

**CONTAGION AND
IMPLICATIONS FOR ANTIBACTERIAL SOAP USE**

**STUDENTS' BELIEFS ABOUT CONTAGION AND
IMPLICATIONS FOR ANTIBACTERIAL SOAP USE**

By

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ABSTRACT

The thesis examined McMaster University undergraduates' beliefs about health and contagion, and their implication for antibacterial soap use. A qualitative methodology was used and 30 participants were interviewed, and the transcripts coded and analysed for emergent themes. Students understand health in terms of having energy, being disease free, and as something to be achieved through healthy lifestyle choices and cleanliness. These beliefs form an explanatory model of health that has several key components used to make health decisions, including using or not using antibacterial soap. The participants see their health as continually threatened by sources of illness. Contagion is one of the principal threats identified and understood as transmitted through the air, or on the surfaces of contaminated people and objects.

Two modes of defence were articulated in the interviews. Internal components of defence involve maintaining immune rigour; external components drives activities such as personal hygiene and cleaning to protect against pathogens. Men tend to have a more internally focussed explanatory model of health, while women have a more external focus. This seems to explain why the women in this study were eight times more likely to use antibacterial soap than the men, a finding that was statistically significant ($p=.027$).

Social values are expressed through the explanatory model, including social boundaries and morality. The model also aligns very well with the biomedical paradigm in that it reduces health to its physical components, provides a mechanistic explanation of the body, and separates mind and body as discrete entities and as an object of control. Biomedicine seems to be broadening into new social domains, such as gender, social boundaries and morality, which are also reflected in students' beliefs about health.

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CHAPTER 1: OVERVIEW

Introduction

Good health is a priority for most, and consequently, also for researchers. However, the means by which good health is defined, created, and maintained are exceptionally variable. A sophisticated understanding of the beliefs people hold about their health is vital to effect appropriate policy changes or improve individual health and well-being. One potentially harmful trend in public health is the current increase in the use of antibacterial soap in North America. Confronting this issue first entails an exploratory study of the issues as perceived by those participating in the phenomenon. The purpose of this thesis is to examine the links between beliefs about health, contagion, and antibiotic soap use in Hamilton, Ontario, Canada.

Washing with soap used to be uncommon in America, and was seen as unnecessary for health (Kostka and McKay, 2002). More recently however, North Americans strongly link cleanliness, soap, and health (Hoy, 1995). Moreover, the current trend of adding antibacterial agents to soap for everyday household use is quite recent. It has only been in the past thirty years that antibacterial agents, predominantly the chemical triclosan, have been available in soap for public use in North America. In the past seven years the number of antibacterial soap products has increased to such an extent that the majority of soaps on the market contain an antibacterial agent (Perencevich et al., 2001).

Scientists have begun investigating the potential effects of this practice on individuals, the public, and the environment (i.e., Larson et al., 2003; Gilbert and McBain, 2001; McBain and Gilbert, 2001; Aschwanden et al., 1998). However there has been no exploration into the reasons why these chemicals have become so widespread, particularly since there is evidently no advantage to their use in a domestic setting (Larson et al., 2003). Given the socially important nature of hygiene in Western society, examining the reasons for the increase in antibacterial soap use requires an exploration of the health beliefs associated with this behaviour.

The principal purpose of the study is to investigate the perceptions of McMaster University students regarding health and contagion, and the health-seeking behaviours that follow from their beliefs. This is one part of their explanatory model of health, which provides a larger context for

understanding contagion and their consequent use of antibacterial soap. A second purpose of the study is to add to the anthropological literature about the symbolic ways in which people understand health and illness (Helman, 2000; Lock and Gordon, 1988).

Research Question

The following research question establishes the primary focus of the research: What are the beliefs about contagion held by McMaster University students that affect their use of antibacterial soap?

North American students' understanding of pathogens and disease transmission incorporates, yet extends far beyond, the biomedical model of health (Nemeroff and Rozin, 1994; Nemeroff et al., 1994). Cultural beliefs about the aetiology of disease, specifically theories of illness causation, are intimately related to health-seeking behaviours, such as antibacterial soap use. These beliefs include combinations of the supernatural world, the social world, the natural world, and the individual (Helman, 2000). Thus, understanding individuals' beliefs about infectious agents requires an appreciation of how each component contributes to the aetiology of disease and to their explanatory model of health (Kleinman 1980). Consequently, this question addresses both the purposes of understanding students' health beliefs and contributes to medical anthropological theory by comparing students' explanatory model of health with the biomedical model.

Setting and Population

McMaster undergraduates' beliefs are the focus of the study. These students are well positioned to provide insight into the research question for several reasons. McMaster is a mid-sized Canadian university of approximately 12 000 undergraduates, located in the city of Hamilton (population 490 000), Ontario. Located about 100 km from the metropolis of Toronto, the setting is similar to that of many Southern Ontario Universities. For 2002-2003, the majority are students enrolled in the faculties of Social Sciences at (25%), followed by Science, and Engineering (both 18%). However, McMaster University also offers a wide range of medical programmes due to the presence of a large hospital complex on campus (McMaster Medical Centre). These are faculties of Nursing, Health Sciences, Medicine and Midwifery, which total 14% of enrolment. This diversity on campus provides an opportunity to access a wide range of

participants from health science and non-health science specialties. Young people who have been raised within the context of modern antibacterial soap use are a particularly effective choice for study.

Why Study Antibacterial Soap Use?

As the number of household products containing antibacterial chemicals has grown, concern in the scientific literature about the potential hazards relative to the health benefits conferred by these products has also increased (e.g., Larson et al., 2003; Gilbert and McBain, 2001; Larson, 2001; Perencevich et al., 2001; Schweizer, 2001; McMurray et al., 1999; Aschwanden et al., 1998; Keswick et al., 1997). The principal hazards include the mutation of pathogens into forms that are resistant to antibiotic chemicals and to antibiotics, the reduction in individual immunity, and environmental dangers (Koplin et al., 2002; Gilbert and McBain, 2001; Larson, 2001).

It was originally believed that the active agent in antibacterial soap, triclosan, did not create adaptive pressure on bacteria since these agents use several biochemical targets to kill bacteria (McBain et al., 2002). However, recent laboratory evidence demonstrates that over time, bacterial exposure to triclosan causes new resistant colonies to form (McMurray et al., 1999). Since triclosan is an important first-line defence against drug-resistant strains of pathogens, such as methicillin resistant *Staphylococcus aureus*, it is important to maintain its effectiveness (Gilbert and McBain, 2001; Zafar et al., 1995). Thus if widespread use causes dangerous pathogens to become resistant to triclosan, the dire predictions by McBain and Gilbert (2001) may become reality. Furthermore, bacteria tend to share information, so if an innocuous species becomes resistant to triclosan in the process of regular exposure on the surface of skin, it may confer that resistance to more pathogenic species. This is particularly hazardous since triclosan destroys bacteria by inhibiting the lipid-producing *fab 1* enzyme in bacteria, which is the same enzyme used by the primary anti-tuberculosis drug, isoniazid. Consequently, if *Mycobacterium tuberculosis* becomes resistant to triclosan, it also becomes more resistant than non-resistant strains to isoniazid (Parikh et al., 2000).

Another concern about the dangers of antibacterial soap centres on the low pathogen load experienced in the West, referred to as the “hygiene hypothesis.” Without the continued exposure to microbes, it is theorized that

the immune system becomes over active and fails to recognise self from non-self, consequently attacking 'self' tissues. This may be contributing to the rise in autoimmune diseases, ranging from allergies and asthma to multiple sclerosis and lupus (Crane, 2002; Hamilton, 1998; Rook and Stanford, 1998). Also, naturally occurring beneficial microflora on the skin, which serve to protect against pathogenic bacteria, are killed indiscriminately when antibacterial soap is used (Larson, 2001; Keswick et al., 1997). Using antibacterial soap can dry the skin, creating cracks and sores that can cause infection (Larson, 2001).

Biocides are resistant to biodegradation, and are currently found in lakes and streams throughout the United States and Canada (Kolpin et al., 2002; Lee and Peart, 2002; Schweizer, 2001; McMurray et al., 1999), including Hamilton Harbour (Backus, Struger and Cagampan, 2002). Once in water systems, these chemicals have a largely unknown environmental impact, although they do seem to affect algal blooms (Wilson et al., 2003). The chemicals are at concentrations too low to destroy all of the bacteria, thereby creating an effective selective environment for those bacteria resistant to the antibacterial agent (McBain et al., 2003; Russell, 2002).

In the human environment, antibacterial soap creates resistance to both the chemicals in the soap itself and to antibiotics. In a study of college dormitory bathrooms, Meade et al. (2002) found that bathrooms with antibacterial soap had higher ratios of bacteria resistant to triclosan, which also had resistance to the antibiotics ampicillin and tetracycline. Unfortunately, there seems to be little or no added benefit to using antibacterial soap in a domestic setting (Larson et al., 2003; Keswick, 1997). Consequently, there is clearly more driving this behaviour than mere health benefits, especially since antibacterial soap creates health problems and solves none. Therefore understanding its use from a cultural perspective is an important motivation for conducting this research.

Anthropological Framework

Since antibacterial soap has no direct benefits and many ill effects, there are clearly cultural factors that are motivating people to use it (McMurray et al., 1999; Larson, 2001; Perencevich et al., 2001). Appreciating these motivations calls for applying anthropological theory, which also provides the opportunity to contribute to the current knowledge base. Medical anthropology is at the intersection between human biology

and culture in that it accounts for health behaviours that are both biologically and culturally informed, having physical and social outcomes. As a behaviour motivated by the pursuit of good health and social acceptance, and as a behaviour that affects students' health as well as their social selves, antibacterial soap use calls for recourse to the current and classical literature from medical anthropology.

Given the complex interplay between students' health beliefs and their behaviours, several areas of inquiry inform this research. These include knowledge of the body, medical theory, social boundaries, and moral expression. Extensive literature exists on all of these topics, which provides a theoretical framework for the research. In their seminal work on the body, Scheper-Hughes and Lock (1987) describes three bodies: the individual body, the social body, and the body politic, embodied in the "mindful" human body. The individual body is the phenomenological lived-experience people have of their bodies. The social body describes the way the human body is applied as a natural symbol for nature, culture and society. The body politic is the form of control over bodies, such as regulating leisure, production and reproduction. These three bodies evidence themselves throughout the anthropological literature. Lock and Gordon (1988) describe the body as divided into various components in Western medical theory. Studying the beliefs of students raised with western medicine permeating their daily lives, and understanding the theories that organize it, necessarily frames the research.

Another crucial means of framing the research is Douglas' (1966) seminal work that describes the social body as explaining hygiene behaviours throughout the world, including the daily routines of washing practiced by most Canadians. Douglas (1966) explains that the seemingly arbitrary nature of cleanliness is understandable as a metaphor for social boundaries. Specifically, when people designate certain areas or things as clean or unclean, they are describing their understanding of the social and moral order in metaphorical terms. Cleaning, therefore, is a socially significant behaviour that delineates insiders from outsiders, and prescribes appropriate social behaviour. Thus, it is necessary to also incorporate knowledge about health and morality into this research. Biomedical practice is loaded with a moral compunction to do what doctors prescribe (Lock and Gordon 1988). Kirmeyer (1988:60) notes that the seemingly objective biomedicine "has never been lifted completely out of the moral realm." Consequently, to understand students' behaviours, it is necessary to

recognise the links between biomedicine and morality, and that they are enacting moral behaviour in the quest for good health.

Overview of the Thesis

As the issues surrounding perceptions of health and illness are deeply entrenched in students' belief systems, only an in-depth analysis is sufficiently thorough to determine the various factors contributing to antibiotic soap use. A qualitative approach is best suited to this task since it has the requisite depth of analysis to discern cultural health and illness beliefs. Therefore I conducted one-on-one interviews with 30 McMaster undergraduates through the summer and fall of 2002. I also transcribed and coded all of the interviews.

The coded interviews provided an overview of the topics and emergent themes that were important to the students. The emergent themes were carefully analysed to uncover subtle and important meanings from which overarching themes that pervaded all of the results were derived.

I argue in this thesis that students' explanatory model of health consists of several components, including health decisions such as using or not using antibacterial soap. I also argue that gender influences which components of the model students emphasize. Since students' health behaviours follow from their explanatory model of health (Kleinman 1980), this gendered emphasis has direct bearing on antibacterial soap use, which shows a significant gender difference. Other social factors clearly influence the explanatory model, including socio-economic divisions and concepts of morality. Finally, students' explanatory model of health aligned very closely with the classic biomedical paradigm with the addition of social and psychological aspects of health. I interpret this as a reflection of an expansion of biomedicine into new spheres (e.g., Rossol, 2001; Wellman, 2000; and Barker, 1998).

The prospects for success of public health efforts to change current antibacterial soap use depend on accommodating these complex health beliefs. The body is central to our lives since it is both a medium and a metaphor for our social selves. Focussing on the body in relation to health issues provides a key point of entry into understanding perceptions of good health and health maintenance.

The first chapter of this thesis provides an overview of the central issues to be examined. Chapter two of this thesis describes the methods used

in this study. The interpretive nature of the data required a qualitative approach. The chapter describes the development of a research question, supporting thematic questions, and an interview guide. It also explains how consideration was made for ethics, recruitment, interviewing and data analysis. Chapter three presents the results, in which I answer the research questions and discuss the various health-related behaviours participants described during their interviews. It describes how students understand health, contagiousness and how they perceive and describe microbes.

Chapter four offers an interpretation of these results in terms of the students' explanatory model of health. The model illustrates their perceptions of dangers to health from both internal and external sources. Gender, morality, social boundaries, and a comparison with the biomedical paradigm are also discussed.

Chapter five shows how the results of this study are necessary for any public health programme that is designed to reduce antibacterial soap use. The chapter looks at limitations of the study and suggests avenues for future research.

CHAPTER 2: METHODS

Introduction

Due to the interpretive nature of the questions posed in this study, a qualitative approach was the most appropriate to use (Baum, 1995). To begin, I developed a research instrument that would obtain thorough and rigorous results and that would elicit topical and relevant answers. Equal numbers of male and female undergraduates of McMaster University were recruited and interviewed. The data collection was conducted in a manner that would ensure participants' anonymity and safety. Interview data were coded and analysed for emergent themes to answer the original research question and to illuminate any unexpected results.

Using a Qualitative Approach

Deciding which methodological approach is best suited to answer the research questions requires examining the nature of the information being sought. In this case, despite seeming mundane in the daily lives of North American students, health-seeking behaviours are framed within a complicated and multifaceted health belief system (Helman, 2000). Consequently, addressing the complex issues that explain why students use antimicrobial products necessitates an in-depth analysis of their beliefs about contagion and what they do to avoid it. Undertaking such an in-depth analysis requires the use of a methodological approach that enables people to describe their own beliefs and behaviours in their own fashion (Kvale, 1996). Specifically, accessing such beliefs and behaviours requires the use of qualitative methods, such as interviews and focus groups.

Interview Guide Development

Developing an effective research tool is essential for eliciting meaningful responses in an interview setting. Consequently, a careful process involving detailed consideration of the questions and subsequent testing was followed to create the interview guide used in this research. According to Kvale (1996), the first steps in developing the interview guide

entails developing thematic questions. Then the specific questions are developed, tested, and modified before being used in the study.

The thematic questions are intended to elucidate the theoretical information being sought from the participants, specifically the reasons interviewees behave the way they do. With the overall research question¹ clearly in mind, as suggested by Foddy (1993), I outlined thematic questions which proceeded from general issues to specific areas of the research (Table 2.1): Question A) *How do participants understand health?* was very general, and was necessary to place students' specific understanding of contagion within the context of their overall health beliefs. Question B) *How do participants understand contagiousness?* began to focus the interview into the specific area of interest and establish the significance of contagion within their understanding of health. Question C) *How do participants perceive infectious agents?* intended to determine how pathogens fit into students' beliefs about contagion, and whether contagion includes more than infectious diseases. Question D) *What are the principal health seeking-behaviours?* was designed to reveal the specific behaviours students use to protect and maintain their health.

Moving from general to specific questions provided a means of slowly introducing the topic, while preventing the development of mental sets that could affect answers to subsequent questions. Mental sets are created when participants are asked specific questions first, which causes them to focus only on those specific subject areas when they subsequently respond to more general questions. Therefore I began with general questions to ensure that when answering general questions, participants did not edit from their answers statements they had already made in response to more specific questions (Kornhauser and Sheatsley, 1965).

