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Through Asian Eyes:

Illuminating the Glass Ceiling for Chinese Engineers

by

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A THESIS

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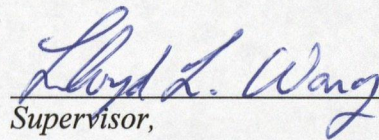
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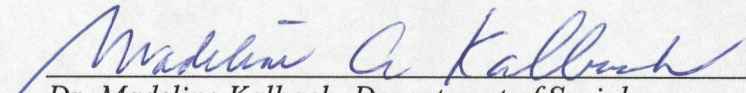
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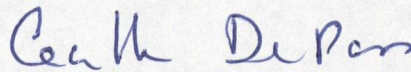
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ABSTRACT

Historically, the Chinese have endured institutional racism from the Canadian and American governments. Although it is true that the Chinese have improved their position significantly in terms of economic, occupational, and class standing, there is evidence that the Chinese are underrepresented in managerial positions, and earn less than their White counterparts in the workplace. This study utilizes a survey-questionnaire and in-depth interviews to determine the extent to which Chinese engineers perceive occupational barriers that produce the glass ceiling effect. Statistical data in this study reveal that in general, respondents perceive the existence of a glass ceiling for Chinese engineers in Canadian organizations. Additionally, approximately one-third report a personal experience with the glass ceiling due to their ethnic background. Further analysis reveals that perceptions and experiences of the glass ceiling vary by nativity, age, and gender. Interview data illuminate perceived causes, coping strategies, and potential solutions to the glass ceiling.

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DEDICATION

To Patrick Li, my Ju.

You are my inspiration.

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CHAPTER 1   INTRODUCTION

Institutional racism has been a part of Chinese life throughout their history in Canada and the United States (CCNC 2001; CRRF 2000; Driedger 1987; Hiller 2000; Lee 1999; Li 1998; Tang 2000; Tong 2000; Woo 2000). From facing discriminatory immigration restrictions to being denied the right to vote, the Chinese have endured overt racism from both sets of governments. Although the term is a contested and controversial one, they have now made it so far as to be considered by some to be the "model minority" of these countries (Asian Americans for Community Involvement 1993; Li 1998; Marger 1997; Tang 1997a; Tang 2000; Woo 2000). Some of the Chinese success today is due to the changing emphasis of the immigration policies in both countries (Li 1998; Woo 2000). Yet despite access to, and protection of, equal rights and treatment as legislated in the Canadian Charter of Rights and Freedoms and their bestowed title of the "model minority", there is still evidence that the Chinese are disadvantaged within Canadian and American society. While it is true that the Chinese have improved their position significantly in terms of economic standing, occupational standing, class standing, and social acceptance, there is evidence that the Chinese are underrepresented in managerial positions, and earn less than their White, non-Hispanic counterparts in the workplace (Boyd 2000; FGCC 1995; Li 1998; Tang 1997a; Tang 2000; Woo 2000). Understanding this paradox is vital; through illumination, clarification, and dissemination of these matters, employers and employees alike could be better informed about how each could take responsibility for creating an effective, positive, and more equitable work

environment for the parties involved. Yet, literature on the Chinese Canadian and American work experience is scant (Chen and Thatchenkery 1997; Woo 2000).

The purpose of this study is to examine the extent to which occupational barriers are perceived to exist for Chinese Canadian engineers. Glass ceiling, is defined by the United States Department of Labor, are "... artificial barriers based on attitudinal and organizational bias that prevents qualified individuals from advancing upward in their organization." Although it is clear that the paradox above encompasses a variety of different issues, ranging from the devaluation of immigrant credentials to societal barriers of getting in the door of various corporations (CCIS 2000; FGCC 1995), this study focuses specifically on the perceptions and the workplace experiences of University of Calgary trained Canadian Engineers. The objective of this study is to begin to fill in the literature gap on the Chinese in the profession and the glass ceiling.

Chapter 2 establishes the context for this study and presents a brief overview of the Chinese experience in Canada, followed by a detailed discussion of the theoretical framework that guides this thesis. The chapter begins by outlining the history of institutional racism against the Chinese as established by the Canadian immigration laws and then discusses the changes in characteristics of the Chinese population in Canada. Success of the Chinese in both Canada and the United States has lead to the image of Chinese in these countries as the "model minority." The theoretical framework contextualizes the Chinese entry into professional positions and their lack of mobility into managerial positions. The notion of the glass ceiling phenomenon is then discussed for both the United States and Canada. Finally, this chapter discusses the research problem of this thesis and then provides an explanation as to why this issue is sociologically relevant.

Chapter 3 describes the research design of this study. This chapter notes the data source for this thesis, explains my involvement in the generation of the data, and discusses the epistemological orientation adopted for the basis of the thesis in terms of analysis and presentation. Ontologically, a constructionist-type orientation is used. As will be discussed, the data collected utilized both quantitative and qualitative methodologies. What follows are details of the information gathering steps, including development of the sampling frame, development and administration of the survey questionnaire and the conducting of the interviews. Finally, this chapter concludes with a detailed examination of how each set of survey and interview data are analyzed.

Chapter 4 presents the results gathered from the survey-questionnaire. Before the adjudication of respondent perception on glass ceiling issues, an outline of the respondent profile, in the form of demographic characteristics, is listed. Respondents' perceptions on glass ceiling issues are divided into three main areas of inquiry. The first being respondents' overall perception of Chinese managerial representation in Canadian engineering organizations; the second being respondents' perception of how glass ceiling issues affect upward mobility of respondents' own careers and careers of other Chinese engineers that they know of; and finally, the obstacles or perceived causes for their difficulties in ascending up the corporate ladder.

In Chapter 5, respondents' key demographic characteristics are correlated with each of the three dimensions of perception of the glass ceiling. The purpose of performing these statistical calculations is to discern the degree to which these demographic variables affect the perception of the glass ceiling. The demographic variables used for crosstabulation are: nativity, current age of respondent, and gender.

In Chapter 6, there is the presentation of the findings from the personal interviews. The common themes discussed by participants include: 1) actual experiences with the glass ceiling, 2) perceived reasons for difficulty in terms of ascent to higher managerial positions, 3) choices and coping strategies, 4) how respondents perceive the future of engineering concerning equity in the workplace, and 5) possible solutions to the glass ceiling.

Chapter 7 provides the conclusion to this thesis.

CHAPTER 2

REVIEW OF CURRENT RESEARCH AND THEORETICAL FRAMEWORK

INTRODUCTION

The Canada E-book (2005), a web-based publication produced by Statistics Canada, states that "... Canada is a multicultural society whose ethno-cultural composition has been shaped over time by different waves of immigrants and their descendents." Statistics Canada (2005) goes on to report that over the past century, Canada has welcomed more than 13.4 million immigrants. And, according to the 2001 Census, 18.4% of the population was born outside Canada, the highest proportion in 70 years. In the year 2000, 58% of these new immigrants were from The People's Republic of China. Of this, the single occupational group that dominated the landed immigrant cohort of 2000 were professional occupations in the natural and applied sciences, with engineering as the dominant occupational grouping (Citizenship and Immigration Canada 2003). Furthermore, data from the 2001 Census of Canada, PUMF Individual File (2.7% Sample) reveals that 14.5% of all the Chinese in Canada (single ethnic response) work in the natural and applied sciences. Compared to all other occupational categories, the natural and applied sciences category holds the highest concentration of Chinese. A translation of these figures shows that there are 72 657 Chinese out of 1 064 763 people in this occupational category[1]. Thus, the examination of the workplace experiences of

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[1] Tables and definitions of these figures and variables are listed in Appendix D.

Chinese professionals is an important area of research in terms of their successful incorporation in Canadian society.

Throughout this thesis, the minority group of interest is referred to as the Chinese or Chinese-Canadians and refers to the ethnic identity of the participants in this study. Statistics Canada (2005: website) defines ethnic origin as:

> "...the ethnic or cultural group(s) to which the respondent's ancestors belong. An ancestor is someone from whom a person is descended and is more distant than a grandparent. Ancestry should not be confused with citizenship or nationality."

Fenton (1999:4) describes the term 'ethnic group' as "primarily used in contexts of cultural difference, where cultural difference is associated above all with an actual or commonly perceived shared ancestry, with language markers, and with national or regional origin." Although the author of this thesis is aware that the term 'race' carries within it notions of biological essentialisms that have been proven counterfactual, the term 'race' is referred to in this thesis albeit sparsely. As Fenton (1999:4) states, "a discourse in which the idea of 'race' is present remains a powerful feature of common-sense thinking and of the ordering of social relations."

This chapter begins with an outline of the Chinese experience in Canada, followed by a detailed discussion of the theoretical issues that bring attention to the sociological problem of the Chinese Canadian engineers and their perception of the glass ceiling.

THE CHINESE EXPERIENCE IN CANADA

The historical development of the Chinese in Canada provides a contextual background to the growth and development of the beliefs and perceptions held by the Chinese today regarding equity issues in the workplace. As Anderson and Frideres (2000:11) point out,

> "One must fully appreciate the history of the relations, whether myth or reality, that impinges upon the views, attitudes, and behaviour of ethic-group members.... The historical collective conscience of the ethnic group is an important contextual factor that will give us fertile ground upon which to build a theoretical explanation of today's behaviour."

This thesis does not provide an explanation of the behaviour of Chinese engineers in the workplace. Rather, the objective of this thesis is to examine Chinese engineers' perceptions and experiences of the glass ceiling within Canadian organizations.

A History of Discrimination

There is substantial research into the Chinese experience and history in Canada. Chinese immigration to Canada began with the gold rush in 1858 (Baureiss 1987; CCNC 2002; Li 1982; Li 1987). It was the hope and goal of those initial Chinese settlers to find the "gold mountain." Yet what many faced instead were lives of hard labour in mining, fishing canneries, and most frequently, in the construction of the western section of the Canadian Pacific Railway (Baureiss 1987; CCNC 2002; Chan 1981; Li 1982; Li 1998). Upon completion of the railway in 1885, the federal government implemented a head tax

policy to limit Chinese immigration to Canada. The head taxes increased as hostile feelings towards Chinese grew, eventually leading up to the Chinese Exclusion Act of 1923 (Baureiss 1987; Chan 1981; Li 1982; Li 1998). Strong racist feelings towards the Chinese were fuelled by politicians who would use the anti-oriental sentiments in their campaigns and by employers who used the Chinese workers as "scabs" to end strikes, thus causing white working class resentment (Baureiss 1987; Chan 1981; Li 1982). Just prior to the implementation of the Exclusion Act, the federal government had passed a law stating that the Chinese people were not allowed to vote in federal elections (Chan 1981). Because they were no longer recognized as full citizens, this meant that the Chinese could no longer be employed as pharmacists, lawyers, or accountants (CCNC 2002; Li 1982). Anti-Chinese legislation was not lifted by the government until a change in the social climate towards the Chinese occurred when, in World War II, China and Canada became allies to fight the Japanese (Li 1982; Li 1998). The Exclusion Act was repealed in 1947. Although this lead to a relaxation in immigration restrictions towards the Chinese, politicians, such as Mackenzie King, were still adamant about keeping Canada free from such "unassimilable" peoples, thus Chinese immigration was still highly restricted compared to that of Europeans and Americans (Li 1998). In 1967, the introduction of the point system finally eliminated the overtly racist immigration policies. Since then, immigration of Chinese and other Asians has increased significantly. Asian immigration between the years of 1991 to 1996 accounted for nearly sixty percent of the total immigration. This is a substantial increase in comparison to the 1960s, when Asian immigration totalled only twelve percent (CRRF 2000).

As a result of these past racist policies and anti-oriental sentiments, the Chinese population in Canada has developed some unique characteristics in the areas of family and generational development, and in their economic profile.

Development of the Family and Second Generation

Due to the implementation of the various head taxes, very few Chinese immigrants could afford to bring their families with them to Canada in the late 1800s and early 1900s (Li 1998). In addition to financial considerations, the social climate of overt racism and discrimination towards the Chinese also provided a significant deterrent to bringing their families. Thus much of the first generation Chinese then were young, adult males, many of whom were "... married bachelors who sent remittances to support their families in China" (Li 1998:63). Although this did not mean that there were no Chinese women who immigrated with their husbands, the sex ratio imbalance was drastically high at approximately fifteen hundred men to one hundred women in 1921. This imbalance would subsequently fall over the years, however, a balanced sex ratio was not seen until 1971 (Li 1998). In 1947 to 1962, more Chinese women than men immigrated to Canada as a result of family reunification after the war in combination with the implementation of less restrictive immigration policies (Li 1998).

The significance that this has for the Chinese population in Canada today is that although Chinese have been part of Canada for more than one hundred years, the majority of the Chinese population in Canada today, consists of immigrants. That is, because of the imbalanced sex ratio of the first set of Chinese immigrants, the Chinese-

Canadian community was not able to reproduce itself. Unable to replace its aging population, due to the restrictive policies towards the Chinese, it was also "unable to replace its aging population through immigration..." (Li 1998:73). The combination of these factors eventually led to a decline in the Chinese population in the years of 1931 to 1951 (Li 1998). It was not until post-war immigration that the Chinese population was replenished despite a history in Canada for over one hundred thirty years. According to Li (1998), over 70 percent of the Chinese population in Canada were foreign-born in 1991. In 2001, 57.1% of the Chinese in Canada were foreign-born (this figure is derived from the 2001 Census and can be found in Appendix D, Table D.4).

Economic Profile

Chinese immigrants in the late 1800s and early 1900s had originally emigrated to escape the poor economic and war-ravaged conditions of China (Li 1998). Thus upon arrival, they were willing to accept lower wages. They were mainly menial hard-labour workers, who met the labour needs of the time in Canada. Upon completion of the Canadian Pacific Railway, the Chinese were concentrated in the unskilled labour sector such as coal-mining and salmon canning (Li 1998). According to Li (1998), while approximately seventy percent of Chinese workers were employed in the service sector, menial jobs, or as labourers. Less than half of one percent worked in professional occupations at that time. While service sector jobs still employed approximately eighteen percent of the Chinese Canadian population in 1991, Li (1998) states that the Chinese are no longer under-represented in the professional and other white-collar occupations.

However, differences appear between native-born and foreign-born Chinese-Canadians in the occupational structure. That is, a higher percentage of native-born Chinese Canadians are likely to be in managerial, professional, and white collar jobs than foreign-born Chinese. This point is also confirmed by data that indicate the high educational achievement and economic success of the Chinese in Canada today, not to mention the growing number of self-employed Chinese entrepreneurs (Li 1998).

Although this indicates clear upward occupational mobility for Chinese in Canada, it would be erroneous to conclude that this upward mobility had little to do with structural forces. That is, much changes in the overall status of Chinese population has to do with the changing immigration policy (Li 1998; Woo 2000). Since post-1960s immigration policy places a heavy emphasis on occupational and education qualifications, many Asian immigrants with such qualifications have been coming to Canada. Immigrants from Asia have been increasing in numbers since the late 1960s. The increased numbers of professional and educated immigrants has boosted these foreign-born Chinese into professional occupations, which then has boosted the median family income of the Chinese population in Canada (Li 1998).Their human capital, along with their children's, has provided the grounds for the development of a new Chinese middle class in Canada. Included, as an integral part of this new middle class, are those Chinese in the professions, such as engineering.

The New Chinese Middle Class in Canada

In describing the current overall situation of the Chinese in Canada Li (1998:121) states "…the Chinese are no longer under-represented in professional and other white-collar occupations…" and that the gap of Chinese Canadians compared to "other" Canadians in managerial jobs is closing. Moreover, he defines a new middle class as comprising of those in managerial, administrative, professional and technical occupations, and here thirty-eight percent of the Chinese in the labour force are in these occupations (Li 1998:129). Li (1998:130) states that in the 1991 Census a total of 40.6% of foreign-born and native-born Chinese-Canadians reported being in managerial and administrative occupations. He uses this as evidence that the Chinese have moved upward in terms of social mobility. Success of the Chinese has lead to the development of the stereotypic image of the Chinese as a Model Minority group in both Canada and the United States (CCIS 2000; Li 1988; Osajima 1988; Tang 2000; Woo 2000).

THEORETICAL CONTEXT

The literature is scant on the phenomenon of Asian Canadians in the contemporary workplace and issues of the glass ceiling. Although it is hard to establish empirically, Thatchenkery and Cheng (1997b) suspected that this omission is largely rooted in the dual fact that Asian Americans are not a politically influential group and that they are perceived as a Model Minority. Similarly, Taylor & Stern (1997) state that the positive stereotyping of Asian Americans as a model minority may be a contributing factor in the paucity of research because the portrayal of qualities appear positive and

thus, do not appear problematic. Insofar as how the model minority image affects policy, Wong, Chienping, Nagasawa, and Lin (1998) state that the model minority stereotype has fostered an attitude that affirmative actions need not include Asian Pacific Islanders. In an attempt to rectify the lack of research, Woo (2000) states that much research on Asian Americans and the glass ceiling has been initiated by non-academic groups such as civil rights organizations (Woo 2000).

Due to the scarcity in the Canadian literature on Chinese or East Asians and the glass ceiling, most of this literature review contains American research on Asian Americans and the glass ceiling in the contemporary workplace, and only a brief review of limited Canadian research. The following discussion includes a justification on using American literature for a Canadian thesis, an outline of the model minority thesis, a summary of glass ceiling in relation to Chinese in both the United States and Canada, and then concludes with this thesis' statement of problem.

Using American Literature: A Qualification

Research on the Asian American experience in the workplace provides a good foundation for this thesis because of the similarities that exist in the history of the Chinese in both countries. That is, the Chinese story in Canada is mirrored in the United States. Specifically, the initial arrival of the Chinese to the United States in the mid to late eighteen hundreds was in hopes of finding a "golden mountain", much like they did in Canada (Chan 1986; Cordasco 1990; Lee 1999; Tong 2000). Also similar to Canada, historical records of American immigration policy also includes a relatively lengthy period of an enforced Chinese Exclusion Act that was repealed only four years before the

Canadian Chinese Exclusion Act was repealed (Danilov 1999; Lee 1999; Tong 2000). Finally, like the Canadian policies, American policies also restricted the Chinese from the right to vote, the right to work in specified fields, and also required every Chinese residing in the US to be legally registered during the period of Chinese exclusion (Lee 1999; Tong 2000).

More recent developments have resulted in the Chinese holding similar socio-economic positions in both countries today. Specifically, owing to the exclusionary period for Chinese in the US, the Chinese in America are experiencing a delay in the development of their second generation (Woo 2000). In addition, Woo (2000) states that the Chinese are considered to be the "model-minority" in America because they are found to have reached parity with Caucasians in terms of earnings, class, and occupational status. Despite this belief, Woo (2000) and Tang (2000) find that Asian Americans are under-represented in managerial positions.

Other societal level similarities are that both Canada and the United States have federal codes or mandates that disallow unequal treatment of individuals based on race, and ethnicity. For the United States, this code is the Civil Rights Act, where as for Canada, this is the Canadian Charter of Rights and Freedoms (Driedger & Halli 2000). In addition to these policies, both countries have federal mandates, the Employment Equity Act for Canada (Driedger & Halli 1999) and various employment acts under the jurisdiction of the Civil Rights Act for the US (EEOC 2002), of equal job opportunities to be afforded to all. Finally, both countries have a fundamental cultural belief in meritocracy (FGCC 1995; Li 1998; Woo 2000). The success of some Asian groups,

combined with this belief in meritocracy, has lead to the development of an image of Asians commonly referred to as the Model Minority image.

The Model Minority Thesis

The model minority thesis postulates that as a group, Asians have overcome structural barriers, successfully assimilated into North American society, and risen above the ethnic prejudice and discrimination barriers placed in their paths thus achieving high educational attainment, income parity with Whites, and societal acceptance despite their cultural differences (Cheng 1997; Li 1998; Osajima 1988; Tang 1997b; Woo 2000; Wong et al. 1998). The Chinese are considered the "model-minority" because they are found to have reached parity with Caucasians in terms of earnings, class, and occupational status (Osajima 1988; Woo 2000). Packed within this thesis, first introduced by Peterson (1966), is the notion of successful structural assimilation in terms of successful attainment of the relevant human capital. According to Gordon (1964), successful structural assimilation is demonstrated by the presence and activity of the minority group within social institutions. The development of this newfound image, as Osajima (1988) points out, rests upon exactly these criteria; the empirical evidence presented in support of the model minority image cites statistics of educational achievements, movement of Asians into high status occupations, rising incomes, and low rates of mental illness and crime. He goes on to argue that the model minority image defines success in narrow, materialistic terms. One measure of success can therefore be income in comparison to the dominant group. Scholars such as Le (2005), Osajima (1988), Tang (1997b) and Woo (2000), point out

that articles typically use median family income to show that Asian Americans are on par with whites, if not are more successful.

The optimistic model minority thesis suggests that the Chinese have achieved success in the workplace despite cultural differences. According to Osajima (1988), success has been attained through a combination of two concurrent elements. The first element belongs to Asian culture; being that Asians place a strong emphasis on hard work, educational achievement, and hold strong family values. The second element vital to Asian American success lies in the fundamental belief that American society is meritocratic; that rewards, such as economic remuneration, are based on qualifications, skills, attitudes, and behaviours of individuals or individual groups.

According to Cheng (1997), the Asian American model minority phenomenon remains in place today as "general knowledge;" and that the general public believe that Asian Americans are too successful to be considered a disadvantaged minority group. Jo and Mast (1993) are careful to note that praise of Asian Americans as model minorities is not just from mass media images, but are also found in scholarly journals.

Critics of the model minority thesis postulate that the pervasive notion of Asians as a model minority has done a disservice to this population. Although the qualities are perceived as largely positive rather than negative, the portrayal of Asian as model minorities tends to be largely stereotypic (Cheng 1997; Osajima 1988; Tang 1997b; Woo 2000; Thatchenkery and Cheng 1997). Thatchenkery and Cheng (1997) state that such profiles lead to the creation of stereotypes and other myths that Asian American employees, especially those with managerial aspirations, want to avoid. Specifically, scholars who examine the occupational progress of Asians find that although educational

attainment is indeed high, and Asian engineers are well qualified, returns on education are lower than that of their White counterparts in terms of positional attainment within professional occupations and their earnings (CCIS 2000; Cheng 1997; Friedman and Krackhardt 1997; Tang 1997b; Woo 2000; Wong et al. 1998). Other researchers, who have focused specifically on Asian engineers, find that although educational attainment aides in the access to professional positions, such qualifications prove to be insufficient, even for native-born Asians to attain upward career mobility, access or promotions into decision making positions (CCIS 2000; Cheng 1997; Friedman and Krackhardt 1997; Tang 1997b; Woo 2000; Wong et al. 1998). They conclude that there are obstacles that hinder the advancement of Chinese engineers; or the existence of a glass ceiling.

