Tobacco use among construction workers:

A qualitative study exploring experiences and meaning

by

Beverley Ann Hoekstra

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Master of Science
in
Health Studies and Gerontology

Waterloo, Ontario, Canada, 2013

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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ABSTRACT

While smoking prevalence among the general Canadian population has declined to 17%, declining rates have not been achieved equitably across all sub-populations (Statistics Canada, 2011). Smoking prevalence is particularly high among blue-collar workers, and individuals employed in the construction industry have the highest smoking prevalence (34%, Conference Board of Canada, 2013). Though studies have attempted to understand these disparities and how to combat them, research is necessary to understand the social contexts in which construction workers smoke. This study sought to understand these contexts by exploring experiences and meaning of smoking. Semi-structured, in-depth interviews were conducted with 14 construction workers living and working in Southern Ontario.

Qualitative inductive analysis was conducted in three phases: (1) simultaneous data gathering and generating nodes, (2) coding and subgroup analysis, and (3) limited theory development. Grounded theory approach to analysis identified six main categories encompassing various subthemes. These included: day-to-day workplace experiences, experience of smoking, reasons for smoking, sociability of smoking, mechanisms associated with continued smoking, and experiences with quitting or cutting back. Sub-group analyses identified differences between participants depending on age, skill level (unskilled worker versus skilled tradesperson), and job sector (residential versus commercial/industrial). Social theories and concepts identified in the literature review were referred to, including the Social Contextual model by Sorensen and colleagues (2004). A potential set of contextual factors and modifying mechanisms that may be impacting construction worker's tobacco use on or off jobsites are presented.

The findings indicate that smoking is a complex issue among construction workers. For many, smoking goes hand-in-hand with working. Smoking is a social experience, and common on worksites. Workers experience various smoking policies on different jobsites. Policies may or may not be followed or enforced. Smoking has different meanings for different workers. However, factors external to the workplace must also be considered (e.g. partner smoking status). Supports that could be offered in workplace contexts include incentives, coverage of quitting aids, and limiting smoking (e.g. smoke-free policy).

These findings have implications for policy and practice. Further research, including collaborative intervention development, is necessary to address high and persistent rates of tobacco use among construction workers.

ACKNOWLEDGEMENTS

The work presented here would not have been possible without support and encouragement from many individuals. First off, I am grateful to my supervisor Dr. John Garcia. Your mentorship has made this experience a great one. Thank you for stimulating my thinking, and for all the thought-provoking discussions. I appreciate your guidance, and your encouragement has been fundamental to my success.

I would like to thank my committee members Dr. Bruce Baskerville and Dr. Phil Bigelow. Thank you for your expertise and feedback throughout the stages of this research.

I am also grateful to my colleagues and friends in the School of Public Health and Health Systems, and the Propel Centre for Population Health Impact. Your support has been essential over these past two years, and I have learned a great deal through our collaboration and teamwork.

I am grateful to my family and friends for ongoing support and encouragement. Thanks to my parents, Pat and Judy Hoekstra, for instilling in me the importance of education. Thank you for allowing me to be myself, but for also encouraging me to become a better version. I am grateful for the sacrifices you made for me.

To my sisters and brother, thank you for being my best friends. Thanks for telling me if I'd been in the cave too long, and to put a sprig of sage in my boot.

And to my partner Matthew, thank you for your encouragement and love. Thank you for your patience throughout this journey, and for understanding its importance to me. Thank you for being with me through the good times, and the bad. I can't wait for our next chapter.

Financial support for this research was provided by Cancer Care Ontario and the CIHR Training Grant in Population Intervention for Chronic Disease Prevention: A Pan-Canadian Program (Grant #: 53893), as well as the Ontario Tobacco Research Unit through an Ashley Studentships for Research in Tobacco Control.

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1. INTRODUCTION

Tobacco use is the leading cause of preventable disability, disease and death in Canada and the World (Health Canada, 2010; World Health Organization, 2012). Canada has achieved substantial success in tobacco control and this success has been recognized as one of twelve great achievements contributing to increased lifespan of Canadians (Canadian Public Health Association, 2010). However, declining smoking rates have not been achieved equitably across all populations (Health Canada, 2011). Despite dramatic declines in tobacco use among the general population (17% of Canadians aged 15 or older were smokers in 2011), differences in smoking rates exist among various subpopulations (Health Canada, 2011). Notable differences in smoking rates are seen across occupational groups, and significantly higher smoking rates have been found among blue-collar workers including miners, hotel and food service workers, and construction workers (Centers for Disease Control and Prevention [CDC], 2011).

Employment and working conditions are basic determinants of health (Public Health Agency of Canada, 2012), and key factors that must be addressed to reduce inequalities in health (Barbeau et al., 2004a). In an analysis of National Health Interview Survey data from the last ten years, the CDC found "substantial differences in smoking prevalence…across industry and occupation groups" (CDC, 2011). Smoking rates are highest in the trades/transport/equipment group categorized under the national occupational classifications; 28.4% are current smokers (Health Canada, 2011). This occupational group includes individuals employed in construction and mechanical trades, as well as operators of transportation and heavy equipment (Statistics Canada and Human Resources and Skills Development Canada, 2011).

In order to design effective cessation interventions tailored to the construction sector, it is essential to further understand the experiences and meaning of tobacco use for construction

workers, and the social contexts in which smoking takes place. Sherriff and Coleman (2012) state "opportunities for smoking and the social norms that operate across and within construction sites must be understood and addressed prior to implementing a workplace cessation service if they are to have the greatest chance of being effective" (p.131). While studies have attempted to understand the population by characterizing their tobacco use, no published work could be identified that investigated experiences and meaning of tobacco use in a Canadian construction worker population. Poland and colleagues (2006) have argued the social context of smoking as the "next frontier in tobacco control", and state tobacco control efforts are being hampered by not engaging with smokers or understanding the meaning they attribute to their smoking. Bang and Kim (2001) suggest it is important to "investigate why smoking prevalence is high among these groups of workers" and state the "high smoking prevalence in these occupations may be associated with job related stress, socioeconomic status, and other factors" (p. 238).

The overall purpose of this study was to describe the experiences and meaning of smoking within a sample of Ontario construction workers. Understanding the contexts in which smoking takes place for construction workers can assist in creating effective interventions to motivate and aid the population in their attempts to quit smoking, cut back or remain tobacco free at work and across other settings.

Understanding the literature regarding blue-collar and construction worker populations, and the work has already been done to decrease smoking inequalities is essential in making future progress in tobacco control. Despite efforts by practitioners, researchers and policy makers to decrease smoking among all Canadians, differences in smoking rates among subpopulations continue to exist. Statistics demonstrate that the current approaches are not affecting the blue-collar or construction worker populations as they have been in other populations, meaning the

current multi-level approaches that have decreased smoking prevalence in the greater population are not having a major impact upon these subpopulations (Sorensen et al., 2004). In order to address these inequalities, new or alternative approaches should be considered as innovations beyond current practices. The following section provides the review of literature conducted as a key component of this thesis project.

2. LITERATURE REVIEW

The literature review was conducted in three stages, and consisted of a review of both peer reviewed journal articles and grey literature. The research databases used for literature searching included ProQuest, PubMed, Scopus, Ovid Databases, Web of Science and Google Scholar. Medical Subject Headings (MeSH) were used, as well as other search terms. Specific terms used during each stage are identified in the following sections. After conducting the initial literature review and successfully defending the proposal of this thesis, an additional review of the literature took place in the spring of 2013 to include the most up to date research on the following topics.

Initially, literature regarding construction and blue-collar workers was reviewed in order to characterize this group. Some of the literature reviewed for this project referred to blue-collar workers, apprentice trade workers, manual workers or building trade workers. Given that construction workers are a subset of the broader blue-collar population, failing to consult the evidence on blue-collar workers would have constrained the review of literature. Consulting this research has provided insight for better understanding construction workers and their tobacco use.