According to Kvale (1996) thematic questions are necessary since they outline the types of data to be obtained for analysis. However, eliciting the necessary information from participants requires that dynamic questions be formulated that encourage a comfortable and conversational interview. Dynamic questions "...promote a positive interaction; keep the flow of the conversation going and motivate the subjects to talk about their experiences and feelings (Kvale, 1996:130)." Consequently, when the thematic

¹ What are the beliefs about contagion held by McMaster University students that affect their use of antibacterial soap?"

questions were completed, I designed questions that would enable participants to articulate their understanding of the relevant issues (Table 2.1).

Once the preliminary interview guide was completed, it was piloted with five graduate student peers who were not part of the study sample. Being familiar with the research process themselves, they were willing to offer critical feedback. Following each test interview, my graduate student colleagues provided feedback about what each question was asking, and through this it was evident that certain questions were interpreted in unexpected ways, given the intended meaning of the question. A few minor changes were made and the questions in Table 2.1 were chosen for the final interview guide. For example, initially I asked participants the question using the word “disease” rather than “sick”, which brought out more commentary on non-infectious illness, such as cancer and genetic disorders. Thus, for all questions involving “disease” I used the word “sickness” to indicate that I was asking about infectious diseases.

Question 1, *In your opinion, what does being healthy mean?* aimed to establish what the participants considered to be important health issues, particularly whether they viewed infectious illness to be an important factor for health, or if it is only secondary to more general health concerns. Question 2, *Would you say, in general, your health is excellent, very good, good, fair, or poor?* is a well-tested question (Öunpuu, 2000). It is a measure of the self-perceived health of the participants, which may have a substantial effect on their understanding of health and illness. Question 3, *What steps do you take to try to keep from getting sick?* asked participants to describe their behaviour and provided a concrete medium for them to express their feelings and beliefs about illness. Question 4, *How do you think these steps that you described help to prevent you from becoming sick?* asked participants to explain their understanding of how these steps prevent disease. Presumably the question also indicated the significance of contagion to their explanatory model of health, since it required that they explain their internal logic. Question 5: *Think of a time you were sick, how did you get sick and what did you do to take care of yourself?* provided a concrete situation for participants to discuss. It enabled them to explain both their understanding of disease transmission and their understanding of health in general. It effectively provided an opportunity for participants to summarize the ideas they expressed in the initial questions.

Thematic Questions	Specific Questions
A) How do participants understand health?	1) In your opinion, what does being healthy mean?
	2) Would you say in general, your health is? Excellent, very good, good, fair, or poor?
B) How do participants understand contagiousness?	3) What steps do you take to try to keep from getting sick?
	4) How do you think these steps that you described help to prevent you from becoming sick?
	5) Think of a time you were sick, how did you get sick and what did you do to take care of yourself?
C) How do participants perceive infectious agents?	6) What do you think causes people to become sick with infections?
	7) What do you see when you think of “insert the participants word (germ, bug, pathogen etc)”?
	8) How do you keep “participants word” from spreading from person to person?
D) What are the principle consequent health-seeking behaviours?	9) Do you use antibacterial soap?
	10) Why do you (or not), use antibacterial soap?
	11) Do you have anything else you'd like to add?

Table 2.1: Interview development and questions

Question 6: *What do you think causes people to become sick with infections?* was designed to allow the participants to articulate their views of the causes of infectious disease which narrows the scope of discussion. Prompts, such as “*For example, what would make people sick with if they had a cold, stomach flu or bronchitis?*” were available if students did not begin to discuss infectious disease or provide a term for pathogens, to avoid using my own terminology during the interview. This was important since using the participants’ terminology generated more confidence that they were discussing something about which they were knowledgeable.

Question 7: *What do you see when you think of [insert the participants word]?* asked participants to describe their visual understanding of pathogens, providing an explicit description of a core issue of the research – contagion.

Question 8: *How do you keep “participants word” from spreading from person to person?* explicitly asked how participants understand disease transmission.

Question 9: *Do you use antibacterial soap?* was a simple yes/no question to gauge individuals’ degree of concern about pathogens, which may be linked to their antibacterial soap use. Also this question provided some, albeit very limited, statistical information that could help determine whether antibacterial soap use is widespread in the sample.

The last specific question, Question 10: *Why do you (or do you not), use antibacterial soap?* allowed participants to reflect on what they had just said about disease prevention with respect to a very specific behaviour choice. Also, it was intended to demonstrate participants’ knowledge of ‘scientific’ explanations of contagion, and whether they knew the science of antibacterial soap.

The final question, Question 11: *Do you have anything else you'd like to add?* allowed participants the opportunity to add anything they thought of during the interview but did not have the chance to say, or to bring up their own thoughts about the topic.

Finally, any probes used were intended to clarify the meaning of the question by providing specific examples of pathogens or scenarios that participants could use to describe their behaviour

Participant Recruitment and Demographic Composition

According to the requirements of qualitative methodology, recruiting followed the purposeful sampling technique, in which participants are selected because they have “direct and personal knowledge” of the phenomenon in question, which they are willing to share (Sandelowski, 1993:179). Consequently, to recruit participants I specifically asked McMaster undergraduates if they were willing to be interviewed. I found students for the study largely in four ways. Either I knew them since they once had been my students, or professors they knew introduced me to them, or I solicited participants in lectures, and I asked students if they would put their friends in contact with me.

Code	Sex	Age	AB Soap Use	Ethnicity	Faculty	Health Index	Living Arrangement	Year
FAD1S	F	22	Yes	Chinese-Can	Arts – Science	Very good	Off-Campus	4
FAD6S	F	22	No	Filipino-Can	Arts – Science	Very good	Off-Campus	4
FAD7S	F	20	Yes	Japanese-Can	Arts – Science	Very good	Off-Campus	1
FAT6	F	20	Yes	East Indian	Anthro-Multimedia	Fair	Parents	2
FWD10	F	21	Yes	Jewish	Religious Studies	Fair	Parents	3
FWD12	F	23	Yes	Italian	Anthropology	Excellent	Off-Campus	5
FWD2S	F	21	Yes	Canadian	Arts and Science	Very good	Parents	3
FWD3	F	21	Yes	Caucasian	Anthro-Multimedia	Fair	Boyfriend	3
FWD5	F	26	No	Caucasian	Gerontology-Socio	Very good	Off-Campus	3
FWD8	F	21	Yes	Caucasian	Gerontology-Psych	Very good	Off-Campus	3
FWD9	F	22	Yes	Caucasian	Gerontology	Very good	Off-Campus	3
FWO11S	F	21	No	Caucasian	Biology	Very good	Off-Campus	3
FWO13	F	21	Yes	Caucasian	Multimedia-Comm	Very good	Parents	3

FWT1	F	20	Yes	Caucasian	Psychology	Very good	Parents	1
FWT5	F	26	Yes	Canadian	Psychology	Very good	Parents	3
MAD11	M	22	Yes	Chinese	Computer Science	Fair	Off-Campus	4
MAD16S	M	20	No	Chinese	Biochemistry	Very good	Residence	3
MAT18	M	21	No	Chinese	Multimedia-Comm	Poor	Parents	3
MBJ1	M	20	Yes	Black	Economics	Very good	Off-Campus	3
MWD12S	M	22	No	WASP	Arts and Science	Very good	Off-Campus	3
MWD13	M	23	Yes	Canadian	Anthropology	Very good	Parents	3
MWD14S	M	19	No	Canadian	Physics	Very good	Parents	2
MWD15	M	21	No	White	Philosophy	Fair	Parents	3
MWD17S	M	22	No	White	Arts – Science	Excellent	Off-Campus	4
MWD4S	M	21	No	White	Biology	Fair	Off-Campus	4
MWT2	M	23	No	Caucasian	Undecided	Fair	Parents	1
MWT3	M	21	Yes	Caucasian	Undecided	Excellent	Off-Campus	1
MWT4	M	22	No	White	History	Fair	Parents	3
MWT5	M	22	Yes	White	Peace Studies	Very good	Parents	1
MWT6	M	27	No	Canadian	Peace Studies	Very good	Off-Campus	3

Table 2.2: All demographic data provided by participants.

I sought an equal number of women and men, and the sample contained representation of at least some ethnic diversity. I aimed to find participants under 30 years of age to reduce any factors that would have more to do with their age and experience than their being McMaster undergraduates. Specifically, the study sample consists of 15 men and 15 women, with an age range of 19 to 27 (Table 2.2). The high degree of ethnic variability listed in Table 2.2 is due to the self-reported ethnicity, which I asked all the participants to fill out on the demographic information form.

For example, one student referred to himself as a “WASP,” meaning a White Anglo-Saxon Protestant and another student defined herself as Jewish.

The majority of students lived off campus, reported themselves as Caucasian, of very good health, and enrolled in the social sciences (Table 2.3). The average age of the sample was 21.8 and the average academic year was 3.4.

Personal Information	Category	Total	Percent (out of 30)
Living Arrangement	Off-campus	15	50%
	Parents	13	43%
	Other	2	6%
Health	Excellent	3	10%
	Very Good	18	60%
	Fair	8	27%
	Poor	1	3%
Ethnicity	Caucasian/	20	67%
	Chinese	4	13%
	Asian	3	10%
	Other	3	10%
Faculty	Arts and	6	20%
	Social Science	10	33%
	Science	5	17%
	Humanities	7	23%
	Undecided	2	6%

Table 2.3: Synthesized demographic information of study sample

Interviewing

Good interviewing skills require both training and practice, which I had previously developed by conducting semi-structured interviews with health professionals as a research assistant at the University of New Brunswick. The interview techniques I had acquired on a cancer research project were then refined during the testing of my interview guide. Semi-structured interviewing requires good basic social skills as well as attentive listening skills, neutrality, soliciting further responses, maintaining focus

during the interview, and continual critical analysis of the information being presented (Kvale, 1996). Participants need to feel comfortable and to care enough about the interview to provide meaningful answers. This requires that the interviewer create a comfortable situation by building rapport in order that participants feel that the interviewer respects them and expects respectful and carefully considered responses in return.

Maintaining impartiality in the verbal and non-verbal cues given by the interviewer is necessary both to refrain from leading the participant towards what the interviewer may believe to be the correct response, and to have the participants feel that their responses are considered legitimate by the interviewer. Negative cues expressed by the interviewer would clearly direct participants away from their beliefs since participants may feel that their beliefs are 'wrong' and need to be changed. Negativity can also create defensive feelings in the participants, which may inhibit their free expression. By contrast, overly affirmative cues can lead participants to articulate their beliefs more fervently than they feel.

Often participants will offer short, one-sentence responses, without full clarification or explanation. Thus, assuming that there is sufficient rapport and that the participant is relaxed, the interviewer must be able to ask probing questions to solicit further explanations. Conversely, participants occasionally ask questions or begin to discuss issues that are clearly not related to the topic of the interview. To prevent the interview from turning into an idle conversation, it is necessary to focus the topic of discussion back to the interview guide.

Possibly the most important component of an effective interview is the interviewer's conscientious attentiveness. It is essential that the researcher understand the social clues given by the participant so that socially appropriate responses are made and the participant is made comfortable. Also, the actual data must be constantly evaluated for any points that are unclear or interesting so that further queries are made and nothing significant is overlooked. Moreover, constant attention is necessary so that if the subject matter is drifting off topic, the focus is returned so that the interview ends in a timely manner, out of respect for the participant. Finally, quick, unobtrusive note-taking is necessary for details which may not be clear on the tape, and also to make sure all of the unclear or interesting points are fully explored before the end of the interview.

Consequently, to prepare for each interview, I read over all of my questions. I had the consent and the demographic information forms

prepared, and ensured that the tape recorder was cued and ready. Then I took a few minutes to clear my head of anything external to the interview and prepare myself for the “performance.” During the interview I was aware of all of the issues raised above, maintained welcoming body language, and remembered personal details about the participant to demonstrate that I appreciated their time, so if this information came up, I wouldn't have to ask them to refresh my memory. A full-sized tape recorder was used for both recording of the interview (by permission of the participants) and transcribing.

After the interview I made notes about the key points and significant areas of concern raised by the participant. Usually I did not wait more than a few days to transcribe the interview, so I could still visualize the interview while I was transcribing it. This enabled me to make notes in the transcription about non-verbal cues. Transcription involved sitting at the computer with the tape-recorder next to the keyboard, and typing out what was said, almost verbatim. If words were indecipherable, then a likely approximation was inserted into the text in square brackets. Usually I was able to recall what the word was from the interview. I listened to but did not record completely unrelated discussion. Occasionally, despite the above precautions, I felt that something was insufficiently explored. In such instances, I would send the participant an e-mail requesting a quick written explanation.

The setting for the interviews was usually my office, although a few were done in more social settings, such as coffee shops, food courts, or the campus pub, where I would usually buy coffee for myself and the participants at my personal expense. Since the research was not funded, there was no official monetary compensation for the participants. This may have been an advantage since it served to equalize any possible power dynamic. There is a possibility for an unequal amount of power attributed to the interviewer; however, given my relationship to the participants, this was unlikely the case. First, I had only recently finished my undergraduate degree when the interviews took place, so I was close in age and status to the participants. Second, they were doing me a favour by agreeing to be interviewed and spend unpaid time with me. Thirdly, I had an informal style and manner during the interviews. Participants likely feel more at ease when there is an equal power relationship between themselves and the interviewer. This is important so that they are more able to openly share their beliefs, and thereby offer higher quality data.

Ethics

As with all studies involving humans, careful consideration of ethics is indispensable to ensure proper protection of the participants and use of the data. Beliefs surrounding personal hygiene behaviour is unlikely to be a sensitive issue for most people. Certain issues, such as sexually transmitted diseases, may be more personal than people are comfortable discussing. Consequently, only broad, general questions were asked about people's views about contagiousness, rather than explicit questions about their personal habits. Even so, to protect participants' privacy and to increase their comfort with the interview process, stringent measures were taken to maintain participants' anonymity.

Before the interview, each participant filled out a "Personal Information Sheet" which contained their name and demographic information, such as age and sex. Codes were placed on these sheets, which were the only means of identifying participants on all tapes and computer files. The sheets were kept in a secure location, and will be destroyed following the completion of this study. Since I performed all of the interviewing and transcription, I am the only person who can identify what any individual said during an interview, and I am ethically bound not to repeat this information to anyone. As an additional precaution, digital file protection was used on all electronic data.

Another potential risk is that students could believe that the interviewer has some authority over their grades or some influence on their professors, particularly since I work as a teaching assistant. Consequently, each student was verbally informed and required to sign a consent form that explicitly stated that there is no academic benefit from participating. Also, no interviews were conducted with students who were currently taking a class I was assisting. This ensured that students did not think that I might influence their grades, so that they felt free to participate or not, and to answer honestly.

Another potential ethical dilemma is that this information might be used inappropriately after it is disseminated. Although this is a problem faced by all researchers and not easy to protect against, it is a possibility that should not be ignored. Consequently, during the analysis, some thought was given to the possibility that such an in-depth analysis of beliefs about cleanliness may provide helpful information to soap manufacturers and

marketers. It is unethical to use information presented in an academic study of this nature as a means of better marketing a product to the participants.

Finally, all research involving humans requires approval by the McMaster University Research Ethics Board (MREB), which asks a series of ethical questions of all researchers. Before proceeding with any data collection, I applied to MREB and awaited their ethical approval before proceeding with the research. They approved this research immediately without requiring any further changes to the approach.

Developing Codes and Coding in NVivo 2.0

Determining coding categories is a challenging and involved process designed to ensure that nothing is missed and that codes properly reflect the data. There are two general approaches to coding between which I took the middle ground (Crabtree and Miller, 1992). One possibility is to begin at a macro level and create coding categories *a priori* and then fit the data into these groupings. This has the advantage of creating highly structured and readily analysed coding categories without overwhelming detail. However, this highly structured approach can impose artificial analytical categories on the data and may fail to find all of the important components of the data.

Another possibility is to use an editing style in which the text is read carefully and coded entirely according to what is found in the data. This has the advantage that the coding groups are truly representative of the data, and no data are missed since every line is coded. However, this approach may be overly detailed and thereby fail to reflect the broader trends in the data. It may also create an unmanageable number of coding categories (Crabtree and Miller, 1992).

As an alternative, I combined both approaches by creating a few initial categories and then carefully coding sub-categories from the data. Initially I created some broad categories according to the thematic questions I had outlined when developing my interview questions. Then I read through five or so transcripts to create editing-style coding groups within the initial categories. For example, I created the general categories of health, prevention, and causes, while the specific definitions of health, steps for prevention of illness and the perceived causes of illness I established entirely while coding the first few transcripts. I then recoded the initial five

transcripts to ensure that they had all been coded consistently with the finalized coding categories. Combining both approaches provided broad-scale structure to the data, while ensuring that everything was included in the coding.