The Glass Ceiling

The metaphor of a ceiling was first introduced by Kanter (1977) in her ethnographic study of a corporation. The term glass ceiling then became popularized through a Wall Street Journal 1986 article that discussed the invisible barriers that women confront as they approach the top of the corporate hierarchy. In 1991, the US Department of Labor defined glass ceiling as "... artificial barriers based on attitudinal and organizational bias that prevents qualified individuals from advancing upward in their organization." According to the Federal Glass Ceiling Commission (1995), there are three levels of barriers: societal, which concerns opportunities and discrimination before women and/ or minorities get hired and are outside of the direct control of the businesses; governmental barriers, which refer to such things as law enforcement and public

dissemination of information; and internal structural or pipeline barriers, these are within the direct control of the business or corporation. The FGCC (1995) uses the analogy of a pipeline because upward mobility in a corporation is the result of a series of processes. As stated earlier, these internal or pipeline barriers are the concern of this study. Barriers within the pipeline are those that involve formal policies, official decisions made by those in power, conscious placement of visible minorities and women on certain assignments, and placement of individuals on the "managerial" versus the "professional" track. But beyond the formal, hard and fast official items, are the informal aspects such as network circles, social functions, and office events. With regards to this level of barrier, the Commission (1995) uses a pipeline analogy to depict the above official corporation on-goings. Woo (2000) expands this analogy to include the informal aspects. Ultimately, those affected by a glass ceiling have lower incomes in comparison to those who are not affected. This is the case for Chinese engineers in Canadian firms, as will be shown later.

Much of the glass ceiling work within the engineering profession has focused on the way women's opportunities have been blunted in advancing through the profession's ranks (e.g. Alessio and Andrzejewski 1998; Athananasiadou 1997; Cook and Waters 1998; Gerdes 1995; Kvande and Rasmussen 1995; Morgan 1998; Tang 1997b). To a lesser extent, some work analyzes obstacles to minority men's career ascensions in the engineering field, but this work has tended to focus on the prospects of Blacks in the United States (e.g. Haberfeld and Shenhav 1990; Solorzano 1995). Furthermore, the geographical focal point of these studies has been the United States (e.g. Burnstein 1994; Etzkowitz et al. 1992; Tang 1995). A study by Cotter et al (2001:655) finds that the occupational disadvantages for women are significantly different than for that of visible

minorities; they conclude that the label "glass ceiling effect," should not be used to describe the occupational disadvantages of racial groups because "racial inequalities" failed to meet their four "glass ceiling effect criteria." However, careful reading of Cotter's article reveals that the only racial group tested was African American. In the presentation of their findings, the Federal Glass Ceiling Commission (1995:58) is careful to note that "…although all affected groups experience the glass ceiling as a serious limitation, the issues are not the same for white women and women of color. They are not the same for women and minority men, and they are not the same for men of different racial and ethnic background." Thus, one should be wary of generalizing Cotter et al's particular findings to all racial groups.

In her examination of the occupational mobility of Asian American engineers, Tang (2000:171) notes that career mobility is not necessarily associated with advancement. Quoting from Zussman (1985:144-145), Tang (2000) states that there are three types of mobility: promotions, demotions, or zigzag patterns. Promotions are defined as upward movement from a lower position to a higher one. Demotions are downward movement from a higher position to a lower one, and zigzag movements are lateral transfers between two positions at the same level. As alluded to above, this study only examines the upward advancement of Chinese engineers into managerial positions.

According to Tang (2000:141), managerial posts are attractive because these positions represent a "reward for those who put forth their best effort and also a reward for those who are committed to organizational goals." She explains that the career prospects of engineers are inextricably tied to institutional settings, thereby limiting their independence and autonomy. Thus, movement from technical work to management

positions "provides an avenue to assume a certain degree of decision-making power, ranging from making personnel decisions, to budgeting and allocating resources" (Tang 2000:140). In other words, managerial responsibility entails a multiplicity of roles whereas technical positions only require technical specialty. As a result, managerial positions are considered to be higher in status, more prestigious, significantly more influential (on the direction of the company), and have higher salaries.

In terms of how Asians American engineers fare in their climb into managerial positions, researchers have found that Asian American engineers have had limited success when compared to Caucasian engineers (Tang 2000; Woo 2000). Tang (2000:175) shows that the estimated odds for switching from the technical engineering track to the managerial track are 19% lower for Asians compared to Caucasians. Tang (1997;2000) also finds that Asian Americans are less likely to receive promotions to managerial positions even after controlling for nativity, length of residency time in the US, and other demographic characteristics, such as education and experience, than Whites. As well, results from Tang (2000) and Woo (2000) indicate that despite taking human capital investments, demographic characteristics, and occupational field and organization into account, Asian American engineers are less likely to be in managerial positions than Whites. Tang (2000) finds that these results hold regardless of place of birth, in other words foreign-born or native-born, for Asian engineers. In particular, Tang (2000:180) finds that race significantly affects track switching, from technical to managerial, among Asian engineers with ten to nineteen years of experience in that being a racial minority lowers Asians' estimated odds to switch tracks by 26%. Thus, results from these studies indicates that for some reason, Asian American engineers appear to be limited in terms of

their movement into managerial positions in comparison to Caucasian engineers. Tang (2000) arrives at the conclusion that Asians engineers may have to overcome more obstacles to attain the ultimate career goal of moving into management positions. ·Likewise, Woo (2000:145) conclusively states, "... the statistical data cited... can be distilled to a single dominant and recurring fact – the disproportionate under-representation of Asian Americans in management."

The Glass Ceiling in Canada

In 2000, the Canadian Race Relations Foundation (CRRF) published a study entitled "Unequal Access: a Canadian Profile of Racial Differences in Education, Employment and Income." Their findings revealed that visible minorities generally have higher education levels that either non-racialized groups or aboriginals. However, in spite of these higher educational attainment, visible minorities still trail behind non-racialized groups with regard to employment and income. With regard to glass ceiling issues, the CRRF (2000:3) find that "compared to non-racialized groups, visible minority and Aboriginals with university education are less likely to hold managerial/ professional jobs." Insofar as the actual existence of a glass ceiling, the Canadian Human Rights Commission (2001) provides documentation of specific cases that have been brought to the attention of the Federal Court System. In their 2001 Anti-Discriminatory Casebook, the Human Rights Commission described the case of an Indian-born research scientist, a leading scientist in the field of optics named Dr. Grover, who worked with the National Research Council (NRC). According to the Canadian Human Rights Tribunal, a new

director and some other managers of the NRC deliberately and systematically thwarted Dr. Grover's career. While this case is not one specifically of a Chinese engineer, it demonstrates that discrimination and glass ceilings exist in the workplace for visible minorities in Canadian society.

The CRRF (2000:12) provides a quote from Hou and Balkrishnan (1996:324), "Social inequality is primarily manifested in income inequalities." Concerning visible minorities, the report by the Canadian Race Relations Foundation find that visible minorities with university degrees earned approximately $7 000 less than non-visible minorities while taking factors such as educational levels into account. They do state, however, that Baker and Benjamin (1995) find that the Chinese experience one of the smallest wage differentials.

A search of the literature on Chinese Canadian engineers or Asian engineers in Canada resulted in only one article that focuses directly on the contemporary Canadian workplace. Boyd (2000) examines Asian Canadian immigrant engineers who arrived in Canada when they were twenty-eight years or older. She finds that close to fifty percent of those who work as an engineer in Canada are foreign-born, and of this group, Asian-born engineers make up a significant portion of these engineers. Asian born engineers typically come from China, Hong Kong, Philippines, and India, and have lived in Canada for less than ten years. While Boyd (2000) concludes that having advanced degrees does offer some protection against being unemployed, she found that educational returns are still lower than for those who are Canadian-born. That is, compared to Canadian-born male engineers, Asian foreign-born engineers, who are permanent residents, are less likely to be in managerial or engineering occupations, but at the same time, are more

likely to be employed in technical and other occupations. Boyd (2000) does find, however, that as the number of years residing in Canada increases, so does the likelihood that these Asian born engineers will be employed in engineering occupations. Nevertheless, these Asian born men are still less likely than the Canadian-born to be employed as managers, even after fifteen years of residence in Canada. Thus, she postulates that this may be evidence of a glass ceiling in the Canadian engineering profession for the Asian-born.

Given this postulation of a glass ceiling for Asian-born engineers an Ordinary Least Squares regression of income on several independent variables for all scientists and engineers was conducted using the 2001 Census of Canada. The purpose of this regression analysis is to provide background empirical data that point to a strong likelihood of a glass ceiling for visible minority scientists and engineers and also for Chinese engineers. More specifically, this multivariate analysis consisted of analyzing Canadian natural and applied scientists' income (this category includes engineers) on selected independent variables. Income was chosen as the dependent variable because of its relationship to managerial and technical positions. As noted earlier, managerial posts differ from technical positions in that managerial positions carry a greater level of responsibility, authority, and salary (Tang 2000). Thus, income provides a proxy measure of the position level of both visible minorities and/ or the Chinese compared to non-visible minorities; income differential will provide an indication of the glass ceiling.

The independent variables for this analysis include age, education, mother tongue, home language, gender, visible minority status (for equation 1), and Chinese (for equation 2). Age (using 15 years and older) is a continuous variable, and provides an

approximation of work experience. Education is measured using highest level of schooling. The variables mother tongue and home language are included to consider official language abilities[2]. The 2001 Census User Guide (p.88) defines mother tongue as, "... the first language learned in childhood and is still understood by the individual at the time of the census," and home language as "the language spoken most often at home by the individual at the time of the census" (p.90). Both mother tongue and home language are dummy coded, where English and/ or French are coded 1 and all other languages are coded as 0. Gender is derived from the Sex variable of the Census, where Males are coded 0 and Females coded as 1. Visible minority status is dummy coded, with white as 0 and all other visible minority groups as 1. Chinese status is derived from the visible minority variable. Rather than considering all visible minority groups, this variable is dummy coded Whites equals 0, Chinese equals 1, and all other visible minority groups are coded as missing. Table 2.1 below provides the unstandardized and standardized coefficients from this analysis.

The unstandardized coefficients show that age, education, a mother tongue of English or French, and a home language of English or French have positive regression coefficients. That is, an older, more educated, engineer who has a mother tongue and home language of an official language will make more than an engineer who is younger (less experienced), has less education, and has a mother tongue and home language of a non-official language. The remaining variables have negative regression coefficients. Thus for both equations, being female, foreign-born, and a visible minority or a Chinese

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[2] Pendakur and Pendakur (2002) state that research in Canada and the US suggests there is a penalty for not knowing English. Their findings show that knowledge of a minority language is associated with lower earnings, conditional on knowledge of a majority language.

brings a lower income than an engineer who is male, Canadian-born, and white. Equation 1 reveals that visible minority natural and applied scientists make $3 820 less per year than whites after controlling for work experience (measured by age), education, mother tongue, home language, gender, and nativity. Equation 2 reveals that the Chinese make $8 686 less than their white counterparts when controlling for the effects of experience, education, mother tongue, home language, gender and nativity. The R squared value of Equation 1 and Equation 2 show that given the chosen independent variables, 19.3% and 19.7% respectively of the explained variance in total income of natural and applied scientists in 2001 are explained. Following Tang (2000)'s logic that managerial positions hold greater responsibility, authority, and thus salary, the lower income of Chinese compared to whites indicates that Chinese natural and applied scientists, which includes engineers, are not as likely to be in managerial positions than their white counterparts. Put another way, the income differential indicates that a glass ceiling likely exists and thus it is important to look at Chinese engineers' perception of the glass ceiling.

Table 2. 1 Unstandardized (b) and Standardized (B) Regression Coefficients for Total Income
of Canadian Natural and Applied Scientists in 2001

	Equation 1		Equation 2	
	b	B	b	B
Independent Variables				
Age	989.347	.346**	998.377	.352**
Education	2631.647	.223**	2721.281	.229**
Mother Tongue (English/ French)	1263.263	.017 *	1670.647	.018 *
Home Language (English/ French)	7251.920	.082**	7938.345	.059**
Gender (Female)	-9217.902	-.119**	-10223.610	-.131**
Nativity (Foreign-born)	-1729.273	-.025 *	-1415.480	-.017 *
Visible Minority	-3820.131	-.048**		
Chinese			-8686.124	-.038**
Constant	-18092.24		-20068.56	
R Squared		0.193		0.197
N		27,115		22,295

*p<.05 **p<.001

Source: Compiled from 2001 Census Public Use Microdata File on Individuals. It is a 2.7%
sample of the census population enumerated

STATEMENT OF PROBLEM:

CHINESE ENGINEERS AND THE PERCEPTION OF THE GLASS CEILING

In looking at the 1991 Census of Canada, Public Use Microdata File on

Individuals (3% sample), Li (1998:129) states that of all Canadians in middle class

occupations, Chinese are twice as likely as other Canadians to work in the natural

sciences, engineering and mathematics. Data from the 2001 Census reveals that the

Chinese constitute 7.2% of the natural and applied sciences occupation; this percentage is

double their representation of 3.5% in the overall Canadian population[3]. In addition,

14.5% of Chinese in Canada work in the natural and applied sciences occupational

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[3] Details of these figures are listed in Appendix D.

category, representing the most popular occupational choice for the Chinese. Li postulates that "this tendency of Chinese-Canadians to work in scientific and engineering occupations may reflect a desire to avoid disadvantaged competition in those professional areas that require more social interaction and social skills in addition to technical expertise" (1998:129). It is precisely this point that provides the basis of the research questions for this thesis.

While Li postulates that the reason the Chinese in Canada enter into occupational fields such as engineering because they perceive less "disadvantaged competition," it is the goal of this thesis to examine the Chinese-Canadian engineers' perception of the glass ceiling in the workplace. The issue of interest is how Chinese engineers believe they, as a group, fare in terms of upward advancement into managerial positions. Thus the research questions this thesis aims to answer are: 1) To what extent do University of Calgary trained Chinese engineers perceive and experience a glass ceiling, if any, and; 2) What are the reasons they believe the glass ceiling exists for Chinese Canadian engineers.

Discernment of the perception of discrimination is an important issue to illuminate for all groups within Canada and within all sectors or spheres. Under the Canadian Human Rights Act, all residents of Canada within federal jurisdiction are protected from discrimination and harassment both at work and when requesting a service (CHRC 2004). Discrimination, according to the Canadian Human Rights Commission (2001:2) is treating someone differently or unfairly because of a personal characteristic; whether intentional or not but based on ground relating to personal characteristics (such as race, colour, national or ethnic origin, age, etc) of the individual or group, that "has an effect which imposes disadvantages not imposed on others or which withholds or limits

access of other members of society." The Canadian Human Rights Commission website (2004) specifically states that "under the Employment Equity Act, the Commission is responsible for ensuring that federally regulated employers provide equal opportunities for employment to the four designated groups: women, Aboriginal peoples, persons with disabilities, and members of visible minorities. While the Canadian Human Rights Act applies just to public federal jurisdiction, it is reasonable to expect non-discrimination in the private sector as well.

According to the 2001 Census, 18.4% of the Canadian population was born outside of Canada; this percentage translates into 5.8 million people. As well, visible minorities accounted for 13% of the Canadian population. The Daily (2003), Statistics Canada, reports that approximately 1.8 million people living in Canada in 2001 were immigrants who arrived during the previous 10 years (between 1991 and May 15, 2001). Statistics Canada goes on to state that of those who immigrated to Canada in the 1990s, 58% were born in Asia. The People's Republic of China was the leading country of birth among individuals who immigrated to Canada in the 1990s (The Daily 2003). With the predicted increase in proportion of immigrants specifically from East Asian countries (Hiller 2000), it is of utmost importance to determine what issues they face in terms of equitable treatment in the occupational sphere. That is, due to the large and increasing numbers of Chinese in Canadian society, it is vital to understand issues of workplace inequity this ethnic group believe they face.

Citizenship and Immigration Canada (2003) reported that "one of the most striking recent immigration trends is the rising number of immigrant skilled workers." According to this report, the rise in concentration of highly skilled, well-educated

immigrants has brought a rise in the professional occupations in the natural and applied sciences (CIC 2003). A report published by the CIC (2003) state that within the professional occupations in natural and applied sciences, engineers stand out as the dominant occupational grouping. Li (1998:129) finds that among those in middle class jobs, Chinese-Canadians were twice as likely as others to be engaged in the natural sciences, engineering, and mathematical occupations in 1991.

Thus, the engineering profession is an important occupation to study because the quality and success of this occupation is crucial to Canada's economic success. According to The Daily (2004), engineering services accounted for 84% of industry operating revenues in 2003. Boyd & Thomas (2001) state that as an increasing part of the global economy, engineering services are exported and are employed by high technology sectors with extensive global links.

CHAPTER 3   RESEARCH DESIGN

DATA SOURCE

This thesis is based on 2002 data gathered from a research project entitled "Chinese Canadian Engineers and the 'Glass Ceiling,'" recently funded by Canadian Heritage with Dr. Lloyd Wong as principal investigator. I have been involved in this research project, as a research assistant and member of the research team, from its initial stages of sampling and instrument design in April 2002. This thesis is based on 2002 quantitative and qualitative data gathered from the research project entitled "Chinese Canadian Engineers and the 'Glass Ceiling.'"

EPISTEMOLOGICAL ORIENTATION

Methodological considerations are greatly influenced by the epistemological and ontological standpoints adopted by the researcher. Mason (1996:13), states that a researcher's ontological standpoint informs researchers of the type of material that will count as evidence or data. On a similar vein, Crotty (1998:3) tells us that epistemology is a theory of knowledge that is embedded in the theoretical perspective that informs the methodology; it is a "way of understanding and explaining how we know what we know." It is therefore important to highlight the ontological and epistemological standpoint of this thesis prior to outlining the details on the sampling methods used, the data collection techniques applied, and the data analysis steps taken.

The modus operandi for this project utilized both quantitative and qualitative methodologies; a mail-out survey-questionnaire that consisted of both closed and open-ended questions and one series of open-ended, semi-structured interviews. In this particular research project, I have adopted the ontological view that social reality can be understood through people's interpretations, views, and understanding. So for this thesis, what counts as data are people's accounts and perceptions of their interactions and encounters in the workplace; a constructionist's standpoint or epistemology (Palys 1997). As will be made clear in the data collection section below, the mail-out survey was designed to determine whether general trends and patterns existed among Chinese Canadian engineers with regard to the perception of the glass ceiling in the workplace. The in-depth, semi-structured interviews provided an opportunity to hear the voices of these men and women with respect to the issues we raised in the survey, and to add color and texture via personal accounts to the general trends and patterns found in the survey data. Thus the orientation of this thesis, while utilizing quantitative data from a mail-out survey, is primarily guided by a qualitative, constructionist standpoint.

The following is a detailed outline of the steps used to define and obtain the sample, collect the data, and analyse the data.

SAMPLE

The project utilized a purposive, non-probability sampling technique to generate the sampling frame. There are two reasons for this. The first is that there is no readily

available public list of all active, practicing engineers in Canada[4]. The second is that we were not looking for a representative sample to which we could generalize across all Chinese Canadian engineers. Rather, it was the goal of the research team to reveal commonalities in the perceptions and experiences of a cohort of engineers who were likely to be available for in-depth interviews in the City of Calgary.

The target population and the sampling frame is Chinese Canadian engineering graduates from University of Calgary from the years of 1980 to 1992. University graduates were chosen because professional engineering, as an occupation in Canada, requires a minimum qualification of a university bachelor's degree from a recognized university. The year of graduation range, 1980 to 1992 inclusive, was chosen because it was expected that these graduates would have had approximately ten to twenty-two years in the workforce. This time spent in the workforce is vital in that it allows for each individual to have gained some insight into several key issues. Specifically, they would have gained an awareness of the internal structures and routines of the business world, both formally and informally. Secondly, these engineers would have likely gained a mature insight into their occupational achievements, ambitions, occupational mobility, barriers, and have made observations about their profession with regards to, and in relation to, their peers and co-workers. Finally, the varying years in the workforce would have allowed enough time for a portion of them to have climbed, or attempted to climb, into the managerial ranks. This would allow for a realization on the part of the

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[4] There is a national non-regulatory organization called the Canadian Council of Professional Engineers which has 12 provincial and territorial member associations. It is the provincial and territorial associations, such as APPEGA – Alberta and PEO – Ontario, that are regulatory and also who would have lists of all the engineers who are practicing in a particular province or territory.

respondents of where their biggest obstacles lie, and/ or a realization of the specific aspects of their interactions or skill sets that have become their greatest barriers.

As stated above, this study used both a mail-out survey and in-depth, semi-structured interviews. Survey results are amenable to statistical analysis which allows for the research team to detect patterns and similarities in terms of experiences and/ or more general workplace perceptions. The semi-structured interviews, on the other hand, allowed for details and relations between multiple variables that would otherwise be difficult to assess using only survey data alone to be flushed out. It also allowed the participants in this study to frame the issues important to them, whether they agreed with the issues we brought forth or not, more or less on their terms. The following is a step-by-step list of the method used in constructing the sampling frame.

Research Methods

Because this project involves the study of human beings, an application to the University of Calgary's institutional ethics committee was submitted by Dr. Wong and approved in February 2002. In the following April, the research team contacted the University of Calgary Alumni Association for a list of all the engineering graduates from 1980 to 1992 inclusive. The list contained 8 663 names. A manual filter of surname identification was applied by the research team to identify those engineers who were of Chinese descent. Although there are few sources available that allows researchers to identify specific Asian ethnic groups, Lauderdale and Kestenbaum (2000) state that records with names of persons offer the possibility of inferential ethnic classification; the

inference of ethnicity from surname identification has been used extensively in the United States since the 1950s, most commonly for identification of the Spanish ethnic group. Lauderdale and Kestenbaum (2000) state that inferential ethnic classification typically involves researchers over-sampling a particular minority group to participate in a cohort or panel of study by selecting persons by surname from a roster or directory. Through this process, the research team identified 528 of these graduates as Chinese. Ethnic origin was then confirmed visually through the use of graduation pictures in the University of Calgary Tallysticks (yearbooks) available at the archives of the university. Of the above graduates, 486 were identified as being Chinese using their pictures from University yearbooks. Following the completion of this identification process, a filter in the form of information availability through the alumni office was applied; the alumni office retains information on whether or not an individual wishes to be contacted by the Alumni office, if the person is deceased, or may not have a forwarding address of the individuals identified. Thus the final count of the sampling frame consisted of 379 Chinese engineers who had graduated form the University of Calgary from 1980 to 1992.

Participants of the interview portion of this study were self selecting; the last page of the mail-survey contained a section in which respondents could provide their contact information if they were interested in being interviewed. Interviewees were chosen primarily on two criteria: time availability and varying experiences in the workplace. Because the interviews were conducted in August, many of the potential interviewees were not available. Interviewees were also chosen on the basis that they either been promoted into managerial ranks (as indicated by question 24 of the survey) or expressed some form of differential treatment in the workplace based on their answers given on the

survey. The details of the construction processes of both the mail-out survey as well as the interview schedule are discussed below. This is then followed by the procedural steps taken.