Following the review of the broader study population, it was clear that an understanding of current cessation efforts within the blue-collar and construction worker population was needed. After an understanding was gained of the population and tailored cessation interventions, literature involving the use of similar qualitative methodology was reviewed. This was not limited to research conducted in the construction worker and blue-collar populations in order to identify as many studies as possible. Three subheadings divide the literature review into these categories: Study population and their smoking behaviour; Cessation interventions tailored to

construction/blue-collar workers; Studies utilizing similar methods. Following the review, a summary and implications section outlines the research to date and the implications for this project. Sensitizing concepts are then described, and a chart of the concepts identified from the literature review is provided.

For the purpose of this thesis project, construction workers were operationally defined as a subset of the blue-collar workforce, employed in manual work that involves constructing, repairing or renovating buildings, or developing land. The eligibility criteria for participation in this study was that participants were currently employed in the construction industry, did not have administrative roles (e.g. supervisor, foreman or superintendent), were either male or female, between the ages of 18 and 64, were from any ethnic background or socioeconomic status and could take part in the interview in English. Refer to the methods section for more information about recruitment and the study sample (p.38).

2.1 Study population and their smoking behaviour

A search for literature to describe this study population was initially conducted by consulting grey literature. A Google search interchanging terms such as *construction workers, construction industry* and *construction in Ontario* was conducted to learn about characteristics of this population. Reference lists of resources were referred to in order to further investigate different sources, and find primary sources. Subsequently, smoking rates among the population were reviewed by searching both grey and peer reviewed literature; search terms used to identify these articles also retrieved many articles that document characteristics of the study population. The search terms interchanged in these various searches included: *construction worker, construction, construction occupation, labourer, manual worker, blue collar, blue-collar, blue-collar worker, tobacco, tobacco use, smoking, lung cancer, cigarette smoking,* and *smoking*

cessation. Given the broad spectrum of search terms used, the amount of results varied. Some searches yielded a number of results in the tens (e.g. 59), while other yielded results in the hundreds (e.g. 223). Some searches were limited to the past five years in order to whittle down the number of results from in the hundreds to 50 or 60 results. Articles were reviewed by either reading the abstract or entire article, to determine if the research could add to this phase of the literature review. Much of the evidence presented in this phase of the review is grey literature. The researcher's knowledge, 18 published studies were relevant to this phase of the review. These articles are described here.

Construction workers, a subset of the blue-collar workforce, form a unique and distinct group that has been identified as a high risk occupational group for smoking (Sorensen et al., 2007; Ham et al., 2011). The construction sector is defined as "primarily engaged in constructing, repairing and renovating buildings and engineering works, and in subdividing and developing land" (Industry Canada, 2011, *Definition)*. "Ontario's diverse and complex construction industry is made up of a number of primary sectors, each with subsectors" including: asbestos operations; industrial, commercial and institutional; residential; roads; underground; utilities; window cleaning; and other construction (Ministry of Labour, 2011). The construction industry is characterized by multiple employers, multiple union worksites that are constantly changing, and unionized and non-unionized workers of various skill and training (Ministry of Labour, 2011). Canada's Construction Sector Council defined the average age of a construction worker as 41 years of age in 2009, making the average age of this occupational group well over the young adult threshold. An analysis of the young adult (ages 20-34) workforce in Ontario by Stich and Garcia (2011) reported that only 6.6% of the young adult workforce was employed in the construction industry.

Rates of tobacco use among construction workers are staggeringly high. In 2011, Statistics Canada identified that construction workers had the highest smoking prevalence by industry, at 34% of all workers (as cited in The Conference Board of Canada, 2013). Smoking rates among the broader blue-collar population are also very high. The 2005 Canadian Tobacco Use Monitoring Survey identified a 32% prevalence of smoking among blue-collar workers in Ontario, while the white-collar prevalence was 12% (as cited in Minian, 2008).

Construction workers form a unique subpopulation of the blue-collar workforce, and studies related to characterizing factors of this occupational group have identified trends in smoking. Chin and colleagues (2012) found union commitment (assessed using a likert scale and statements such as "I am proud to tell others that I am a union apprentice" p. 431) to be significantly associated with current smoking after adjusting for confounders, and concluded a worker with a more positive view of their union was more likely to be a current smoker. Job insecurity and non-permanent work contracts have been found to be associated with current smoking after controlling for confounders (Peretti-Watel, Constance, Seror & Beck 2009), and construction workers are frequently changing employers and worksites (Ham et al., 2011).

Ham and colleagues (2011) have highlighted the role of cultural norms in influencing differences in smoking rates among occupational groups. High smoking prevalence in construction workers was attributed, at least partially, to workplace culture including aspects such as a lack of smoke-free workplace policies, pace of work, and the scattered nature of construction work (i.e. constantly changing worksites) (Ham et al., 2011). A well cited study that sought to understand occupational and worksite norms regarding smoking cessation in blue-collar and white-collar workers reported that worksites form a distinct sense of community, with different social norms and attitudes towards smoking cessation than other worksites (Sorensen,

Pechacek & Pallonen, 1986). More recently, Carlan, Bigelow, Wells, Garritano and Vi (2012) note that complex networks are operating in the dynamic context of the construction industry, and describe characteristics such as hiring practices, multiple employers, and supervisor-worker relationships to be unique to the industry and in contrast to traditional industries or work organizations. Bang and Kim (2001) suggest it is important to "investigate why smoking prevalence is high among these groups of workers" and state "high smoking prevalence in these occupations may be associated with job related stress, socioeconomic status, and other factors" (p. 238).

In order to understand if characteristics specific to construction and blue-collar occupations were responsible for high rates of tobacco use, Fujishiro and colleagues (2012) investigated the association between various tobacco measures and occupation, while controlling for education and income. The authors describe that the current literature is unclear on whether the high prevalence of smoking in blue-collar occupations is attributable to income and education, or if occupation specific characteristics increase tobacco exposure (Fujishiro et al., 2012). While the authors found that most occupational differences in current smoking status could be explained by income and education, there were two important findings: (1) independent of income and education, male blue-collar workers had higher odds of being a heavy smoker than professionals and managers; and (2) blue-collar workers were significantly more likely to be exposed to environmental tobacco smoke (ETS) than other occupational groups (Fujishiro et al., 2012). The authors state that the findings suggest "a vicious cycle by which workplace characteristics associated with blue-collar jobs are related to more smoking, which in turn not only increases ETS exposure but also reinforces even greater smoking among workers" (Fujishiro et al., 2012, p.143).

While research to date involving blue-collar and construction workers has shed light on specific characteristics related to smoking in these populations, the health impacts of smoking among these populations have also been identified. Ham and colleagues (2011) analyzed 15 years of national data from the United States and concluded that compared to white-collar workers, blue-collar workers are at a higher risk for ever smoking, current smoking and persistent smoking. Of these blue-collar workers, construction workers were most likely to be current daily smokers (Ham et al., 2011). Calvert and colleagues (2012) analyzed 19 years of lung cancer cases from a California registry and found construction workers to have a significantly elevated risk of lung cancer, though findings couldn't be adjusted for smoking status. Claessen, Arndt, Drath and Brenner (2010) found in an occupational cohort of close to 15,000 construction workers that smoking was clearly associated with increased risk of occupational disability, regardless of cause or age. Dong, Wang, Daw and Ringen (2011) found in a ten year follow up study conducted in the United States that after controlling for confounders, construction workers had increased odds of chronic lung disease, as well as arthritis, back problems, work disability and work related injuries when compared to white-collar workers, though the authors used self-reported health status. These persistent inequalities in smoking rates among construction workers identify the need to further investigate factors that may be hindering cessation efforts.