The mechanics of coding are fairly simple with NVivo, a popular qualitative data management software package (Fielding and Lee, 2002; Weitzman and Miles, 1995). An important reason to use this software for this study is that it is commonly used, so it is likely familiar to faculty and reviewers. Furthermore, NVivo is popular because of its ease of use, which enables quick and easy coding and de-coding of text, searches and modeling. Essentially, to code in NVivo, the researcher creates “Tree Nodes” which represent the broader coding categories, such as “definitions of health,” and “Sub-nodes” that represent the more detailed divisions within the categories, such as “feeling good.” As I read through the interview transcripts, I carefully considered each line of text and selected it to be included in one or more nodes. Specifically, I developed a series of aggregating related scripts, and collected them in NVivo nodes. Each ‘node’ is essentially a text file that contains only the aggregated selections from every transcript, which provides two means of analysis. These nodes were developed by carefully perusing the transcripts for commonly repeated concepts or behaviours, such as general definitions of health and incidence of hand washing. These codes were constantly revised through the ‘constant comparative method,’ in which transcripts were recoded and the nodes were revised to better reflect the data as new interview transcripts were included in the data and new coding categories were discovered (Creswell, 1998). When new transcripts were added but no new codes were needed, this indicated the beginnings of redundancy or ‘saturation’ in the interviews. Thus the nodes that were consistently filled reflected general trends, since the volume in each node may reflect the degree of significance of that topic (Sandalowski, 1993). Also nodes can be used as collections of data on a theme, providing an easier means of finely analysing a topic. Since they are created based on commonly occurring concepts, nodes are generally indicative of the principal themes. Consequently, this process of coding the text into categories (called nodes in NVivo) creates the necessary organization within the data to enable an analysis.

Once the interview data have been aggregated into categories through coding, recognising the emergent themes and highlighting patterning of the data is the initial step in the analysis (Creswell, 1998). There are a number

of approaches to the subsequent steps in the analysis, since each data set requires a slightly altered approach. Some of the principal methods for accessing the meaning in the data include deeply interpreting specific statements, describing the metaphors used by participants, and even quantifying the frequency of certain words or phrases (Kvale, 1996). Once this has been accomplished, themes emerge from the data that provide the necessary analytical framework. These provide both the details of what students believe about certain aspects of health, and also create an overall depiction of their explanatory beliefs. Only with a comprehensive understanding of the data is it possible to explore its significance to students' beliefs about health and to anthropological theory.

Data Analysis

The initial step in the analysis is highlighting any patterning in the data (Creswell, 1998). I used two principal techniques to determine the emergent themes and understand the students' beliefs. Initially, I returned to answer the original four thematic questions that were outlined at the early stages of the questionnaire development. In order to answer these questions, I then used the second technique, which involved applying the knowledge of the data acquired through the interview and coding process. While doing these steps, I became very familiar with the data, and consequently had a general sense of students' response to the questions and the trends within those beliefs. Thus to answer the research questions, I reflected on my interpretations of students' responses, and then returned to those codes and re-read them to see if my assessment was substantiated in the data. Also, I modeled the nodes in NVivo to visually represent the relationships between the themes. Finally I created tables and found quotes that broadly reflected what was already evident from the language and repetition of certain themes in the data.

Once the original questions were answered, there remained a number of beliefs that surfaced beyond the original scope of the questions. In order to ensure that everything that emerged from the study was reported, I proceeded to reread the coded sections that did not directly answer the original research questions, and then I wrote out the major themes within them. I created models to visually reflect the relationships between the

major themes, and some of the gendered trends within those themes. Furthermore, I created tables reflecting the general trends within these emergent themes, such as gender and educational differences in the health beliefs. I then examined all of the different emergent themes through both the written sections and with the models, and searched for over-arching trends and structure, which provided the underlying framework for students' explanatory model of health. Finally, I examined these trends within the context of anthropological literature to establish the underlying meaning and metaphors these beliefs represent to students.

CHAPTER 3: RESULTS

Introduction

In this chapter I explore the results in a structured way to answer the theoretical questions in this study. The original questions of how students understand health, contagion, and pathogens are used to frame students' responses to the interview questions. To answer the question of how these beliefs affect behaviours, particularly antibacterial soap use, an outline is provided of the health-related behaviours students described. This chapter also outlines the larger trends that run throughout participants' behaviours and beliefs.

Thematic Questions

1) How do participants understand health?

Generally, students in this study describe health in terms of a balanced assortment of behaviours, rather than as a particular state of being. It is what students do that makes them healthy, not the intrinsic qualities they possess. Students understand health to be the outcome of a quality diet, adequate exercise, and freedom from disease. The outcomes of these behaviours are only described in very general terms, such as “feeling good” and “having energy” (Table 3.1).

Being mentally stable is also often viewed as important to overall health, beyond physical well-being. Students expressed this concept in terms of having a positive outlook and a life well balanced between work and recreational activities: “maintaining a happy attitude, a positive attitude, I think...contributes to health” (FWO13). Students listed certain behaviours such as spending time alone and relaxing with friends as ways to maintain mental health. Students emphasize that it is also very important to balance diet, exercise and psychological rest: “...as long as I maintain equilibrium...you know eat right, get enough sleep, that sort of thing, I shouldn't really have to worry about getting sick” (MAT18).

Components of Health	Number of Male	Number of Female	Total (out of 30)
Having energy and feeling good	10	9	19
Disease-free	7	9	16
Good nutrition	6	8	14
Fitness	10	8	18
Mental health	9	5	14

Table 3.1: Constituents of being “healthy”

Clearly students believe in a reciprocal relationship between physical and mental health. For example, when they discussed health, ideas of physical and psychological health seemed interchangeable. Students moved in their comments between taking care of themselves physically to ensure both physical and mental health, and taking care of themselves mentally to protect their physical health:

If I'm starting to feel down or depressed I know probably that has to do with my immune system going down, or if I start feeling stressful, that's normally, how I communicate with my body how I feel emotionally. That's how I can tell if something's wrong (FWO11).

Achieving physical health is deemed necessary for reducing emotional stress, and similarly, physical health is necessary for students to function well emotionally.

There seemed to be few gender differences in the overall constellation of behaviours that students felt were necessary to maintain good health (Table 3.1). Instead, there was only a differential emphasis on the various behaviours. Men and women both frequently cite freedom from disease, having energy or feeling good as indicators of good health achieved through all of these behaviours (Table 3.1). Those participants who did not describe health explicitly in these terms instead described diet and exercise as being necessary for health. Thus, students generally believe that by eating well, exercising, and maintaining a strong mental state, it is possible to keep a high energy level and minimize most diseases.

Students' vision of good health is imbued with the metaphor of a 'healthy' body as a well-functioning machine. The concept of the body was a common topic throughout the interviews. Of the 30 interviews, 13 women mentioned it 40 times and 14 men mentioned it 55 times.

These comments illuminate students' relationship with their bodies. They usually describe their bodies as functioning autonomously from themselves: "I find that sleep helps because my body can just take care of itself" (FWD3S). Yet they are 'owners' of their bodies: "It's all a matter of how I'm taking care of my own body" (MAT18). Also, the functioning machine has several different components that require different treatment: "...hands are probably the dirtiest part of the body" (FAT6). They view the immune system as one of the important 'parts' of the body contributing significantly to overall health.

Students tend to believe that preventive behaviours, such as sleeping, eating well and exercising help to provide energy which can be fed into the immune system, which consequently also help to reduce the effect of pathogens to which they are exposed: "You can keep away a cold by being healthy, by eating properly, exercising, being fit, proper hygiene. I think that's about it, I would say for healthy" (FWD10). Consequently, the majority of preventive behaviours, and the reasons students give for practicing them, involve the maintenance of immunity (Table 3.2).

Almost every instance in which students mention lack of sleep, stress or poor diet, they also cite an increased susceptibility to pathogens. Thus students recognise pathogens as the ultimate cause of sickness and the majority feel that without a compromised immune system, the effects of pathogens would be greatly reduced:

I know I'm more susceptible to getting colds and stuff when I haven't been sleeping properly or eating properly. [because] ... my immune system isn't as productive and my body's using energy towards just kind of staying awake instead of, ah, fighting disease (MWD12).

Given students' beliefs that immune health is important to disease prevention, it is understandable that they envision the majority of their preventive behaviours as assisting immunity. Other than diet and exercise, students ensure a well-maintained immune system primarily through sleep and stress reduction. Some also take supplements, such as vitamin C and Echinacea, and drink ample water (Table 3.2). A few students even recognise the importance of limited exposure to pathogens since they believe

that the immune system needs to be kept working in order to be prepared for exposure to highly pathogenic organisms: “I think all-in-all you need to challenge your immune system” (FWO11). Nonetheless, the majority of students viewed exposure to pathogens as entirely detrimental to health: “Like what kind of good germ is there?” (FWD10).

Behaviour		Males	Male Mentions	Females	Female Mentions
Lifestyle					
	Activity	12	22	11	14
	Diet	14	21	12	16
	Sleep	10	15	9	11
Avoidance	Stress relief	2	2	4	8
	People	10	13	12	28
	Food/Drink	9	10	8	10
Cleaning	Objects	7	12	7	13
	Environment	2	4	7	12
	Hands	9	23	12	28
Other	Personal hygiene	4	6	9	19
	Not smoking	2	3	3	3
	Drinking water	3	3	3	3
Supplements	Medical intervention	0	0	5	7
		4	6	8	16
Immune Maintenance		8	14	7	16
Psychological stress relief		14	26	12	27
		5	8	3	4

Table 3.2: Health-seeking behaviours, by individual males and females, and by total mentions.

Therefore, the majority of students not only take steps to protect their immune health, but also take steps to protect themselves from exposure to pathogens. Some students have great faith in both their overall constitution, and their immune health, and believe pathogens and illness are unavoidable and so they do not attempt to reduce exposure: "...sometimes you get sick; once a year, you just get sick" (MWD17). Other students recognise the importance of internal constitutional rigour, but also believe that protective behaviours are also essential to ensure good health. These students avoid situations in which they feel have the potential for exposure to pathogens, such as not touching certain objects and cleaning places they feel may accumulate pathogens (Table 3.2). Evidently, there is variability in the extent to which students rely on their own personal rigour and immune systems for protection. Most students fall along a continuum of believing largely in internal constitutional rigour to believing strongly in protecting themselves from external threats, such as pathogens.

While pathogens are clearly the most commonly recognised external threat, there are several other potential sources of harm (Table 3.3). Students consider threatening aspects of their lives that inhibit their ability to perform health-conferring behaviours. Some of these are particular to the life of an undergraduate student, such as staying up all night studying for exams, routinely going to smoky bars late at night and managing the anxiety related to school, finances, and social obligations. These forms of threats to health are general 'lifestyle' choices, and include smoking, stress, lack of sleep and poor diet (Table 3.3). Other types of dangers to health include environmental pollutants and inclement weather. While they were in the minority, some students strongly identified allergies as an aspect of their health requiring constant management (Table 3.3). For these students, there is often a strong link drawn between allergens and pathogens, particularly since they both relate to immune health: "I'm thinking: 'is it just allergies or do I have a bug?'" (FWT5). Often avoiding both allergens and pathogens becomes part of these students' daily routines. Avoidance principally involves attention to personal hygiene, cleanliness, and passing up certain foods.

Behaviour		Males	Females	Total
Lifestyle				
	Smoking	3	3	6
	Stress	8	9	17
	Insomnia	6	5	11
	Poor diet	5	5	10
Total		22	22	44
Environment				
	Pollutants	3	2	5
	Weather	5	5	10
	Allergens	1	4	5
Total		9	11	20
Pathogens		12	16	28

Table 3.3: Dangers to health cited by individual males and females.

Thus, being healthy is understood as having energy and not being ill and it is the consequence of healthy lifestyle choices, a well maintained immune system, and avoiding or protecting against potentially hazardous exposure. Also, students identify many threats to their health, which tend to be the inverse of their vision of good health. This can be seen in a diagram created in NVivo (Figure 3.1) that visually represents all of the major nodes that contribute to good health as well as the various potential causes of ill health.

Students clearly believe that health is defined as the reciprocal relationship between having energy, and guarding against the threat of illness (Figure 3.1).

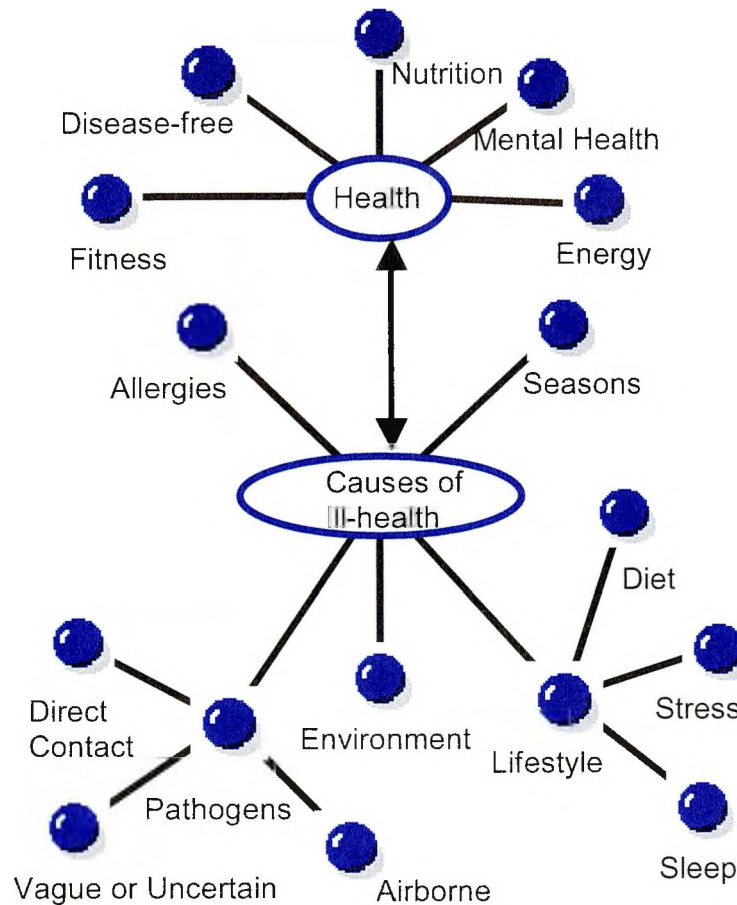


Figure 3.1: Students’ conceptual model of “being healthy”

All of these beliefs surrounding the factors contributing to, or threatening, good health result in a collection of health-seeking behaviours. While many of these behaviours relate to students’ belief in the primacy of immune competence, they also relate significantly to their understanding of contagiousness and pathogens. Consequently, to understand students’ health-seeking behaviours, such as antibacterial soap use, it is essential to examine how they understand disease transmission.

2) *How do participants understand contagiousness?*

Although students clearly are aware of the contagious nature of pathogens, they have difficulty articulating the mode of transmission. Generally they talk around the issue, and easily cite examples of situations in which transmission can occur, but speak in very vague terms when they try to specifically describe how they understand contagion: “Well some of them, some things like colds just spread, people just pass them on” (MWT2). When participants had difficulty describing the movement of pathogens, they would illustrate their understanding by describing situations involving transmission:

Another thing that is a big thing I think of passing germs, or colds or whatever is money. Because, people are always passing money and passing money and passing money, and there are so many germs on money. That's what I think is probably the number one thing in passing germs, I think, personally, maybe, but who knows (MWT2).

Others articulated their beliefs about modes of transmission more concretely: “I see it like lice, like jumping off. That's how I see it, on your hands especially. Germs jump off onto other things” (FWD10). However, for all participants, at least one of two underlying principle means of transmission was described: airborne and contact with sick people or objects (Table 3.4).

Transmission	Males	Females	Total
Direct contact	14	13	27
Airborne	13	12	25
Amount of Pathogens	4	4	8
Vague or Uncertain	9	11	20
Pathogen dependent	4	4	8

Table 3.4: Modes of transmission by individual males and females.

Students tend to describe contagiousness as the invisible movement of pathogens or as invisible harmful substances shared among people, often through air or on material vectors. Specifically, pathogens, or “germs” are understood to travel in the air, as airborne particulates, or as a sort of invisible substance that covers all unclean surfaces and skin: “What I see is

a little particle, tons of particles in the air and something, inhaling something or touching something, and then touching my face, and it's working its way into me" (MWT6).

Students also describe pathogens as residing on surfaces, such as hands, doorknobs, and other communal surfaces: "There's just a lot of stuff floating around in general... in the air, or on objects... like your tape-recorder, like my bike, like my shirt. Everything. Well people are everywhere, people touch everything" (MWD14).

Clearly students understand some features of microbe transmission, yet they omit specific details, such as likely surfaces, the length of time that organisms can survive on surfaces, and which modes of transmission are most effective. Also they do not describe how the pathogens came to be in the air, why they remain there, or how these invisible 'germs' enter their bodies and make them ill.