DATA COLLECTION

The Survey-Questionnaire

Construction and design of the survey-questionnaire began immediately after the completion of the sampling frame. The goal of the survey was to attain demographic information and to detect whether patterns existed in regards to perceived workplace issues with special attention to the artificial barriers that make up and define the glass ceiling. Once again, the glass ceiling is a series of artificial barriers that do not directly involve individual qualifications except that they impede qualified individuals from advancing into managerial ranks (Woo 2000). Artificial barriers are outside of the realm of official qualifications and manifest themselves in the more intangible areas of daily office interactions in the form of networks and cultural attitudes that exist in the workplace (Woo 2000). Due to the nature of the topic at hand, the research team felt it was important to focus on the participants' perceptions and experiences of the workplace in order to examine these artificial barriers, which is consistent with the epistemological standpoint. Therefore, in addition to the attainment of specific background information detailed below, the questionnaire was designed to attain information in three areas: the respondents' overall perception of the representation of Chinese in all levels of management in engineering firms in Canada; the participants' perception of their

prospects, and the prospects of other Chinese engineers that they knew of, regarding career advancement in lieu of the overall representation; and their identification of specific obstacles or challenges faced by contributors to this study in terms of advancement of their careers into managerial positions.

The survey-questionnaire was broken down into five sections. Part A consisted of demographics, educational background, immigration, citizenship, employment history and status. Questions in Part B, which was intended for respondents who were presently employed, targeted information on current job responsibilities, training programs provided by employers (including cultural sensitivity programs), level of position within their current firm, and respondents' assessments of promotional opportunities for themselves and other Chinese within their current place of employment. Self employed respondents answered questions that inquired about types of responsibilities they felt they faced and reasons why they decided to become self-employed.

Part D, the Experiences section, focuses on the four areas of perception listed above. Overall representation was assessed via a multiple rating list where respondents were asked to rank the adequacy of Chinese representation in varying career levels of Canadian engineering firms. Obstacles to career advancement were evaluated though the utilization of a Likert scale question set as well as a check list type question. The obstacle lists provided to the participants were broken down into two types: social capital, or office-environment challenges, and human capital, personal skill set type challenges. Experiences in terms of being denied promotions and view of the compatibility between Chinese cultural background and Western corporate culture were evaluated using closed ended questions with spaces for comments following each yes or no box.

Part E completes the questionnaire by asking respondents about the future direction of their career. At this point, a space was provided for respondents to add comments about the study or other experiences they felt were not asked about, and informed that there was an interview portion to the study to be conducted. Respondents indicated an interest in being interviewed by providing their name and contact information in the given space; in other words, interviewees were self selecting. The survey-questionnaire can be found in Appendix A.

The Mail-Out Package

The mail-out packages included the survey-questionnaire, self-addressed stamped envelopes, a small token gift of $5 put in a red "lucky money" envelope, as well as a cover letter written by the Alumni office. The red "lucky money" envelope is a cultural custom that represents a form of reciprocity. Reciprocity is a notion that is tightly bound with the Chinese culture; according to Hwang (1987) it acts as a behavioural guide and is beneficial in that is a "social mechanism that an individual can use to strive for desirable resources..." (p. 946). Hwang (1987) states that the expression of reciprocity especially important when the nature of the relationship is an "instrumental;" between strangers where "... the relationship serves as a means ... to attain other goals" such as that between nurses and outpatients (Hwang, 1987: p. 950), or in this project's case, to encourage participation in the filling out of the survey-questionnaire.

A separate cover letter was written by the Alumni office for several reasons: the alumni office felt it would be important to introduce this project as one they supported, to

inform the potential respondents that participation was purely optional, and any given information would be strictly confidential. As well, the research team felt that potential respondents would be more receptive to an organization that they were familiar with.

The first page of the survey was a cover letter from the research team. This short cover letter briefly mentions who the intended target respondents are, the interests of the research team, a very brief idea of where the research results may be headed, informs participants of confidentiality and anonymity, and expressed our appreciation for their time and attention.

The Semi-Structured Interviews

The second part of the research project aimed at "adding color and texture" to the issues identified above via in-depth, open-ended interviews. The goal of the interviews was to probe perceptions of glass ceiling issues based on their answers from the questionnaires. The interview schedule consisted of three themes: personal experiences related to all social aspects within the workplace environment with special attention to glass ceiling, their perception on why this phenomenon happens, and possible solutions to the glass ceiling (if any). A series of eleven starter questions were prepared prior to the interviews. Start questions can be found in Appendix B.

The interviews typically lasted between an hour and an hour and a half. Although a serious of eleven starter questions were prepared, the interviews often began to take their own direction following the first four questions. Interviewees would typically begin to tell stories with related themes and key words that would lead to probing-type inquiry

questions asked by the interviewers. All of the interviews were conducted by two research assistants, one of whom was me.

Survey-questionnaire construction began in mid April of 2002, following the completion of the sampling frame. On June 6, 2002, 379 survey-questionnaire packages were mailed out. Reminder cards were sent out to all participants on June 27 of 2002. In July and August a total of 172 completed questionnaires and 20 uncompleted questionnaires were returned. Uncompleted questionnaires were returned due to three reasons: inaccurate addresses, the person had moved with no forwarding address, or the person was no longer an engineer and therefore did not qualify for the study. Each returned questionnaire was numbered and photocopied upon receipt.

The 172 completed returns from a total eligible number of 359 possible respondents yields a response rate of 48%. This is a respectable response rate for mail-out questionnaires given that Palys (1997:147), quoting Gray & Guppy (1994), states that it is rare to have a response rate of more than 40% when dealing with mail-out questionnaires. As well, from a total of 172 returned surveys a total of 67 individuals indicated that they were interested in participating in an interview; yielding a percentage of 39%.

Construction of the interview schedule and introductory questions began in mid July. On August 2, 2002, the three focus questions for the interviews were finalized and contact of potential interviewees began on August 3. Interviews were conducted from August 6 to August 21, and September 4 to September 9 of 2002. Although the total number of participants who expressed interest in further participation of this study was 67,

only 23 individuals were interviewed. In other words, 13% of the sample was interviewed. Limitations regarding the individuals who were actually interviewed were based on location and cost considerations in that only those who lived in Calgary were interviewed. Gender and job position were also taken into consideration; special efforts were made by the research team to contact and interview all three female respondents who volunteered to be interviewed, and ensured that at least three of those who had indicated they had made it into the managerial ranks were chosen.

Prior to each interview, participants were told about confidentiality, the freedom to stop the interview at any point should they feel any discomfort during the interview, and how the information was to be processed following the interview. As well, interviewees were given two copies of a consent form that informed them of similar issues; one copy was signed and returned to the interviewers, the other was for participants to keep. A copy of the consent form can be found in Appendix C. Each interview was audio taped with the participants' consent. At the end of each interview, participants were given a Lucky Red Envelope containing $50 inside. Several participants refused to accept the money and stated that they had participated in the interview portion of the study simply because they had wished to provide our study with more information. The money from this portion was then donated by Dr. Wong to the University of Calgary Library as suggested by one of the interviewees.

The following section presents analysis of the data.

DATA ANALYSIS

Survey-questionnaires were photocopied and numbered upon arrival. Coding and entry of the data took place in early September. Transcription of the interviews began on September 16, 2002. On October 15, I began preliminary analysis of the survey data using SPSS. On November 2 of 2002, preliminary analysis of interview data began in the form of initial readings and manual detection of trends and/ or patterns. By December 4, 2002, I had completed an initial statistical summary of the survey data.

The next chapter will discuss in detail the findings from the survey-questionnaire.

CHAPTER 4

THE UNIVERSITY OF CALGARY GRADUATES AND THEIR PERCEPTIONS OF THE GLASS CEILING

INTRODUCTION

The theme throughout this thesis is the examination of perception of a glass ceiling and therefore, its artificial barriers. The data presented focuses on perception because such barriers, as alluded to previously, are often subjective in nature. The source for all the remaining figures and tables in this thesis are from the Chinese and Chinese-Canadian Engineers and the "Glass Ceiling" Survey 2002.

This chapter first presents a demographic description of the respondents and then provides a detailed presentation of respondents' perceptions of glass ceiling.

DEMOGRAPHICS

This section provides a statistical description of the respondents. Complete data can be found in Appendix E.

Age

As stated in the Research Design chapter, targeted respondents graduated between 1980 to 1992 inclusive and therefore had spent approximately 10 to 22 years in the workforce. As such, the research expected that the ages of the respondents would reflect

this. Correspondingly, 80% of respondents fall between the ages of 35 to 54. More specifically, 12.9% of respondents are between the ages of 30 to 34, 22.2% are between the ages of 35 to 39, 43.9% are 40 to 44, 14.6% are 45 to 49, and 6.4% are aged 50 or older (see Appendix E, Table E.1).

Gender

The original intent of this study had not set out to examine gender differences regarding perceptions or experiences with the glass ceiling. However, because a significant proportion of respondents are female, at 20%, a brief discussion on differences in how male and female respondents perceived and experienced glass ceiling issues is included in the correlations (Appendix E, Table E.2). This gender ratio is reflective of that found in the 2001 Census for Chinese scientists and engineers; 80% of Chinese scientists and engineers are male and 20% are female. Details of this calculation are listed in Appendix D, Table D.6.

Nativity

Approximately 74% of the respondents indicated that they were not born in Canada, while 26% are native-born (see Table E.3 in Appendix E). This number is reflective of the nativity ratio for the Chinese scientist and engineering population in Canada in 2001; 74.4% are foreign-born and 25.6% are Canadian-born. Details of these figures can be found in Appendix D, Table D.5.

Age of Arrival

Of the foreign-born respondents, 18.5% arrived in Canada between the ages of 0 to 9 years, 49.2% arrived between the ages of 10 to 19 years, and 28.5% between the ages of 20 to 29 years. The remaining 3.9% of the foreign-born respondents had arrived when they were 30 years of age or older.

Further analysis of this variable reveals that 28.5% of foreign-born respondents arrived in Canada before they were 15 years old (see Appendix E, Table E.5). This statistic brings attention to the fact that nearly one-third of the foreign-born respondents received their high school education in addition to their post-secondary education in Canada, and therefore many can be considered as part of the 1.5 generation.

Length of Residency

Approximately 6% of the foreign-born respondents have lived in Canada for 5 to 9 years, and 17% indicated that they have resided in Canada for 10 to 19 years. The majority of foreign-born respondents, at 51.5%, have lived in Canada for 20 to 29 years, while 25.1% have claimed Canada as their place of residence for 30 years or more (see Table E.6 in Appendix E).

Education

Regarding the highest level of engineering degree held by respondents, the data reveal that 69.2% hold a Bachelors Degree, 25.6% hold a Masters Degree, and 5.2% have earned a doctorate in Engineering. Nearly one-third of respondents majored in electrical engineering at 29.4%. Civil engineering and chemical engineering were also popular

choices at 24.7% and 21.2% respectively. The remaining majors chosen by respondents in descending order of popularity are 17.1% in mechanical engineering, 3.5% in survey engineering, and 2.4% in geomatics (see Table E.7 and E.8 in Appendix E).

Since the University of Calgary Alumni list was used for the sampling frame, all of the participants in this study have received at least a portion of their university training in Canada. Therefore, this study does not cover the experiences of recent immigrants who have arrived with foreign qualifications and credentials in engineering.

Current Employment Status

Approximately 79% of respondents indicated that they currently work for an employer, 13% indicated that they are self-employed, and 5% of respondents are currently looking for work (see Appendix E, Table E.10, E.11, E.12).

Of the 79% who indicated that they are currently working for someone other than themselves, 39% indicated that they are in a managerial position while 61% are not. Of those who are in managerial positions, 48% disclosed that they are in a lower managerial position, 28% in a middle managerial position, and 24% in an upper managerial position (please see Appendix E, Table E.11 and E.12).

PERCEPTION OF THE GLASS CEILING

As discussed in the literature review chapter, Woo (2000) stated that artificial barriers are those that preclude the official qualifications of individuals and often fall outside the realm of official measurements. Moreover, Woo (2000) explains that encounters with these barriers often occur at the level of interaction. The combination of

the two gives these artificial barriers a very illusive quality. However, because women and minorities are those who participate in these interactions, a quarry of the perceptions based on work experiences held by minority groups, such as Chinese engineers, would help to illuminate the barriers.

Respondents' evaluation on how much, if any, the glass ceiling affects career mobility of Chinese engineers is measured at three levels. The first level ascertains the general impression of how respondents perceive the current managerial representation of Chinese engineers in Canadian engineering companies; the second level ascertains how respondents perceive themselves, and others they know, to be doing in the climb and within managerial ranks. Finally, the last level asked respondents to identify specific obstacles they felt they faced or had to overcome regarding the upward mobility of their careers. The data presented in levels one and three can be found in Appendix F and Appendix G respectively.

Level 1. Overall Perception of Chinese Managerial Representation in Canadian Companies

Results show that respondents perceive an under-representation of Chinese engineers in managerial positions of Canadian companies[5]. Figures 4.1, 4.2, and 4.3 illustrate how respondents rank Chinese representation in lower, middle and upper management level positions of their most recent engineering organization. For lower managerial positions, the percentage of respondents who perceive adequate representation of Chinese engineers is 48.4%. Regarding middle

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[5] All percentages listed here are found in Appendix F.

management level positions, only 33.5% of respondents perceive adequate representation of Chinese engineers. Only 14.9% of respondents perceive adequate representation in upper-managerial positions. Thus, as the level of management increases the percentage of respondents who perceive under-representation also increases. Specifically, 35.4% of respondents believe that Chinese engineers are underrepresented in lower management levels, 51.6% perceive under-representation in middle managerial levels, and 66.5% of respondents perceive under-representation in upper management levels. When asked about their perception on the adequacy of Chinese engineer managerial representation in managerial positions of "most other engineering organizations that they knew of," the percentage breakdowns found are almost identical to the ones in Figures 4.1, 4.2, and 4.3. Thus the overall pattern is that a significant proportion of respondents (35 to 67%) perceive the under-representation of Chinese engineers in management levels, and the higher the level of management the greater the perception of under-representation. These findings show a general perception of a glass ceiling.

Figure 4. 1 Perception of Chinese Representation in Lower Management Levels (Most Recent Organization)
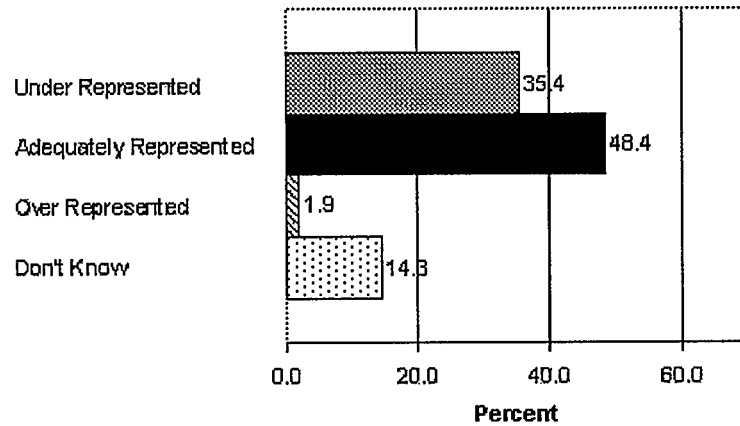
Figure 4. 2 Perception of Chinese Representation in Middle Management Levels (Most Recent Organization)
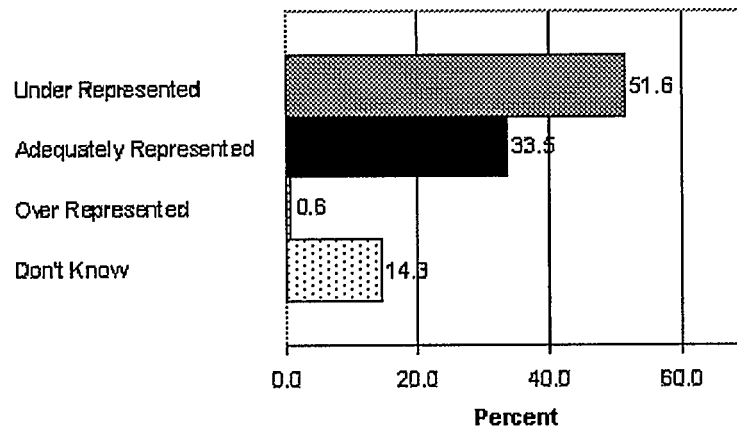
Figure 4. 3 Perception of Chinese Representation in Upper Management Levels (Most Recent Organization)
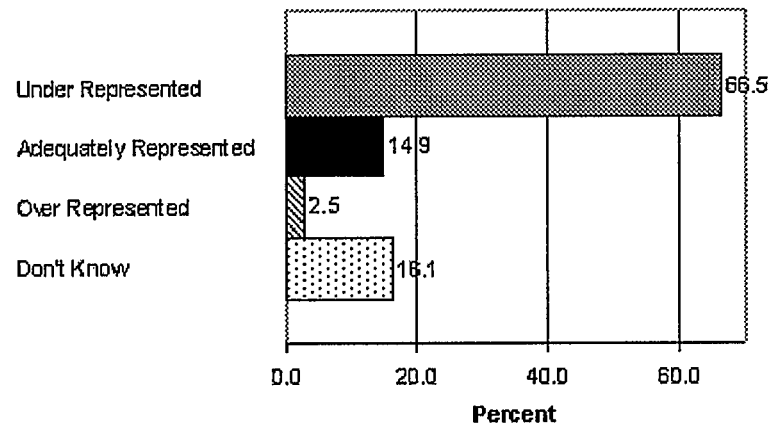
Level 2. Perception in Context: Where do Real People fit in?

The data presented above exhibits the degree to which respondents' perceive adequacy of Chinese engineer managerial representation within engineering firms in Canada. This level of perception explores respondents' sense of how they themselves, and how other Chinese engineers that they are aware of, are progressing through the managerial "pipeline." In addition to detecting how much, if any, respondents' feel that artificial barriers are relevant to the upward mobility of their carers, assessment of this also highlights differences between the perceptions of their own potential compared to the perception of other Chinese engineers who have preceded them in their climb. The rationale here takes into consideration age and the relative length of time they have spent in their career, and the impact these have on the perception of their mobility potential. Specifically, the majority, 80.2%, of respondents fall between the ages of 35 to 54 and thus would have been in the workforce for varying amounts of time, ranging from approximately 10 to 22 years with the majority of them working for less than 20 years. According to the FGCC (1995) it takes at least 20 to 25 years in a corporation to achieve a high level management position. With this in mind, the mathematical breakdown dictates that the majority of respondents would be in the midst of their career climb to the top. As a result, they may view their own potential of achieving a high level managerial position as greater than those who have already spent the requisite 20 to 25 years within the corporate ladder.

This level of perception is gauged via employment of three categories of questions. The first category attempts to establish whether or not respondents believe that being Chinese represents a special challenge to their upward mobility. The second

category solicits respondents' views on limitations of their own advancement due to their ethnic background. The last category looks into the perception of advancement potential for other Chinese engineering individuals they know of.

General Advancement Limited by Ethnic Background

The objective of this sub-category is to illuminate respondents' evaluation of cultural differences as a hindrance to the upward advancement of Chinese engineers in employment settings; that is, respondents' perception on the compatibility between western corporate culture and Chinese cultural values. Neither of these terms, western corporate culture and Chinese cultural values, were defined for respondents therefore leaving respondents free to interpret the key elements and differences between each culture. Whereas Perception Level 1 establishes respondents' views of how well their predecessors generally fared with regards to managerial representation of Canadian engineering companies, this sub-category is unique because it provides insight to the context of being Chinese and the perceived effects on upward mobility for the present day.

The figures in Table 4.1 and Table 4.2 show that approximately 56 to 60% of respondents perceive being Chinese as a handicap to upward career mobility.

Table 4. 1 Chinese Ethnic Background Hinders Chinese Engineers Advancement to Managerial Positions

	Number	Percent
Yes	96	60.4
No	63	39.6
Total	159	100.0

χ^2 (df=2, N=160) = 87.24 $p \le 0.01$

Table 4. 2 Western Corporate Culture Hinders Chinese Engineer Promotion into Managerial Position

	Number	Percent
Yes	86	55.8
No	68	44.2
Total	154	100.0

χ^2 (df=2, N=155) = 77.67 $p \le 0.01$

Personal Advancement Limited by Ethnic Background

This sub-category investigates respondents' perception of whether or not upward advancement of their careers is affected by their ethnic background. Since advancement opportunities are most visibly linked to promotions, respondents were asked questions pertaining to their personal experiences with promotions and promotional opportunities in light of their ethnicity. The data below presents questions that are broken down by specific respondents; those currently employed (by someone other than themselves), and those who are self-employed respondents.

All Respondents

Respondents were asked whether or not they felt that their career advancement into a managerial position had been hindered because of their ethnic background (see Table 4. 3 below.)

Table 4. 3 Percent Respondents Denied a Promotion because of their Ethnic Background

	Number	Percent
Yes	13	8.2
Maybe	21	13.3
Don't Know	28	17.7
No	96	60.8
Total	158	100.0

χ^2 (df=3, N=158) = 110.61 $p \leq 0.01$

Results here show that only a small majority, specifically 60.8%, of respondents answered "no" to this question. More significantly, 21.5% of respondents answered "yes" or "maybe" to believing that they had been denied a promotion because of their ethnic background. Significant also is the 17.7% of respondents who indicated that they "don't know," leaving approximately two-thirds of respondents who answered "no" answer. Although this data is not generalizable, statistical estimation of the proportion of respondents who believe that there is at least a possibility that their ethnic background has hindered their upward mobility (21.5%) equates to approximately 1 561 people from the total population of 72 657 Chinese scientists and engineers in Canada.

Currently Employed

Currently employed respondents were asked to shed light on their assessment of their mobility potential with their current employers (see Table 4.4). When asked if they feel that their advancement opportunities are limited because of their ethnic background, 64.2% of respondents answered "no." Similar to results found above, the percentage of respondents who answered "yes" or "maybe" was fairly significant at a total of 35.5%. When these respondents ranked their promotional opportunities compared to similar co-workers, the results are comparable (see Table 4.5). The vast majority (72.5%) perceive their career advancement opportunities as being the same as other employees while 10.7% perceive better opportunities, and 16.8% perceive worse opportunities than other employees.

Table 4. 4   Advancement Opportunities for Managerial Positions with Current Employer
Limited because of Ethnic Background

	Number	Percent
Yes	19	14.2
Maybe	29	21.3
No	68	64.2
Total	134	100.0

χ^2 (df=3, N=134) = 58.49 $p \leq 0.01$

Table 4. 5   Promotional Opportunities for Career Advancement with Current Employer
Compared to Similarly Educated, Similarly Situated Co-workers

	Number	Percent
Worse than other employees	22	16.8
Same as other employees	95	72.5
Better than other employees	14	10.7
Total	131	100.0

χ^2 (df=3, N=131) = 91.25 $p \leq 0.01$

Self Employed

Self-employed respondents were asked to identify if one of their reasons they became self-employed was because they had felt that racial or ethnic barriers kept them from advancement into a management-level position in the organizations previously worked in. Table 4.6 below shows that a total of 21.7% agreed that "yes, [this was] one of the reasons" they had become self-employed, and 78.3% indicated that this was not one of the reasons. The figures presented here show that approximately one-fifth of those who are self-employed chose to do so, at least in part, because of limited opportunities due to racial or ethnic barriers. This demonstrates the importance of self-employment as a means of dealing with the blocked mobility effects of the glass ceiling.