Disparities identified in the literature provide confirmation that much is yet to be understood related to the construction/blue-collar worker population and their smoking. However, traditional methods of inquiry (i.e. hypothetical deductive analytical studies) may not delve deep enough into the complexities and dynamics of this population. Carlan and colleagues

(2012) describe that each "organization of construction work" (p. 224) differs, and these difference should be understood in order to improve the uptake of health and safety innovations.

It is important to understand and address factors that may contribute to construction worker's smoking other than those related to the workplace, as individuals experience various social situations and influences throughout each day. For daily smokers, tobacco use remains present across many social experiences. Rüge and colleagues (2008) examined the relationship between partner's smoking status and intention to quit smoking in a sample of patients from a general medical practice. The authors concluded that living with a non-smoking partner was associated with having a higher intention to quit smoking or cut back (Rüge et al., 2008). The authors also investigated intention to quit or cut back as a mediating mechanism in the quitting process, and suggest interventions should be designed to address the different needs of smokers (e.g. smokers with a smoking partner versus smokers with a non-smoking partner) (Rüge et al., 2008).

Barbeau and colleagues (2004a) note the importance of tailoring programming within and across different priority groups (e.g. blue-collar and racial minority groups), as tobacco control efforts aimed at low income populations are not likely to reach blue-collar populations belonging to different ethnic groups. Barbeau and colleagues (2006) note that some existing tobacco control efforts targeted to low income groups will not reach much of the blue-collar population who are smokers, as many of the household incomes of this group exceed poverty levels (in the case of their study by greater than 300% of the United States Federal poverty level). This evidence is supported by findings from Bondy and Bercovitz (2011), who qualitatively analyzed data from an online forum in order to understand smoking-related perspectives in the residential

construction sector. The study sample had an average annual income of US $126,000 (Bondy & Bercovitz, 2011).

The influence of macro level factors on tobacco use among construction workers has also been investigated. A study from the United States assessed the influence of the economy, cigarette prices and antismoking sentiment on construction workers, and described how the smoking habits of construction workers are different from others in the population (Okechukwu, Bacic, Cheng & Catalano, 2012). The authors found a non-linear significant association between their measures of the economy and average cigarettes smoked per day in the study population. The authors also found that the association became inversed as the economy performed better than expected, meaning as the economy performed better, cigarette consumption declined (Okechukwu et al., 2012). Several reasons for this decrease in smoking were suggested, such as the reduction in use of smoking for stress relief (Okechukwu et al., 2012). Interestingly, the authors also found that cigarette price was not associated with smoking status or amount of cigarettes smoked among construction workers (Okechukwu et al., 2012). While various studies have been conducted to assist in "understanding, and therefore combating, the high prevalence of smoking among construction workers" (Okechukwu et al., 2012, p. 1385), continued research is needed to further understand this dynamic population.

The first study to investigate the potential influence of partner's smoking status on cessation in blue-collar workers sought to describe smoking prevalence of coworkers and partners. The authors aimed to contextualize the social environment in which blue-collar workers attempt to quit by quantitatively analyzing data from MassBUILT, a longitudinal cessation intervention study (Okechukwu, Nguyen & Hickman 2010). Okechukwu and colleagues (2010) concluded there is a high prevalence of smoking among individuals in the work and home social

contexts of blue-collar apprentices (e.g. partners and friends). Further, the authors concluded that partner's smoking status is highly associated with smoking and smoking cessation in blue-collar apprentices (Okechukwu, Nguyen & Hickman 2010). Okechukwu, Dutra, Bacic, Ayagi and Emmons (2013) further investigated the combined influence of work and home variables on smoking in a blue-collar population. The authors investigated the influence of home smoking status (rules or restrictions about smoking in the home), presence of a child under five in the home, and workplace smoking policy on smoking status. Okechukwu and colleagues (2013) found that a home smoking ban (no smoking inside the home) and partner's smoking predicted smoking status in participants, but presence of a child under five and workplace smoking policy did not predict smoking. However, these data do not speak directly to construction worker's social environment outside of the construction site. Refer to the third section of this review for a description of literature that has attempted to understand these social contexts.

Strong evidence also exists in the literature that supports the double burden construction workers experience related to tobacco use, referring to the compounding effects of their smoking status and the exposure to workplace hazards. Sorensen and colleagues (1996a) surveyed craftspersons and labourers and found, after controlling for gender, that participants reporting workplace exposure to chemical hazards were significantly more likely to be a smoker than those not reporting workplace exposures. Barbeau and colleagues (2006) suggests this dual threat provides evidence for promoting cessation in the context of creating healthier work environment. Chin and colleagues (2012) found increased current smoking among building trade workers to be associated with exposure to chemicals and dust. Combining health promotion and health protection approaches in cessation interventions for construction and blue-collar worker population has been documented well in the literature, and will be discussed below.

2.2 Cessation interventions tailored to construction/blue-collar workers

A search for studies regarding cessation interventions tailored to the construction and blue-collar worker population was conducted using two or three different search keywords at a time. The first term used in all searches was a population descriptor, and terms such as *construction, construction worker, construction industry, blue collar, blue-collar, blue-collar workers, manual,* and *manual worker* were interchanged. The second search term was a describer of cessation services such as *worksite health promotion, tailored interventions, cessation interventions* and *smoking cessation interventions*. A third search term was occasionally used to acquire articles regarding tobacco use, and included *smoking, tobacco use, cigarette smoking* or *smoking cessation*. The various searches conducted for this phase of the literature review yielded a varying number of results, and some of these searches yielded more than 500. The researcher skimmed titles of the search results to determine which studies were relevant to the review of literature. In many cases, the abstract or entire article was read to determine if the research could add to the review of literature presented here. Many of the searches conducted were limited to the past five years. To the researcher's knowledge, 31 studies were relevant to this phase of the review, and they are described here.

Given persistent high smoking rates in blue-collar and construction worker populations, intervention research to combat these health inequalities has been conducted specific to this population. Early work in this area identified relationships between exposure to occupational hazards and smoking (Sterling & Weinkam, 1990) and investigated the potential impact of incorporating health protection and health promotion into interventions (Walsh, Jennings, Mangione & Merrigan, 1991). Researchers described promoting cessation through worksites in the Community Intervention Trial for Smoking Cessation (COMMIT), and called for increased

levels of cessation activities and policies in workplaces (Sorensen et al., 1995; Glasgow et al., 1996). Sorensen and colleagues also described the *double jeopardy* often faced by blue-collar workers due to hazardous workplace exposures and high smoking prevalence (Sorensen et al., 1996a). One of the largest worksite trials in the United States attempted to impact cessation and other health behaviours in a multi-level approach (The Working Well Trial).

The Working Well Trial, involving 111 worksites of various occupational groups, used a multi-level approach that aimed to modify health behaviours at the individual level, and modify social norms and the physical environment at a broader worksite level (Abrams, Boutwell, Grizzle, Heimendinger, Sorensen & Varnes, 1994). The intervention did not produce any significant differences in smoking outcomes between the intervention and control sites (Sorensen et al., 1996b). Sorensen and colleagues stated effective worksite cessation interventions may be possible, however determining how to best intervene to promote cessation is still a challenge (Sorensen et al., 1996b).

The first randomized controlled workplace intervention to integrate health promotion and health protection efforts, The WellWorks Study described in a 1998 publication by Sorensen and colleagues, found no significant effects on smoking cessation. The study did however produce smoking abstinence rates in blue-collar workers belonging to the intervention group that compared to rates in professional and managerial workers (i.e. white-collar) (Sorensen et al., 1998).

Using data from the Working Well Trial, Sorensen and colleagues (2002a) examined the occupational differences in social influences supporting quitting smoking, and how social influence relates to self-efficacy to quit and intention to quit. When compared to the occupational categories ‘technical or clerical and managerial’, blue-collar workers described significantly less

pressure to quit smoking, and less social support to quit (Sorensen et al., 2002a). Results from the study also suggested that blue-collar workers are more likely to experience social influences that discourage quitting and support smoking, when compared to the other occupational groups (Sorensen et al., 2002b). The authors also found that "social pressure to quit and social support for quitting were significantly associated with both intention and self-efficacy to quit" (Sorensen et al., 2002a, p.141). The authors suggest that creating coworker support for quitting smoking might be of vital importance in blue-collar workers, and intervention effectiveness (policies, programs etc.) may be enhanced through creating positive social support for eliminating tobacco use (Sorensen et al., 2002a).