Consequently, students' understanding of contagiousness is highly nebulous, since they view it in very general terms as a process whereby pathogens somehow are transported through the air or on surfaces. Many students had difficulty articulating their beliefs, and professed their ignorance or spoke in very vague terms: "...people say there's a sickness going around. Something going around, I don't know what that means, really. If someone says there's something going around, then I end up with it. So it must be going around or something" (MWD15). Nonetheless, students expressed their beliefs with a number of different examples and with sufficient clarity that an overall picture of their understanding of contagion emerges (Figure 3.1).

Generally, students seem to envision pathogen travel as akin to an invisible powder that coats surfaces, and moves between surfaces much the same way chalk would if their hands were coated in it. Occasionally students describe a high-school experiment or a particular television show that impressed on them the ubiquity of microbes, and how they travel. For example, several students mentioned an experiment where they colonized a petri dish from swabs of their hands, and one student described a television show in which a woman's hands were coated with a powder that could only be seen under ultraviolet light, and after she had run through her daily routine all of the areas 'contaminated' by the powder were illuminated. This is an apt illustration of how students view the direct contact mode of transmission. For example, a student will describe feeling as if there's 'something' (although obviously unseen) adhering to their skin, which they

then pass on to some surface or food. In turn, the next person to touch or consume whatever the first student touched will pick up this unseen substance: “basically if someone has a cold, and they go out one door and you touch the door” (FAT6). Thus, students’ understanding of contagiousness is best described as an obscure invisible substance that permeates the air and skin, which is thereby transferred through human action from one person to the next.

Nonetheless, the way in which this obscure substance is transferred by human action can be very specific, as students often give concrete examples to try to illustrate the way in which they understand contagiousness, despite an obscure description of the phenomenon itself. Students particularly cited bathrooms as being covered in this film of pathogens, especially doors and faucets, which everyone must touch while using bathrooms. Some students even described avoiding public washrooms altogether, despite the ensuing inconvenience and discomfort. Also several students displayed revulsion at the way money passes from hand to hand, meanwhile picking up the film of pathogens and transferring it to subsequent recipients of the money. Another common means of transmission that students describe is through sharing objects and substances, such as drinks, food and cigarettes. Some students mentioned specific types of pathogens, and recognised a pathogen dependent mode of transmission for these diseases (Table 3.4). Several students mentioned sexually transmitted disease (STDs), such as HIV, and food poisoning, such as *Escherichia coli* (*E. coli*).

Precluding these more serious illnesses, there was a wide range of beliefs surrounding both the degree of transmission and the relative importance of contagious agents to overall health. Most students fall along a continuum of belief from the idea that continual exposure to pathogens is unavoidable, since they exist wherever humans exist, to believing that with exceptional diligence, it is possible to almost completely avoid pathogens. Yet most believe that it is possible to reduce, but not eliminate, the amount of exposure through diligence.

Generally, students who believe that pathogens are unavoidable also express either the belief that becoming ill is also unavoidable, and so not worth trying to prevent, or they believe that the ubiquity of pathogens is no cause for concern, due to their own immune rigour. Conversely, students who feel that it is possible to avoid pathogens also usually believe that it is

important to take steps to prevent contagion, and express a higher degree of concern about getting sick.

Although both genders express each opinion, men tend to focus largely on internal prevention, whereas women focussed both on internal and external preventive measures. Men usually express the inevitability of exposure, and assign greater importance to their immune capacity in preventing illness: “I think that as long as I maintain equilibrium, you know eat right, get enough sleep, that sort of thing, really, I shouldn't really have to worry about getting sick” (MAT18). Men also do not consider becoming sick a significant event in their lives and stress constitutional rigour as the most important aspect of maintaining health, almost to the exclusion of pathogen avoidance. While women also believe in the importance of immune health to avert illness, they are also likely to avoid pathogens to protect their health: “And when I'm using a tap I'll turn the water on, wash my hands, and then get a towel, and then dry my hands off, and then use the towel to shut the tap off. You know, just different precautions I suppose, from spreading stuff, 'cause you never know what you might pick up.” While both genders discussed immune competence, women also more often discussed avoidance and stressed removal of pathogens as necessary to ensure good health.

3) How do participants perceive infectious agents?

The generally ambiguous way students describe the modes of transmission of pathogens, as well as the negative connotations ascribed to pathogens, carries over into how they perceive infectious agents. As with the modes of transmission, there is a great deal of variety in how students perceive microbes. Nonetheless, there are some common elements shared by all participants. A few students with a scientific background were able to articulate their perceptions of microbes very clearly since they had actually encountered them in their laboratory courses. However, most students struggled to articulate their perceptions clearly since microbes remain an abstraction to those without access to high-powered microscopes. Despite students' difficulty in expressing their views about microbes, it is evident from their use of language that the majority have some representational concept in their minds about what microbes are, how they work, and what they look like.

That students believe microbes to be alive in some capacity is evident from their statements. Specifically, they refer to microbes as ‘growing’ or ‘breeding’ on certain substances, which would clearly indicate that students envision microbes as alive. Moreover, they believe that pathogens are clearly capable of activity, and even aggression. Students consider pathogens to be capable of actively creating illness by entering and damaging their bodies. “Bacteria can get into your body and start doing this work and you get sick” (MAD16). Students’ descriptions of microbial action are couched in warlike language, and aggressive metaphors are used to describe how pathogens create illness: “I don’t know, it’s just a foreign body or substance, attacks...” (FWD3). In particular, the interaction between people and pathogens is frequently considered a “fight” in which the microbes are trying to enter while the students are trying to protect themselves (Table 3.5). Clearly language is an important means of understanding how students’ perceive micro-organisms.

Terminology	Male	Male mentions	Female	Female mentions	Total	Total mentions
Invade	3	3	1	1	4	4
‘take over’	1	1	1	1	2	2
Fight	9	12	11	18	20	30
‘Gets into you’	3	3	0	0	3	3
Attack	1	3	2	3	3	6

Table 3.5: Use of aggressive language to describe pathogenic infection.

An important insight into how students’ perceive microbes is revealed by the names that they give pathogens. A wide range of terms is used, and many students use scientific terms, such as bacteria and virus, but many also use the term “germ” suggesting that a general, uniform, and generic creature exists (Table 3.6).

When students name both bacteria and viruses, they do not make it clear as to exactly how the two forms differ. Often they use the terms interchangeably, and through the way they describe the mode of action of both bacteria and viruses, it is clear they make little distinction between the two. Also, students who use both terms do not portray each type differently

when they describe how they picture pathogens. Often they also refer to microbes as germs, or bugs, or more ambiguously 'stuff' or 'who-knows-what,' which seems to include all forms of pathogens.

Word	Male	Male mentions	Female	Female mentions
Bug	8	24	7	18
Virus	9	62	11	55
Germ	12	184	14	167
Bacteria	15	187	15	191
Microbe	0	0	2	3
Cell	1	2	1	1
Whatnot & whatever	5	5	3	3
E. coli	2	6	2	2
Pathogen	7	8	3	13

Table 3.6: Words used to describe pathogens by individual males and females and by total mentions.

As well as being ambiguous, the majority of these terms also have a distinctly negative connotation, and often students explicitly express the hostile intent of pathogens: "I think of bad virus cells as coming into my body and having a little war with my white blood cells, or whatever that fights them off; and if I'm sick, the bad guys win, and if I'm not, the good guys win" (FWD12). Clearly here the "bad guys" are the pathogens, actively attempting to cause illness, if her white blood cells are unable to conquer the invaders.

Physical Descriptions

One of the most informative means of revealing students' understanding of microbes was to ask them what they picture when they think of a microbe. From their descriptions and language, it is evident that participants see microbes as obscure and hostile creatures (Table 3.7). The vague nature of their understanding of microbes is first evident by how uncomfortable they are with trying to describe what they pictured. Often

they laughed at the idea of trying to envision what bacteria actually looked like, and they found thinking of them as actual physical beings to be an odd concept. Eventually most provided a wide array of descriptions, reflecting the fairytale quality of the mysterious micro-beasts. In fact, one participant clearly recognised her own creation of an image of microbes: “It’s kind of like a mythical creature that is created by the media, or my own imagination” (FWD5). This “exotic” quality of microbes pervades almost all of the descriptions, and several participants simply said that they did not know what microbes looked like and did not have a representative model in their minds: “I’m fully willing to accept that I have no idea what a bacteria or virus looks like” (MWD14). The majority were able to provide some description, which usually consisted of creating a model of an abstract, hostile being.

Term	Males	Females	Total
Cartoon image	4	6	10
Unable to picture	5	2	7
Unique descriptions	4	7	11
Scientific	4	4	8
Total	17	19	36

Table 3.7: Frequent descriptions of microbes by males and females

Some students clearly had a scientific background, and were able to dispassionately describe the three principal shapes of bacteria (rods, balls, and spirals) and the shapes of viruses commonly taught in introductory university biology classes (such as HIV and the bacteriophage T4), as well as demonstrating some knowledge of the differences between the two.

Conversely, a large proportion described cartoon images that they had either imagined themselves or acquired through educational programmes or television advertisements. One participant even drew an impromptu sketch on a napkin of what he pictured when he thought of a ‘germ’ (Figure 3.2). This image is decidedly simple and hostile, since the creature bears a scary expression and is in an intimidating pose.

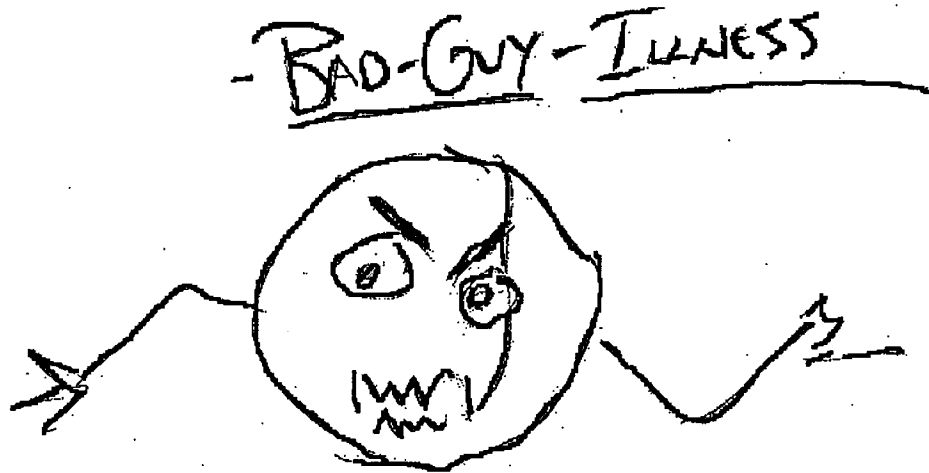


Figure 3.2: Impromptu drawing of a “germ” by MWD15

Many students had altogether unique ideas of what they envisioned a pathogen to be, derived from a wide array of sources. For example, they described “little black things surrounded by white bubbles” or “a skull and cross-bones” or “a disgusting looking thing crawling around.” Clearly participants have diverse understandings of microbes, but are comfortable creating graphical representations of living things that they have never seen (Table 3.7).

This diversity is indicative of the mystical quality that microbes seem to possess, since most participants either use their own imagination to picture microbes, or recall images from television or educational materials from childhood. Another common theme throughout all of the imagery created by the students is a quality of negativity and hostility ascribed to the microbes: “I picture a cartoon perspective; like they’re black and have those little devil antennae and they’re just saying “I’m going to kill all of your good stuff.” That’s what I classify as a germ” (FWO13). This quote succinctly summarizes the common theme of negative ‘boogie-monster’ microbes that students said were shown to them as children to teach them proper hygiene habits.

The message evidently has remained with them and may continue to employ it into full adulthood, since even the facial expressions and body language of many of the participants indicated a sense of revulsion. They often scrunched up their noses in disgust when discussing pathogens and

often wiped their hands on their clothes as though some unseen creatures were crawling on them.

The exact nature of this 'evil beast' does not seem of particular importance to participants since it is only one component of the overall contributing factors of health. Microbes fit into their perceptions of health as elusive and hostile creatures, but the actual beings themselves are either avoidable or conquerable, through the continual battle between the internal rigour of individuals and the external hostility of microbes.

Participants' beliefs about the movement and nature of pathogens are only part of the story of how they understand and maintain their health. This is particularly clear in examining preventive behaviours since students ascribe varying degrees of significance to protective behaviours, regardless of how evilly or benignly they describe microbes. The importance ascribed to microbes depends on the degree to which participants view illness prevention as an internal challenge (such as their immune health), or an external challenge (such as pathogens or environmental pollutants). The relative significance of pathogens and personal immunity is reflected in the behaviours students use to protect their health.

4) What are the principal consequent health-seeking behaviours?

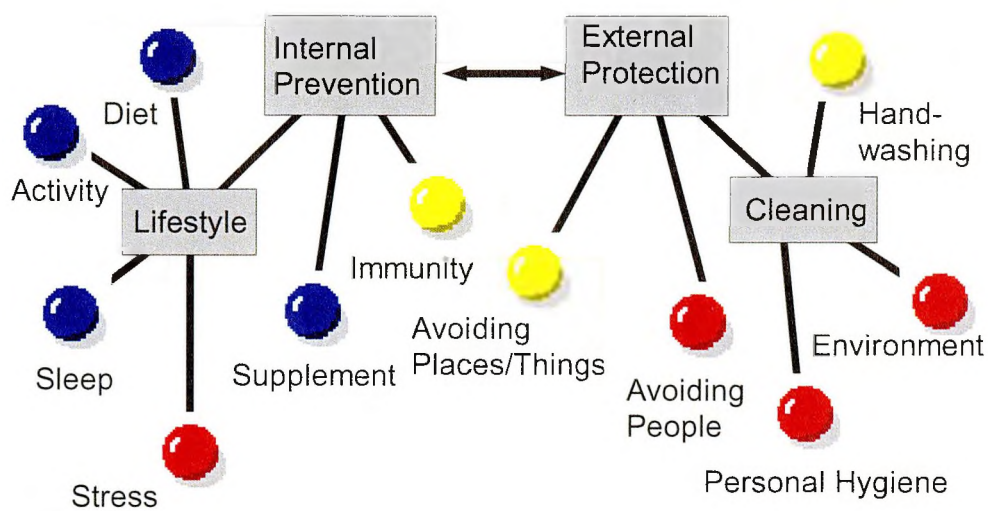
All of the beliefs previously described result in a wide array of protective behaviours, depending on how participants understand their health, contagion, and pathogens. Students understand health as a structured conceptual framework in which protective behaviours are logical consequences of their visions of good health and causes of sickness. Essentially, they see health as a condition of being disease-free and active. They believe there are dangers to health that threaten to undermine this state that dictates vigilance and adherence to proactive behaviours. The primary risk to health resides in the mobility and hostile nature of pathogens, and in situations which increase the chances of immune system depletion: "You have all of these other factors [diet and exercise], which if they're all in balance, probably will limit the ability of an invading organism to get the better of you" (MWD17).

Reasonably, then, students take steps to avoid and destroy pathogens, and to ensure their immune health in order to prevent illness in case of exposure to pathogens. The main health-related behaviours students practice involve hygiene, avoiding potential pathogenic sources, and maintaining

their immune health through conscientious lifestyle choices, such as diet and exercise (Table 3.3). They envision protecting their health with complementary approaches that apply both external protective behaviours and internal preventive behaviours (Figure 3.2). The genders emphasize different behaviours, with women focussing on both external and internal preventive measures while men focus on internal measures. Antibacterial soap use is an important external protective behaviour that strongly demonstrates this gendered trend.

General Health-Related Behaviours

Almost all of the behaviours described by students as being important aspects of their health maintenance belong to either external protective behaviours or internal preventive behaviours. External measures involve protecting bodily boundaries, such as avoiding potentially contaminated surfaces, people and food, as well as cleaning themselves and their environments. Internal preventive measures are intended to make their constitution strong. They include making lifestyle choices that protect and nurture the health of the immune system, such as resting, eating well and remaining physically active (Table 3.2). These beliefs lie along a continuum from one extreme, which emphasizes immunity, to the other extreme, which emphasizes the importance of pathogens. The descriptions students provide of their illness-prevention strategies fall along this continuum of belief, and they are either more internally or externally focussed (Figure 3.3).



(red=female; blue=male; yellow=neutral)

Generally all students cite the importance of maintaining personal health, particularly immune health, and consequently claim to be at least slightly conscientious about diet, exercise, and sleep. Most also consider taking some steps to avoid or destroy pathogens. However, some students consider constitutional rigour to be of utmost importance, while others admit that while they recognise the importance of healthy living, they do not prioritize such behaviours in their daily lives. Alternatively, some students consider protective measures, such as destroying and avoiding pathogens, to be a highly important component of health, while others consider it to be incidental or even unnecessary for health maintenance. While there were students who only focused on one aspect of health maintenance or the other, the majority of students simply tended towards one of the two ends of the belief system.

