and W Mitchison (2016) *Obesity in Canada: Critical Perspectives*. University of Toronto Press, pp. 56-88.

Acknowledgements

The author wishes to thank Arvin Fahramand for Python coding assistance, Niall Byrne for comments on the manuscript, the *"Obesity" in Canada* workshop attendees and volume editors for their helpful feedback.

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Appendix I

Coding scheme

'abnormal', 'abuse', 'abusive', 'addict', 'adipocyte', 'adipos', 'adolescen', 'aetiolog', 'anorexi', 'anorexiant', 'appetite suppressant', 'arteriosclerosis', 'arthrit', 'atherosclerosis', 'attitude', 'behavior', 'behaviour', 'binge', 'BMI', 'body fat', 'body mass index', 'bulimi', 'cancer', 'carcin', 'cardiac', 'cardiorespiratory', 'cardiovascular', 'child', 'children', 'choice', 'cohort', 'committee', 'community', 'compulsive', 'conference', 'control', 'cost', 'deviance', 'deviant', 'diabetes', 'diet', 'dieting', 'disability', 'double blind', 'drug', 'eating', 'eating disorder', 'economic', 'education', 'emotion', 'endocrin', 'energetic', 'energy', 'environment', 'epidemic', 'epidemiolog', 'epigenetic', 'esteem', 'etiolog', 'excess', 'exercis', 'experiment', 'expert', 'family', 'families', 'fasting', '\\bfat\\b', 'father', 'fatty', 'feeding', 'fetal', 'fetus', 'financial', '\\bfit\\b', 'fitness', 'food', 'genetic', 'geograph', 'gestational', 'global', 'glycemi', 'health', 'heart', 'heredit', 'histor', 'husband', 'hypertension', 'ideal weight', 'income', 'inequality', 'infant', 'infectious', 'infectobesity', 'intervention', 'issue', 'juvenile', 'kids', 'lean', 'lipid', 'longitudinal', 'manage', 'matern', 'medicaliz', 'medication', 'meeting', '\\bmen\\b', 'mental', 'mental health', 'metaboli', 'moral', 'morbid obesity', 'morbidity', 'morbidly obese', 'mortality', 'mother', 'movement', 'neighbourhood', 'neighborhood', 'neuro', 'neurolog', 'normal', 'nutrition', 'obesogenic', 'organisation', 'organization', 'orthorexi', 'overfeed', 'paediatr', 'pandemic', 'paradox', 'parent', 'paternity', '\\bpaternal\\b', 'patholog', 'pediatr', 'personalit', 'pharmac', 'pill', 'policy', 'politic', 'polyphagi', 'portion', 'poverty', 'pregnan', 'prevent', 'problem', 'profit', 'psychiatr', 'psycholog', 'psychotherap', 'public health', '\\brace\\b', 'randomized', 'rates', 'restrict', 'rheumatolog', 'right', 'risk', 'sedentar', 'school', 'sick', 'sickness', 'size', 'slender', 'social', 'societal', 'social class', 'social determinant', 'social mobility', 'socio-economic', 'socioeconomic', 'stigma', 'stress', 'surgery', 'surgical', 'tabagism', 'technique', 'technolog', '\\bteen\\b', 'teenage', 'therap', 'thin', 'tobacco', 'treatment', 'trend', 'weight', 'wife', 'women', 'world', 'youth'

Legend: Codes surrounded by "\\b" are codes that were not used as roots for other codes. For example, searching for "\\bmen\\b" would not yield links to "menopause," but "men" would yield men, *men*opause, enjoy*men*t, etc.

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