Table 4. 6 Self-Employment due to Hindrance of Ethnic Barriers for Advancement into Management Positions in Previous Organization(s)

	Number	Percent
Yes, one of the reasons	5	21.7
No	18	78.3
Total	23	100.0

χ^2 (df=1, N=23) = 7.34 $p \leq 0.01$

Perceived Advancement Opportunities for other Chinese-Canadian Engineers

This sub-level asked respondents to assess advancement opportunities of other Chinese engineers that they knew. The questions here were directed to all respondents and those currently employed.

All Respondents

Respondents were asked if they know of any Chinese-Canadian engineers who were denied a promotion because of their race or ethnicity in their most recent organization; and if so, to indicate the approximate number (see Table 4.7). Results show that 77% of respondents did not know of any Chinese engineers who were denied a promotion because of their race or ethnicity. However, 17.1% indicated that they know from 1 to 3 people and approximately 6% know 4 or more, for a total of 23%. These numbers increase when respondents assess Chinese engineers in other engineering organizations that they know of (see Table 4.8). Specifically, 24.7% of respondents know from 1 to 3 people while 15.1% knew 4 or more, for a total of 39.8%; almost double that of their most recent organizations.

Table 4. 7 Chinese Engineers known by Respondents who had been denied Promotion because of Ethnic Background (Most Recent Organization)

	Number	Percent
None	117	77.0
1 – 3	26	17.1
4 or more	9	5.9
Total	152	100.0

χ^2 (df=3, N=152) = 133.12 $p \le 0.01$

Table 4. 8 Chinese Engineers known by Respondents who had been denied Promotion because of Ethnic Background (Other Organizations)

	Number	Percent
None	88	60.3
1 – 3	36	24.7
4 or more	22	15.1
Total	146	100.1

χ^2 (df=3, N=146) = 49.70 $p \le 0.01$

Currently Employed

The research team assumed that at least some of the currently employed respondents would be working in relatively close proximity to other Chinese engineers and therefore would have had an opportunity to observe their promotional opportunities. The data in Table 4.9 rated these respondents perception of the adequacy of promotional opportunities for other Chinese engineers in their current place of work.

The data here show that only 41.7% of respondents perceive adequate promotional opportunities for other Chinese in their current place of work. Meanwhile, 17.4% perceive inadequate promotional opportunities, and 40.9% indicated that they "didn't know." Thus, results here show that only a minority of respondents perceive adequate promotional opportunities for Chinese engineers in their firm.

Table 4. 9 Promotional Opportunities for other Chinese engineers in your firm are:

	Number	Percent
Adequate	55	41.7
Don't know	54	40.9
Not Adequate	23	17.4
Total	132	100.0

χ^2 (df=2, N=132) = 15.05 $p \leq 0.01$

Level 3.   Obstacles or Perceived Causes of the Glass Ceiling

This final facet of perception concentrates on illuminating areas that have become obstacles for respondents regarding career advancement. Employment of the term obstacles, rather than barriers, is deliberate and done so both to take into consideration

the varying levels of which respondents are currently at, and to make an allowance for the varying degrees to which respondents experience these as challenges. That is, relative to the "pipeline," newer respondents to career development may feel that the problem-areas identified in terms of mobility may only represent a temporary hold-up to their progress. Thus, with the development of these skills or weaknesses, these areas will not be problematic to their upward-mobility. In contrast, respondents who have spent more time in the "pipeline" may have come to see these obstacles as actual barriers to their upward-advancement into a managerial position. To recapitulate, artificial barriers that cause the glass ceiling are those that prevent qualified individuals from advancing in their careers (U.S. Department of Labor, 1991).

The results presented below separate obstacles into two categories: human capital type challenges and social capital type hurdles. Crossley (2001:96) defines "capital," a notion he credits to Bourdieu, as "the resources distributed throughout the social body which have an exchange value in one or more of the various 'markets' or 'fields'...." For the purposes of this thesis, human capital obstacles are difficulties experienced by respondents that relate to their personal skills rather than official certifications or other formal, official qualifications. Social capital obstacles, on the other hand, are immediate work environment challenges or those that involve interactions with other individuals.

Human Capital Obstacles

This category elucidates obstacles respondents believe they have to overcome, or had to have overcome, for their advancement into a managerial position. Coleman (1988:100) describes human capital as "... created by changes in persons that bring about

skills and capabilities that make them able to act in new ways." This definition of human capital is employed because the skills listed below fall within the realm of respondents' personal skills that are not formally measured, but are perceived as relevant during assessment for promotions. In other words, these include skills that are perceived as necessary for promotions, but fall outside of official qualifications.

Of these obstacles, more than half of the respondents (58.9%) perceive ineffective interpersonal interaction styles such as being reserved, quiet, or non-assertive was or is an obstacle for them; followed by weak written and verbal communication skills (39.9%), lack of leadership ability (33.7%), and uncertainty of steps required to advance career (28.4%) (see Table 4.10[6]).

Table 4. 10 Percentages for Human Capital Obstacles Identified (Valid Percents Listed)

	Yes	
	Number	Percent
Ineffective interpersonal interaction styles such as being reserved quiet, non-assertive	96	58.9
Weak written and verbal communication skills	65	39.9
Lack of leadership ability	55	33.7
Uncertain of steps required to advance career	46	28.4

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[6] The data in this table is compiled from Tables G.1, G.2, G.3, and G.4 in Appendix G.

Social Capital Obstacles

This second category of obstacles attempts to draw out the challenges faced by respondents and assess their regular interaction in their immediate work-place environment. Woo (1994:47) points out that human relations skills occur in the context of a particular relationship to the organizational culture and its other employees. Coleman (1988:100) focuses on relations within the workplace between co-workers by pointing out that social capital exists in the relations among people and that "social capital comes about through changes in relations among persons that facilitate action." For Crossley (2001:97), social capital, as defined by Bourdieu, are "...the connections and networks which an agent can call upon in their effort to achieve a specified goal." Because these challenges asks respondents to gauge interactions with their superiors, as well as to consider daily on-goings with co-workers, some of the obstacles identified may be construed as perceived causes of the glass ceiling.

Survey results show that 67.3% of respondents perceive exclusion from network circles as an obstacle to the upward advancement of their careers, while a further 50% of respondents indicated that cultural differences create difficulties for their career movement into a managerial position. Other obstacles identified in descending order of support are lack of Chinese role models at 48.7%, lack of encouragement from supervisors at 45.3%, unfair promotional processes at 37.7%, and racial prejudice at 29.6% (see Appendix G, Table G.5, G.6, G.7, G.8, G.9, and G.10).

DISCUSSION AND CONCLUSION

The statistical data in this chapter reveal that the glass ceiling is certainly perceived to exist by many Chinese engineers. Moreover, it can be conceptualized as several glass ceilings; the higher the level of management in engineering organizations, the greater the perception that Chinese engineers are under-represented. A small but significant proportion of the respondents in this study report a personal experience of the glass ceiling that they attribute to their ethnic background. In particular, approximately two-thirds of respondents feel that their own personal opportunities are not limited because of their race or ethnicity, despite more generally acknowledging the under-representation of Chinese engineers in middle and upper management levels. The majority of currently employed respondents (83.5%) believe their promotional opportunities with their current employer are the same as or better than other employees who have similar educational backgrounds and who are in similar positions; this is an optimistically high percentage. However, this positive edge is slightly negated when the reasoning behind why self-employed respondents chose to leave large organizations to become self-employed is taken into consideration. Specifically, 21.7% of self-employed respondents indicated that one of the reasons they became self-employed was because they perceived that racial or ethnic background hindered their career advancement in their previous organizations. This proportion is relevant in that it indicates that many of those who are unhappy with their situation or harboured feelings that discrimination exists in the workplace will change their circumstances.

Interestingly, perception of the glass ceiling is stronger for other Chinese engineers than themselves, and for other engineering organizations that they know of

versus those that respondents are or have worked in. Thus, the perception of the glass ceiling appears to be much more of a barrier for others than for themselves. For example, as taken directly from above, 72.5% of the currently employed respondents perceive that their promotional opportunities with their current employer are the same as or better than other employees similar co-workers. Yet, when these same respondents were queried about promotional opportunities for other Chinese engineers in their firm, only 41.7% perceive adequate promotional opportunities. In addition, a slight discrepancy between percentages is revealed when respondents identified the number of Chinese engineers, in their most recent organization versus other Canadian organizations, they know of who feel that they have been denied a promotion because of their racial or ethnic background. What these data implicate is the complexity of the role that race and/ or ethnicity plays in career advancement amongst Chinese engineers and that simultaneously other related and more refined factors or variables need to be investigated.

Finally, the data presented above reveal that respondents do perceive there to be obstacles in place that may hinder upward advancement of their careers. Once again, the definition of "capital" falls under Crossley's (2001) explanation of capital as seen by Bourdieu; capital are "the resources distributed throughout the social body which have an exchange value in one or more of the various 'markets' or 'fields'...." Concerning human capital obstacles, respondents tend to identify difficulties that are more subjective and less technical in terms of assessment. In particular, 58.9% of respondents indicated that interpersonal interaction style and leadership abilities (33.7%) are ineffective or somehow deficient, therefore affecting their upward mobility. A significant proportion, 39.9%, indicated that "weak written and verbal communication skills" is an obstacle for

them. However, as will be seen in the following chapter, this obstacle varies greatly depending on the nativity status of respondents. Obstacles identified here are consistent with Coleman's 1988 notion of human capital defined above; to recapitulate, Coleman (1988:100) states that "... human capital is created by changes in persons that bring about skills and capabilities that make them able to act in new ways."

Social capital, on the other hand, "...comes about through changes in relations among persons that facilitate action" (Coleman 1988:100). The social capital obstacles identified by respondents are similar to human capital challenges identified in that they too are highly subjective possess an impalpable quality. For example, the most popular obstacle recognized by respondents is the perception of exclusion from network circles at 67.3%. Exactly half of the respondents, acknowledge that cultural differences have presented a challenge to their career advancement (see page 58). Although cultural differences are broadly covered under anti-discriminatory and cultural sensitivity policies adopted by some work organizations, subtle attitudes, preferences, and/ or behaviours based on stereotypes may surface in daily interactions that lead to the perception by respondents of cultural differences existing within the workplace. As will be discussed in Chapter 6, the presentation of this study's qualitative data, exclusion from these key networks and cultural differences directly affects the formation of relationships between the respondents and other co-workers, some of whom are in decision-making positions. This lack of connection denies the respondents from gaining access into key information channels, a key gain to the development of social capital according to Coleman (1988). These information channels can serve to inform the respondent of upcoming promotions. As well, according to the interview-participants of this study, information channels also

provide a path to familiarization between the respondent and their senior executives so that respondents have a greater possibility of being chosen and remembered as candidate choice for promotions. This is consistent with Crossley's (2001:97) definition of Bourdieu's notion of social capital, where he states that "... social capital [is] the connections and networks which an agent can call upon in their effort to achieve a specified goal." Finally, these obstacles do not directly relate to individual qualifications, thereby rendering them closer to artificial barriers, as referred to by Woo (2000), to career advancement for respondents.

These results are not surprising given the recent findings of the Ethnic Diversity Survey released in 2003 by Statistics Canada (in partnership with the Department of Canadian Heritage). Results from this particular survey show that "one in five visible minorities report discrimination or unfair treatment 'sometimes' or 'often'" and that "about 20% of visible minorities ... [have] sometimes or often experienced discrimination or unfair treatment in the previous five years because of their ethnicity, culture, race, skin color, language, accent or religion" (Statistics Canada 2003:21). According to Statistics Canada (2003:24), 7 out of 10 visible minorities who had experienced discrimination or unfair treatment cited their race or skin color as the basis of their mistreatment. Moreover, "the most common situation where perceived discrimination or unfair treatment was experienced was at work or when applying for a job or promotion" (Statistics Canada 2003:24). The results discussed in this chapter are also highly consistent with the findings of the Asian Americans for Community Involvement (AACI) report published in 1993. The AACI (1993) report assessed the perception of glass ceiling issues for Asian Americans in the Silicon Valley in the early

1990s. Similar to above, the AACI (1993) find that as management level increases, so does the perception that a glass ceiling is in place for Asian Americans. As well, respondents of their survey showed that Asian Americans were more likely to perceive a glass ceiling barrier for other Asian Americans that they knew, than for the respondents themselves. The AACI (1993) find that approximately 25% of their respondents felt that they had been denied a promotion because of their race. The AACI (1993) survey also asked their Asian American respondents to identify main obstacles in career advancement. The employee characteristics that were named as barriers were written and verbal communication skills (25%), lack of role models (18%), interpersonal interaction styles (17%), and leadership ability (11%). Company characteristics included arbitrary and subjective promotional processes (40%), lack of encouragement from supervisors (30%), lack of role models (30%), and racial prejudice and stereotypes (25%). Percentage patterns found in the AACI (1993) study are approximately 15% higher in terms of perceptions of glass ceiling than those reported in this thesis, but at the same time, are approximately 15% lower for the reporting of human capital obstacles. However, despite the percentage difference, the result-patterns in this thesis are almost identical to the ones reported by the AACI (1993) regarding perception of the glass ceiling.

Although a glass ceiling is perceived to exist by respondents generally, both the AACI (1993) findings and the results presented in the next chapter show that perception of glass ceiling issues varies by key demographic variables.

CHAPTER 5   CORRELATES WITH THE GLASS CEILING

INTRODUCTION

Crosstabulations between various demographic variables and tables on perception in this chapter determine whether differences exist amongst sub-groups of the respondent base. The demographic variables used are nativity, current age, and gender. Because some of these sub-groups have small numbers, not all comparisons were rendered statistically meaningful with the Pearson's Chi Square test. As a result, the differences in perception presented here do not fully cover the three dimensions of perception as presented in the previous chapter; only the statistically significant tables are discussed. This chapter presents the crosstabulations of the key variables by perception in sections of one key variable at a time. Each key variable section includes a detailed discussion of the crosstabular calculations and then an in-depth examination on the possible reason(s) for the variations observed for that particular variable.

NATIVITY

There are discrepancies regarding particular points of perception between the foreign-born and Canadian-born respondents. As shown in the demographics section of the previous chapter, 74.4% of the respondents were not born in Canada. A detailed discussion of these differences is presented below.

Level 1. Overall Perception of Chinese Managerial Representation in Canadian Companies

The data reveal a difference between the perceptions of native-born and foreign-born respondents regarding overall Chinese managerial representation. Specifically, foreign-born participants tend to perceive a thicker glass ceiling than Canadian-born participants. Differences in respondent rankings of their most recent organizations and in other engineering organizations that they knew of are displayed below in Table 5.1 and Table 5.2.

Worthy of note is the 20 percentage point difference found between foreign-born and native-born respondents in their adequacy rankings of Chinese managerial representation in other Canadian engineering firms. In particular, 17.1% of native-born respondents, in comparison to 38.7% of foreign-born respondents, perceive under representation of Chinese engineers in lower management positions. As well, 40.5% of native-born respondents, in contrast to 61.3% of the foreign-born respondents, perceive under-representation of Chinese in upper managerial positions in other Canadian companies. In addition, native-born respondents are more likely to indicate "don't know" as a response than foreign-born respondents when ranking adequacy of Chinese with regards to middle and upper managerial representation in other organizations they knew of. These findings are significant only for lower and upper management levels.

Table 5. 1 Nativity by Perception of Chinese Representation in Lower Management Levels
(Other Organizations)

	Nativity			
	Canadian Born		Foreign Born	
	Number	Percent	Number	Percent
Adequacy Ranking				
Under Represented	7	17.1	46	38.7
Adequately Represented	18	43.9	38	31.9
Over Represented	0	0.0	2	3.4
Don't Know	16	39.0	31	26.1
Total	41	100.0	119	100.0

χ^2 (df=3, N=160) = 8.66 $p \leq 0.05$

V=0.23 $p \leq 0.05$

Table 5. 2 Nativity by Perception of Chinese Representation in Upper Management Levels
(Other Organizations)

	Nativity			
	Canadian Born		Foreign Born	
	Number	Percent	Number	Percent
Adequacy Ranking (%)				
Under Represented	17	40.5	73	61.3
Adequately Represented	9	21.4	11	9.2
Over Represented	0	0.0	3	2.5
Don't Know	19	38.1	32	26.9
Total	42	99.9	119	99.9

χ^2 (df=3, N=161) = 8.49 $p \leq 0.05$

V=0.23 $p \leq 0.05$

Level 2. Perception in Context: Where do Real People fit in?

Personal Advancement Limited by Ethnic Background

Crosstabulations reveal that the foreign-born respondents perceive greater glass

ceiling effects on their personal career advancement than Canadian-born respondents.

All respondents

The data reveal that a higher proportion of foreign-born respondents perceive that

they have, or may have, been denied a promotion because of their ethnic background than

Canadian-born respondents; approximately 25% foreign-born respondents answered "yes" or "maybe" compared to 12% native-born respondents who answered "yes" or "maybe" to this question (see Table 5.3). On the other hand, the percentage of Canadian-born respondents who indicated that they "don't know" if they have been denied a promotion because of their ethnic background is almost double that of immigrant respondents who indicated the same, at 30.2% and 13% respectively. Interestingly, the total percentages of foreign-born and Canadian-born respondents who answered "yes," "maybe," or "don't know," are approximately 40% for both groups; due in part to the high proportion of Canadian-born respondents indicating that they "don't know" if they had been denied a promotion because of their ethnic background.

Table 5. 3 Nativity by Respondents denied Promotion because of their Ethnic Background

| | Nativity | | | |
| | Canadian Born | | Foreign Born | |
	Number	Percent	Number	Percent
Denied Promotion because of Ethnic Background (%)				
Yes	1	2.3	12	10.4
Maybe	4	9.3	71	14.8
Don't Know	13	30.2	17	13.0
No	25	58.1	15	61.7
Total	43	100.0	115	100.0

χ^2 (df=3, N=158) = 8.49 $p \leq 0.05$
V=0.23 p≤ 0.05

Currently Employed

Similarly, the data reveal a 15 to 20 percent point difference between foreign-born and Canadian-born respondents regarding respondent rankings of promotional opportunities with their current employer in comparison with similar co-workers. As

shown in Table 5.4, 20.8% of foreign-born respondents, as compared to only 5.3% of

Canadian-born respondents, perceive that their advancement opportunities are worse than

similarly situated co-workers; a 15 percentage point difference. Likewise, 86.8% of

native-born respondents perceive promotional opportunities as the same as other similarly

situated co-workers in comparison to 67.3% of foreign-born respondents who perceive

similar promotional opportunities; a 20 percent difference.

Table 5. 4 Nativity by Promotional Opportunities for Advancement with Current Employer
Compared to Similarly Educated, Similarly Situated Co-workers

| | Nativity | | | |
| | Canadian Born | | Foreign Born | |
	Number	Percent	Number	Percent
Compared to Similar Co-workers, Promotional Opportunities are (%)				
Better than other Employees	3	7.9	12	11.9
Same as other Employees	33	86.8	68	67.3
Worse than other Employees	2	5.3	21	20.8
Total	38	100.0	101	100.0

χ^2 (df=3, N=139) = 5.88 $p\leq 0.05$

V=0.21 $p\leq 0.05$

Level 3. Obstacles or Perceived Causes of the Glass Ceiling

Crosstabulations reveal that Canadian-born and foreign-born Chinese respondents

have different perceptions of the obstacles to their career mobility. Slight variations exist

between native-born and foreign-born respondents concerning some of the obstacles

identified in the previous chapter. What follows is a discussion of the identified obstacles

that were statistically significant when crosstabulations with nativity were calculated.

Human Capital Obstacles

There is a significant difference in how Canadian-born and foreign-born Chinese respondents perceive their written and verbal communication skills. The percentage point difference between foreign-born and Canadian-born respondents is 46.7%. Specifically, 49.2% of foreign-born participants perceived weak written and verbal communication skills as an obstacle compared to only 4.9% of native-born respondents (see Table 5.5). The phi co-efficient for Table 5.5 is 0.41, thus indicating that the variable nativity is moderately related to communication skills.

Table 5. 5 Nativity by Human Capital Obstacle Weak Written and Verbal Communication

| | Nativity | | | |
| | Canadian Born | | Foreign Born | |
	Number	Percent	Number	Percent
Weak Written and Verbal Communication Skills (%)				
Yes	2	4.9	63	51.6
No	39	95.1	59	48.4
Total	41	100.0	122	100.0

χ^2 (df=1, N=163) = 27.99 $p \leq$ 0.01
Φ=0.41 $p \leq$ 0.01

Social Capital Obstacles

Similar to above, there is a 23.5 percentage point difference between foreign-born and native-born respondents regarding the perception that cultural differences are a hurdle to the upward advancement of their careers (see Table 5.6). Specifically, 50.8% of immigrant respondents perceive cultural differences as a hurdle in their immediate work-place environment compared to only 29.6% of native-born respondents.

Table 5. 6 Nativity by Social Capital Obstacle Cultural Differences

| | Nativity | | | |
| | Canadian Born | | Foreign Born | |
	Number	Percent	Number	Percent
Cultural Differences (%)				
Agree or Strongly Agree	13	32.5	65	56.0
Disagree or Strongly Disagree	27	67.5	51	44.0
Total	40	100.0	116	100.0

χ^2 (df=1, N=156) = 6.59 $p \leq 0.01$
Φ=0.21 $p \leq 0.01$

Nativity Crosstabulations: A Discussion

Overall, the results indicate that a higher proportion of foreign-born respondents perceive a glass ceiling for Chinese engineers than Canadian-born respondents. The 46 percentage point difference between foreign-born and Canadian-born respondents who perceive that weakness in oral and/ or written communication skills is a hurdle to their upward advancement is a notable finding, and may help to explain why a higher proportion of foreign-born respondents perceive their promotional opportunities as worse than other similarly educated and similarly situated co-workers. As well, the 23.5 percentage point difference between foreign-born and native-born respondents who perceive that cultural differences are an obstacle to the upward advancement of Chinese engineers is congruent to the 15 to 20 percent percentage point differences found for the glass ceiling perceptions that Chinese engineers are under-represented in managerial levels of Canadian organizations. The combination of cultural differences and weaker communication skills for foreign-born respondents may also help to explain why more

foreign-born participants perceive that they have, or may have, been denied a promotion because of their ethnic background than Canadian-born respondents.

Canadian-born respondents differed from the immigrant respondents in that a higher percentage of Canadian-born respondents chose "don't know" as their adequacy ranking of Chinese managerial representation in other Canadian organizations that they knew of; thus contributing to the 20 percentage point difference between Canadian-born and foreign-born respondents who perceive the under-representation of Chinese engineers in Canadian organizations. As well, a much higher proportion of Canadian-born respondents chose "don't know" when responding to the question of whether or not they perceive that they have been denied a promotion due to their ethnic background, at 30.2% compared to only 13% of foreign-born respondents. In choosing this response, the researcher speculates that Canadian-born respondents show a reluctance to give a definitive indication that their ethnic background did not factor into their denial of a promotion. While this reluctance can be interpreted as an unwillingness to give judgment, it does show that Canadian-born respondents may consider that there is the possibility, no matter how slight, that being of Chinese ethnic background has hindered their career advancement.