Students' health seeking choices follow logically from the conceptual framework each uses to define and maintain their health. Consequently, there is variability in the behaviours they claim to be diligent in following. Thus, those who believe that keeping generally healthy is the most important factor in preventing illness emphasize strategies that principally include diet and exercise. For them, avoiding pathogens is usually of only minimal importance because it is both pointless and futile to do so; pathogens are quite contagious, even unavoidably so, thus avoiding them is futile. The danger of pathogens is rendered inconsequential by maintaining a high level

of immuno-competence through diet and exercise: “I think staying healthy in a more generalized sense fortifies one against illness; keeps the immune system strong against illness” (MWT5).

These students internalize their illness prevention strategy, and essentially believe that if they are careful to maintain their overall health, then they do not need to avoid pathogens, which are ubiquitous anyway and not particularly virulent. These students tended to be men, and never used antibacterial soap by choice.

Conversely, other students consider constitutional rigour equally important to the nature of pathogens and their contagiousness. Usually such students consider pathogens to be potentially quite harmful, regardless of their own immune levels. Moreover, unlike individuals who considered pathogens inescapable, these students feel that pathogens, while contagious, are avoidable through diligence and cleanliness. They tend to focus less on health maintenance techniques, such as diet and exercise, than those who consider immune health techniques supreme. Instead they concentrate on avoidance behaviours, such as staying away from public bathrooms and hospitals, careful personal hygiene, and not touching potentially contaminated areas such as door handles and faucets:

I think just making sure you don't share things with other people, like drinks or things like that. The public bathroom thing, just trying not to touch anything, it's hard but, I mean hovering when you can [to not sit on the toilet], and so with the faucets, if you have like a handkerchief, like your own handkerchief, you could just use that, maybe, but you have to remember to have the clean side up so you don't touch the bacteria side. It is kinda hard to do germ prevention, but just things like that... (FAT6).

Although such students take care to avoid surfaces that they consider to be particularly covered in microbes, they also conscientiously and consistently wash their hands, themselves, and their surroundings. They are also likely to mention keeping watch on food expiration dates, as well as carefully cooking their food. These students externalize their illness prevention strategy, as they believe that the best way to prevent illness is to avoid the pathogens themselves rather than rely on their own level of immunity. These people also tended to be women, and to use antibacterial soap.

Antibacterial Soap Use

While the majority of students have used antibacterial soap, all of the individuals who emphasize the external in their health belief system routinely use antibacterial soap. One female student even mentioned it without any prompting (FAD1). When asked whether they used antibacterial soap, those who used it generally said that it was because they felt that they were cleaner due to the antibacterial component: “You hear the name, and you’re like; ‘antibacterial, ooh, it’s going to kill bacteria and leave me cleaner’, so you think that’s a good thing” (FWD12). The students who do not use antibacterial soap largely claim it was not necessary, and some even suggested that it could be detrimental: “I don’t feel it’s necessary. I don’t like to expose myself to chemicals if I can help it” (MWT5). Clearly students’ internal or external focus is reflected in the decision whether or not to purchase antibacterial soap. Moreover, the gendered trend within the internal versus external focus is strongly reflected in antibacterial soap use.

Despite the small sample size, the use of antibacterial soap clearly delineates a difference between men and women. Specifically, of the 17 participants who regularly use antibacterial soap, only 5 are men whereas 12 are women. Among women, only two *do not* use antibacterial soap, whereas among men, only four regularly *use* antibacterial soap. The data demonstrate a clear statistical significance; women use antibacterial soap more than men, with a Yates’ corrected p-value of 0.027 (Table 3.8). This difference in a simple behaviour is indicative of a fundamental dichotomy between the belief systems of women and men.

Antibacterial Soap Use	Yes	No	Total
Male	5	10	15
Female	12	3	15
Total	17	13	30

Yates corrected $\chi^2 = 4.89$; $p=0.027$; degrees of freedom = 1

Table 3.8: Chi-square analysis of antibacterial soap use by gender

For this sample of people, antibacterial soap is clearly important, since half describe regularly using it as part of their health routines. Almost all of the students described situations where they used antibacterial soap, when it was beyond their control, such as at their parents’ house, or if their

housemates purchased it. Every participant knew what was meant by “antibacterial soap.”

Other Health-Related Behaviours

While most health-related behaviours mentioned were common among the majority of the students, unique behaviours were occasionally described. For example, some students described avoiding smoky places, which could compromise their overall internal rigour. One student described avoiding “street-meat” because he felt that it could contain dangerous pollutants, either microbes or chemicals. Another student mentioned wearing a mask when he was sick to prevent other people from getting sick; however, he added that while it was common practice in Hong Kong, it wasn't necessary in Canada probably due to the much lower population density here. Two students mentioned avoiding sunlight to protect themselves from skin cancer. Finally, several students mentioned drinking a substantial amount of water to purge themselves of pollutants and pathogens.

Often these students had water bottles with them in the interviews, indicating that they were actually performing the health-enhancing behaviours described. Nevertheless, it seems highly possible that this is not always the case. Several students described their behaviours, and then qualified the statement by saying that they fell short due to other demands on their time and resources. It seems likely that many students were describing ideal rather than actual behaviours: “I think everyone should make an effort, just you know, keep themselves clean” (MWD13).

The behaviours described above are only a sampling of the techniques that students employ to protect themselves from illness. From paying close attention to the expiry dates on food to exercising daily, and taking vitamin supplements, students have found many ways to protect themselves according to their personal understanding of health, pathogens, and contagiousness. While there is a great deal of consensus in the shared system of belief, there are gender trends within both the belief systems and within the resulting behaviours. Conversely, there is agreement among students enrolled in different programmes, and among the years in the programme.

Trends in the Data

Although there are no absolute lines dividing the responses, general trends in the data suggest differences between groups of individuals in the sample. The most noticeable trend is the difference between women and men. While a number of men focussed on external threats, the majority considered maintaining their internal health to be the best defence against pathogens. Commonly, men described being healthy as exercising and eating well, and disregarded the potential impact of pathogens: “The only thing you can do, I think, to prevent yourself or other people from getting sick is just to keep yourself in the best possible condition that you can” (MWT2). Usually men believe that microbes are unavoidable and not terribly harmful, and that to prevent illness, good mental and physical health, principally including diet, exercise and rest are paramount. Essentially, while men mention some simple protective measures, such as washing their hands, they usually focus much more on preventative measures that increase their internal robustness.

Conversely, women tended to focus more heavily on external means of protecting their health. They believed that diligent hygiene practices were required in order to avoid pathogens, while at the same time were concerned about measures to protect internal health: “You can keep away a cold by being healthy, by eating properly, exercising, and with proper hygiene” (FWD10). As with the men, women always mentioned general good health as a necessity for disease prevention, but the principle difference resides in their inclusion of personal hygiene as a factor equally important to constitutional rigour. For example, there were two men who did not use soap at all, preferring to seek out pathogens to increase their immune tolerance, whereas *every* woman mentioned keeping herself and her environment clean. Generally, then, women fall into the “external boundary” end of the spectrum, while men fall into the “internal rigour” end of the belief continuum.

Interestingly, this gender difference is the only truly striking trend within the data. There seemed to be little difference among students based on the degree programme they were enrolled in at McMaster, except for a slight difference between science and the non-science students. There was some tendency for students in the sciences to have a more internal focus in their health beliefs, as is reflected in their infrequent antibacterial soap use,

but it just fails to be statistically significant, with a p-value of 0.0904 (Table 3.9). The only two females who did not use antibacterial soap were both science students, suggesting an interplay between gender and degree programme. Since there were equal numbers of male and female students from science and non-science programmes, the use of antibacterial soap by non-science students is not due to a predominance of female non-science students.

Antibacterial Soap Use	Yes	No	Total
Science	3	7	10
Non-science	14	6	20
Total	17	13	30

Yates corrected $\chi^2 = 2.87$; $p = 0.0904$; degrees of freedom = 1

Table 3.9: Chi-square analysis of antibacterial soap use by science vs. non-science students.

Another difference between the students who had training in science and the students in other disciplines was that the former were able to describe microbes and viruses in detail. Also, several students worked in the hospital as kitchen aides or in housekeeping, and they also tended to have more detailed descriptions of pathogens.

Similarly, despite having interviewed only six students (25%) who were not of European ancestry, there seemed to be little differences between their responses and those from participants of European descent. However, two of these students had one parent who was from European ancestry and all but one student from Hong Kong, were raised in Canada, and went through the education system here.

Neither did age seem to have much impact on the nature of responses, which is understandable since all participants were aged between 20 and 26, except for one who was 19 and one who was 27 years old. Similarly, the year of the degree programme seemed to have little impact on the students' health beliefs.

Clearly, gender has the strongest impact on beliefs about health and consequent behaviours, followed by degree programme, either in a science or non-science. Given the small, homogeneous sample, age, year in programme, and ethnicity did not seem to strongly influence behaviour.

Summary of Findings

As is evident from the data, students largely conceptualize health in terms of having energy and being disease free, and as something to be achieved through eating well and exercising. They understand contagion as essentially transmission of microbes through the air or through contact with another person or contaminated objects. Students understand the pathogens themselves as being representations of abstract and hostile mythical creatures.

All students have an organized belief system and their health seeking behaviours follow rationally from this explanatory model of health. The behaviours resulting from students' understanding of health are both internally and externally focused. Those who focus internally attempt to maintain immune rigour; externally focused individuals might emphasize cleaning to protect against pathogens. Students rarely only focus on either the internal or the external, but instead tend towards one end of the spectrum or the other.

The most striking trend within the responses is the gendered focus of the internal and external beliefs and behaviours. Men tend to have a more internally focussed explanatory model of health, while women have a more external focus. Similarly, science students focus more on internal prevention while non-science students focus both on internal prevention and external protection. Since this was a largely homogeneous sample, there are no striking trends due to age or ethnicity.

CHAPTER 4: DISCUSSION

Introduction

This chapter explores the overarching meanings of the results within the context of anthropological literature. The emergent themes are synthesized into an explanatory model of health, which is comprised of the dangers to health, internal prevention and external protection and concepts of health. The model proved to be strongly gendered and contains metaphors of social boundaries and morality. The explanatory model also aligns well with the biomedical paradigm and its associated social values (Gordon, 1988 and Kirmayer, 1988). This analysis reveals that while health beliefs are used to express social issues, the underlying biomedical framework remains unchanged.

Explanatory Model

Using simple arrows and blocks to represent students' explanatory model of health, I created a graphic model of the themes that emerged from the interviews (Figure 4.1). This helps to synthesize the results into an overall picture of students' understanding of health. After briefly outlining the components and showing how they are represented in the model, I describe them in detail and discuss their significance.

The ubiquitous and overarching concept of “Dangers to Health” is represented as a large rectangle at the top of the diagram (Figure 4.1). These dangers vary, but fall into three general categories, psycho-social stressors, the environment, and pathogens (Table 3.3).

Students articulate two principal strategies for ensuring good health, “Internal Prevention” and “External Protection”. Two cascading rectangles represent these strategies on the model (Figure 4.1). Many different forms of specific behaviours are subsumed under these broad categories, but consist largely of either lifestyle choices or avoidance behaviours (Figure 4.1). Two downward arrows illustrate these strategies, both of which point to the ultimate goal of this belief system, which is maintaining health (Figure 4.1). Students conceive of health as a state that confers enough energy to fulfil their daily tasks. Health is represented as a bar at the bottom, representing a final achievement (Figure 4.1).

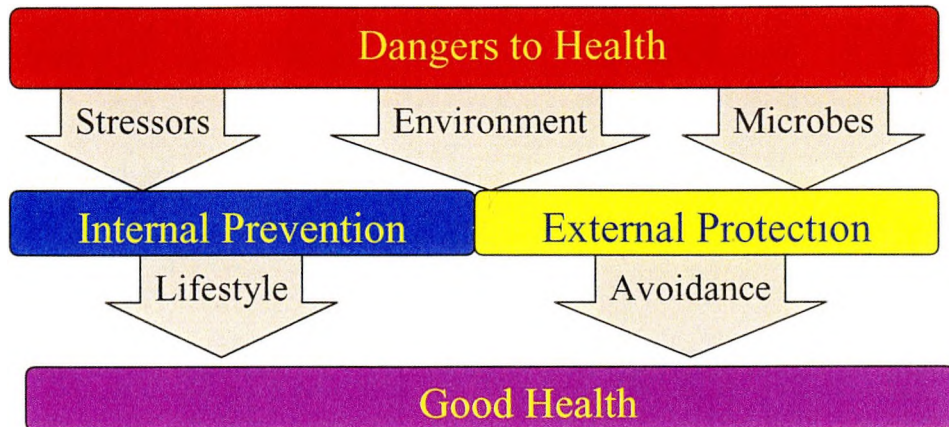


Figure 4.1: Students' explanatory model of health

Dangers to Health

Students believe many unavoidable health hazards constantly endanger health, and that these hazards are fundamental constituents of their everyday lives. They see that while each health hazard is potentially a singular cause of illness, the dangers can work in conjunction to strengthen their mutual influence. Students envision a wide variety of these dangers to their health, and all of these perceived dangers align well within one of three groups.

First, students believe that psychosocial factors can negatively affect their physical health. These largely include academic burdens, relationships with romantic partners, friends and parents, financial difficulties, and any other important social aspects of their lives.

Say you have four exams in a row, and you're studying, studying, studying, you're up all night studying, you get up in the morning studying, you're getting worn down mentally, and well, physically too because you're not getting sleep, you're studying all this time. I think that getting worn down mentally has an effect on your body would have an effect on you getting sick, because you're more prone (MWT2).

There is evidence to support the thesis that there is a relationship between psychological and physical stress among Canadian university

students (Iwaski 2003). Students reported that their illness episodes often occurred during periods of high stress, particularly at the end of the semester when term papers were due and examinations were taken. According to Scheper-Hughes (1994), illness is a commonly employed form of social protest for those lacking formal means. This suggests that students are expressing their discontent at the many demands on their time and energy through bodily protest.

The second source of danger to health envisioned by students is from environmental factors, such as allergens, pollutants and inclement weather. Usually the environment was mentioned only when students had specific experiences with it. For example one student's father became sick from exposure to a toxin at work. Three students described the carcinogenic nature of living in Hamilton due to its high level of industrial pollution. The students with severe allergies were very conscientious about avoiding their allergens to prevent an allergic reaction. Another student described bicycling too early in the year and catching a chill from being underdressed for the weather. He claimed that getting too cold in the winter compromises the immune system, thereby increasing vulnerability to pathogens.

This interconnection between health and the environment is also found in employed men and women in Hamilton (James and Eyles, 1999). As with James and Eyles' (1999) findings, students see environmental threats as highly external and beyond their control. Similarly, the relationship between the environment and ill health was ambiguous for both students and Hamilton residents (James and Eyles, 1999). In this study, the environment was mentioned less frequently than psychosomatic stressors, and was less directly linked to ill health than pathogenic threats (Table 3.3). This may be because I directed participants more towards contagion than the environment.

Of all dangers to health students recognised, pathogens were mentioned most frequently and consistently. Students described pathogens in general terms, and they tended to be universally represented as 'germs.' Only a few students differentiated between "good" and "bad" pathogens, and fewer still discussed specific pathogenic species. All students considered pathogens to be coating the surfaces of objects and skin, so contagion occurs whenever something 'contaminated' encounters something 'clean.' Their concept of contagion therefore is more encompassing than just pathogens and represents an amorphous, polluting threat.

This fear of 'contamination' was particularly salient for the women in this study, who were more likely to take precautions to avoid and remove pathogens. The men were much less likely to be concerned about pathogens threatening them, even though they held a similar view of contagion.

All students envisioned the mode of pathogenic transmission to be shared by all microbial species; that is, they move from surface to surface. Although a simple view of the process of contagion, it is an important aspect of students' beliefs. Since they believed that contagion is the ultimate source of illness, and is invisible, ubiquitous and dangerous, it permeated their discussions of health, health maintenance, and disease.

Contagion carries broad symbolic significance and is both a metaphor imbued with social meaning and a medical reality for the participants. Their understanding of contagion parallels meanings found in western history and medicine: "Contagion requires contact, but it always implies more than this: it implies absorption, invasion, vulnerability, the breaking of a boundary.... to simultaneously function as a deeply resonant metaphor for the circulation of social, moral, or political dangers through a population, and as a visceral, horrible infection" (Bashford and Hooker, 2001:4-5). This powerful metaphor illustrates the complex influence of politics, gender, and biomedicine embodied in these students' beliefs about health.