Building on previous work, Sorensen and colleagues (2002b) published the results of an integrated health promotion-occupational health and safety intervention aimed at increasing cessation in blue-collar (manufacturing) workers. The WellWorks-2 study used a randomized controlled design to assign 15 worksites to an integrated intervention or a health promotion intervention only. The authors found that six months smoking abstinence rates among workers assigned to the comprehensive intervention were more than double the abstinence rates of workers assigned to the health promotion only intervention (Sorensen et al., 2002b). This was the first workplace cessation intervention to produce quit rates in blue-collar workers that were comparable to rates in white-collar workers. A process evaluation of the WellWorks-2 study indicated that despite a similar amount of activities being offered in both conditions, the integrated intervention had higher levels of participation among workers using three different measures (Hunt et al., 2005). Sorensen and colleagues (2002b) stated workplace interventions failing to address occupational hazards are missing significant sources of health related problems and costs for workers and employers.

Following the WellWorks-2 success, Sorensen and colleagues published an article describing the *social contextual model* to reduce tobacco use in blue-collar workers. The authors describe how occupational smoking disparities "reflect larger structural forces that shape the social context of peoples' lives", and that current multi-level approaches effective in decreasing smoking prevalence in the greater population are not working in subpopulations (Sorensen et al., 2004, p. 230). Sorensen and colleagues states it is necessary for interventions to respond to peoples' social contextual and day to day realities, and it is imperative to understand and address patterns of social circumstance; qualitative research was advocated for in order to understand the meaning of health behaviours (Sorensen et al., 2004).The social contextual model provides modifying conditions and mediating mechanisms that can assist in framing an intervention to address otherwise untargeted aspects of social context (Sorensen et al., 2004). In this instance, the effect of integrating occupational hazards into workplace interventions as a mechanism to enhance cessation was investigated (Sorensen at el., 2004). Sorensen and colleagues state the greatest promise for preventing cancer rests in effective interventions that encourage people to change multiple and interrelated high risk behaviours, which are "disproportionately concentrated in lower socioeconomic status groups…" (Sorensen et al., 2004, p. 193). Since the publication of the social contextual model, several evaluations of interventions utilizing the framework have been published (e.g. Barbeau et al., 2006; Okechukwu et al., 2009; Sorensen et al., 2007; Sorensen et al., 2010; Quintiliani et al., 2012).

Much research related to interventions tailored to this population have identified the integration of health promotion and health protection as necessary and holding great promise, given the evidence of smoking and occupational hazards as being positively related (Barbeau et al., 2004b; Barbeau et al., 2006; Sorensen, 2004; Chin, 2012). The integration could be related to

other factors, such as workers having an increased desire to quit smoking when they are exposed to on the job hazards, compared to non-exposed smokers (Sorensen et al., 1996a). The integration could also be related to employees having a disinterest in participating in cessation programs when occupational exposures are not being addressed (Barbeau et al., 2004b). Integrating health promotion and protection interventions is a more holistic approach to creating an environment that is supportive of overall worker health (Sorensen, 1998; Barbeau et al., 2004a; Sorensen & Barbeau, 2006). Regardless of the health benefits, a "reduction in smoking may lead to economic benefits in terms of reduced absenteeism and increased productivity" (Cahill, Moher & Lancaster, 2008, p. 16). Further, "health plans need to consider whether they are at risk of violating their fiduciary duties if they fail to offer smoking cessation benefits" (Ringen, Anderson, McAfee, Zbikowski & Fales, 2002, p. 367).

Barbeau and colleagues (2006) published the results of a pilot test of MassBUILT, a union based cessation intervention for apprentice iron workers. The intervention utilized previous work of the BUILT project (Building Trades United to Ignite Less Tobacco project), a collaboration among the State Building and Construction Trades Council of California and University of California Berkeley. MassBUILT was based on the social contextual model and addressed occupational health and safety hazard concerns with smoking cessation interventions; the pre-post design included one intervention site and no control group (Barbeau et al., 2006). The authors observed a 41 per cent baseline smoking prevalence and a 19.4 per cent quit rate after the intervention (Barbeau et al., 2006). The effectiveness of this intervention was published by Okechukwu, Krieger, Sorensen and Barbeau in 2009, who described significant differences in quit rates between the intervention group compared to control at one month follow up, but no significant differences in quit rates at six month follow up. Significant decreases in smoking

intensity (number of cigarettes smoked per day) were observed in the intervention group at six month follow up, compared to the control group (Okechukwu et al., 2009).

Sorensen and colleagues (2007) published an evaluation of a telephone and mail delivered cessation intervention for construction labourers based on the social contextual model. The study involved collaboration with an international labour union, allowing for engagement of workers who may have restricted access to worksite health promotion programs (Sorensen et al., 2007). This intervention was tailored to the needs of the participants and targeted to specific social contexts and occupational hazards of a construction workplace (Sorensen et al., 2007). The authors found at six month follow-up that 19 per cent of baseline smokers in the intervention group had seven day abstinence from smoking, while only eight per cent of the control group reported seven day abstinence (Sorensen et al., 2007). The intervention was adapted and tailored to motor freight workers, for the Gear Up for Health Study which was described by Sorensen and colleagues in 2010. Gear Up for Health resulted in an adjusted quit rate of 23.9 per cent for participants, versus only a 9.1 per cent rate for non-participants (Sorensen et al., 2010). Gear Up for Health was then adapted, resulting in a cessation program for unionized workers and their dependents, which was evaluated and published by Quintiliani and colleagues in 2012. The authors found this intervention to produce a quit rate of 30.9 per cent at six month follow up for intervention participants, but did not use a control group for the study (Quintiliani et al., 2012). The ability to adapt the social contextual model to various blue-collar groups and continue to produce statistically significant and higher quit rates than those in control populations identifies the potential success of this model in future cessation interventions. Two key factors related to the social contextual model were used during the data collection phase of this project as sensitizing concepts (dual threat or occupational hazards and tobacco use; integrating health

promotion and protection). This model was also used during the final phase of data analysis. Refer to section 5.2.6 regarding limited theory development for further discussion of the social contextual model as it related to this project (p.120).

Other studies have produced significant findings when testing interventions not based upon the social contextual model. For example, Ringen and colleagues (2002) designed an intervention for Taft Hartley Funds, who provide group health care coverage to union workers and their partners in the United States. The intervention included 1-call or 5-call, over the phone, cessation counseling sessions and nicotine replacement therapy (Ringen et al., 2002). The authors state the study was not designed to be a controlled experiment, however they did find a self-reported twelve month overall point prevalence quit rate at 27.5 per cent (Ringen et al., 2002). This evaluation was most likely conducted as a means of providing evidence for Taft Hartley Funds regarding feasibility and investment potential, given other measures reported such as return on investment and various cost breakdowns.

Groeneveld and colleagues (2011) used a randomized controlled trial to evaluate the effects of a six month lifestyle intervention for construction workers at risk for cardiovascular disease. The intervention included individual counseling using motivational interviewing and information about nicotine replacement therapy (Groeneveld et al., 2011). At six month follow up 31 per cent of participants in the intervention group had quit smoking, while only 13.4 per cent of the control group had, although the effect was not sustained at the twelve month follow up (Groeneveld et al., 2011). The intervention was found to be more effective in participants over 45 years of age at both six and twelve month follow-up (Groeneveld et al., 2011). The authors concluded from the study that "it is vital to find out the determinants of *maintenance* of 'new' lifestyle behaviour" [italics in original source] (Groeneveld et al., 2011, p. 842).