AGE

As alluded to in Chapter 4, the age of a particular respondent allows the researcher to estimate the approximate length of time that particular respondent has spent in the workforce. By crosstabulating the current age of all respondents with the various

levels of perception, this section investigates the differences in perception of glass ceiling issues by the current ages of all respondents. As a reminder, the current ages of respondents are as follows: 12.9% are aged 30 to 34, 22.2% are 35 to 39, 43.9% are 40 to 44 years of age, 14.6% are 45 to 49, and 6.4% are 50 years of age or more.

Level 1. Overall Perception of Chinese Managerial Representation in Canadian Companies

The data in Table 5.7 reveal that respondents differed by age in their adequacy rankings of lower managerial levels only. Variations in perception are large, as percentage point differences for the adequacy ranking "under-representation" range from 2 to 30 percent for respondents' most recent organizations, and approximately 6 to 40 percent for lower managerial positions of other Canadian organizations. Generally, the results show that respondents in the age category of 45 to 49 are most inclined to perceive the under-representation of Chinese engineers in lower managerial positions while respondents under 40 are most inclined to perceive adequate representation.

Regarding adequacy rankings for respondents' most recent organizations, the majority of respondents under 40 years of age perceive that Chinese engineers are adequately represented at the lower managerial level; 57.1% of respondents aged 30 to 34, and 68.6% of 35 to 39 year old respondents perceive adequate Chinese managerial representation (as shown in Table 5.7). For the remaining respondent-groups, perception of adequate representation decreases as age increases. Specifically, the percentages for the perception of adequate representation are as follows: 43.5% of respondents in the age range of 40 to 44, 33.3% of 45 to 49 year old respondents, and only 27.3% of those who

are 50 years of age or older. Concerning differences between respondents who perceive under-representation of Chinese managers, only 20% of respondents in the age category 35 to 39 perceive this compared to 50% of respondents from the age category 45 to 49; hence the 30 percentage point difference mentioned above. The percentage difference between the remaining groups are all less than 10% with 38.1% of 30 to 34 year olds, 36.2% of 40 to 44 year olds, and 45.5% of those who are 50 or older perceiving the under-representation of Chinese engineers in lower managerial levels of their most recent organizations.

Respondent rankings of Chinese under-representation in lower managerial levels for other Canadian organizations they knew of (Table 5.8 below) show similar statistical patterns to those discussed above (from Table 5.7). In particular, only 22.2% of respondents aged 35 to 39 compared to 61.9% of respondents in the category 45 to 49 year olds perceive that Chinese are under-represented; a percentage point difference of nearly 40. Percentages for the remaining groups who perceive under-representation are: 33.3% for 30 to 34 year old respondents, 28.6% for 40 to 44 year old respondents, and 45.5% of respondents age 50 or older.

Table 5. 7 Age by Perception of Chinese Representation in Lower Management Levels (Most Recent Organization)

	Age (years)								
	30 – 34		35 – 39		40 – 44		45 – 49		50 or older	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Adequacy Ranking										
Under Represented	8	38.1	7	20.0	25	36.2	12	50.0	5	45.5
Adequately Represented	12	57.1	24	68.6	30	43.5	8	33.3	3	27.3
Over Represented	0	0.0	0	0.0	1	1.4	2	8.3	0	0.0
Don't Know	1	48	4	11.4	13	18.8	2	8.3	3	27.3
Total	21	100.0	35	100.0	69	99.9	24	99.9	11	100.0

χ^2 (df=12, N=160) = 20.98 $p \leq 0.05$
V=0.21 $p \leq 0.05$

Table 5. 8 Age by Perception of Chinese Representation in Lower Management Levels (Other Organizations)

	Age (years)								
	30 – 34		35 – 39		40 – 44		45 – 49		50 or older	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Adequacy Ranking										
Under Represented	7	33.3	8	22.2	20	28.6	13	61.9	5	45.5
Adequately Represented	9	42.9	13	36.1	27	38.6	5	23.8	2	18.2
Over Represented	0	0.0	1	2.8	1	1.4	2	9.5	0	0.0
Don't Know	5	23.8	14	38.9	22	31.4	1	4.8	4	27.3
Total	21	100.0	36	100.0	70	100.0	21	100.0	11	100.0

χ^2 (df=12, N=159) = 20.97 $p \leq 0.05$
V=0.21 $p \leq 0.05$

Level 2. Perception in Context: Where do Real People fit in?

Personal Advancement Limited by Ethnic Background

Similar to above, results in this section show that respondents differ by age in their perception of the effects their ethnic background has on career advancement.

Currently Employed:

Percentage point differences calculated from Table 5.9 below reveal that the biggest differences in lies between respondents of the age category 35 to 39 and 45 to 49. Once again, 35 to 39 year old respondents are the least likely to perceive limited advancement to managerial positions with their current employer due to their ethnic background; with only 18.8% who answered "yes" or "maybe" to this question compared to 64.7% of 45 to 49 year old respondents who answered "yes" or "maybe." Generally, increasing age is correlated with an increasing perception that advancement is limited with their current employer due to their Chinese ethnic background as age increases. For the remaining groups who answered "yes" or "maybe" percentages are as follows: 31.6% of 30 to 34 year old respondents," 35.9% of 40 to 44 year old respondents, and 57.2% of respondents age 50 or older.

Table 5. 9 Age by Limited Advancement for Managerial Positions with Current Employer because of Ethnic Background

	Age (years)								
	30 – 34		35 – 39		40 – 44		45 – 49		50 or older	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Advancement Limited because of Ethnic Background										
Yes	2	10.5	0	0.0	8	12.5	7	41.2	2	28.6
Maybe	4	21.1	6	18.8	15	23.4	4	23.5	2	28.6
No	13	68.4	26	81.3	41	64.1	6	35.3	3	42.9
Total	19	100.0	32	100.0	64	100.0	17	100.0	7	100.1

χ^2 (df=8, N=139) = 19.71 $p \le 0.01$

V=0.27 $p \le 0.01$

Similarly, respondents aged 35 to 39 remain comparatively the most optimistic when ranking the perception of their promotional opportunities compared to similar co-workers; with 18.8% indicating that they perceive their promotional opportunities as better than other employees, 78.1% chose the "same as other employees," and only 3.1% indicated that their advancement are worse than other employees (see Table 5.10). On the other hand, respondents in the age category 45 to 49 are the least optimistic in their perception of their comparative promotional opportunities; while none of the 45 to 49 year old respondents perceive better advancement opportunities, 47.1% perceive comparatively worse upward advancement opportunities. Only 52.9% of respondents between the ages of 45 to 49 perceive that their promotional opportunities are the same as other employees. For their ranking of "worse than other employees," the percentage point differences between respondents of 35 to 39 and 45 to 49 is 44%. The difference between these two groups is less for their ranking of "same as other employees" at approximately 25%.

Table 5. 10   Age by Perception of Promotional Opportunities for Advancement with Current Employer Compared to Similarly Educated, Similarly Situated Co-workers

	Age (years)									
	30 – 34		35 – 39		40 – 44		45 – 49		50 or older	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Compared to Similar Co-workers, Promotional Opportunities are										
Better	3	15.8	6	18.8	5	7.8	0	0.0	0	0.0
Same	12	63.2	25	78.1	51	79.7	9	52.9	4	66.7
Worse	4	21.1	1	3.1	8	12.5	8	47.1	2	33.3
Total	19	100.0	32	100.0	64	100.0	17	100.0	6	100.0

χ^2 (df=8, N=138) = 22.16 $p \leq$ 0.01

V=0.28 $p \leq$ 0.01

Level 3.   Obstacles or Perceived Causes of the Glass Ceiling

The data in Table 5.11 show that respondents at different ages tend perceive the degree to which social capital obstacles hinder their upward mobility in a manner similar to their perception of the glass ceiling. In general, 35 to 39 year old respondents are least inclined to perceive that social capital obstacles negatively affect their career advancement, while the large majority of respondents ages 45 or older perceive that these obstacles exist.

Social Capital Obstacles

Respondents vary by age for the social capital obstacles "lack of encouragement from supervisor," "racial prejudice," and "cultural differences." For respondents who agree that these items are hurdles to their upward career advancement, the lowest percentages are respondents in the age category of 35 to 39. With the exception of this group, increasing age is generally associated with an increasing perception of these work-environment hurdles.

Regarding the work-environment hurdle "lack of encouragement from supervisor," 70% of respondents ages 50 or older agree that this is an obstacle (as shown in Table 5.11). In contrast, only 24.2% of respondents aged 35 to 39 year old respondents agree, producing an percentage point difference of 45.8%. The percentage point difference between respondents ages 30 to 34 and 40 to 44 is small at only 2.2%, with 42.9% of respondents aged 30 to 34 compared to 45.1% respondents aged 40 to 44 who agree that they were not receiving enough encouragement from supervisors. Likewise, although the percentages are higher, the percentage point difference between respondents aged 45 to 49 and age 50 or older is small, at only 0.4%, with 69.6% of age 45o 49 respondents compared to 70% of respondents ages 50 or older who agree that lack of encouragement from supervisors is a hurdle to their upward career mobility.

Table 5. 11 Age by Social Capital Obstacle Lack of Encouragement from Supervisors

	Age (years)								
	30 – 34		35 – 39		40 – 44		45 – 49		50 or older	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Lack of Supervisor Encouragement										
Agree	9	42.9	8	24.2	32	45.1	16	69.6	7	70.0
Disagree	12	57.1	25	75.8	39	54.9	7	30.4	3	30.0
Total	21	100.0	33	100.0	71	100.0	23	100.0	10	100.0

χ^2 (df=4, N=158) = 13.87 $p \leq$ 0.01
V=0.30 $p \leq$ 0.01

As stated in Chapter 4, only 26% of respondents perceive racial prejudice as hurdle to their upward career advancement. Although this percentage is small, respondents varied significantly by age when ranking whether or not they perceived this as an obstacle. Generally, as age of respondent increases, so does the perception that

racial prejudice hinders their upward advancement. In particular, only 12.5% of respondents who are 35 to 39 perceive this as an obstacle compared to 56.5% of respondents aged 45 to 49 (see Table 5.12). These two age categories represent the lowest and the highest percentages respectively, producing an percentage point difference of 37.5%. Similar to above, percentages for respondents in the age category 30 to 34 are higher than those in the age category 35 to 39, at 21.1% and 12.5% respectively. And, respondents who are 40 to 44 are close to respondents in the 30 to 34 year old category in that there is only a 5.8 percentage point difference between these groups, with 26.9% of 40 to 44 year old respondents perceiving that this is an obstacle for them. Once again, 56.5% of respondents age 45 to 49, and 50% of respondents age 50 or older agree that this represents an obstacle for them.

Table 5. 12   Age by Social Capital Obstacle Racial Prejudice

	Age (years)								
	30 – 34		35 – 39		40 – 44		45 – 49		50 or older	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Racial Prejudice										
Agree	4	21.1	4	12.5	18	26.9	13	56.5	5	50.0
Disagree	15	78.9	28	87.5	49	73.1	10	43.5	5	50.0
Total	19	100.0	32	100.0	67	100.0	23	100.0	10	100.0

χ^2 (df=4, N=151) = 15.52 $p \leq 0.01$
V=0.32 $p \leq 0.01$

Perception that cultural differences are a work-place hurdle varies by age in a manner consistent with the previously discussed pattern (see Table 5.13 below). That is, respondents who are 35 to 39 are least inclined to perceive this as an obstacle (at 36.4%), and respondents of the age category 45 to 49 are most inclined (at 73.9%); producing an

percentage point difference of 37.5%. The overall pattern of variation by age is again, increasing age associated with increasing perception of cultural difference as an obstacle. The remaining percentages of respondents who agree to cultural differences as a hurdle by age category are: 42.9% for 30 to 34 year old respondents, 48.5% of 40 to 44 year olds, and 70% for respondents who are 50 years or older.

Table 5. 13   Age by Social Capital Obstacle Cultural Differences

	Age (years)								
	30 – 34		35 – 39		40 – 44		45 – 49		50 or older	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Cultural Differences										
Agree	9	42.9	12	36.4	33	48.5	17	73.9	7	70.0
Disagree	12	57.1	21	63.6	35	51.5	6	26.1	3	30.0
Total	21	100.0	33	100.0	68	100.0	23	100.0	10	100.0

χ^2 (df=4, N=155) = 9.80 $p \leq 0.05$
$V=0.25$ $p \leq 0.05$

Age: A Discussion

In general, the variation of perception by age is simple: increasing age is weak to moderately associated with increasing perception of glass ceiling issues. Respondents between the ages of 35 to 39 are consistently at the extreme low in terms of perceiving a glass ceiling while respondents of the ages 45 to 49 are consistently on the higher extreme. Despite finding statistically significant results for Chinese representation in lower managerial levels only, thereby indicating that respondent perception of Chinese representation in middle and upper managerial positions do not vary by age, crosstabulations on personal career advancement show that respondent perception on glass ceiling issues do indeed vary by age. An examination of the social capital obstacles

reveals that older respondents, especially those who are ages 45 or older, tend to perceive significantly more hurdles in their workplace environment than younger respondents. This perception may contribute to the variations that respondents show in their perception of the glass ceiling as age increases.

Another possible explanation for the differences in perception relates to the placement of respondents in their career "pipeline" relative to their age. As stated in Chapter 4, age categories provide a general indication of the length of time respondents has spent in their career. Assuming that respondents graduate at approximately 22 to 23 years old, and therefore start their career at approximately 25, respondents who are 30 years old would have spent approximately 5 years in their careers. The Federal Glass Ceiling Commission (1995) states that the climb into high-level managerial levels takes approximately 20 to 25 years, thus using the above numbers as an ideal example, it is unlikely for a respondent who has spent only 5 years in the workplace to be in a high-level managerial position. On the other hand, the likelihood of a respondent who is 50 years old has spent much more time within the career "pipeline" and therefore the likelihood of attaining a high-level managerial position is much greater for them, although not necessarily more likely – given the research topic at hand. Relating this to the variation in perception illuminated by the crosstabulations above, it is reasonable to presume that younger respondents are more likely to be in positions where promotions are more prevalent because movement is into junior or mid-level management positions. In contrast, respondents aged 45 or older have spent their requisite 20 to 25 years in the career "pipeline" and promotions into upper managerial positions may be much more infrequent. It is not to say that promotions are infrequent because the respondents are

Chinese, but rather it is to say that there are simply less positions at the upper managerial level and thus promotions into these positions are much more selective and competitive. Thus, because respondents aged 30 to 34 may be just at the beginning of the "pipeline," it is likely that they are not yet experiencing mobility within their careers. Meanwhile, respondents of 35 to 39 may have just begun the upward movement through the "pipeline," therefore producing a lower likelihood to perceive blocked mobility. Careers of respondents of age 40 to 44 may still be moving upward. However, due to the limited higher-level managerial positions, a greater percentage may be beginning to experience stunted upward mobility thereby producing a slightly higher proportion perceiving glass ceiling issues. Respondents between the ages of 45 to 49 who hold particular career-attainment goals may be particularly frustrated at this point, and thus most likely to perceive blocked mobility. Finally, respondents who are 50 years or older may have developed counter-tactics or strategies to meet their perceived work-place challenges, as revealed through the interviews and presented in Chapter 6. While not all respondents may hold the desire to move into high-level managerial levels, career mobility should still follow a typical prescribed path set by the organizations of which they belong. Thus, observations on upward mobility remain based on an ideal conventional "pipeline" path.

GENDER

The glass ceiling concept has been a dominant women's issue. As noted in Chapter 4, expectations for this study originally anticipated too few Chinese women

engineers to make meaningful comparisons. However, because 20% of the participants are women, the exploration of gender differences amongst Chinese engineers is feasible.

Level 2. Perception in Context: Where do Real People fit in?

General Advancement Limited by Ethnic Background

More male respondents than female respondents perceive an incompatibility between belonging to the Chinese ethnic background, and thus holding at least some Chinese cultural values due in part to upbringing, and the ability for Chinese engineers to be promoted into managerial positions. The calculated percentage point difference here is 19.3% less female respondents perceiving that being of the Chinese racial or ethnic background has an impact on upward advancement of Chinese engineers than male respondents. As seen in Table 5.14, 45.5% of female participants compared to 64.8% of male respondents indicated that they perceive that their Chinese cultural background and upbringing hinders the upward advancement of Chinese engineers.

Table 5. 14 Gender by Chinese Cultural Background and Upbringing leads to Difficulty for Promotion of Chinese Canadian Engineers to Managerial Positions

	Gender			
	Female		Male	
	Number	Percent	Number	Percent
Chinese Cultural Traits/ Values Hinder Advancement				
Yes	15	45.5	81	64.8
No	18	54.5	44	35.2
Total	33	100.0	125	100.0

χ^2 (df=1, N=158) = 4.10 $p \leq 0.05$
Φ=0.16 $p \leq 0.05$

Personal Advancement Limited by Ethnic Background

Currently Employed:

Female and male respondents differed in terms of their perception of comparative promotional opportunities for career advancement with their current employers. Male respondents are more optimistic in their perception of promotional opportunities for career advancement with their current employer compared to similarly situated, similarly educated co-workers. Overall, a higher percentage of male respondents than female respondents indicated that their career advancement prospects are better than other employees or the same as other employees (see Table 5.15). In particular, 11.9% of male respondents perceive better opportunities and 75.2% perceive the same promotional opportunities. In contrast, only 6.9% of female respondents perceive their advancement opportunities with their current employer are better than other employees, while 62.1% perceive their promotional opportunities as the same as other similarly situated employees at their current workplace. The percentage point difference between female and male respondents who perceived their promotional opportunities as better is 5%, the percentage point difference for the ranking "same as other employees" is 13%. More telling is that nearly one-third of female respondents perceive their promotional opportunities as worse than other similarly situated employees at 31% compared to only 12.8% of male respondents who perceive this. The percentage point difference here is 18.2%, a percentage that mirrors the 19% differences between male and female respondents observed above.

Table 5. 15 Gender by Promotional Opportunities for Career Advancement with Current Employer Compared to Similarly Educated, Similarly Situated Co-workers

	Gender			
	Female		Male	
	Number	Percent	Number	Percent
Compared to Similar Co-workers, Promotional Opportunities are (%)				
Better than other Employees	2	6.9	13	11.9
Same as other Employees	18	62.1	82	75.2
Worse than other Employees	9	31.0	14	12.8
Total	29	100.0	109	100.0

χ^2 (df=2, N=138) = 5.63 $p \leq$ 0.05
V=0.20 $p \leq$ 0.05

Perceived Advancement Opportunities for other Chinese-Canadian Engineers

The data reveal that female respondents know more Chinese engineers who perceive that they have been denied a promotion because of their ethnic background than male respondents. Specifically, 15.6% of female respondents have known 4 or more individuals who perceive that they have experienced the denial of a promotion due to their ethnic background compared to only 3.4% of male respondents (see Table 5.16); producing a 12.2 percentage point difference. In contrast, 19.3% of male respondents have only known 1 to 3 individuals who perceive blocked mobility due to their ethnic heritage compared to only 9.4% of female respondents. There is a 9.9 percentage point difference between male and female respondents within the response category of knowing 1 to 3 individuals. The percentage point difference is small between female and male respondents who have not known any Chinese engineers who perceive blocked mobility because of their ethnic background at 2.3%; this percentage point difference

arises from the difference between the 75% of female respondents and the 77.3% male respondents.

Table 5. 16 Gender by Chinese Engineers known that have been denied Promotion because of Ethnic Background (Most Recent Organization)

	Gender			
	Female		Male	
	Number	Percent	Number	Percent
Number of Other Chinese Engineers known denied Promotion because of Ethnic Background				
4 or more	5	15.6	4	3.4
1 to 3	3	9.4	23	19.3
None	24	75.0	92	77.3
Total	31	100.0	114	100.0

χ^2 (df=2, N=151) = 7.83 $p \leq 0.05$
V=0.23 $p \leq 0.05$

Gender: A Discussion

Crosstabulations in this section reveal that female and male respondents differ in their perception of glass ceiling issues. Female respondents are more pessimistic than male respondents regarding their own advancement opportunities into managerial positions. Comparisons between male and female respondents reveal that a significant majority of male respondents perceive that being of Chinese cultural background and upbringing leads to difficulty for the promotion of Chinese engineers into managerial positions in Canadian organizations. Put another way, more male respondents attribute their perception of blocked mobility to being of the Chinese ethnic background. While female respondents are more inclined to perceive their own promotional opportunities as comparatively worse than other similarly situated employees than male respondents, they

are less inclined to attribute their advancement difficulties to their ethnic background. Because none of the social capital or human capital obstacles were rendered statistically significant, difficulties faced by female respondents cannot be attributed to differences in perception of these hurdles.

The in-depth interviews (discussed in Chapter 6) conducted with the female participants revealed that gender differences are more significant for the female engineers, who participated in these interviews, than being of a minority ethnic group. That is, in explaining perception of their limited or blocked mobility, being a woman is more relevant than being Chinese. Results here are consistent with the "double-jeopardy" phenomenon. For Tang (1997b), being a white female in a male-dominated profession, such as engineering, places them in a disadvantaged position by virtue of their gender. Being a minority and a woman, then, may place these women in a doubly disadvantaged position. Tang (1997) states that "the double penalty thesis underscores the additive adverse effects of being a minority and a woman on one's career."

DISCUSSION AND CONCLUSION

The crosstabulations in this chapter uncovered considerable variations in respondent perception of glass ceiling issues based on nativity, current age of respondent, and gender. In particular, foreign-born respondents perceive a thicker glass ceiling than Canadian-born respondents. While this may be true, discrepancies exist both between and within the foreign-born respondent groups depending on the respondents' length of residence in Canada. Increasing age is weak to moderately associated with increasing

perception of glass ceiling issues. And finally, male respondents are more inclined to attribute perception of blocked mobility to ethnic background than female respondents.

Differences between native and foreign-born respondents regarding limitations in personal career advancement due to ethnic background can be attributed in part to the comparatively high percentage of foreign-born who perceive weak written or verbal communication skills as a barrier (51.6% compared to only 4.9% Canadian-born respondents; a 46.7 percentage point difference). Woo (1994:49) explains, "whether or not poor English is also accompanied by language discrimination, it is a major barrier for foreign-born or recent immigrants. In addition, cultural differences in social histories or backgrounds constrain even the most informal socializing." Woo's statement from her 1994 Research Monograph may also help to explain why 23.5% more foreign-born respondents perceive cultural differences as an obstacle to their upward advancement than native-born respondents.

Despite the comparatively optimistic view of native-born respondents, results from this study show that nearly 40% of Canadian-born respondents are unwilling to indicate definitively their ethnic background has not or does not contribute, at least in part, to the hindrance of their upward career mobility. A reminder here that 9.3% of Canadian-born respondents chose the response "maybe" and 30.2% chose the response "don't know" to the question "have you ever been denied a promotion because of your ethnic background." These results are similar to the findings of the Asian Americans for Community Involvement's 1993 report on perception of the glass ceiling for Asian Americans working in the Silicon Valley. Specifically, the AACI (1993:21) state that their "...finding[s] suggest that even among native-born respondents, a substantial

percentage considered race to be a barrier to management opportunities for Asian Americans."