Internal Prevention and External Protection

The participants in this study envision two complementary spheres that help them to achieve health: internal prevention and external protection (Figure 3.3). Internal prevention involves relying on their own constitution to withstand threats to their health. External protection entails avoiding or creating a barrier against threats to their health.

These two modes of health maintenance produce different types of health-related behaviours. Internal prevention tends to lead to an emphasis on lifestyle choices, such as a quality diet and sufficient rest and exercise. External protection tends to lead to an emphasis on avoidance behaviours, such as maintaining good personal hygiene and clean surroundings, and keeping away from contaminated places and people. Women in this study focus equally on internal and external behaviours, while men strongly emphasize the internal. This is consistent with Saltonstall's (1993) observation that: "Men tended to emphasize the inner body... while women

focussed more or less equally on both inner and outer phenomena” (Saltonstall, 1993:182-183).

The division between internal/external beliefs and consequent behaviours carry two principal, socially important metaphors for participants in this study. As explained further in the next section, the explanatory model expresses metaphorical boundaries between the participants and others, and between women and men and carries moral injunctions.

Health

The interview questions were designed to move from a generalized inquiry about health, into perceptions of healthfulness, and on to specific dangers to health (Table 2.1). The model of health that emerged shows that students consider health as something to be achieved, not a basic state of being (Figure 4.1). Students describe themselves as being healthy because they take many steps to attain a state of health, rather than because they are free of pain or not bed-ridden.

Saltonstall (1993) also found that U.S. adults considered health an achievement: “..health was conceptualized as creation and as accomplishment of a bodied, thinking individual” (Saltonstall, 1993:181). Students in this study similarly feel that health is worth attaining, and some clearly feel an obligation to maintain their health: “I think everyone should make an effort, just you know, keep themselves clean... because if everyone makes an effort to keep things clean there's less risk of anyone catching anything” (MWD13). This concept that health is an achievement is understandable, given Crawford's (1984) argument that individuals feel responsible for their own health maintenance because many illnesses can be linked to daily lifestyle choices.

This sense of responsibility is particularly evident in the way that students articulate their understandings of health. They have a highly varied way of describing health, intermixing obligatory behaviours with indicators of health and states of being. The obligatory behaviours both men and women describe involve getting sufficient exercise, eating nutritious meals, and avoiding certain places and foods, such as bars and fast food. The most common indicator of health is the ability to perform all of the physical and psychological requirements of being a student, as well as engaging in recreational activities.

Saltonstall's (1993) respondents "created" definitions of health, and each had a unique manner of expressing their understanding of it. Given the wide range of their responses to the question, "What is being healthy?" McMaster undergraduates also expressed personal definitions of health (Table 3.1). However, there was either an implicit or explicit theme pervading all of these definitions. Every student's understanding of health evidences an abstract concept of an overall sense of well-being. Saltonstall (1993) explains that: "The idea of health was closely associated with the idea of 'well-being,' that is, abstract notions of health and healthiness" (Saltonstall, 1993:180). For participants in this study, this means that every component, including social, psychological and physical aspects of the person, is functioning optimally.

This understanding of health is both medically and socially significant. Medically, these beliefs underlie and form the foundation for a number of different health choices, including working out, dieting, and using antibacterial soap. Socially, students' understanding of health evinces the concept of 'embodiment.' According to Radley (2000), embodiment as a field explores "...the way in which social and ideological matters become inscribed on the bodies of those concerned (Radley, 2000:3)." Students' healthy bodies "embody" their identities, through which they create the distinctions between themselves and others. Their bodies also define and express social roles, particularly gender roles, since gender underscores all beliefs and especially the consequent health behaviours.

Gender

Overall the explanations men and women offered for health were similar, except for a few variations. For example, more men than women cite mental health as a definitive component of health (Table 3.3). The significance of gender becomes far more apparent when students describe the methods they apply to achieve health. As was the case in Saltonstall's (1993) study: "The homogeneity between men's and women's abstract conceptions of health dissipated into gender specific forms when it translated into action in the everyday world" (Saltonstall, 1993:181). Men focus predominantly on internal prevention, while women more equitably balance internal prevention with external protection (Figure 3.3). This is also

consistent with Saltonstall's finding (1993): "Men tended to emphasize the inner body...while women focussed more or less equally on both inner and outer phenomena." Men believe more strongly in their essential ability to prevent illness while women feel the need to avoid and protect themselves from illness, as well to maintain their internal resistance.

This difference has significant effects on health-seeking behaviours. One is the frequency with which women cite personal hygiene and cleanliness of the home as a critical element of protective action, compared to men. Specifically, 12 women mentioned personal hygiene, cleaning their surroundings, or both, while only four men mentioned any of these activities. These gender differences appear to explain the striking disparity in antibacterial soap use (Table 3.8). Antibacterial soap is considered to be a potent cleaning agent: "after I use it...it gives me a feeling that everything on my hands has been cleaned out" (FAT6). Therefore women, who value cleanliness, are much more likely to use it than men, who consider cleanliness incidental to their health maintenance.

These differences in beliefs and consequent behaviours have significant social implications about gender. Students' beliefs about their health reflect their appropriate gender roles since they are expressing their gendered identities through their physical bodies. This explains participants' gendered beliefs and behaviours about contagion.

Men in this study focus on internal rigour and make lifestyle choices that express their masculinity. This focus reveals that they are 'tough' by showing that they are impervious to contagion. They feel that protecting themselves beyond the most basic measures would indicate weakness: "As long as I stay fit, you know, your germs shouldn't be able to hurt me" (MAT18). Men also feel strongly that they do not need to fear contagion because of their own immune strength, and they see no need for the extra protection that antibacterial soap supposedly provides:

I'm not, ah, motivated enough to go with the antibacterial for the extra dollar or whatever it costs... it's honestly not a major concern for me. Sickness, bacteria, stuff like that. Not a major concern. The most I'm getting probably is like a cold right, so I get a cold, I get a cold (participant shrugs) (MWD15).

The lack of antibacterial soap use by men is a demonstration of their toughness. Being tough is traditionally masculine, in the "old-fashioned

mold of a brawny, brutal he-man” (Martin, 1994:57). Canadian men do not have the same style of machismo as that found in Mexico, but it is nonetheless present: “Mexican machos are not dead any more than are their North American counterparts...” (Gutmann, 1996:236). This is evident in men’s disregard for the threat of illness because it shows that they are more powerful than pathogens.

Also, male participants reject the traditionally feminine behaviour of cleanliness: “I find that other people take extraordinary measures to prevent contagion, but like I find it kind of silly” (MWD12). Some men even said they never used soap, as if it were just a ridiculous social convention that was beneath them. The rejection of cleanliness demonstrates that men find women’s traditional cleanliness roles emasculating. Through the metaphor of contagion, they disdain the ‘feminine’ social expectations of cleanliness and thereby confirm their manhood.

Finally, men assertively expressed the opinion that there was one ‘good’ and ‘right’ way to prevent illness: “Sports and eating well supports a healthy body, if you don’t do any of those things you’ll get fat and you’ll get sick” (MWD13). Male participants were largely uncompromising in their adherence to internal prevention and dismissive of external protection and compromise between the two. Being assertive and uncompromising is another characteristically masculine identity trait (Martin, 1994).

Women in this study believe in external protection and actively participate in avoidance behaviours to express their femininity. This is evidenced in their willingness to participate in the typically female behaviours of exceptional personal hygiene and cleanliness – the behaviours men refuse to enact because they are too ‘womanly.’

Cleaning is classically woman’s work, and is associated with a moral duty for women as protectors of the home and of cultural status. The discovery of the germ theory at the end of the nineteenth century, which describes the pathogenic source of disease, resulted in public health advocates’ zealous preaching of household and personal cleanliness. Men were expected to build hygienically constructed homes but “the work of cleanliness, both in symbolic and practical terms, landed squarely in women’s cultural domain” (Tomes, 1998:64). However, the technical ability to achieve the exacting standards of cleanliness of the time was only possible by established and wealthy citizens. This created a form social barrier between wealthy Americans and the millions of immigrants who arrived in the US and Canada at the end of the nineteenth and the beginning

of the twentieth centuries. These immigrants struggled for cleanliness for employment, and social acceptance. An exacting level of cleanliness eventually became an integral part of the American way of life, particularly for women (Hoy, 1995). The recent technological revolution of household machinery has not reduced this imperative (Cowan, 1983). This helps to explain women's need for cleanliness: "I'm a very clean person, like I like things clean, just so that I don't feel that I'm going to get contaminated" (FWD9).

The extra care women in this study describe in cleaning and hygiene also shows that they fear the potential threat of contagion:

The whole sink area and everyone's always coming into contact with it. If it's not cleaned regularly, that could be a factor as well [in] that the dishes are piled up in the kitchen and mould is growing; it could contaminate anyone that's coming into contact with it. The same thing goes for the bathroom (FWO13).

This may be due to a greater sense of vulnerability to contagion, and they are dependent on antibacterial soap for the protection of their boundaries. Being vulnerable and dependent are classically feminine traits, according to Martin (1991). She explains the gender stereotypes of aggressive men and passive women terms of eggs and sperm:

... social effects are being wrought from the biological imagery of egg and sperm...the imagery keeps alive some of the hoariest old stereotypes about weak damsels in distress and their strong male rescuers (Martin, 1991:500).

Women in the study may also feel more vulnerable to disease due to "traditional conceptions that women's bodies [are] dirty and dangerous" (Tomes, 1998:64). They also expressed the 'feminine' in the way that they focus on both internal rigour and external protection. This evidences their greater sense of balance and willingness to have multiple correct approaches to maintaining health, a more flexible position than the men were willing to take.

Thus, female students express their gender by focusing on the external as well as the internal components of health, while male students express their gender by focusing more on the internal types of health maintenance.

This embodiment of gender also serves to create and maintain these gendered domains.

Social Boundaries

The explanatory model of health illustrates that students use their understanding of health to create social boundaries between themselves and others. Within the model, there is a clear distinction between external threats and the internal individual. Students describe their protective behaviours, in terms of avoiding and removing pathogens from their physical skins. However, the boundaries they create are not only between their bodies and dangerous elements of the external world, but between their social bodies and other social groups. They are also protecting their “symbolic skins” which is the “sense of personal identity which extends far beyond the borders of their skin” (Helman, 2000:15).

In protecting their physical skins from potential sources of contagion, these participants are protecting their social position and gender. For example, students are careful to protect themselves from “dangerous” sources, including other people:

It's just a matter of staying safe, and avoiding so-called dangers. Just avoiding... if I see someone cough, and they cover their hand with it, I'm not going to go shake their hand (MAT18).

Strangers are particularly ‘dirty’ as compared close family:

If my sister is not sick, and we share a bottle of water or whatever, I don't really care... With my friends, I'm a little bit more conscientious, especially when they're sick. If it's my sister that gets me sick, then so be it, I guess it's not too bad. If we have to share something, like a bottle of water, like we have to, I don't really care. If it's a friend of mine, and there's a bottle of water, I'll try to refrain from sharing (MAT18).

Here a social boundary between the speaker, his sister, and his friends is drawn using the metaphor of contagion. Similarly, another student described how he felt dirty going into the big city of Toronto, because of all of the strangers touching things:

In the summer I work in Toronto and you can get your hands on anything, you know, you open the [subway] door and there could be anything on it... [since] it's a city. Because everyone goes through I assume the cities are more dirty than the rural areas. But yeah, I definitely wash my hands if I touched something gross (MBJ1).

This student not only felt that cities were more likely to enable exposure to contagion, but that this amorphous threat was also a metaphor for the social boundaries he envisions between himself and the more alien city dwellers. His physical skin has become his “social” skin, which he metaphorically uses to articulate his relationship with people in the city.

The female participants' concern with hygiene may reflect a particular awareness and vulnerability of their boundaries. Women are historically and cross-culturally considered “dirty” and sources of pollution due to their reproductive roles (Douglas, 1966). Consequently, they may feel more vulnerable to disease and strive to symbolically maintain boundaries through their hygiene behaviours.

These examples illustrate participants' use of the explanatory model of health to define social boundaries. This contributes to their sense of identity by differentiating between themselves and the “Other” (Crawford, 1994).

Many of the threats to health seem to have a contagious nature, even though they are not necessarily pathogens. For example, environmental pollutants are transferable through the air and surfaces. Students' representation of pathogens as hostile is a metaphor for all ambiguous potential threats (Table 3.7). These include both natural physical threats and threats to their social boundaries. When participants use the “natural” occurrence of contagion as a metaphor to define social boundaries, they draw a comparison between the natural pathogens and social threats. This makes the social boundaries represented by the boundaries of health seem natural rather than cultural. There is also a scientific authority associated with the concept of contagion, and the accepted means of avoiding and protecting against it. Aligning their understanding of social order with the natural order provides an effective means of validating their social system.

According to Douglas, (1966), cleaning automatically creates boundaries by distinguishing between what is 'dirty' and what is 'clean'. She argues that defining 'pure' and 'impure' universally serves as a metaphor for social structures that are 'embodied' by the human body:

“We cannot possibly interpret rituals concerning excreta, breast milk, saliva, and the rest unless we are prepared to see in the body a symbol of society, and to see the powers and dangers credited to social structure reproduced in small on the human body” (Douglas, 1966:116).

These impurities define social boundaries both within and between social groups, and are maintained by symbolically protecting 'pure' people from contamination by 'impure' food, people and substances. They also create social and individual identities, differentiating between self, and non-self, clean and defiled.

Health maintenance is a metaphor to signify boundaries between groups: "... "health" has become a primary means of signification by which borders are maintained, threats specified and internal weakness shored up" (Crawford, 1994:1348). The metaphorical boundaries correspond to a natural system that serves to substantiate the social structure they outline.

Students' belief in the embodiment of social boundaries through health fully supports this explanation of protective behaviours. They fastidiously clean themselves and their surroundings as well as avoid polluting people and places (Table 3.2). The best explanation that they have for this is an ambiguous sense that 'contagion' is everywhere and out to get them. This is readily evident from the hostile imagery (Figure 3.2) and terminology used to describe pathogens (Table 3.6). According to Martin (1994) there is a barrage of images in the media which convey a hostile and warlike relationship between human immune systems and pathogens that is laden with social stratifications:

The portrait of the body conveyed most often and most vividly in the mass media shows it as a defended nation-state, organized around a hierarchy of gender, race and class. In this picture, the boundary between the body ("self") and the external world ("nonself") is absolute (Martin, 1994:51-52).

The participants have adopted the hostile descriptions of the immune system in the media to serve as a means of distinguishing themselves from others. For them: “health is a key concept in the fashioning of identity [and]... the ‘unhealthy’ come to be represented as the other of this self” (Crawford, 1994:1347).

Morality

Students describe their lifestyle choices in highly moralistic ways. As with all moral codes, those described by McMaster undergraduates are ideals which most admit to rarely achieving. Students think what they *should* be doing to be responsible and maintain their health relates to what they eat, drink, and do by way of physical exercise.

Diet is a significant component of students' lives that reflects both their beliefs about health and their underlying assumptions about correct behaviours. In describing their diet, both men and women often use words like “should” and “try to”. For example: “...generally I try to eat really well...try to avoid junk food” (FAD6S) and “...try and eat as well as I can” (MWD13). As students make seemingly value-free food choices, they are actually expressing their sense of what is appropriate behaviour for active participants in Canadian society.

Students also feel that maintaining a certain level of activity is necessary to achieve social correctness. They couched their comments in morally significant language: “I have a, a work-out regime – which is aerobic, and some weights, and I try to eat properly. I think ... it's your own responsibility to basically keep yourself as healthy as possible” (MWT6). The word “responsibility” shows that this student feels a strong obligation to maintain his health (Conrad, 1994).

Maintaining physical activity also benefits students emotionally and socially since they associate it with morally sanctioned personal achievement. As one student describes it: “...if I do exercise, then I feel physically better, and then I feel emotionally better, and then I can perform” (FWD5). Moreover, failing to engage in proper fitness reduces students' confidence in themselves: “I don't exercise, and um, I eat well, and I'm clean. I really do need to exercise, and I'm weak because of it” (FAT6).

Drinking is an important aspect of student culture, and has associated moral implications (Demers, et al. 2002). For example, a number of participants asserted that they try not to drink to excess: “I don’t take anything, put into myself anything that’s toxic. Like maybe I go out drinking once every two weeks, a month maybe” (FWO11). Limiting drinking behaviour is evidently necessary because the associated toxins are a danger to health. Historically drinking itself was morally restricted, as events such as prohibition indicate, yet now it seems that it is the health consequences that are amoral (Hallowell, 1972).