To assess the progress that has been made at the general population level through intervention to increases cessation, Zhu and colleagues (2012) reviewed the literature from the last two decades. The authors use US national data from 1991-2010 which shows no increase in the population cessation rate, and discuss different explanations for this such as issues with reach or effectiveness of the interventions (Zhu et al., 2012). The authors state the lack of progress in population cessation suggests a need for studies to specifically assess intervention effectiveness on a population level (Zhu et al., 2012). The authors also state that by focusing on interventions that will improve the odds of a smoker succeeding at quitting, "the field of cessation has … neglected to investigate how to get more smokers to try to quit and to try more frequently" (Zhu et al., 2012, p.116). The concept of impact being equated to effectiveness multiplied by reach (i.e. impact = effectiveness x reach) is critically examined, and the authors conclude that increasing reach to effective interventions may not necessarily be sufficient (Zhu et al., 2012).

Despite continued efforts to reduce smoking in the blue-collar and construction worker population through developing and testing tailored interventions, availability of such interventions may be further hindering these efforts. A consistently cited investigation of factors such as availability of workplace health programs found operatives, labourers and craftsmen to usually have the lowest availability of worksite health programs (Grosch, Alterman, Peterson &Murphy, 1998). Interestingly, participation in workplace programs was relatively high when programs were made available to these occupational groups (Grosch, Alterman, Peterson, Murphy, 1998). Other studies, however, have described the relatively low level of participation in workplace interventions by blue-collar/construction workers (Sorensen et al., 1996a; Sorensen et al., 2010; Barbeau et al., 2006). Collaborations between researchers and unions have provided

opportunities for better reach and increased participation in interventions (Barbeau et al., 2001; Barbeau et al., 2007).

Given specific characteristics of construction occupations (e.g. scattered worksites, insecure or temporary contracts), traditional workplace health promotion programs may be inaccessible or infeasible (Ham et al., 2011; Sorensen et al., 2007; Sorensen et al., 2010; Okechukwu et al., 2009). Studies have utilized non-traditional methods such as telephone delivered interventions to reach this population (Ringen et al., 2002; Sorensen et al., 2007; Sorensen et al., 2010). The relatively small size of construction worksites may also have unknown consequences on the effectiveness of workplace interventions. Sorensen and colleagues (2005) investigated a small-business worksite intervention among working class, multi-ethnic populations and were able to produce greater improvements in various outcomes among the intervention group than in the control group. Tiede and colleagues (2007) conducted an exploratory study to investigate the feasibility of promoting smoking cessation in small blue-collar worksites. The authors found both employers and smokers believed it is desirable and appropriate for employers to promote cessation resources to employees who wanted to quit. However, this study only had a 35 per cent participation rate, and could represent only those views of employers more receptive to cessation interventions in the workplace (Tiede et al., 2007).

Researchers are continuing to investigate the construction and blue-collar worker population, and effective ways of understanding and reaching this population. Other exploratory studies have attempted to understand perceptions, meaning or the quitting experience for smokers. A review of current literature attempting to answer comparable research questions as

those that were proposed in this project, or studies using similar methods will be described in the subsequent section.

2.3 Studies utilizing similar methods

A search for studies using similar methods was conducted using search terms such as *qualitative methods*, *qualitative research methods*, *qualitative research*, and *mixed methods* while interchanging the population descriptors and tobacco use key words already mentioned. No published studies were identified that have attempted to answer the proposed research questions in this study's population, however three articles were identified that present relevant evidence (Katainen, 2011; Bondy & Bercovitz, 2013; Sherriff & Coleman, 2012). These studies will be briefly reviewed, but discussed in more depth in relation to this project throughout the discussion session.

A recent study published by a Finnish researcher resembles the methods used in this project. Katainen (2011) interviewed 19 manual (construction and warehouse) workers to understand the meaning of smoking in working-class contexts and how it is attached to the social setting and daily routines of this sampled population. From a pragmatist viewpoint, Katainen (2011) described that behind every action is a habit, and a social environment in which smoking is common may facilitate its continuation and negate reflecting on the habit. It was found that smoking was enforced by the benefits it provided, made socializing easier and increased worker's sense of belonging (Katainen, 2011). Bondy and Bercovitz (2013) qualitatively analyzed text from online residential construction discussion forums in order to identify motivators or aids to assist workers when quitting smoking, and to describe experiences with cessation supports. Smokers described little social value in smoking and peer support for quitting was apparent; advice was given by discussants to avoid smokers (Bondy & Bercovitz, 2013).

Sherriff and Coleman (2012) conducted semi-structured focus groups with 23 employees from construction sites and seven individual interviews with employers of routine/manual workers in the United Kingdom to gain insights into beliefs, behaviours and cessation needs of the population in order to inform interventions. The authors describe the "'hard-to-reach' sample, given their transient and often unsociable working hours, short-term contract arrangements and minimal spare time to participate in research" (p.126). Diverse strategies were used to recruit participants. Results indicated that the unique environment of construction sites (e.g. the social norms) likely contribute to smoking among construction workers (Sherriff & Coleman, 2012). Other motivators for continued smoking include physical effects, habit and routine, opportunity, and social factors (Sherriff & Coleman, 2012). Refer to the discussion for more on these studies in the context of this research project.

A search for literature regarding the use of grounded theory methods related to tobacco use both in the study population and in other populations was undertaken. A search in Scopus and Web of Science with the key words *smoking* or *tobacco* or *tobacco use*, *grounded theory method* and *blue-collar* or *blue collar* or *working class* consistently returned no results. However when searching without the population descriptors (e.g. blue-collar), 37 articles from the past five years resulted. Of these studies, most involved populations such as health care providers, individuals affected by chronic or mental illness, young adults, or women. Eight studies were found that have attempted to understand aspects such as the contexts, perceptions, experiences or meaning of smoking. While not all took place in a blue-collar or construction worker population, these articles provide valuable insights into the smoking experience and the use of grounded theory method when exploring this research area.

Katainen (2010) attempted to examine differences in meaning of smoking in various work contexts by interviewing 55 non-manual and manual workers. The author refers to work by Bourdieu (1977, 1984) and Williams (1995), who claim the habits of individuals that we call health behaviours are not necessarily considered health related in everyday life, and more likely to be governed by routines, cultural patterns, and social practices than by conscious efforts to improve one's health (Katainen, 2010). The main difference found between manual and non-manual workers was the ways smokers accounted for their smoking: non-manual workers were more positive about their smoking and justified it with different arguments and contemplated the negative and positive aspects, while manual workers implied the self-evident nature of smoking in their everyday lives, especially the workplace (Katainen, 2010). The author makes an important point regarding health related qualitative inquiry, describing participants eagerness to emphasize good health intentions and hide pleasurable or irrational aspects of daily choices (Katainen, 2010). This point was taken into account during the data collection phase as participants could have hid certain aspects related to their health behaviours that would of limited study findings (to try to avoid this, participants were reminded that the investigator had no expectations of them during the interview, and was only looking for honest thoughts and opinions). The potential of a social desirability bias is addressed in the discussion section (p.156).

Another study to investigate alternative aspects of blue-collar smoking was an exploration of the circumstances that influence perceptions of health promotion, disease prevention and cancer risk reduction by Goldman and colleagues (2008). The study involved 37 interviews with individuals from working class occupations or neighborhoods (Goldman et al., 2008). The social contextual framework (Sorensen et al., 2004) was used as a guide for the

authors to further understand factors that may impact health behaviour and capacity to change (Goldman et al., 2008). The immersion/crystallization method of analysis according to Borkan (1999) was used to identify themes. This method is described as an organizing style in which the researcher repeats cycles of delving into and experiencing the data, followed by critical reflection, and concludes when "intuitive crystallization" or insights and interpretations emerge (Borkan, 1999, p.180). The authors concluded that health messages should be developed to consider contexts of participants' lives and keep cancer prevention as a distinct category while linking this with health promotion (Goldman et al., 2008). Participants in the study thought about health, but not specifically cancer prevention (Goldman et al., 2008). Whether these findings could be generalized to a construction worker population or not, these findings were considered when drafting the data collection tool, as wording such as 'cancer prevention' need not be used.