Crosstabulations of glass ceiling perception by age illuminated a positive correlation between age and perception of glass ceiling issues; increase in age is weak to moderately associated with an increase in perception of the glass ceiling. Comparatively, 35 to 39 year old respondents are the most optimistic group, and 45 to 49 year old respondents are the least optimistic group.

An explanation for the observed variation pattern of perception by age (that is, age increase in association with perception increase) provided above speculated that early successes, in terms of promotions through the technical ranks, may have helped to alleviate perception of glass ceiling affects on respondents' career advancements. However, as respondents spend more time in the "pipeline" and promotions ideally move them towards higher-level management positions, glass ceiling issues may become more prevalent and perhaps even impermeable for older respondents. Results from the AACI (1993) report support this notion. In particular, the AACI (1993) find that discontent regarding promotional opportunities generally increased with age, and that "... in early career stages, respondents do not consider the glass ceiling a serious problem. But as they build up their seniority and want to move into higher positions, the glass ceiling becomes more apparent" (AACI 1993:18). Additionally, tenure is an employment condition that is similar to age in that increase in dissatisfaction with the lack of promotional opportunities is observed as Asian Americans gain more tenure with a company.

Finally, crosstabulations for gender by perception reveal that female respondents are much more pessimistic in terms of perception of their own career advancement

prospects in comparison to other similarly situated co-workers than male respondents. The data in section also reveal that male respondents are much more likely to attribute limited or blocked mobility to their ethnic background than female respondents. Results from the AACI (1993) report found that Asian American women were less likely to experience discrimination due to race than men. Woo (1994:51) speculates that "...these women may not report as much race discrimination because some of the barriers are experienced as gender-related." As revealed in Chapter 6, female respondents do indeed perceive gender as a more prevalent issue than their ethnicity when explaining upward mobility issues.

In addition to presenting significant issues for the female participants of this study, Chapter 6 illuminates significant themes relevant for all interview-participants.

CHAPTER 6

THROUGH THE EYES OF CHINESE CANADIAN ENGINEERS: A QUALITATIVE ILLUMINATION OF GLASS CEILING ISSUES

INTRODUCTION

The quantitative data outlined in Chapter 4 show that a good proportion of respondents perceive the existence of a glass ceiling barrier. Chapter 5, on the other hand, reveals that participants' experiences vary along key demographic variables. The interview data in this chapter illuminate the fundamental elements of participants' lives, such as coping strategies, stage of career, or simply lived experiences, that contribute to the multiplicities in respondent perceptions. Twenty-three interviews were conducted in order to determine the nature of these experiences, as well as to understand more fully the personal and subjective perceptions of the effects of discrimination and cultural difference in the workplace. Also as per Chapter 3, the interview schedule consisted of three focal questions: what is the participant's experience of the glass ceiling, what are their perceived causes for the glass ceiling, and what potential solution(s), if any, does the participant believe will help alleviate the problem of the glass ceiling. All interviewees were employed at the time of the interview; four are self-employed, and three interviewees are women. Analysis of the data gathered from the interviews illuminated five themes discussed by participants. These themes are: 1) perception and experiences of the glass ceiling; 2) perceived reasons for the glass ceiling; 3) choices made by participants as ways of coping with these issues; 4) how time will change the engineering

profession in relation to equity in the workplace; and 5) possible solutions. The remainder of this chapter will discuss these themes in detail.

PERCEIVING AND EXPERIENCING THE GLASS CEILING

Interviewee dialogue on overall Chinese managerial representation in Canadian organizations and perception of their own career advancement opportunities resembled the statistical patterns exhibited in Chapter 4; the majority of interviewees perceive an extremely limited number of Chinese engineers in senior managerial positions or higher. Interviewees often expressed that Chinese engineers move quickly and easily to middle managerial ranks, but then progression in terms of continued upward advancement ends at that point. The quotations provided below are typical of the views expressed by interviewees on this issue:

> "Certainly in the higher levels, there is certainly a barrier. Middle management, supervisory, I don't see a barrier there at all." Interviewee 21

> "There are exceptions – 1 or 2 maybe, maybe 5 in town that will climb very high. They will become VP status and up. But other than that no one; there is not a single Chinese engineer who is at the VP level, or even at the General Manager Level. I don't think I've never seen one. I've said there are exceptions, ok. But I don't know them personally, but I know they exist at that level. But very, very few." Interviewee 19

> "People, the Chinese, the few that I know um that are in big companies that are all alike – they climb up through the junior ranks very quickly, you see. And then they, they kind of get stuck in the middle level, the intermediate level. They call it senior level, but it doesn't go up into the real decision making where you can actually influence the direction that the company will go." Interviewee 15

Participants who were in middle managerial positions, and employed by someone other than themselves, at the time of the interview revealed that they too felt their opportunities were limited. Interviewee 4 explains:

> "So, you know, right now there is still a glass ceiling of the upper management level. So, I've probably hit the top. For me to reach the next level, which would be a director or the executive officer, umm, I think we have, we still have some work to do to break that barrier within this corporation."

Once again, Interviewee 4's comment above exposes a perception that further upward advancement opportunities are limited given their current position. Other similarly situated interviewees also expressed this sentiment.

PERCEIVED REASONS FOR DIFFICULTIES IN CAREER ADVANCEMENT

A common thread that linked all the interviews was participants' willingness to talk about the self-identified weak points, often referred to by interviewees as "hurdles" to their career advancement, without much provocation from the interviewers. Interviewees typically approached their discussion of difficulty-areas from the viewpoint of personal weaknesses or specific challenges they felt they faced regarding the upward advancement of their careers. Commonly identified reasons fall under the following themes discussed in detail below: communication skills, network circles, cultural differences, promotional processes, racial prejudice, external forces, and gender.

Communication Skills

A commonly identified obstacle faced by participants is weak verbal communication skills in English. Interviewees who identified communication skills as a problem area for themselves all spoke with a slight Chinese accent. Although the strength of participants' accents varied, none of these respondents had severely thick or heavy accents that would severely hinder their spoken English. Below are three examples given by interviewees on how communication skills affect the upward mobility of Chinese engineers who speak with an accent.

> "In fact, one manager, about ten years ago, mentioned to me 'in order to move up, one of the things to improve on your communication skill."
> Interviewee 23

> "I think that in an organization this size, your speaking ability's got a lot to do with it. You have a little accent then it, I think, that puts a damper into your advancement opportunities. I actually find that a lot of these people, in my own experience, the uh Orientals, the Asians, they have very good work ethics. Technically they are extremely good, they are so focused that, you know, they work. Ok, so we don't polish our communication skills as well as the others which puts a big hurdle towards our Chinese people, immigrants specifically." Interviewee 16

> "And then the accent, the trouble is that it gives the listener a kind of perception, right or wrong is not the point, that uh you are not educated. And then you're educated why can't you correct it, right? Even though you are very competent in the technical side, I mean the looking the qualifications, but the problem is that they perceive that you are not educated. Ok, and then the common thing [is that they do] not exactly they say it right in front of your face, but that's the general perception."
> Interviewee 11

It is notable that several interviewees, who spoke without an accent, also identified verbal communication skills as an obstacle for other Chinese engineers that they know.

Network Circle

Almost all interviews touched on the subject matter of "connections" or "networks" in relation to promotions. Many of the interviewees mentioned that they were not part of these circles because they do not participate in "extra curricular" work activities such as drinking, and that this was to their disadvantage in terms of upward advancement of their careers; the particular network circles in question here were often referred to as an "old boys club." However, all who discussed this stated that this exclusion from the network circles is not a form of discrimination against them because of their ethnicity or racial background, but rather is a logical, rational phenomenon that they understand as "human nature." That is, interviewees recognize that social functions, such as having lunches with the boss, are places for the exchange of information on upcoming job promotions and that with increased time spent with senior employees there is an increased level of comfort between the Chinese engineer and the management group. The explanation given by interviewees followed that it was natural for people to hire those who they are comfortable with, and already knew well, as opposed to taking a risk on someone different or unfamiliar. One interviewee, Interviewee 18, went on to explain that she felt that the increased time spent with these people also helped to alleviate the perception that there is a cultural difference between herself and her managers. Several interviewees mentioned that these connections were more important as engineers moved further up the ladder. Interestingly, all interviewees who worked in the oil and gas industry talked about an extremely "tight" and "small" circle at the top, for example VPs and those who "sit in the Petroleum Club," and that entry into these circles was extremely difficult. Finally, many interviewees expressed the opinion that many of their Chinese

colleagues do not participate in network circle activities. The quotations provided below highlight these points.

> "I think that has part of it. I think that's probably part of it because unless you are involved in those circles, right, when you do, when you go through a selection process, people always go for something that's easiest path, the path of least resistance. So rather than, 'Well I don't know about that guy, or I don't know about her, or you know, I don't know her too well, you know, but just looking at a piece of paper or an interview, blah, blah, blah, blah.' Whereas, 'Oh yeah! This guy I know intimately, he's a good guy! Much more comfortable, I can work with him.'... Old boys' networks, yep, definitely, in the companies, in especially oil and gas, they have a really tight knit community there, although it's very big, but, I mean, yeah." Interview 21

> "I mean it is through, actually, a lot of the connections, a lot of the breaking down cultural barriers, is through daily interactions though social events... All you're asking is give you a little bit more time and try, from their side, to look from your point of view. And that is a big part. I find that the cultural thing is like that. So you know, if they could accept you and if WE as Asians, ok, can be, can spend more time with them and stuff like that, I think that [would] help a lot." Interviewee 18

> "I think the fact that I managed to get up to my level as a manager because I had connections and I socialized with the people that can make the decision to promote...Especially the higher level you go. The more junior level, it's probably more your technical skills and your ability to do whatever job you're, you're hired for, but you get more into the management level, it's who you know; your networking...So, it's systemic. It's not purposeful discrimination, but when they make that decision it's who's been in their face, who they see every day, who they talk to every day. Obviously they're going to have a preference for that person than someone else who they just know. So, I think that's where the glass ceiling is. And that's why I said, you know, sometimes it may not be the fact that you're Chinese-Canadian, it's just that you're not part of the circle."
> Interviewee 4

It is noteworthy that interviewees are speaking directly to the notion of social capital discussed in Chapter 4. To recapitulate, Coleman (1988:100) stated "... social capital comes about through changes in relations among persons that facilitate action." Similarly,

Crossley defines (2001:97) social capital as "... the connections and networks which an agent can call upon in their effort to achieve a specified goal."

An interesting twist in which network circles affect the upward advancement of two participants surfaced during the interviews. Both of these interviewees are in middle management levels of their corporations but had trouble moving up due to network circle exclusion not because they were not connecting or networking with their superiors or senior level executives, but because these senior level individuals, who had been their network connections, had either retired or had been laid off. One of these interviewees stated that because he was part of the "old crew" and labelled as part of that group, the new and younger seniors were not as interested in networking with him. The other perceives that a lack of connection with his new boss hinders his advancement into a senior managerial position.

Cultural Differences

Cultural differences represent a special challenge to upward career advancement into a managerial position for a large majority of interview participants. Captivatingly, even participants who were born in Canada stated that they perceive cultural differences as a hurdle to their upward advancement. Overall, the perception of cultural differences appears to affect participants' lives in two ways. First, it diminishes the development of relations between the interviewees and their co-workers; and second, participants perceive that these differences directly affect their work.

Concerning co-worker interaction, many interviewees suggested that differing interests between themselves and other co-workers affects their ability to sustain regular and engaging conversations. For example, a significant number of participants articulated that they were not particularly interested in watching sports and therefore could not discuss with their workmates "last night's hockey game." Interviewee 4 commented:

> "We all put our kids through piano and the arts and whatnot. Umm, these guys, it's always hockey. So for those with kids in hockey school, they fit right in. They come in, after a Saturday night hockey and say hello, Mr. So-And-So, it was great! You scored so many goals! And then there's the football field or the hockey pool. You talk to the Chinese-Canadians who are managers on the floor, you're talking piano. You're talking ducks and cats trying to talk to each other."

Interestingly, interviewees perceive these differences as rooted in cultural difference; they perceive the Chinese values have a stronger emphasis of culture than on sport. Similarly, drinking, or more specifically referred to as the lack of Chinese ability to drink (by interviewees), was commonly brought up as a subject of difference. Participants perceive that this generalized inability to drink affects co-worker bonding in a manner parallel to sport. Other frequently mentioned differences were food preferences, and Chinese conservativeness regarding personal space. As described by the interviewees, the Chinese etiquette is highly conscious of one's personal space; generally, there is very little physical contact. For example, the usage of handshakes as opposed to hugging when greeting members of the opposite sex.

Regarding cultural differences and its direct affect on their work, almost all interviewees are of the perception that Chinese culture is very much family oriented. While this emphasis may not be unique to the Chinese culture, Interviewee 16 raises the

point that for himself, and many other working immigrants including the Chinese engineers of this particular study, his parents are not fluent in English and therefore have great difficulty carrying out regular activities. He explains:

> "Ok. And also at the same time, um, because we're struggling, many of us struggling with our, our parents not able to speak English, so we have attend to them, help them to do all these things. And some of these Caucasians, don't seem to understand that. It's just, "Well, I accept it that your parents living by themselves, in the home, and you go see them once in a while." It's widely accepted. Ok. But we have to take care of the parents. It's taking them to see the dentist, to see the doctor, those little things. They call and just because they're sick, you have to go see them. So these sort of things that has some major impact on our day-to-day schedule."

A second cultural difference raised by interviewees that affects their working-relationship is the Chinese respect for elders. Several interviewees mention that the respect for elders was often transferred into the work environment and therefore lead to an inability for them to confront their seniors either in the boardroom or when they felt they were being taken advantage of. Interviewee 17 provides a clear description of this:

> "I think it's pretty difficult to understand, being an engineer is one thing but understanding business process when you're not part of the society initially? That's a huge one to amend. There's a difference in etiquette, for example – not that one's more rooted than the other, but there are those differences. The Chinese tend to respect their elders, whereas [in] some societies, well, that's not a priority. You know, this and that type. That's an interesting one there, because of that when you're in a boardroom and there's some elders in there, you kind of keep your mouth shut. Which is wrong! You know, you got to come across as outspoken and so on. So yeah, there's some cultural differences there."

As revealed in the quotation, this difference in interpersonal interaction style is described as a cultural difference.

Racial Prejudice of Senior Management

Approximately two-thirds of those interviewed professed the existence of racial prejudice within the workplace. For most of these interviewees, racial prejudice is very subtle yet very real. In his discussion of cultural differences, Interviewee 19 states:

> "In terms of discrimination, it always comes up when you have to deal with the color issue. Discrimination exists in a professional environment like [in the] engineer environment like us, but they are often behind the surface. It's one layer below. If I go to a blue-collar party, somebody may come up to me and say, 'I don't like your face.' It maybe a guy who is a grade 3 dropout or whatever. You will never find it here."

While this was a common point of discussion for the interviewees of this study, many interviewees qualified this view by explaining that the majority of these senior partners and/ or vice-presidents are individuals who grew up in the 1930s and early 1940s, during periods of overt racism. Thus, for them, working with visible minorities is something unfamiliar and uncomfortable.

While discussing the perception that racial prejudice exists in the workplace, a surprising trend emerged. Many interviewees who commented on this topic area brought up racial encounters their children had experienced. The telling of these anecdotes brings attention to the fact that the issue of prejudice is a very prevalent issue in the day-to-day lives of the interviewees, and for their children.

External Forces

External influences are topics brought up by interviewees that are outside of their control; they are inherent to the business structure or related to market forces that affect the upward career advancement of participants. These include company downsizing, the dual ladder, and pay compensation for those higher up on the technical ladder.

Downsizing

Company downsizing, as expressed by a handful of interviewees, is perceived to affect the longevity a Chinese engineer has in management. That is, interviewees believed that in a situation where companies must lay-off employees, visibility in terms of skin color influences the order in which employees are let go. Interviewee 19 explains:

> "Ok, the company has been downsized many times. We used to have like 7000 people, perhaps 10 years ago, and about uh 4 or 5 years ago it becomes around 4000, that's where we are now. So uh when every lay-off comes, not all colors are treated the same. Dark skins are, I think, treated the lowest level, they are the first to go out the door. So I have a lot of friends that I used to work with which are collared people and now we have a few left. There are a lot less non-white people here in the company now. And uh the first ones that I see go out the door are the Indian people, Pakistani people. When the first round comes – and (company name) has probably gone through about 1 round of lay-offs every 2 or 3 years, ok so it has been continuously changing. When lay-off comes, those people are gone first. And then comes the Koreans and the Chinese and uh, and uh whatever the slightly collared ones. And uh a lot of people they got laid off, they are not bad workers, they are very good workers actually.

Thus, the perception held by interviewees is that many of the Chinese engineers who have made it into higher managerial positions are not able to retain their positions for a long period.

Managers versus Technical Employees: The Dual Ladder

During the participants' discussions of experiences with upward advancement, many interviewees explained the difference between managers and technical employees in terms of the responsibilities held by each. Interviewees consistently report that technical employees are responsible for holding an expertise in a particular area and targeted to solving technical problems, doing calculations, or just "looking at the nitty-gritty." On the other hand, managers hold "greater responsibilities." Specifically, these positions require "looking at the bigger picture," raising money, "focusing in on the company's bottom line," and "making the real decisions." More often than not, interviewees made this distinction in order to highlight the existence of two paths of upward advancement within their current place of employment; the existence of a dual ladder. The two quotations below exemplifies that the language used by interviewees utilizes the term "ladder" to describe these two tracks.

> "They basically have the two different level, ok, two different kind of a, how we say ladder, what they call ladder...One is a technical ladder, the other one is a management ladder." Interviewee 22

> "Companies will have two structures... you have the management ladder, which you climb up, and you have the technical ladder." Interviewee 14

Descriptions of these ladders reveal that career advancement for the "technical ladder" is truncated in comparison career advancement on the "management ladder." For example, in her discussion of the differences between these ladders, Interviewee 18 states:

> "The most you can climb [on the technical ladder] is maybe a supervisor, a specialist, and that's it. You do not have the same promotion classes as the management. Whereas [for those on the management ladder, the promotions classes go from] supervisor, to manager, VP and so on. They typically don't have that stumped opportunities."

The terminology used by interviewees provides insight as to how people come to be on these particular ladders. Typically, interviewees describe employees as being "raised" or "built" by the company. For many interviewees, there is a sense that the company decides on which ladder they are "raised." Regarding Chinese engineers, the majority of interviewees perceive that senior executives stream Chinese engineers onto the technical ladder. Most interviewees who commented on this issue stated that there is no opportunity to change ladders once senior managers have chosen which ladder particular engineers are to be on due to the grooming process and assignment of engineers to ladder-specific tasks.

Pay Compensation

In addition to the stunted career path, several interviewees stated that employees higher up on the technical ladder, for example specialists, are compensated with a high level of pay. The high salaries make leaving her/ his position, to find a more "prestigious" but equal in pay job at another company, difficult and thus is seen as a hurdle to Chinese engineers who are interested in achieving managerial ranks through

lateral career movement. That is, many interviewees perceive that Chinese engineers who are interested in acquiring a managerial position elsewhere must face a penalty of having to start on a lower step in terms of both pay and status.

Gender

For the women interviewees, gender is perceived to be a more significant and relevant factor than their ethnicity or "race" in terms of career mobility. All three women interviewees acknowledged that cultural differences did contribute to differences within workplace experiences. However, being a female in a male-dominated profession affects their careers more than their ethnic background. Each of the three interviewees stated that they perceive a glass ceiling for women, with particular mention of senior management positions. But, they were also quick to point out that there was also a glass ceiling for Chinese. A quote from Interviewee 14 highlights this:

> "But, on the really upper management levels, I really think there is a real glass ceiling and if it's there for women, it could easily be there for someone who's Chinese."

All three women interviewees were in positions of supervisory to middle management positions, and all had told anecdotes of individuals who did not cooperate with them due to their gender. Below are two examples:

"Because I'm Chinese? No, I wouldn't say so I think it's more because I'm a woman. No, not about being Chinese. It's more of a concern as an engineer – you know, being a woman than being Chinese. There's a lot more Chinese engineers than there are women engineers." Interviewee 14

"I think the barrier is more between the male and the female and uh, versus, simply because, it's female and visible minority." Interview 18

Once again, the lack of cooperation stemmed from gender differences more than their ethnic background.

CHOICES AND COPING STRATEGIES

Throughout the interviews, participants frequently talked about how they navigated their way through the pipeline. Interviewees indicated that they chose different courses of action to handle different situations in the workplace. In particular, some interviewees discussed how they changed their behaviour to fit in better or to get ahead while others made mention of where they believed they had to draw the line. Many interviewees developed strategies to cope with the discrimination participants felt they faced.

Choosing "Tribes" and "Hats"

Before participants made choices, they first had to realize that they were facing a crossroads. For interviewees who spoke of decisions related to fitting in and drawing the line, almost all interviewees articulated a realization that there was a sort of "system" based on differences they had to break through in order to reach managerial levels. For

most, these differences are between themselves, visible minorities who lack in "social

décor" due in part to their Chinese racial or ethnic heritage, and other employees of their

workplace. Interviewee 17 explains:

> "You just boil it right down to the basic human behaviour, if you don't
> wear the same feathers and have the same war paint you're outside of that
> trough. You're not in the controlling tribe, and if you don't fit the
> controlling tribe, you're outside. It's that simple."

So for these particular interviewees, the question and choice is: to what degree do they

change themselves in order to achieve the end goal of gaining promotion(s) to more

senior managerial positions? Below are two instances of participants verbalizing this

particular junction.

> "And there's always ways to get around it. Ok, there's ethical ways and
> there's unethical ways. How badly do you want it? And that's really up to
> the individual. So you identify the risk barrier, [you ask yourself] do I
> really want it? Yeah, I wouldn't mind. But looking at what you really have
> to do? No thanks. You get the power or status or a little money at the end
> of the day, what do they really want, right? That's the question that each
> individual has question themselves. Do they want it that bad? Some people
> do, some people don't." Interviewee 21

> "So I mean that you will say, 'Hey, I can change myself so much, right,
> and then I want a promotion. I want all those things, but to a point that I
> say, 'hey am I going to change for that reason?'" Interviewee 11

As stated above, some interviewees stated that they would learn to play the game

by learning to adapt. Adaptation techniques consisted of changes in behaviour or habits.

Food was a highly popular item of change by many participants. In particular, they stated

that they would not discuss and/ or bring to the office items such as sushi or going to dim

sum or eating duck feet. Behavioural changes included such things as "walk[ing] with

that swagger, wear[ing] the blue jeans, swear[ing] occasionally" (Interviewee 17) or changing mannerisms to fit the particular group they were associating with at the time be it clients or managers. A quotation stated by Interviewee 15 provides a good example of this below.