Smoking is also considered to be an inappropriate behaviour, and evidence of moral weakness: “I’ve been trying to quit smoking many, many times, but every time it’s just like, when exams come back, it just doesn’t work out that well” (MAD11). Smoking is unquestionably a serious health risk and is associated with increasingly contentious social factors, such as the right to smoke contrasted with the moral obligation for people to not endanger others and to protect their health in order to remain functioning members of society (Quiles, et al., 2002). Smoking is an apt example of students using a metaphor for health as a means of moral expression. Clearly there are moral implications about lifestyle choices, which also exist for cleanliness and hygiene behaviours.

As is the case for other lifestyle choices, personal hygiene and cleanliness are objective and rational health-seeking behaviours that are also expressions of moral beliefs. These health behaviours, and their explanations for them, indicate students’ belief in wellness as a moral virtue, reflecting a broader trend in North American society (Schaler, 2002; Conrad, 1994; Edgley and Brissett, 1990).

There has been a long history in Western thought of confounding morality and health:

Logically enough, the 17th and 18th century guides to health and longevity emphasized the need to control all of those aspects of life a prudent man or woman could control: diet, exercise, sleep, evacuations and emotions....It is obvious that such concern with day-to-day routine provided an occasion for enforcing a society’s behavioural norms; there could be no practical distinction between the realms of morality, meaning and mechanism” (Rosenberg, 1995:29).

This has persisted into modern North American society in the form of 'healthy lifestyle choices' (Conrad, 1994; Schaler, 2002). As the traditional religious explanations of disease causation, specifically as a form of punishment for sin, fades with the reduction of religion in daily life, there has been a similar increase in the prevalence of a secular morality (Temkin, 1977). In particular: "... health and the body imagined through it... [are] packed with connotations about what it means to be a good, respectable, and responsible person" (Crawford, 1994:1348). This moral injunction to be healthy is as effective in controlling social behaviour as the fear of God. Participants' explanations of their health, particularly their lifestyle choices, are far thicker with moralistic messages than can be explained in purely medical rationalizations. They show that: "In the late twentieth century, health continues to be a moral discourse, an opportunity to reaffirm the values by which self is distinguished from other" (Crawford, 1994:1353).

Participants extensively describe their lifestyle choices in terms of what they should and should not do to achieve health. These behaviours, such as smoking, drinking, carousing late into the night, and promiscuity, were associated with moral weakness before they were considered medically unsound (Rosenberg, 1995).

Participants' Explanatory Model and Biomedical Paradigm Compared

A substantial correlation exists between students' explanatory model of health and the biomedical paradigm. This not only has implications about how students understand health, but about the biomedical model as well.

The participants in this study perceive a division between mind and body, reducing the origin of illness to a natural cause that has mechanical effects. They seem to have a broad understanding of health, since they recognise the importance of psychological and social effects on their health as potential threats to health. This understanding of health is compatible with the biomedical paradigm.

The biomedical paradigm has several basic assumptions and carries Western social values. These assumptions include reducing health to its basic physical components, a mechanistic explanation of the body, and a dualistic vision that separates mind and body as discrete entities and as an

object of control (Sampson, 1999). These assumptions serve to create a hierarchical boundary between that which is seen to be healthy and good versus that which is seen to be unhealthy and evil (Crawford, 1994). This boundary is maintained with the moral injunctions carried by the biomedical paradigm.

The Assumptions of the Biomedical Paradigm

According to an anthropological interpretation, biomedicine is a cultural construct of Western medicine that contains several fundamental assumptions about society, nature and individuals, and the natural causes of disease (Longino, 1998; Gordon, 1988). It is characterized by a reductionism that is mechanistic, essentialist and dualistic (Gordon, 1988).

The biomedical paradigm adheres to the classic mind/body dichotomy of Cartesian dualism, which creates many other dualistic symbolic classifications, including: rational/irrational, reason/emotion, culture/nature and male/female (Kirmayer, 1988). The dualistic approach within the western biomedical framework creates divisions between the mind and body, the objective observer and subjective patient, and similarly the known self and the strange non-self. Biomedicine has long been criticized for artificially dividing the mind from the body, according to Rene Descartes' description of the body and soul (Samson, 1999). This was originally a means of rationalizing the previously immoral act of dissection and to distinguish the naturalistic causes from the cosmological causes historically ascribed to illness (Samson, 1999).

This dualism results in a piercing and detached examination of the human body, and creates a distinction between the objective 'knower' and subjective 'known' and is a source of power over the ill. This "clinical gaze" subtracts and abstracts the patient and creates authoritative "truth" over people and their bodies (Foucault, 1980). Since the body is an "exemplar of naturalism in medicine" (Gordon, 1988:29), the dualistic assumption within biomedicine also becomes a seemingly natural way of representing the body.

Dualistic separation of mind and body has also resulted in interpreting the mind as an intangible ghost that runs the body, a corporeal machine that can be completely understood in mechanistic terms. This assumption has created the 'body-as-machine' metaphor so pervasive within biomedicine,

reducing the human body to a collection of independent parts that may be manipulated without affecting the rest of the body or the mind. In this system, each sex is merely a different model of the same 'machine.' The materialistic and mechanistic reduction of the human body to a collection of parts also reflects the biomedical assumption that there is an essential, naturalistic cause of all diseases, such as a pathogen. All of these assumptions in the biomedical paradigm reflect the underlying assertion that practitioners maintain a neutral and objective stance, since biomedicine is grounded in a physical 'reality.' This implies that biomedical practitioners are free from cultural prejudice and moral judgement.

As a culturally mediated health system, biomedicine has emerged from the Western intellectual tradition, and it is replete with these social values despite a rhetoric that claims objectivity (Longino, 1998; Kirmayer, 1988; Burson, 1989). For example, in practice, the biomedical system is internationally variable, since diseases are diagnosed differently in different countries (Payer, 1990). One way Western social values are expressed through biomedicine is in the hierarchy of the internal divisions. The classic divisions within biomedicine, such as mind/body, culture/nature and male/female are naturalistic metaphors to create and maintain social hierarchies (Kirmayer, 1988). For example, in her study of Costa Rican prostitutes' perceptions of HIV, Downe (1997) discovered that the anti-AIDS campaign served to perpetuate class and gender boundaries by portraying prostitutes as HIV carriers, as external contagious threats to the male-headed prosperous nuclear family, and thereby to Costa Rica as a nation.

The biomedical paradigm is also laden with Western morality and medical practice acts as a form of social control. Historically, illness was viewed as a punishment for 'sin', such as sexually transmitted disease as a punishment for promiscuity (Temkin, 1977). Currently, there is a secularization in North America, and medicine is moving in to fill the void (Swatos and Christiano, 1999). Medicine acts as system of control since "responsibility for being sick is shifting to the individual, who through will, reason, and healthy lifestyle should be able to prevent it" (Gordon, 1988: 28). For example, in his study of undergraduates' health promoting behaviours, Conrad (1994) showed that health "can be a moral discourse and the body a site for moral action."

Assumptions of the Participants' Explanatory Model

The explanatory model of health (Figure 4.1) is divided into a number of interacting and yet independent parts. In total, this interactive construct reflects basic assumptions about participants' bodies and health.

First, they differentiate between their minds and bodies. Bodies are described as separate from their minds, which are isolated from their physical selves. Their bodies are described as though they are a possession, like a car that requires maintenance: “[When] I’m not taking care of my body, then I guess it’s not going to be at like, peak performance” (FWD12). Some even ascribe autonomy to their bodies to the extent that the body has knowledge of what it requires, and finds means of communicating that need to its ‘owner’: “If your body’s trying to tell you that there’s a problem, I wouldn’t see the advantage in deliberately doing something to ignore that problem” (MWD4S).

The students in this study knowingly ignore their bodies at times when other needs, such as psychological or social goals, take precedence. For example, while they frequently mention the need for sufficient sleep, they will say that they decide to ‘abuse’ their bodies in order to study or party late into the night. This is also consistent with their explanatory model of health in which they identify physical stressors that impact their body and psychological stressors that impact their minds. They see dangers to health as either physical or psychological, since they threaten either the body or the mind, but not both.

Second, the body is compartmentalized into various independent components. These components are both abstract, such as the immune system, and materialistic, such as hands. All have a mechanistic ‘function’ in which each part must fulfil a role to achieve health. The explanatory model reflects the view that the different parts must be kept functioning properly: “You know you can’t use too much of one thing... You know, it’s just, that’s why there’s different things for different parts of our body. You know we don’t just use one part for everything” (MAT18).

Third, they not only incorporate these dualistic beliefs into their explanatory model, they clearly believe that there is a specific cause of illness. For example, at the conclusion of an interview, after the tape was off and I was offering my thanks, they frequently asked me if they “got it right,” since they believed that with my education in biology, I would know the ‘true’ causes of illness and the nature of pathogens. This also shows that

they believe that physicians and scientists are the authority on the cause of illness. That they esteem biological knowledge is in evidence when they tried to explain their understanding in terms of what they had learned in school, and how the consequent behaviours make rational and natural sense.

All of these assumptions exemplify the social boundaries and moral values expressed in their beliefs about health. The division between the mind and body sustains the distinction between internal and external social boundaries described above. This serves to strengthen the inside versus the outside of their metaphoric boundaries. Also there is an implicit hierarchy associated with the mind/body division, in which the "good" rational mind manages the "bad" irrational body. For example, students ignore the needs of their bodies, but their bodies cannot 'ignore' their minds. Aligning social groups as either inside or outside also metaphorically serves to distinguish that inside groups are good while outside groups are bad.

The participants in this study also articulate their beliefs and resulting behaviours with regard to health as being purely mechanical requirements of different body parts. This provides a rational and natural explanation of the resulting moral implications of these beliefs and behaviours and an effective means of rationalizing the moral codes inscribed into their health beliefs:

While naturalism separated nature from morality, naturalism itself serves as a basis for morality. To say something is natural provides a bedrock of support. To say something is "rational" is even stronger. Rationality is not only a dominant western value, it is where values are hidden (Gordon, 1988:39).

Understanding how students explain health is only possible within the context of modern Western biomedicine. This convergence of societal and personal norms is not unexpected, especially given the highly visible medical presence in Ontario, and more particularly at McMaster University. McMaster has a vast array of medical programmes and a large hospital that dominates the campus both physically and fiscally. As a group of young people raised in the Western biomedical tradition, McMaster students are well enculturated into the biomedical paradigm. These beliefs are expressed in students' descriptions of their ideas of health, their behaviour, and their bodies.

Biomedicine and Participants' Explanatory Model Expanding: Apparent Holism

Biomedical practitioners have begun to incorporate broader approaches to analysis and treatment and seem to be becoming more holistic (Strong, 1986). This new approach to health is a response to both social science criticism and to a perceived threat resulting from the rise of complementary and alternative medicine (Kelner and Wellman, 1997; Schaler, 2002). Ironically, the revised more 'holistic' biomedical paradigm has enabled a further expansion of biomedicine into social spheres, such as those traditionally ascribed to politics and religion.

Seeming Holism of the Participants' Explanatory Model

In this study, students present a multifactorial approach to health that has a broader scope than the classic biomedical framework. Their explanatory model incorporates psychological stressors, such as scholastic demands, social stressors, such as interpersonal relationships, as well as a multitude of potential biological factors. They also recognize the importance of cultural and economic factors, since they discuss the beliefs they inherited from their parents and the limits of an undergraduate budget in choosing whether or not to use antibacterial soap.

They also recognise the reciprocal relationships among psychological, social, and biological influences on their overall well-being. Many noted that psychological or social stress would be expressed by feeling physically unwell. Conversely, physical illness would render them psychologically incapable of managing daily tasks or social interactions:

...the only thing I can say about getting sick or preventing yourself from [catching] germs or things like that is ... keeping yourself in the best possible shape that you can. I also think that being healthy emotionally and mentally has a big part of it too. ...maybe I'm wrong, but when you get worn down mentally, it kind of wears your body down at the same time. I think the only [way] to like prevent yourself from (other than being in the best possible condition you can be), is to every day walking around wearing gloves, wearing masks, wearing an airtight rubber suit, or whatever... (MWD4S).

Even when I asked a straight-forward question about what specifically caused illness, students often failed to cite any singular threat to health. They listed a number of different factors, which either affects their mental or physical health. These beliefs are much more comprehensive and their view *seemingly* contradicts the traditional reductionism found in the biomedical paradigm.

However, the multitude of threats to health that participants cite are not truly incorporated into an integrated system of health beliefs, but are merely additions to potential threats to health. Instead of citing a singular ultimate cause, a series of causes may be ranked according to the perceived influence of each cause over the illness. They do not envision the body as a unified whole, as with Ayurvedic and Chinese medicine. Rather, they have simply extended the 'body-parts' to include non-corporeal components (Unschuld, 1992; Trawick, 1991). They picture their secondary social "symbolic skins" also to be sources of illness, which may be reduced, compartmentalized, and healed individually as with their various organs (Helman, 2000:15).

Since their definition of health incorporates social factors, participants are in fact echoing the extension of biomedicine into traditionally social spheres. However, as the biomedical paradigm is being used increasingly to address social components of illnesses, it still retains both its basic assumptions and underlying values.

Expansion of Biomedicine and the Inflexible Paradigm

There have been many books and journal articles by academics and advocates harshly critiquing the biomedical establishment for its assumptions and values (e.g. Lock, 2000; Markens, 1996; Miewald, 1997; Reissman, 1983; Rossol, 2001; Sawkicki, 1991; Barker, 1998; Baer, 1989; Burson, 1989). These objections have been particularly directed towards the 'biomedical hegemony' of doctors and health institutions.

Recently it seems that biomedical practitioners have responded to criticism about these assumptions by seemingly becoming more holistic, in that there is greater acceptance of alternative therapies and medical explanations of social problems, with some practitioners even becoming advocates of social reform (Kleinman, 1980). Biomedical institutions have begun to expand into new roles, and integrate issues that were previously considered to fall within the realm of the church and the state:

The medicalized body was separated [mind from body] only to be reconnected to a complex web of social and environmental 'etiologies.' These reconnections laid the foundations for the social, environmental and behavioural 'medicines' which would subsequently claim a multiplicity of social objects as their proper domain of intervention" (Crawford, 1994:1351).

Lifestyle choices and sexuality are now being addressed by a new, "holistic" biomedicine, for example (Conrad, 1994)

Biomedical practitioners have begun to apply Schepher-Hughes and Lock's (1987) "body-politic" to achieve their goals. Physician-advocates, such as Paul Farmer, unabashedly call for an international redistribution of power and wealth, and political groups such as "Médicins Sans Frontières." For example, this organization has an "advocacy" section on their website and contributions to biomedical academic journals (Farmer, 1999; *Medicins Sans frontieres*, 2003a & b). These biomedical doctors are demonstrating an increasing awareness of social, economic and political factors that contribute to health. A large body of literature documents the expansion of the biomedical domain into social problems – racism and deviance – and natural processes – childbirth, childhood, and aging (Timini, 2002; Rossol, 2001; Wellman, 2000; Barker, 1998; Gonyea, 1996). Finally, there has been growing incorporation and acceptance of complementary and alternative medicines by biomedical systems, such as incorporating midwives into Ontario hospitals and the creation of the "National Institute of Health, Office of Alternative Medicine" (Miles, 1998; Government of Ontario, 1991; Baer, 1989).

This trend towards broadening the appropriate domains for "health" and healthcare is evidently far reaching, since it has even affected the World Health Organization (WHO): "the modern public health movement has captured the WHO" (Strong, 1986:193). This contradicts the basic assumptions of biomedicine, which culminate in a definition of health as merely the absence of disease. The revised WHO, however, continues to follow many precepts of its original medical model, and remains technocratic and unreflexive (Strong, 1986). Biomedical practitioners have not relinquished their basic assumptions or any of the values imbedded in the biomedical paradigm.

As biomedicine expands into more social arenas, it is well situated to articulate social boundaries since it already acts directly to manipulate

Scheper-Hughes and Lock's (1987) "mindful body;" a preferred medium of expression across all societies (Douglas, 1966). The classic divisions within biomedicine, such as mind/body, culture/nature and male/female have apparently expanded to include social and individual bodily boundaries. These are metaphors for the lines between 'us' and the "Other", including other races or ethnicities, classes and genders, in biomedical terms.

These metaphors are readily evident in biomedical practice, both in infectious disease and chronic disease control. For example, people who are infected with a contagious illness are now considered "vectors" of disease, and are treated as alien and dangerous due to their infectious potential. This creates social boundaries presumably for 'rational' public health reasons (Downe, 1997). Unfortunately, this application of the culturally-bounded biomedical model to the social components of disease transmission has dire implications for the people, or 'vectors,' it is designed to control.

Morality and health have long been intertwined in western disease causation models (Temkin, 1977), but previously ill-health was punishment for other socially unacceptable behaviours. With the modern advent of supposedly unbiased biomedicine, presumably disease and morality have finally been separated, and an entirely naturalistic explanation of disease causation has been achieved. Yet the biomedical paradigm retains its "rational bedrock" means of defining moral behaviour (Gordon, 1988).