Thompson and colleagues (2003) investigated the psychosocial aspects of smoking and quitting among 51 heavy smokers, and found participants had both internal (e.g. emotional and addictive) and external (e.g. social environment) pressures to continue to smoke. More than 75% of participants in the study believed social pressure to smoke was too strong in their environments, and if they quit they feared losing their smoking friends (Thompson et al., 2003). Social aspects of smoking such as taking breaks at work were reinforcing pre behavior (Thompson et al., 2003). Almost 90 per cent of participants saw smoking as 'their friend' and worried what would take its place (Thompson et al., 2003). This study identified key factors supporting continued smoking, such as perceived difficulty in quitting, physical and psychological addictions to smoking, reinforcing factors for smoking and tendency to procrastinate quit attempts (Thompson et al., 2003).

In the literature search, two studies were found that attempted to further understand the contexts and experiences of smokers, though both were in general populations. One sought to describe the experiences of individuals attempting to quit and involved ten semi-structured interviews with participants of various demographics (Bott, Cobb, Scheibmeir & O`Connell, 1997). The authors aimed to identify the language used by those attempting to quit when describing coping strategies dealing with urges to smoke (Bott et al., 1997). Five key themes were identified, which included the personification of the cigarette and replacing an old habit with a new one (Bott et al., 1997). This theme of replacing a habit also emerged in Thompson and colleagues (2003).

Laurier and colleagues (2000) investigated the everyday contexts of smoking through 54 semi-structured interviews with participants of various backgrounds. The authors found enjoyment from a cigarette can be derived from satisfying a physiological craving or from embodying a context (Laurier, McKie & Goodwin, 2000). Moreover, cigarettes for regular smokers create familiarity, comfort, enjoyment, as well as relaxation when smoked on work breaks or during difficult tasks (Laurier, McKie & Goodwin, 2000). The authors argue that in situations of socialization or work stress, the benefits of smoking are more obvious than the health benefits of quitting (Laurier, McKie & Goodwin, 2000). While this research is dated, no comparable work has been published within the past five years.

Three other studies were identified in the review of literature that used a grounded theory approach to investigate the experience or process of making a quit attempt. Roddy and colleagues (2006) conducted focus groups with smokers from the most socioeconomically deprived areas in Nottingham, United Kingdom who had made an unsuccessful quit attempt in the past year in order to identify barriers or motivators to gaining access to cessation services.

The authors conducted semi-structured discussions on a range of topics (e.g. experience of quitting, smoking behaviour) and continued to collect data while analyzing results to refine the topic guide according to the emerging themes (Roddy et al., 2006). Barriers to using cessation services were related to fear of failure or being judged, or perceived lack of knowledge regarding cessation services or aids; participants felt marginalized and that their nicotine addiction "was not taken as seriously as addiction to heroin or alcohol" (Roddy et al., 2006, para.9). The authors conclude unmet needs identified by the participants (e.g. limited cessations services) were likely more widely applicable in other settings as well (Roddy et al., 2006).

McVea, Miller, Creswell, McEntarrfer and Coleman (2009) conducted semi-structured interviews with adolescent smokers and analyzed the transcripts using grounded theory procedures to develop a model of how youth experience attempts at smoking cessation. The authors explored participants' experiences with making a quit attempt through four to six individual interviews with 15 participants (McVea et al., 2009). Analysis using a grounded theory approach (open coding, axial coding, constructing matrices, selective coding) was conducted, and a preliminary theory of the phenomenon was developed (McVea et al., 2009). The authors found emotionally compelling and hard to ignore reasons to quit were highly motivating, but describe that further research is needed to test this model (McVea et al., 2009).

Lundh, Hylander and Törnkvist (2012) used grounded theory method to develop a theoretical model that describes the perspective of patients who have difficulty quitting smoking after being diagnosed with chronic obstructive pulmonary disease. Fourteen semi-structured interviews were conducted face to face with patients throughout Stockholm County in Sweden, and data was analyzed by one researcher on three coding levels (open, theoretical and selective) (Lundh, Hylander & Törnkvist, 2012). Throughout analysis, data was constantly compared with

another author and four additional interviews were conducted to ensure relevancy of the emerging theory (Lundh, Hylander & Törnkvist, 2012). The authors describe next steps including clinically testing the model with an instrument developed based on the model's categories, and adjusting the model for other ailments such as depression, anxiety and alcohol use (Lundh, Hylander & Törnkvist, 2012).

These three studies, while not conducted in blue-collar or construction worker populations, provide insights for using the grounded theory method to explore experiences and perspectives of individuals grappling with smoking cessation. Many of the studies included in this section of the literature review incorporated features of qualitative and grounded theory methods that were also used throughout this research project (e.g. semi-structured data collection tool, sample size, coding procedures). Reviewing and understanding this current body of evidence informed the subsequent phases of this research project. The research also assisted in providing an increased understanding of that which is still to be understood regarding tobacco use among construction workers, and how to best assist the population during attempts to become smoke free.

2.4 Summary and implications

This threefold review of literature addressed issues related to the study population, targeted interventions and comparable methodologies. Many trends emerged. It is evident that this study population is dynamic and complex related to both demographics and smoking status. Current approaches to cessation are not reaching this group, and more than work contexts need to be addressed when aiding in cessation attempts. Much evidence regarding the double burden of workplace hazards and smoking have supported integrating health promotion and protection interventions to aid the study population. Alternative approaches to cessation through telephone

delivery methods or integrated interventions for union members could be a potential way to reach this unique group.

Qualitative studies have identified that various social aspects affect the smoking behaviour of the study population, and social benefits are feared to be lost through quitting. Smokers also feared how they would replace smoking, or what smoking could be replaced with. Studies that utilized comparable methodologies in other populations identified key insights that were taken into consideration during the later stages of this research project, specifically the data gathering and analysis phases. The integration of previous research was especially important during the development of sensitizing concepts. These concepts are discussed below.

2.5 Sensitizing concepts

Sensitizing concepts were first described by Blumer in 1954 as the opposite of a definitive concept; they give a general sense of reference or guidance in research analysis. Charmaz (2003) described sensitizing concepts as a way of organizing and deepening our perceptions, but only in order to provide a possible beginning for analysis, not an ending point for avoiding it. Inductive research has been approached by many researchers who have purposely refrained from reviewed relevant literature in order to remain uninfluenced by current theories or what is already known about a subject or population (Glaser & Strauss, 1999). This approach is generally seen as unrealistic and no longer broadly supported (Bazeley, 2007). In order to assist in data collection and analysis for this research project, several sensitizing concepts were identified through the review of literature (Blumer, 1954; Charmaz, 2006).

An important concept that provided reference during data gathering and analysis was the social contextual model described by Sorensen, Barbeau, Hunt and Emmons (2004). This model allows for understanding how population characteristics, specifically occupation, can influence

smoking behaviours by identifying social contextual factors that may function as modifying conditions or mediating mechanisms (Sorensen et al., 2004). Much work (e.g. Barbeau et al., 2006; Sorensen et al., 2007; Okechukwu et al., 2009; Sorensen et al., 2010) has been documented in the literature regarding the application and efficacy of the social contextual model for developing tailored cessation interventions for blue-collar workers, including construction workers. The model organizes social contextual factors into levels or categories according to the social-ecological theory (McLeroy, 1988; Stokols, 1996), which include individual factors, interpersonal factors, organizational factors, neighbourhood and community factors, and societal factors. According to the model, social contextual factors are considered modifiable conditions (Sorensen et al., 2004). However, if it is not feasible to change the social context through interventions, variables can be understood and classified as modifying mechanisms that inform and tailor interventions (Sorensen et al., 2004).