> "You realize it, 'ok, I've got to play, play these games.' So then you go, 'Ok, I'll play along with that.' You know, this guy's a little crude, ok, I can be crude. These other guys are a little more refined, ok, I can, I'll behave in that manner. So you put on – you end up having a whole wide assortment of different hats. So you learn all this, and then, you're able to adapt."

Alternatively, several other interviewees stated that they were not willing to make the changes, despite the fact that they would not get the promotions and thus would be "paying the price."

Counter-Tactics and Coping Strategies

Interviewees who had made it into middle managerial positions faced a slightly different junction in that, as stated above, these individuals perceived that they had actually hit the glass ceiling and found difficulty breaking through. For some, reactions to hitting this barrier resulted in the development of counter-tactics such as making it known to supervisors that they are unhappy or, as commonly put, "getting in their face," and applying for every senior job that comes up. Interviewees who follow this path of action described themselves as having "developed thick skin" (Interviewee 4) and "being hardened" (Interviewee 19). Conversely, others admit defeat and accept that they will most likely not get promotions into senior managerial levels. For example:

"I've almost accepted the fact that I'm not trying to climb the ladder like some other people" (Interviewee 11)

"Based upon my values, do I really want to be here?" So realizing that there is a barrier, because of my ethnic[ity], my culture, and realizing that the activities and stuff that's going on on top there, and realizing that my other values, my other priorities, yeah, why do I, why would I really want to cross that barrier? Interviewee 12

What is interesting here is that interviewees rationalize this admission as a personal choice.

IN THE FUTURE...

Interviewee perception regarding changes in the engineering workplace is generally positive. The majority of interviewees are optimistic that acceptance of diversity, and therefore a greater equality with respect to Chinese managerial representation, would eventually occur over time. Although participants are hopeful, all acknowledged that this change would take a considerable amount of time. Many interviewees used the example of women moving into the workplace and achieving high status positions, such as chief executive officers, as a comparative timeframe. Several participants articulated that it took women approximately 50 to 80 years, depending on the interviewee, for the greater acceptance of women at these levels to occur. So, acceptance of visible minorities will take just as long or longer. All interviewees who were optimistic stated that this change would take several generations. That said, interviewees stated that the rise of Chinese to positions of power can already be seen with

the likes of Governor General Adrienne Clarkson and politicians such as the former
Honourable Gary Mar, the Alberta Minister of Health and Wellness.

SOLUTIONS

Most interviews ended with participants' comments on changes that can be made
within engineering organizations, by the Chinese engineers generally, and in terms of the
governmental policies. A compilation of these comments forms the final theme in this
chapter.

In addressing the Chinese engineers, several interviewees stated that it is
unreasonable to expect the company to change for the newcomer, and that the majority
will not change for the minority. That said, participants stated that the onus of change is
on both the Chinese engineers and that of the organizations in which they work. For
Chinese engineers, interviewees perceive that the engineers themselves have a
responsibility to know what she or he is getting into and should be willing to make some
sacrifices for the job. Similarly, interviewees perceived that for Chinese engineers, "there
is a need for conformity to the standards of that company" (Interviewee 17).

As for the engineering organizations, interviewees expressed that the current
cultural sensitivity programs are only reaching the surface level. Specifically, they said
that employers tout cultural diversity through the production of pamphlets with visible
minorities on them and making claims that increases in diversity is good for business
because of globalization. However, at present and for the most part, these companies are

doing little more than paying lip service to cultural diversity. As Interviewee 16 acknowledged during his discussion of cultural diversity at his current workplace:

> "... my really honest opinion is that you talk the talk, ok? Walking what you talk is sometimes not as simple."

So then the question becomes: what needs to change?

In the interviews, participants often referred to an issue of managerial accountability regarding acceptance of diversity in the workplace. Two interviewees specifically voiced that there is a trickle-down effect of the attitude held by senior managers to the rest of the team. Interviewee 19 explains:

> "Um, in terms of how to change it to make it better for engineers, is the leader. The leader of a crew or a department is very important. I found that I when I was really working for that person I told you about, that perception, that negative perception of collared people got permeated down from that level all the way down to the working level. Now if that, if the person heading it is really does not have a collared view, then you will find that a lot of these people do not have this problem with the exception of 1 or 2 who will always be there, but it's under the surface, they will bury it. But if the boss is really of the attitude, 'you know, all them are stupid,' then the people underneath that person will gradually show more and more intolerance. It will show more and more. So it's the head, the leader."

Interviewees expressed that for change to occur, managers must first acknowledge that this glass ceiling phenomenon does exist for visible minorities, and that it is not just a gender issue. Several participants expressed that an increased awareness on the existence of this issue combined with an increased awareness of cultural diversity issues, such as the differing styles of work ethic between different racial or ethnic groups, will help bring about acknowledgement by upper management.

While the issue of cultural diversity and equity in the workplace may already be on the list of things-to-do for high-level employees, solving this problem will not occur unless it becomes a priority. Interviewees expressed that in addition to managerial accountability, there must be people who are willing to take the initial steps. A few interviewees stated that cultural sensitivity programs should be all inclusive; everyone at every level should partake in these programs, and subject matters need to cover all cultures and all areas of differences, including the hegemonic or dominant ones.

Finally, regarding government involvement in alleviating glass ceiling issues, several interviewees indicated that governmental guidelines need to be in place. Interviewee 4 said that presently, companies currently do not have any real consequences to face, so there is no real necessity to change. He believed that following a more "American model," where there is an incentive program, may help induce change. Interviewee 17 provided details of this "American model" to the researchers. She stated:

> "I think that comparing Canada to the [United] States, ok I have limited exposure to the States, I find that if the Federal government, if they were to have a great push on equal environment, something like what the States offered, I think that it will help the visible minority, whether you're a man or a woman, to rise faster, break into the circle faster, not only in oil and gas but also in any other industry. Because in the States they have the equal employment rule and they actually give you a tax break if you hire a visible minority. And they give you a tax break on that, and so they encourage – that's why you know that in uh in the States they have quite a number of females, oriental people in the top manager areas. Like it or not a lot of industries, a lot in the industry, they don't like it, ok, because this is something like somebody, you know, shoving it down their throat. But, look at it this way, it is actually helping."

At the same time, two interviewees were careful to note that equal opportunity programs may taint the achievements of those who rose to the top on their own because it could

lead to the perception that were it not for these quota-programs, etc these visible minorities would not have made it on their own.

CONCLUSION

The goal of this section was to illuminate some of the more personal and subjective views of those who participated in this study. The data collected from these interviews shows that interviewees perceive the existence of a glass ceiling that limits advancement of Chinese engineers into senior management positions, a notion consistent with the statistical data previously presented. The reasons provided by interviewees as to why they felt they faced an artificial barrier to the upward advancement of their careers overlap somewhat with obstacles identified from the survey. Overlapping areas included communication skills, exclusion from network circles, of cultural differences, and racial prejudice of senior management. External forces, specifically downsizing, the existence of a dual ladder, and pay compensation, were also identified as obstacles participants believed they face in terms of upward advancement, but not examined as areas of hindrance to career upward mobility by the statistical portion of this study. Gender is a particularly salient area of difference in that female interviewees perceive the male-female difference as a more significant contributor to their career advancement than was their ethnic background. Because the interview process prompted participants to discuss at length their experiences within the pipeline, navigational techniques for survival were illuminated. While some interviewees revealed choices they felt were necessary for their survival and continued progress through the pipeline, other interviewees indicated how

they cope with facing discrimination at the higher levels. Interview data also show that in general, participants are optimistic in their perception of how time will change the issue of workplace equality for visible minorities. Finally, through their discussions on areas require attention, a theme of possible solutions to the glass ceiling was developed.

While the some of the information presented in this chapter overlaps the data discussed in Chapters 4 and 5, information extracted from the interviews adds depth by re-establishing what the glass ceiling issues are for participants of this study. These issues were further enhanced by providing an explanation as to how and why obstacles affect the upward advancement of the interviewees.

CHAPTER 7   CONCLUSION

The notion of the glass ceiling, as it applies to Chinese engineers in Canada, is relatively new and unexamined. As such, it was the objective of this study to contribute to this issue by answering the questions: whether or not University of Calgary-trained Chinese engineers perceived a glass ceiling, and what reasons they believed the glass ceiling exists for Chinese Canadian engineers. With the increasing diversity in Canada, illuminating such an issue will aid our understanding of ethnic and racial discrimination in Canada. This research documents Chinese engineers' perception and experiences of the glass ceiling.

Statistical data in this study reveal that in general, participants in this research project perceive the existence of a glass ceiling for Chinese engineers in Canadian organizations. Moreover, perception of the glass ceiling increases as the level of management increases. Approximately one-third of the participants in this study reported a personal experience with the glass ceiling due to their ethnic background. That said, respondents show a greater inclination to report the glass ceiling barrier as more salient for other Chinese engineers than for themselves. Overall, currently employed respondent perceptions of their comparative promotional opportunities appear optimistic. However, nearly 40% of self-employed respondents indicated that one of the reasons they became self-employed was because of the perception that racial or ethnic barriers hindered their career advancement into a management-level position, thereby highlighting importance of self-employment as a means of dealing with blocked mobility due to the glass ceiling.

The obstacles encountered by respondents in their trek up the pipeline, includes weakness in verbal and written communication skills in English or French and a lack of inclusion in key network circles.

Further statistical analysis reveals that the perceptions and experiences of the glass ceiling varies by nativity, age, and gender. Foreign-born participants perceive a thicker glass ceiling for Chinese engineers than native-born participants. In addition, foreign-born respondents are more likely to indicate that cultural differences and difficulties with verbal and oral communication skills are obstacles to their upward career advancement. This may provide an explanation of why a higher proportion of foreign-born participants specified experiences with the glass ceiling than Canadian-born respondents. A final caveat to this exploration of differences between foreign-born and native-born respondents lies in the fact that despite their generally more optimistic perception of the glass ceiling, approximately 40% of these respondents chose "maybe" or "don't know" when responding to the question "have you ever been denied a promotion because of your ethnic background?" Thereby, indicating that even a significant proportion of native-born respondents may consider their ethnic background, at least in part, to be a barrier to their upward career advancement.

Similarly, respondent's perception of glass ceilings varied by age. Specifically, older respondents tended to perceive more glass ceiling experiences than younger ones, with respondents who are 35 to 39 are least inclined towards perceiving a glass ceiling, while 45 to 49 year old respondents are the most inclined. Woo (2000:177) postulated two explanations as to why increasing seniority is associated with increasing perceptions of a glass ceiling. The first is that age is associated with one's location on the career

ladder. She explains that younger recruits are optimistic because the organization has granted them certain career development opportunities, and that only with increasing seniority does one press against the upper levels of the corporate structure. Thus, as stated in Chapter 4, newer members to the career "pipeline" may experience upward mobility through junior ranks thereby alleviating their perception that a glass ceiling exists, while older members in the "pipeline" may be experiencing a plateau thereby producing a higher percentage who perceive that a glass ceiling exists.

The second explanation provided by Woo (2000:177) states that older and less acculturated Asian Americans will have greater language problems and experience other social and cultural constraints that prevent them from venturing outside certain networks or niches. While the results in Chapter 5 did not render any of the human capital obstacles statistically significant, the crosstabulations show that respondents do vary by age for the social capital obstacles lack of encouragement from supervisor, racial prejudice, and cultural differences. Statistically, it followed that older respondents are more inclined to perceive these as obstacles than younger respondents. Although not tied explicitly to age or residency length, the qualitative data in Chapter 6 reveals that communication skills and the perception of cultural differences does affect one's ability to join key network circles.

The perception of glass ceiling issues for women respondents in this study reflects dimensions of both gender and ethnicity. Female respondents are much less optimistic about their own advancement opportunities. While the crosstabulations reveal that male respondents are much more inclined to attribute the perception of limited upward mobility to their Chinese ethnic background, interview data reveal that for the women of

this study, gender is a much more salient issue to explaining limited mobility than their ethnic background.

Overall, the in-depth interviews reveal how and why specific elements, within both themselves and their immediate place of work, contributed to their experiences with the glass ceiling. Interestingly, interviewees did not necessarily interpret the two most commonly identified obstacles as discrimination towards their ethnic background, but rather as something they could understand. Specifically, interviewees explained that network circle exclusion can be understood from the point of "human nature;" people are more comfortable working with those who they are familiar with rather than those who they do not know. As well, many interviewees expressed cultural differences from personal experiences, such as their diminished interest in bonding with co-workers, rather than from the point of view of discrimination from superiors or other co-workers. Noteworthy here is that even Canadian-born interviewees perceive cultural differences as a hindrance to their upward career mobility. The interviews also illuminated the fact that getting ahead in the workplace consists of constantly making choices and the development of coping strategies in the face of limited opportunities. Lastly, several interview participants discussed suggestions for the alleviation of glass ceiling issues for all minority groups within Canadian organizations.

As stated in Chapter 4, the results of this study are perhaps not surprising given the recent findings of the Ethnic Diversity Survey (2003). To recapitulate, the EDS (Statistics Canada 2003:21) found that 20% of visible minorities reported experiences of discrimination or unfair treatment in the previous five years because of their ethnicity, and that perception of discrimination or unfair treatment was most commonly

experienced "at work or when applying for a job or promotion" (Statistics Canada 2003: 24). Given that even a significant proportion of Canadian-born participants perceive cultural barriers as a hindering their upward career mobility, the findings in this study hint at the possibility that the glass ceiling is caused by more than individual or group deficits, such as English language facility. Woo (2000:197) states that in addition to formal experiences and education, qualifications for management encompass certain ineffable qualities, "such as a certain 'presence,' leadership style, or some other kind of 'cultural capital' – qualities that inhere not simply in the individual but in a set of relationships." Crossley (2001:97) states that the manner in which an individual is perceived can be considered a form of Bourdieu's symbolic capital. He goes on to state that "racism, sexism, and various forms of stigmatization are extreme forms of capital deficit in this respect." Interviewees illuminated, for example through their discussion of how having an accent affects the way in which they are perceived and therefore hinders their upward advancement, perception by other co-workers, especially top-level executives who are responsible for promotions, plays an integral part in determining the permeability of the glass ceiling for Chinese engineers.

One of the goals of conducting research on the glass ceiling is that perhaps, with further analysis and emergent policy recommendations, the issues examined within this thesis can be overcome. The Federal Glass Ceiling Commission (1995:59) reports that the majority of CEOs perceived the glass ceiling as something that did affect women but no longer does. Moreover, the majority of the CEOs they interviewed had not internalized the broadened definition of the glass ceiling and were less likely to think of the glass ceiling as something that applies to minority males. As stated in Chapter 6,

many interview participants agreed with this finding and reported that for the glass ceiling to be removed, at least for Chinese engineers, appreciation and acknowledgement by top-level executives must be a factor. Awareness and acknowledgement are important to the fracturing of the glass ceiling for Chinese, and all other minority groups in Canada, because successful programs within corporations need to address preconceptions and stereotypes (FGCC 1995). According to the FGCC (1995:39), successful glass ceiling initiatives must have strong CEO support, be inclusive, emphasize accountability, are comprehensive, and must be specific to the organization.

This research project aimed to illuminate perception and lived experiences of the glass ceiling as held by Chinese engineers in Canadian organizations. This may represent only a small beginning step to truly understanding the glass ceiling issue as it exists in Canada, at least with respect to the Chinese. Clarity of this issue can only be achieved with research that is both larger in scope and perhaps expanded beyond the borders of this specific minority group. That is, further studies in this area would benefit from an inquiry of top-level executives, such as vice-presidents and chief executive officers, of Canadian engineering companies on their perception of equity in the workplace. In addition, a greater consideration of targeting an older range in participant age may also add valuable insight to this subject matter because the nature of the glass ceiling, as stated above, applies more to employees who are in the mid to upper climb up their career pipelines. Perceptions from other Canadian trained Chinese engineers from across Canada, but especially in the three largest Canadian metropolitan areas of Montreal, Toronto, and Vancouver, would contribute greatly in that there is a greater concentration of Chinese within these three locations and a greater history of diversity, which may

ultimately affect workplace perceptions and equality issues. The paucity in research of the glass ceiling with respect to Chinese engineers renders the possibilities for future research in this area endless, and all equally valuable. However, in this particular study, illumination of the glass ceiling was through Asian eyes.

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APPENDIX A   SURVEY-QUESTIONNAIRE

UNIVERSITY OF
CALGARY

CHINESE AND CHINESE-CANADIAN ENGINEERS AND THE "GLASS CEILING"

Survey of University of Calgary Graduates, 1980 – 1992

Department of Sociology
Faculty of Social Sciences
2500 University Drive, N.W.,
Calgary, Alberta, Canada
T2N 1N4
www.ucalgary.ca

Hi!

We would like to hear about the experiences of people like you: Chinese and Chinese-Canadians who are educated and, likely, experienced professional engineers who have been in the labour force for many years. We are interested in your work experience, your career progress, and your perception and any experiences of the "glass ceiling". The glass ceiling is the artificial barrier, based on attitudes and organizational bias, that may prevent qualified individuals from advancing upward in their organization, particularly into management-level positions.

Our aim is to try to understand the glass ceiling issue along with creating productive recommendations for improvement. Insights gained from this research project may be communicated to government agencies, professional engineering communities, corporations and universities.

Notes on your participation:
This survey should take approximately 10-15 minutes.

Please bear in mind that *your identity will remain strictly confidential.* This means that your name will not be used and any revealing information about you will be completely disguised. Any information you give will be processed in such a way that it cannot be linked to you in any way.

You are under no obligation to complete the survey, or to fill in any part of it. You do not have to answer every question, and you may stop filling out the questionnaire at any time if you do not feel comfortable in proceeding. However, we do not anticipate that the questions will cause you any discomfort.

Thank you in advance for helping us in our effort to understand the very important issue of the glass ceiling. We hope you may even enjoy having the opportunity to explore your own experiences with this issue through the survey.

Thank you!!

Lloyd L. Wong, Ph.D.
Associate Professor, Department of Sociology

INSTRUCTIONS:

Please answer the questions by checking ☑ the appropriate response(s) or by writing your answer in the space provided.

PART A
GENERAL INFORMATION

1. Sex: ☐ Female   ☐ Male

2. Age: ☐ 30-34
        ☐ 35-39
        ☐ 40-44
        ☐ 45-49
        ☐ 50-54
        ☐ 55-59
        ☐ 60-64
        ☐ 65 +

3. Where do you presently live? (city, country)

   _____

4. Are you:
              ☐ Chinese/ Chinese-Canadian
              ☐ Asian/ Asian-Canadian
              ☐ Other Asian

5. Were you born in Canada?
   ☐ Yes
   ☐ No ———➤ a. How long have you lived in Canada?

                  _____ (years)

              b. How old were you when you arrived in
                 Canada? _____ (years old)

              c. Are you a Canadian citizen now?
                 ☐ Yes
                 ☐ No ———➤
                          i. Do you plan to become a
                             Canadian citizen?
                             ☐ Yes   ☐ No

6. What is your highest engineering degree?
        ☐ Bachelors
        ☐ Masters
        ☐ Ph.D.

   a. Year of graduation (for highest degree): _____

   b. Engineering major (e.g. Civil): _____

7. Have you ever qualified as a P. Eng?

    ☐ Yes ———▶ a. When did you qualify? _____ (year)

                        b. Is your P. Eng. status current?

                             ☐ Yes   ☐ No

    ☐ No

Employers Since Graduation

8. Since you graduated, how many engineering employers or companies have

    you worked for? _____

If you have had more than three (3) engineering employers, please answer questions 9-11 with reference to your three most recent engineering employers <u>not including</u> your present employment situation.

EMPLOYER #1 (your last engineering employer before your present situation)

9a. What was this employer's business? (e.g. oil company, government)

_____

b. When you were with this employer, about how many people worked for

    this company at <u>all</u> of its locations? _____

c. When you were with this employer, about how many professional

    engineers worked for this company? _____

d. When did you start with this employer? _____ (year)

e. When did you leave this employer? _____ (year)

f. Why did you stop working for this employer? (Please feel free to include professional and personal reasons.)

_____

_____

g. Did you go to work for another engineering employer at any time after this?

    ☐ Yes ———▶ How many months was it before you started

                         your next job? _____ (months)

    ☐ No ———▶ Please go to question # 12 on page 8

EMPLOYER #2 (your last engineering employer before your present situation)

10a. What was this employer's business? (e.g. oil company, government)

_____

b. When you were with this employer, about how many people worked for

this company at all of its locations? _____

c. When you were with this employer, about how many professional

engineers worked for this company? _____

d. When did you start with this employer? _____ (year)

e. When did you leave this employer? _____ (year)

f. Why did you stop working for this employer? (Please feel free to include
professional and personal reasons.)

_____

_____

g. Did you go to work for another engineering employer at any time after this?
      ☐ Yes ——▶   How many months was it before you started

your next job? _____ (months)

      ☐ No ——▶   Please go to question # 12 on page 8

EMPLOYER #3 (your last engineering employer before your present situation)

11a. What was this employer's business? (e.g. oil company, government)

_____

b. When you were with this employer, about how many people worked for

this company at all of its locations? _____

c. When you were with this employer, about how many professional

engineers worked for this company? _____

d. When did you start with this employer? _____ (year)

e. When did you leave this employer? _____ (year)

f. Why did you stop working for this employer? (Please feel free to include
professional and personal reasons.)

_____

_____

g. Did you go to work for another engineering employer at any time after this?

    ☐ Yes ———▶ How many months was it before you started

                            your next job? _____ (months)

    ☐ No

CURRENT EMPLOYMENT STATUS

12. Do you <u>presently</u> have a job for which an employer pays you?

    ☐ Yes ———▶ Please go to Part B, page 9 (next page)

    ☐ No

13. Are you <u>presently</u> self-employed?

    ☐ Yes ———▶ Please go to Part C, page 12

    ☐ No

14. Are you <u>presently</u> looking for work?

    ☐ Yes ———▶ Please go to Part D, page 13

    ☐ No

PART B
YOUR PRESENT JOB

15. Where is your present job located? (city, country)

_____

16. What are the terms of your employment?

    ☐ Permanent full-time
    ☐ Permanent part-time
    ☐ Full-time, contract
    ☐ Part-time, contract
    ☐ Other, please specify:

_____

17. What is the title of your job? _____

18. Which of these are part of your job? Please indicate the three most important with 1 as most important, followed by 2 and 3. Add others if they are not listed here.

  _____ Technical   _____ Managerial

  _____ Business planning   _____ Task force/special projects

  _____ Economic analysis   _____ Marketing

  _____ Project management   _____ Sales

  _____ Supervisory/team leader

  _____ Other, please specify:

_____

_____

19. Does your employer provide opportunities in this job for any training course(s) to improve your *technical* skills?

☐ Yes   ☐ No

20. Does your employer provide opportunities in this job for any training course(s) to improve your skills in other, *non-technical* areas?