Modern applications of the biomedical framework appropriate a secular morality to place responsibility for health in the hands of individuals and makes them conform to social expectations. Purportedly for 'good health,' modern biomedical practice dictates the correct, largely social, lifestyle choices, ranging from food choices and physical activity to sexual behaviour and narcotic use. According to Edgeley and Brisset (1990:259) the previous idea "that most anyone can be healthy, given the proper... lifestyle, has been translated into an ethic that everyone should be." For example, previously obesity represented the deadly sin of gluttony, and now it is a highly correlated co-morbidity factor in mortality rates; a biomedical version of a deadly sin (Peeters, et al., 2003). The quest for the normal, healthy, body, according to current medical standards, has become a discourse in Western morality and social order (Lock, 2000).

The expansion of biomedicine into social arenas also has implications for gender. Previously, in accordance with the mechanistic approach to the body, biomedicine did not fundamentally distinguish between the two genders. Each sex was simply a variation on a theme, and the distinction

was primarily about reproductive differences, and so the dualism of male/female was something innately related to their biology, but did not necessarily extend to their social roles. Also, there is an implicit hierarchy within these divisions, and male/mind is decidedly supreme over female/body.

As biomedicine expands into the social realm, it brings with it these gender specific values, and so now what was once simply a characteristic of masculinity or femininity is now pathological. For example, impotence in men did not necessarily reflect an inherent failing of manhood (Meilka, 2002) and premenstrual syndrome did not exist before the medicalization of women's anger (Markens, 1996; Reissman, 1983). Medicalization of gender issues likely has the consequence of allowing the biomedical value system to define appropriate "healthy" behaviour for women and men.

Modern medicine has also responded to the accusations of being hegemonic by merely incorporating more aspects into its framework. While it is laudable when physicians act as advocates for the impoverished ill, they are simply moving further up the diagnostic order instead of restricting themselves to the immediate causes of ill health (e.g.; Paul Farmer). Now modern doctors are not only looking at a microscope to find the cause of disease, they have now moved to a macroscopic level, while still adhering to the classic tenets of biomedicine.

Finally, to become truly holistic and truly recognise the physical body, the social body and a body politic as an integrated whole, biomedicine must fundamentally change and not adhere to mechanistic reductionism. In attempting to reconcile the physical and social bodies, the biomedical paradigm disguises itself as holistic, while western medical practitioners tenaciously adhere to its basic theoretical framework and merely add social and psychological factors to the hierarchal list of 'causes' of diseases.

While this expansion of a biomedical morality is unlikely the desired effect of those looking for greater holism from biomedicine, it seems an inevitable consequence of such demands. Given the overwhelming success of the scientific approach to curing disease, such as antibiotics and vaccinations, it seems likely that the underlying assumptions of biomedicine are what provide doctors with the ability to cure so effectively. For example by only focusing on the microbe itself and its mode of action, it is possible to design chemicals that inhibit vital biochemical pathways only in the micro-organism and not the human it has infected.

Consequently, when a western doctor treats a patient for a disease such as tuberculosis, the most immediate and direct solution conceived by biomedical research is to use appropriate chemotherapy. Given the effectiveness of such treatments, it is difficult to deny the validity of this choice. Although there are undeniable social and economic factors associated with tuberculosis, the biomedical institutions and practitioners fundamentally lack an adequate paradigm to address these issues (Farmer, 1999; Longino 1998).

Western medicine has a long history of interrelating disease causation with moral injunction; controlling the deviant factors, such as pathogens, is the primary mode of operation (Temkin, 1977). As biomedicine expands, practitioners bring this mode of action to social spheres they are now expected to address.

Biomedicine brings its power against disease to the social factors underlying disease, and becomes a locus for social control: “a [new-modelled] medicine which needs to engineer both the biological and the social realm and can call all of the resources of the state to do this is ripe for exploitation” (Strong, 1986:195). Calls for biomedicine to become more ‘holistic’ results in expansion into social domains and makes it a more powerful vehicle for social control, as with many other more traditional and holistic healing systems. For example, applying health as a means of social control has been evidenced with other, more holistic traditional healing systems, such as those found in East Asia (Lock, 2000). Ultimately, as with the shaman’s power to both cure and injure, the biomedical power to heal also provides it with the power to control (Brown, 1998).

CHAPTER 5: CONCLUSION

Introduction

This study was designed to explore why people choose to use antibacterial soap since it has adverse consequences and no health benefits (Larson, 2002; Gilbert and McBain, 2001). A qualitative approach was used to determine how students' beliefs about health and contagion affect their antibacterial soap use.

It was found that students have a gendered explanatory model of health that explains their antibacterial soap use as a protective behaviour. This model is a metaphor for social boundaries and outlines a moral code. It also aligns well with the biomedical paradigm, and reflects the expansion of biomedicine into untraditional social domains. Incorporating these explanations of students' antibacterial soap use are necessary for any public health programme designed to reduce antibacterial soap use.

The study is best viewed as a preliminary foray into this area of inquiry. There was insufficient time and resources to contextualize the participants' beliefs within the media, the education system, and their families. More research is needed regarding the messages portrayed by these sources. The interviews failed to elicit the emotional meaning of contagion for students. Future research should seek to gain a greater understanding of the emotional aspect of contagion. The sample size should be increased to enable a statistical analysis.

Major Findings

Overall, students understand health in terms of having energy, being disease free, and as something to be achieved through eating well and exercising. These beliefs form an explanatory model of health that has several key components used to make health decisions, including using or not using antibacterial soap. The participants see their health as continually threatened by sources of illness. Contagion is one of the principal threats identified. They understand pathogens to be transmitted through the air, or on the surfaces of contaminated people and objects.

Two modes of defence were articulated in the interviews. Internal components of defence involve maintaining immune rigour; external components spotlight such activities as personal hygiene and cleaning to protect against pathogens. Men tend to have a more internally focussed explanatory model of health, while women have a more external focus. Consequently, the women in this study consider antibacterial soap an important product since they believe it to be more effective protection of their external boundaries. The men believe that their internal rigour will negate any ill effects from any pathogens they encounter, and rarely use antibacterial soap. These beliefs explain why women were found to be eight times more likely to use antibacterial soap than men.

Another striking aspect of data is that social values are expressed through the explanatory model, including social divisions and morality. The division between internal and external is a metaphor for social boundaries (Douglas, 1966). The threat of contagion and dirt acts as a means of dividing participants from others. They describe protecting their health in terms of cleaning off contamination by unknown filthy sources, as well as by avoiding people they consider potentially polluting. A secular morality is articulated through their description of what they “should” do to maintain internal rigour. They offer prescriptions and proscriptions, such as exercising and refraining from casual sex; eating or not eating specific foods (such as eating fruits and not eating fast food), and avoiding dirty places, such as public washrooms. The increasing trend in North America to moralize health maintenance is readily evident in the way participants describe their preventive behaviour, which acts as a form of social control (Conrad, 1994).

The explanatory model of health revealed in this study aligns very well with the biomedical paradigm. Participants believe ill-health has a specific physical cause, which is usually a form of contagion. They commonly refer to their bodies as an object in their possession, rather than as an integral part of themselves. They describe a relationship between themselves and their bodies in which their psychological and physical health reciprocally affect one another. With this understanding of health, they are adding categories to the potential causal factors in a highly divided system rather than truly incorporating all of these factors into a vision of an integrated system.

Biomedicine is characterized by a mechanistic, reductionist approach to health, with an uncompromising division between mind and body (Gordon, 1988). This tendency to appear to have a broader interpretation of

health is reflecting an expansion of biomedicine into new spheres in response to criticisms of being overly essentialist (e.g., Rossol, 2001; Wellman, 2000; Barker, 1998). Biomedical practitioners have merely added social and psychological factors to their list of potential sources of disease, just as the participants in this study have done. This has enabled even greater influence of biomedical theory into social domains, such as the maintenance of social boundaries between groups and moral control (Baer, 1989).

Limitations of the Study

While this study provides a preliminary ethnomedical exploration of beliefs and behaviour in a small sample of undergraduate students at McMaster University, a better contextualized and more penetrating study may have been possible with greater time and resources. Since participants' beliefs are framed within a larger community, it would have been ideal to explore their beliefs within this context. As expected, they reflect some of the values and beliefs of their culture. Given greater time, the sources of their ideas about health could have been more thoroughly scrutinized. How the media, education and family values shape their beliefs could have been examined. The media was mentioned by several participants in the study as particularly influential. It would have been interesting to examine the messages in the media about contagion and antibacterial soap to which students are exposed.

Students often spoke very casually about their beliefs and behaviours, and clearly did not consider simple preventive measures as particularly meaningful. Since health is so much a part of daily lives, participants rarely reflected deeply about contagion. It was challenging to elicit commentary about health in general, and contagion specifically. This was advantageous since it put participants at greater ease than if the research topic were more contentious, and students were willing to discuss their beliefs. Ironically it also meant that students often found themselves at a loss for words. It seems they found it difficult to express even mild opinions on a topic so intrinsic to their daily routines. This dispassionate response was unexpected given the overwhelming success of the antibacterial soap market (Perencevich, 2001). The ability of marketers to convince people to spend more money on a product that has little obvious benefit implies that

they are effectively manipulating consumers' fears. This study may have been more informative if I had been able to explore deeply the more emotional basis for these decisions and to further explain the widespread use of antibacterial soap.

Participants' explanatory model of health was nonetheless readily evident, as were the resulting health-seeking behaviours along with the connections to the biomedical framework. Consequently, while the overarching theoretical significance is discernible, the deeper, more personal meaning of these beliefs is less apparent. Ideally an expanded study also would reveal personal meanings for the participants.

Future Research

Since this study has provided an initial exploration of students' beliefs about health, it would now be possible to broaden the scope of inquiry to include other sources of data. This would inspire sufficient confidence in the findings to enable policy makers to pursue activities that would reduce the current rate of use of antibacterial soap. First, it is imperative to identify the principal media sources that influence public opinion about health. Second, interview questions must be designed to solicit greater emotional responses from participants. Finally, it would be helpful to add a statistical survey of a larger sample to determine the true extent of antibacterial soap use and to confirm or challenge the impression from this study that it is a highly gendered behaviour.

Examining the principal media sources would entail both interviewing students about the media they are most likely to use, as print or electronic, and extensive sampling of the cleanliness and hygiene messages appearing in popular sources. Decoding advertisements by employing techniques such as semiotics, should be used to explore the social subtext (Tomaselli, 1996; Williamson, 1978). This process would provide an analysis of the messages students use to inform their beliefs about health. It would also further illuminate both where students obtain their ideas and provide more detail about content.

Given the difficulty students had in expressing the more personal aspects of their health beliefs, the rigour of the study would be enhanced by having additional interviews. The interview guide would be adjusted to

encourage participants to discuss the more emotional and personal components of their health. Questions could be asked such as, “describe how the idea of walking into a ‘dirty place’ such as a public washroom makes you feel?” Perhaps participants who have experienced a serious infectious illness could be interviewed. This would provide the more interpretive and meaningful aspects of their beliefs and experience of contagion, and effectively complement the current research results.

A larger sample of participants is needed for a statistical survey. This study suggests that it is probable that science students do not use antibacterial soap as often as social science and humanities students, but it would not be possible to be confident of this without a larger sample that could be analysed statistically. Clearly examining the media, conducting more interviews aimed at more emotional issues, collecting statistical data would be the next processes in conducting an analysis of this phenomenon. Only with these research phases completed would it be possible to address, and perhaps resolve, some of the concerns about antibacterial soap raised by both medical and environmental researchers.

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**APPENDIX A: CONSENT FORM TO PARTICIPATE IN
RESEARCH**

CONSENT TO PARTICIPATE IN RESEARCH

Students' Beliefs About Contagion and Implications for

Antibacterial Soap Use

You are being asked to participate in research conducted by Catherine Ahern, a Masters student from the Department of Anthropology, McMaster University. The research will contribute to a graduate thesis to be completed by June 2003.

For questions or concerns, please contact:

Catherine Ahern: aherncm@mcmaster.ca 905-529-4071

Dr. Ann Herring: herring@mcmaster.ca 905-525-9140 ext. 23920

Purpose of the Study

The study is intended to gain an understanding of McMaster University undergraduate students' beliefs surrounding contagion, and their associated preventative behaviours.

Procedures:

If you consent to participate in the study, I will ask you to:

- Participate in an informal interview with me which will take approximately half an hour.
- Answer a series of questions regarding disease transmission, and what you do to remain healthy.
- Allow me to record (on audio tapes and through note taking) during the interview, for the sole purpose of acquiring data for my thesis report.

Potential Risks and Discomforts

If at any time you feel uncomfortable answering a question, please inform me and feel free to ask that we skip to the next question, or end the interview entirely. Please do not feel to obliged to answer any of the questions.

Potential Benefits

Potentially, this research may provide health care workers with information which could facilitate improvements in student health. Also it may contribute to anthropological literature on cultural understandings of infectious disease.

Anonymity and Confidentiality

To protect the anonymity of all participants, any information that is obtained in connection with this study will remain strictly confidential. Also, your name will be removed from any records of this interview process. I will be the sole person with access to any information that connects participants with their specific interview data.

Participation and Withdrawal

At any time during the interview, you may refuse to answer any question(s) and/or withdraw your participation and stop the interview. You may request that I remove your responses from my records, after the conclusion of the interview and prior to publication of results.

Rights of Research Participants

You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the McMaster Research Ethics Review Board (MREB). If you have questions regarding your rights as a research participant, contact the MREB Secretariat:

Michael Wilson (Phone: 905-525-9140, ext. 23142)
Office of Research Services Gilmour Hall, Room 306-K
McMaster University,
1280 Main Street West
Hamilton, ON L8S 4L9
Signature of Participant

I understand the information provided for the study "Students' Beliefs About Contagion and Implications for Antibacterial Soap Use" as described

herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name _____

Signature_____

Date_____

Signature of Investigator

In my judgement, the participant is voluntarily and knowingly giving informed consent and possess the legal capacity to give informed consent and participate in this study.

Researcher's Signature _____

Date_____

APPENDIX B: INTERVIEW QUESTION FORM

Interview Preamble

Thank you for participating in my study. The purpose of this study is to understand what students think about health and illness and what they do to keep themselves from getting sick, and why. These questions are aimed at this purpose, but are also designed to allow room for you to guide me towards other factors. There are no right or wrong answers – whatever is true for you is the “right” response.

I will be using the information that I collect to develop an understanding of people’s attitudes about illness. Your identity will never be exposed. Your interview transcripts will be identified with a code and studied with all of the other interviews for my graduate thesis.

As we talk, I may ask you to further explain what you say, but is not a test of any kind. When I have completed the data collection aspect of the study, you may receive the results if you would like, and be given the opportunity to provide feedback on the findings

Before we proceed, I need to ask you to sign a consent form. At any time during the interview you can withdraw from the study, or afterwards if you change your mind, I can withdraw your interview from my research.

Do you have any questions?

Interview Question Form

Researcher: Catherine Ahern

Participant information

Code Number: _____
Name _____
Living arrangement _____
Ethnicity _____
Health Index Rating _____
Age _____
Sex _____
Major _____
Year _____

Questions

- 1) In your opinion, what does being healthy mean?
 - Indicators of health – not being sick? Having high energy levels?
 - Causes of ill-health (environment/ diet/ immune system rigour).
 - Importance of immune system health / lack of infectious illnesses
- 2) How would you rate your health?
 - a. Excellent
 - b. Very good
 - c. Fair or,
 - d. Poor?
- 3) What steps do you take to try to keep from getting sick?
 - Are there foods, people or places people should avoid to prevent getting sick?
- 4) How do you think these steps that you described help to prevent you from becoming sick?

- Why should people avoid the things you listed before, such as...?
- 5) Think of a time when you were sick, what do you think caused it and what did you do to take care of yourself?
 - Was it the time of year, the people you were with, exposure to something?
 - 6) What do you think causes people to become sick with infections?
 - What do you see the 'active agent' of disease to be?
 - For example, what would get people sick with if they had a cold, stomach flu or bronchitis?
 - 7) What do you picture when you think of "insert the participants word (germ, bug, virus, pathogen etc)"?
 - What do you think it's made of?
 - What do you think it looks like?
 - How big do you think it is?
 - 8) How do you keep "participants word" from spreading from person to person?
 - For example, if someone you were living with was sick with it, what would you do?
 - How do these actions work?
 - 9) Do you use antibacterial soap?
 - 10) Why do you (or not), use antibacterial soap?
 - Do you think they work?
 - How do you think they work?
 - 11) Is there anything else you'd like to tell me about "participant's word" or about getting and preventing becoming ill?