The social contextual model and other concepts identified throughout the literature review were used during the data collection phase as sensitizing concepts. Questions within the interview guide probed on the concepts, and the sensitizing concepts were reviewed at the end of the interview to ensure all concepts had been discussed. The sensitizing concepts were also referred back to during data analysis (Phase 2.3: Review of emerging categories in comparison to sensitizing concepts and research rationale).

The following table provides a detailed description of the sensitizing concepts identified from the literature review. These concepts are divided according to the three phases of the literature review. Concepts are also identified according to their potential levels of influence, and potential modifying conditions or mediating mechanisms are identified. Examples of questions that were asked to probe on specific concepts are included in the chart.

Table 1: Summary of sensitizing concepts identified from literature review

Phase of literature review	Concept identified	Level of influence	Description	Potential modifying conditions or mediating mechanisms	References	Example interview questions probing on concept
Phase 1 – Review of study population and their smoking behaviour	Tobacco use in home life	Interpersonal factor	For regular users, tobacco is consumed across social settings. The tobacco use behaviours of construction workers (including quit attempts) may be affected by colleagues, partner and/or family smoking status	Family roles, social norms	Okechukwu, Nguyen & Hickman, 2010	Could you describe your smoking at home? Does anyone in your home smoke?
	Non-permanent, dispersed nature of work	Organizational factor	Construction workers frequently change worksites. Worksites can consist of any range of settings (e.g. new building sites, homes, roads) that could be indoors, outdoors or mixed. Different worksites or employers may have varying policies on tobacco use	Organizational support for smoking cessation, tobacco free workplace policies	Peretti-Watel, Constance, Seror & Beck, 2009; Ham et al., 2011	Do you work mostly inside, outside or both? How often do you change job sites? Tell me about your last three job sites.

Phase of literature review	Concept identified	Level of influence	Description	Potential modifying conditions or mediating mechanisms	References	Example interview questions probing on concept
Phase 2 – Review of tailored interventions	Dual threat or occupational hazards and tobacco use	Organizational factor	Negative effects of occupational hazards could be compounded by a construction worker's smoking status. Higher smoking rates could be associated with exposure to occupational hazards. Construction workers may be more interested in quitting if they are also exposed to occupational hazards	Hazardous workplace exposure	Sorensen et al., 1996a; Barbeau et al., 2006; Chin et al., 2012	What are your biggest risks at work? What hazards are you exposed to? Do your smoking habits change around hazards? If so, How?
	Integrating health promotion and protection	Organizational factor	Integrating health promotion and protection into interventions is a holistic approach to promoting worker health. Construction workers may not be as interested in cessation interventions if occupational hazards are not being addressed. Integrating health protection is a mechanism to enhance cessation interventions.	Organizational support for smoking cessation	Sorensen et al., 2004; Barbeau et al., 2006; Okechukwu et al., 2009; Sorensen et al., 2007; Sorensen et al., 2010; Quintiliani et al., 2012	Have you had any health and safety training that dealt with smoking at work? Does your workplace offer help for someone who wants to quit smoking or cut back?

Phase of literature review	Concept identified	Level of influence	Description	Potential modifying conditions or mediating mechanisms	References	Example interview questions probing on concept
Phase 3 – Review of studies utilizing similar methods	Sociability of smoking	Intrapersonal factor, Interpersonal factor, Organizational factor	The social environment on or near construction sites may affect tobacco use. Smoking may impact a construction worker's sense of belonging, or bring ease to socializing on a worksite (as a shared practice). Tobacco use may be a routine social practice on a construction site, and workers could be socially pressured to smoke	Social norms	Katainen, 2010; Katainen, 2011; Laurier, McKie & Goodwin, 2000	Do you think smoking is a social experience at work? Who else do you smoke with outside of work?
	Fear of a loss	Intrapersonal factor	Construction workers could view quitting as a loss, and worry what could take its place. Workers could want to replace smoking with a new behaviour. Tobacco users may fear a loss of their smoking friends	Daily stressor	Bott, Cobb, Scheibmeir & O`Connell, 1997; Thompson et al., 2003	How would work be different if you didn't smoke? If you were to quit/cut back, what might worry you?
	Tobacco use provides structure	Intrapersonal factor, Interpersonal factor, Organizational factor	Tobacco use may provide structure to daily routine through established smoking breaks. Tobacco use could serve as a way to legitimize a break, and be a means of relaxing	Organizational support for smoking cessation	Katainen, 2011; Laurier, McKie & Goodwin, 2000	Do your workdays follow a schedule? How does smoking affect your work day?

3. STUDY RATIONALE

This study will describe the experiences and meaning of smoking for a small sample of construction workers in Ontario. No published or gray literature has been found that answers the identified research questions in this study population. This study's findings are anticipated to fill this gap in the literature, as persistently high smoking rates among construction workers indicate much is still to be understood regarding their tobacco use.

Despite limitations to population-wide generalizability (given the sample size), this study yields transferable lessons and several practical implications. Furthermore, the results assist in informing plans for programming, services or supports for construction workers in order to motivate or make attempts to quit. Study results provide insights for practitioners working in tobacco control, and specifically those providing cessation supports to construction workers. There are implications for future research including descriptive and analytic studies on the prevalence of various factors implicated in tobacco use in related populations, which are later discussed in the discussion section (p.169).

3.1 Research purpose

1) To document the experience of tobacco use and meaning of tobacco use among construction workers on construction sites and in other settings

2) To describe, explore and understand the individual contexts and interpersonal, organizational, community wide and societal factors influencing construction workers using tobacco on or near a job site

3.2 Research questions

1) What factors are associated with the social experience of tobacco use on a construction site?

2) What are the contextual cues, antecedents and consequences of smoking in this setting?

3) What are the main reasons and underlying mechanisms that affect tobacco use related behaviours including smoking, smokeless tobacco use and quitting tobacco use, for the study population?

4) What supports for reducing tobacco use would construction workers find helpful and/or use?

4. METHODS

4.1 Preface

The present study stemmed from both personal interest of the investigator and the work of local public health departments through demonstration grants from the Ministry of Health and Long-Term Care (MOHLTC). In 2012, eleven demonstration sites were selected and funded by the MOHLTC to implement workplace cessation initiatives aimed at reducing smoking rates in four different employment sectors: construction, mining, manufacturing and hospitality (Ontario Tobacco Research Unit, Current Cessation Projects, 2013). At the time of the proposal of this thesis, the two largest local health departments in Ontario, Ottawa and Toronto, were involved in workplace cessation interventions with construction companies, and had secured partnerships with local construction companies. In the months following the proposal of this thesis and in the time that data collection was to take place, collaboration with these two health departments became unfeasible due to circumstances out of the control of the researcher and her advisory committee (e.g. delays in MOHLTC funding, partnerships deterioration, program implementation). Several options were explored to move forward with the collaboration. However, given the timelines outlined by the School of Public Health and Health Systems for completion of the thesis requirements, collaboration was no longer an option. Several other alternatives were explored as a means of recruiting study participants, including collaboration with construction companies on campus at the University of Waterloo or approaching construction trade unions. Ultimately, recruitment took place via an online classifieds website and an online job search website. This method of recruitment is discussed in more detail in the recruitment section of this methods section.

4.2 Methodological approach

This project aimed to describe the experiences and meaning of smoking for construction workers. In order to achieve the study purpose, the grounded theory method originally developed by Glaser and Strauss (1967) was used. Grounded theory method allows for theory to be inductively developed from data that has been systematically gathered and analyzed (Glaser & Strauss, 1967). This approach allows the researcher to move beyond simply describing a phenomenon and generate various predictions and applications about the phenomenon (in this case, smoking among construction workers) (Creswell, 2013; Glaser & Strauss, 1967).