☐ Yes   ☐ No

21. Does your employer have cultural diversity and sensitivity training programs?

☐ Yes
☐ No
☐ Don't Know

22. Compared to co-workers with similar educational backgrounds and in similar positions, your promotional opportunities for career advancement with your current employer are:

☐ Worse than other employees
☐ Same as other employees
☐ Better than other employees

23. Promotional opportunities for other <u>Chinese</u> engineers in your firm are:

☐ Adequate
☐ Not adequate
☐ Don't know

24. Are you currently in a management position?

☐ Yes ———➤ What level of management are you in?
                        ☐ Lower level management
                        ☐ Middle level management
                        ☐ Upper level management

☐ No ———➤ Are you interested in career advancement to a managerial position?
                        ☐ Yes
                        ☐ No
                        ☐ Maybe

25. Do you feel your advancement opportunities for managerial positions with your current employer are limited because of your race?

☐ Yes
☐ No
☐ Maybe

26. Do you make it known to your supervisor that you are interested in a promotion?

☐ Yes
☐ No
☐ Not interested in a promotion

Please go on to Part D, page 13.

PART C
CURRENTLY SELF-EMPLOYED

Please answer this section only if you are <u>currently self-employed</u>.

27. What kind of work do you do? Please indicate all that apply in order of importance with 1 as most important, followed by 2 and 3. Add others if they are not listed here.

_____ Technical   _____ Managerial

_____ Business planning   _____ Task force/special projects

_____ Economic analysis   _____ Marketing

_____ Project management   _____ Sales

_____ Supervisory/team leader

_____ Other, please specify:

_____

_____

28. Why did you decide to become self-employed?

_____

_____

29. Was one of the reasons why you became self-employed because you felt there were racial or ethnic barriers that kept you from advancing in management-level positions in the organization(s) that you worked?
       ☐ Yes, the main reason
       ☐ Yes, one of the reasons
       ☐ No

Please go on to Part D, page 13.

PART D
YOUR EXPERIENCES

For Questions 30 - 33 please consider the following point:

As you may know, Chinese and Chinese-Canadian engineers make up a significant proportion of all engineers in Canada. Please indicate how you feel about the representation of Chinese engineers compared to non-Chinese engineers in the following positions:

	<u>Chinese compared to Non-Chinese Engineers</u>			
	Under Represented	Adequately Represented	Over Represented	Don't Know
30. Technical non-management positions in:				
a. your most recent organization	☐	☐	☐	☐
b. in most other engineering organizations that you know of	☐	☐	☐	☐
31. Lower level management in:				
a. your most recent organization	☐	☐	☐	☐
b. in most other engineering organizations that you know of	☐	☐	☐	☐
32. Middle level management in:				
a. your most recent organization	☐	☐	☐	☐
b. in most other engineering organizations that you know of	☐	☐	☐	☐
33. Upper level management or administrators in:				
a. your most recent organization	☐	☐	☐	☐
b. in most other engineering organizations that you know of	☐	☐	☐	☐

34. In your opinion, have you ever been denied a promotion because of your race/ ethnicity?
   ☐ Yes
   ☐ No
   ☐ Maybe
   ☐ Don't know
   ☐ Not applicable

35. Have you ever been turned down for a promotion to a <u>managerial</u>
position?

      ☐ Yes ————▶ a. What was the reason you were given from
                                        management as to why you were turned
                                        down?

                                        _____

                                        _____

                              b. What do <u>you believe</u> was the reason you
                                        were turned down?

                                        _____

                                        _____

      ☐ No
      ☐ Not applicable

36. How many Chinese/ Chinese-Canadian engineers do you know of who feel they have been denied a promotion to any position because of their race/ ethnicity?

	0	1-3	4-6	7-10	10+
a. in your most recent organization	☐	☐	☐	☐	☐
b. in other engineering organizations that you know of:	☐	☐	☐	☐	☐

37. Which of the following, if any, create or have created obstacles for <u>your</u> career advancement into a managerial position? Please check all that apply:

	Strongly Disagree	Disagree	Agree	Strongly Agree
Lack of encouragement from supervisors	☐	☐	☐	☐
Unfair promotional processes	☐	☐	☐	☐
Racial prejudice	☐	☐	☐	☐
Network circles that exclude you	☐	☐	☐	☐
Cultural Differences	☐	☐	☐	☐
Lack of Chinese Role Models	☐	☐	☐	☐

38. Do you believe that you must overcome, or have had to overcome, any of the following obstacles in order for you to advance your career into or within managerial positions? Please check <u>all</u> that apply:

    ☐ Weak written and verbal communication skills in English/ French
    ☐ Ineffective interpersonal interaction styles such as being reserved, quiet, non-assertive
    ☐ Lack of leadership ability
    ☐ Lack of applicable technical skills
    ☐ Uncertain of steps required to advance career
    ☐ Other, please specify:

    _____

    ☐ None

39. Do you feel that there is something about the *Chinese cultural background and upbringing* that makes it more difficult for many Chinese/ Chinese-Canadian engineers to be promoted into a managerial position?

    ☐ Yes ——▶ Please explain if you wish:

                                     _____

    ☐ No   _____

40. Do you feel that there is something about *corporate culture* that makes it more difficult for many Chinese/ Chinese-Canadian engineers to be promoted into a managerial position?

    ☐ Yes ——▶ Please explain if you wish:

                                       _____

    ☐ No   _____

PART E
GENERAL QUESTIONS

41. If you had your educational and employment choices to make over again, is there anything you would have done differently?

                     ☐ Yes   ☐ No

Comments:

_____

42. Looking ahead, what would you say are your long-term career goals?

_____

_____

43. Is there anything else you would like to say about your experiences as a Chinese/ Chinese-Canadian engineer, or about this study?

_____

_____

_____

_____

_____

Do you live in Alberta and would like to be interviewed further?

Finally, as a second stage of this research project, we will be conducting some interviews in Alberta <u>this summer</u>. These interviews will take only about an hour to conduct. If you would like to take part, please fill in your information below. As a token of our appreciation, each interview participant will receive fifty dollars ($50). A member of the research team will contact you in mid-July to late July to set up an interview date.

Name: _____

Address: _____

_____

Area Code & Phone# _____

E-mail: _____

If you would like to have a copy of the written report on this research and other publications please email Dr. Lloyd Wong at **llwong@ucalgary.ca**.

Thank you <u>very</u> much for your time and patience!

APPENDIX B   INTERVIEW SCHEDULE

Chinese Canadian Engineers and the Glass Ceiling
Interview Start Questions

1. How do you identify or see your self; as a Chinese, Canadian, or Chinese-Canadian?
2. How well do you feel you fit into Canadian Society?
    a. How well would you like to fit into Canadian society?
3. Do you feel more connected with the Chinese community or Canadian society as a whole?

4. In your professional career, would you say that your overall experiences as an engineer have been more positive or negative?
5. Do you think your professional career has come easier or harder because you are Chinese or Chinese Canadian?
6. Can you give us some specific examples of your experiences?
7. From your experiences, would you say that there is an artificial barrier, glass ceiling, or special challenge?

8. In your opinion, what is the artificial barrier, glass ceiling, or special challenge?
9. Do you think cultural differences have played a role in the experiences that you have just referred to?
    a. How (much) so?
10. How do you feel corporate culture plays into this?
11. What do you think is really going on?

Focus Points

1. Personal experiences to glass ceiling
    - What is your experience

2. Why do you think it happens
    - Personal, Cultural, Corporate Culture
    - Language, Cultural Differences, Racism

3. Solutions – Perceived Solutions
    - What they think

APPENDIX C   CONSENT FORM

Consent Form – Chinese and Chinese Canadian Engineers and the "Glass Ceiling"

Investigators: Dr. Lloyd L. Wong, Ms. Ondine Park & Ms. Carol Wong
                    Department of Sociology, University of Calgary

Sponsor: Multiculturalism-Department of Canadian Heritage, Government of Canada

Giving Consent:
This form, a copy of which has been given to you, is part of the process of informed consent. It gives you the basic idea of the research and what your participation will involve. If you would like more detail please feel free to ask. Please take the time to read this carefully.

Focus of the research:
The purpose of this research is to assess Chinese and Chinese-Canadian professional engineer's perceptions, and experiences, of the glass ceiling. This research utilizes the U.S. Department of Labor's definition of "glass ceiling" meaning that it is the artificial barriers, based on attitudes and organizational bias, that *prevent* qualified individuals from advancing upward in their organization into and within management-level positions. The purpose of this interview is for us to learn about your experience and feelings about the glass ceiling.
A possible benefit of this research is that it *might* lead to changes in corporate culture and policy that would reduce the effects of the glass ceiling. The expected outcome is a report that will be available to the general public. Members of the research group may use the research in future writings and subsequent publications.

Participating in the research:
The interview will take approximately one hour. If you have any questions at any time please feel free to ask. The questions should not cause you any discomfort; however, you do not have to answer any questions you do not wish to answer. You may terminate the interview at any point and we will erase the tape.

Confidentiality:
The interview will be tape-recorded and transcribed, and quotations from the tape may be used in our reports. Any information you give will remain completely confidential and no one outside the research team will have access to the information you provide. If you desire, you may request to be sent a copy of any reports or articles prior to their publication, in order to ensure that your confidentiality has been maintained. In addition, you may request a copy of the report and any written findings from this research.

Signature:
Your signature on this form indicates that you have understood, to your satisfaction, the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time. Your continued participation should be as informed as your initial consent, so

you should feel free to ask for clarification or new information throughout your participation. If you have further questions concerning matters related to this research, please contact: Dr. Lloyd L. Wong, (403) 220-6504 or email: llwong@ucalgary.ca

If you have any questions or issues concerning this project that are not related to the specifics of the research, you may also contact the Research Services Office at 220-3782 and ask for Mrs. Patricia Evans.

_____

Participant's Signature   Date

_____

Investigator and/or Delegate's Signature   Date

A Copy of this consent form has been given to you to keep for your records and reference.

APPENDIX D   TABLES DERIVED FROM THE 2001 CENSUS OF CANADA, PUMF INDIVIDUAL SAMPLE (2.7%)

Table D. 1   Chinese Ethnic Origin by Occupation (Weighted)

	Chinese Ethnic Origin (Single Ethnic Origin)	
	Number	Percent
Occupational Category		
Senior Management	4 800	0.96
Other Management	51 090	10.19
Professional: Business and Finance	23 931	4.77
Financial, Secretarial and Administrative	23 738	4.73
Clerical	52 990	10.57
Natural and Applied Sciences	72 657	14.49
Health Professions	12 270	2.45
Social Science, Government, Religion	9 503	1.90
Teachers	14 237	2.84
Art, Recreation, Sport	14 683	2.93
Wholesale, Insurance, Real Estate	13 344	2.66
Retail Trade	28 728	5.73
Chefs, Food and Beverage	31 755	6.33
Protective Services	1 554	0.31
Childcare, Home Support	6 172	1.23
Personal Service	42 041	8.38
Trades, Transport Contractors and Supervisors	923	0.18
Construction	2 655	0.53
Other Trades	16 203	3.23
Transport, Equipment Operators	4 985	0.99
Trades Labourers	4 507	0.90
Occupations in Primary Industries	3659	0.73
Manufacturing Supervisors, Operators, etc	40 201	8.02
Manufacturing Labourers	11 641	2.32
Total	501 399	100.00

Table D. 2   Frequency of Chinese Ethnic Origin in Occupational Category Natural and Applied Sciences (Weighted)

	Number	Valid Percent
Chinese Ethnic Origin		
Chinese Single	72656.80	7.25
Chinese Multiple	5730.55	0.57
Other	924411.60	92.18
Total	1002798.95	100.00

Table D. 3   Frequency Distribution of Ethnic Origin

	Number	Valid Percent
Ethnic Origin		
Canadian	6 019 978.87	22.06
English	1 253 532.05	4.59
Irish	404 995.64	1.48
Scottish	511 873.24	1.88
French	990 755.23	3.63
German	681 310.19	2.50
Dutch/ Netherlands	303 690.47	1.11
Ukrainian	328 250.18	1.20
Polish	251 733.31	0.92
Hungarian/ Magyar	89 327.40	0.33
Portuguese	253 018.80	0.93
Italian	726 759.38	2.66
Greek	143 854.75	0.53
Jewish	184 934.15	0.68
Jamaican	134 304.66	0.49
Lebanese	88 472.52	0.32
East Indian	575 123.15	2.11
Chinese	941 477.24	3.45
Filipino	263 915.45	0.97
Vietnamese	118 707.33	0.44
Korean	96 570.10	0.35
Other British	82 962.96	0.30
Western European	82 974.21	0.30
Eastern European	202 515.23	0.74
Northern European	156 666.77	0.57
Southern European	80 754.51	0.30
Balkan	188 021.01	0.69
Other European	12 240.30	0.04
African	181 466.58	0.67
Arab	140 090.96	0.51
West Asian	161 256.37	0.59
South Asian	221 962.90	0.81
East/ Southeast Asian	96 684.38	0.35
Central/ South American	146 123.42	0.54
Caribbean	188 321.02	0.69
Aboriginal	488 797.56	1.79
Provincial (Canadian)	69 383.87	0.25
Other Single	35 276.35	0.13
Multiple:CBFP	4 538 492.03	16.63
Multiple:CBFP and other	4 018 053.74	14.73
Multiple:Aboriginal	11 614.65	0.04
Multiple:Aboriginal & CBFP	417 843.28	1.53
Multiple:Aborig,CBFP,other	219 723.04	0.81
Multiple:Aboriginal & other	54 463.54	0.20
Multiple: Other	1 128 504.22	4.14
Total	27 286 777.02	100.00

Table D. 4   Chinese/ White by Nativity (Entire Population)

	White		Chinese	
	Number	Percent	Number	Percent
Nativity				
Canadian-born	20 551 413	87.9	273 015	42.9
Foreign-born	2 819 026	12.1	363 678	57.1
Total	23 370 439	100.0	636 693	100.0

Table D. 5   Chinese/ White by Nativity

(Filtered by Occupational Category Natural and Applied Scientists)

	White		Chinese	
	Number	Percent	Number	Percent
Nativity				
Canadian-born	671 803	83.2	4 299	25.6
Foreign-born	135 974	16.8	12 398	74.4
Total	807 777	100.0	16 797	100.0

χ^2 (df=1, N=23 926) = 0.30 $p \leq$ 0.10

Φ=0.04 $p \leq$ 0.01

Table D. 6   Chinese Ethnic Background by Gender

(Filtered by Occupational Category Natural and Applied Scientists)

	White		Chinese	
	Number	Percent	Number	Percent
Gender				
Female	183 286	21.09	3 446	20.04
Male	684 529	78.91	13 722	79.96
Total	867 815	100.0	17 168	100.0

χ^2 (df=1, N=22 295) = 998.78 $p \leq$ 0.01

Φ=0.21 $p \leq$ 0.01

Note:

The filter utilizes a subset of Chinese scientists and engineers in Canada which consist of 28 788 cases from a total of 801 055 cases of the total data set. The Chinese variable is derived from the Visible Minority (VISMINP) variable, where non-visible minority is recoded to 0, 1 is Chinese, and all others are recoded as missing. The Nativity variable is derived from the Place of Birth Variable (POBA), where all Canadian provinces and/ or territories are recoded to 0 and all other countries are recoded to 1. Gender is derived from the Sex variable (SEXP), where male is recoded to 1 and female is coded 0.

APPENDIX E DEMOGRAPHIC VARIABLE TABLES FROM THE CHINESE AND CHINESE-CANADIAN ENGINEERS AND THE "GLASS CEILING" SURVEY 2002

Table E. 1   Age

	Number	Percent
Age (years)		
30 – 34	22	12.9
35 – 39	38	22.2
40 – 44	75	43.9
45 – 49	25	14.6
50+	11	6.4
Total	171	100.0

Table E. 2   Gender

	Number	Percent
Gender		
Female	35	20.5
Male	136	79.5
Total	171	100.0

Table E. 3   Nativity

	Number	Percent
Nativity		
Canadian-born	44	25.6
Foreign-born	128	74.4
Total	172	100.0

Table E. 4   Age of Arrival

	Number	Percent
Age (years)		
0 – 9	24	18.5
10 – 19	64	49.2
20 – 29	37	28.5
30 years or older	5	3.9
Total	130	100.1

Table E. 5   Age of Arrival (Complete)

	Number	Percent
Age (years)		
0 – 4 years	8	6.2
5 – 9	16	12.3
10 – 14	25	19.2
15 – 19	39	30.0
20 – 24	23	17.7
25 – 29	14	10.8
30 – 34	2	1.5
35 – 39	1	0.8
40 – 44	1	0.8
45 – 49	1	0.8
Total	130	100.1

Table E. 6   Length of Residency

	Number	Percent
Residency Length (years)		
0 – 9	8	6.1
10 – 19	23	17.4
20 – 29	68	51.5
30 or more	33	25.1
Total	132	100.1

Table E. 7   Education

	Number	Percent
Highest Degree		
Bachelors	119	69.2
Masters	44	25.6
Ph.D.	9	5.2
Total	172	100.0

Table E. 8 Major

	Number	Percent
Major		
Electrical	29.4	29.4
Civil	24.7	24.7
Petroleum	0.6	0.6
Mechanical	17.1	17.1
Chemical	21.2	21.2
Geomatics	2.4	2.4
Survey	3.5	3.5
Other	1.2	1.2
Total	170	100.0

Table E. 9 Canadian Citizenship

	Number	Percent
Canadian Citizenship		
Yes	160	95.2
No	8	4.8
Total	168	100.0

Table E. 10 Employment Status: Currently Employed (by Someone other than themselves)

	Number	Percent
Currently Employed		
Yes	136	79.1
No	21	12.2
No Response	15	8.7
Total	172	100.0

Table E. 11 Currently Employed: In Management Position

	Number	Percent
In Management Position		
Yes	56	38.8
No	80	61.2
Total	136	100.0

Table E. 12 Currently Employed: In Management Position: Level of Managerial Post

	Number	Percent
Managerial Level		
Lower Management	26	48.0
Middle Management	16	28.0
Upper Management	11	24.0
Total	52	100.0

Table E. 13 Employment Stats: Self Employed

	Number	Percent
Self Employed		
Yes	23	13.4
No	36	20.9
Not Applicable	59	2.3
No Response	113	63.4
Total	172	100.0

Table E. 14 Employment Status: Currently Looking for Work

	Number	Percent
Looking for Work		
Yes	8	4.7
No	38	22.1
Not Applicable	6	3.5
No Response	120	69.8
Total	172	100.0

APPENDIX F   TABLES FOR OVERALL PERCEPTION OF GLASS THE GLASS CEILING FROM THE CHINESE AND CHINESE-CANADIAN ENGINEERS AND THE "GLASS CEILING" SURVEY 2002

Table F. 1   Perception of Chinese Representation in Lower Management (Most Recent Organization)

	Number	Percent
Adequacy Ranking		
Under Represented	57	35.4
Adequately Represented	78	48.4
Over Represented	3	1.9
Don't Know	23	14.3
Total	161	100.0

χ^2 (df=3, N=161) = 84.24 $p \le 0.01$

Table F. 2   Perception of Chinese Representation in Middle Management (Most Recent Organization)

	Number	Percent
Adequacy Ranking		
Under Represented	83	51.6
Adequately Represented	54	33.5
Over Represented	1	0.6
Don't Know	23	14.3
Total	161	100.0

χ^2 (df=3, N=161) = 95.77 $p \le 0.01$

Table F. 3   Perception of Chinese Representation in Upper Management (Most Recent Organization)

	Number	Percent
Adequacy Ranking		
Under Represented	107	66.5
Adequately Represented	24	14.9
Over Represented	4	2.5
Don't Know	26	16.1
Total	161	100.0

χ^2 (df=3, N=161) = 154.95 $p \le 0.01$

Table F. 4   Perception of Chinese Representation in Lower Management (Other Organizations)

	Number	Percent
Adequacy Ranking		
Under Represented	53	33.1
Adequately Represented	56	35.0
Over Represented	4	2.5
Don't Know	47	29.4
Total	160	100.0

χ^2 (df=3, N=160) = 44.25 $p \leq$ 0.01

Table F. 5   Perception of Chinese Representation in Middle Management (Other Organizations)

	Number	Percent
Adequacy Ranking		
Under Represented	71	44.1
Adequately Represented	37	23.0
Over Represented	4	2.5
Don't Know	49	30.4
Total	161	100.0

χ^2 (df=3, N=161) = 58.30 $p \leq$ 0.01

Table F. 6   Perception of Chinese Representation in Upper Management (Other Organizations)

	Number	Percent
Adequacy Ranking		
Under Represented	90	55.9
Adequately Represented	20	12.4
Over Represented	3	1.9
Don't Know	48	29.8
Total	161	100.0

χ^2 (df=3, N=161) = 107.65 $p \leq$ 0.01

APPENDIX G   TABLES FOR HUMAN AND SOCIAL CAPITAL OBSTACLES FROM THE CHINESE AND CHINESE-CANADIAN ENGINEERS AND THE GLASS CEILING SURVEY 2002

Table G. 1   Human Capital Obstacle: Weak Written and Verbal Communication Skills

	Number	Percent
Weak Written and Verbal Communication Skills		
Yes	65	39.9
No	98	60.1
Total	163	100.0

Table G. 2   Human Capital Obstacle: Ineffective Interpersonal Interaction Style

	Number	Percent
Ineffective Interpersonal Interaction Style		
Yes	96	58.9
No	67	41.1
Total	163	100.0

Table G. 3   Human Capital Obstacle: Lack of Leadership Ability

	Number	Percent
Lack of Leadership Ability		
Yes	55	33.7
No	108	66.3
Total	163	100.0

Table G. 4   Human Capital Obstacle: Uncertain of Steps to Advance Career

	Number	Percent
Uncertain of Steps to Advance Career		
Yes	46	28.4
No	116	71.6
Total	162	100.0

Table G. 5   Social Capital Obstacle: Lack of Encouragement from Supervisors

	Number	Percent
Lack of Supervisor Encouragement		
Agree or Strongly Agree	72	45.3
Disagree or Strongly Disagree	87	54.7
Total	159	100.0

Table G. 6   Social Capital Obstacle: Unfair Promotional Processes

	Number	Percent
Unfair Promotional Processes		
Agree or Strongly Agree	57	37.7
Disagree or Strongly Disagree	94	62.3
Total	151	100.0

Table G. 7   Social Capital Obstacle: Racial Prejudice

	Number	Percent
Racial Prejudice		
Agree or Strongly Agree	45	29.6
Disagree or Strongly Disagree	107	70.4
Total	152	100.0

Table G. 8   Social Capital Obstacle: Network Circle Exclusion

	Number	Percent
Network Circle Exclusion		
Agree or Strongly Agree	105	67.3
Disagree or Strongly Disagree	51	32.7
Total	156	100.0

Table G. 9   Social Capital Obstacle: Cultural Difference

	Number	Percent
Cultural Differences		
Agree or Strongly Agree	78	50.0
Disagree or Strongly Disagree	78	50.0
Total	156	100.0

Table G. 10   Social Capital Obstacle: Lack of Chinese Role Model

	Number	Percent
Lack of Chinese Role Models		
Agree or Strongly Agree	76	48.7
Disagree or Strongly Disagree	80	51.3
Total	156	100.0