Grounded theory method was chosen because the goal of the project was to uncover experiences and meaning from participants. However, an ethnographic orientation could also have been used. An ethnographic study aims to uncover data about a cultural group, and shared patterns of belief or behaviour (Creswell, 2013). An ethnographic account of construction workers who are smokers could potentially have answered the research questions of this study by uncovering information about this population's experiences. Grounded theory method, however, allowed for answering the research questions using data from interviews with participants (i.e. their insights) in order to form and influence theory development or conclusions. Refer to the discussion section regarding ethnographic orientation for more on this (p.151).

Quantitative researchers test deduced hypotheses from existing theory, while qualitative researchers (using methodology such as grounded theory) construct new theory using inductive methods or retroduction (Charmaz, 2006). A grounded theory method allowed for data from participants to form explanations and conclusions. Several common elements of the grounded theory method were integrated into this research project. These included: purposive and maximum variation sampling, theoretical sampling, memoing, inductive analysis and coding

(Glaser & Strauss, 1967; Strauss & Corbin, 1998). The grounded theory method will also be discussed through the analyses and findings section in the context of the procedures used for this thesis.

4.3 Ethics approval

Full ethics approval was obtained from the University of Waterloo, Office of Research Ethics on March 15, 2013. An addendum to the initial ethics application was subsequently submitted to accommodate for the change in recruitment method. Full ethics clearance of these modifications was received on March 27, 2013, prior to beginning recruitment or conducting interviews for the study. Informed consent forms were completed by each study participant prior to beginning the interview, when being conducted in person. Consent forms included agreements to (a) participate in the study (b) have the interview audio recorded and (c) the use of anonymous quotations in this thesis or any publications. Participants were made aware of the option to refuse any of the preceding requests, and to not answer certain questions or end the interview at any time. In the case of interviews that were conducted over the phone, a verbal consent script was read. Anonymity was maintained by replacing names with an interview identification number. Only the researcher and advisory committee had access to the data.

4.4 Recruitment

4.4.1 Sampling

It was expected following the proposal for this thesis that a minimum twelve interviews would be conducted to allow for thematic saturation and theoretical sufficiency, meaning no new themes would be emerging (Glaser & Strauss, 1999). Traditional grounded theory method recommends a minimum of 20 interviews to allow for the development of a well saturated theory (Creswell, 2013). However, theory development was not anticipated to take place in this specific

study. Rather, saturation in the main themes (especially related to the sensitizing concepts) was anticipated as a main achievement at the end of data collection. Theoretical saturation will be discussed further regarding the methodological strengths and limitations of the study (p.146)

The present study utilized purposive and maximum variation sampling. Only construction workers were able to provide the necessary information to answer the research questions. Purposive sampling allows for deliberately selecting participants to provide data that is relevant to the study purpose and research questions (Maxwell, 2012). Maxwell (2013) describes that a goal of purposive sampling is to adequately capture the heterogeneity of the population, ensuring a range of variation in the sample and cites Guba and Lincoln (1989) who refer to this as maximum variation sampling.

Within the construction worker population, individuals with various jobs and skill levels were selected to take part, as it was decided by the investigator and advisory committee that occupation/skill levels were important and relevant dimensions of variation within the broader construction industry (Maxwell, 2013). Theoretical sampling (Glaser & Strauss, 1999) was used to include in the sample an equal number of skilled and unskilled workers. Theoretical sampling involves reflecting on the subgroups that have already been involved in data collection, and determining what other groups should be involved; this allows for including multiple comparison groups (Glaser & Strauss, 1999; Strauss & Corbin, 1998). After twelve interviews had been conducted, the sample was predominately made up of members of the construction industry who worked as unskilled workers and only five skilled tradespeople had been interviewed. While theoretical saturation of the categories had already begun to take place, it was necessary to conduct further interviews for theoretical sufficiency. In order to ensure a subsample of skilled workers was included within the broader sample, two additional interviews were conducted with

skilled construction workers. Refer to section 6.3.4 for more information on theoretical sampling (p.152).

4.4.2 Participant recruitment

Participants for this study were recruited via an online classifieds website (http://www.kijiji.ca) and an online job search website (http://www.indeed.ca). Advertisements were posted to these websites for the following locations: Guelph, Hamilton, Kitchener Area, St. Catharines, and Toronto (GTA). Advertisements posted to http://www.kijiji.ca were added to two different pages: construction & skilled trade jobs, and general labour jobs. These advertisements were re-posted to the pages after the advertisement had been up for several days, and the ad was on at least page six of the category, meaning numerous other advertisements were shown before the study advertisement. Reposting these advertisements meant the advertisement was brought back to the top of the category and on the first page. Advertisements only needed to be reposted once on http://www.indeed.ca, after the advertisement was no longer listed on the first page of results when searching for construction jobs in various locations. The advertisements used on these websites in included in Appendix A (p.183).

4.4.3 Eligibility criteria

Participants were eligible for the study if they meet the definition of a construction worker used for this thesis: an individual employed in manual work that involves constructing, repairing or renovating buildings, or developing land. Participants had to consider themselves to be a current smoker, and smoke during regular work hours either throughout the day or on breaks (in the case of a workplace policy). Participants were of different ages, both male and female, and were able to participant regardless of race or socioeconomic level. Participants took part in the interview in English. Eligibility criteria (industry of employment, age and smoking status)

were screened after a participant contacted the investigator. Also, participants were screened for supervisory roles; if participants were a foreman, supervisor or manager they were not eligible to participate.

As mentioned previously, after twelve interviews had been conducted the eligibility criteria were narrowed and potential participants were screened to include in the sample more skilled tradespeople. The final two final interviews were conducted with individuals from a trades listed on the Ontario Construction Secretariat website. The final sample is described in detail in section 5.1 of the findings chapter (p.55).

4.4.4 Use of incentives

Incentives were utilized for recruitment purposes in this study. A search for literature regarding the use of incentives in this population did not return any results. However, using incentives to recruit and retain research participants has become a common occurrence and remains innocuous and ethical in most situations (Grant & Sugarman, 2004). Incentives were outlined in the ethics applications package in order to ensure the use of this recruitment method was ethically sound throughout the study. A $50 gift certificate from a well-known Canadian coffee shop (Tim Horton's) was used as an incentive.

4.5 Data collection

Data was collected through semi-structured, in-depth interviews. An interview guide was drafted prior to proposing this thesis project, and was reviewed by the investigator's primary advisor. The guide was informed by the review of literature and the sensitizing concepts. Following the successful defense of the thesis proposal, the interview guide was carefully reviewed by the other members of the thesis advisory committee who had direct experience with either occupational health and/or structures to understand smoker experiences and preferences.

Questions were added to include an introductory section that facilitated getting to know the study participant and their occupational background (e.g. what do you like about your job?).

Following approval from the advisory committee (i.e. thesis committee) regarding the changes that took place, the interview guide was reviewed with an individual from the construction industry who uses tobacco. This individual has a supervisory role in the industry (site supervisor), and is also an acquaintance of the investigator. This process was modeled after cognitive interviewing that takes place prior to using questionnaires or surveys. Cognitive interviewing is described by Drennan (2003) as a method of understanding how respondents may interpret or perceive questions in order to identify any potential problems that could arise. The method is used to increase questionnaire response rate and reduce errors. The process involves asking the respondent to think aloud as he/she goes reads through the collection tool and tell the researcher what they are thinking (Drennan, 2003; Ryan, Gannon-Slater & Culbertson, 2012).

The investigator read through the interview guide with this construction informant, and the informant stated what he thought was meant by each question. In some cases, the informant described how questions could be rephrased to better represent terminology used in the construction industry, or reflect commonalities of the industry. For example, introductory questions in a previous version of the interview guide included ‘do you change worksites regularly or at all?’ and ‘could you describe what it is like to work where you work?’. These questions were changed to ‘how often do you change job sites?’ and ‘tell me about your last three job sites’. The informant disclosed that most if not all construction workers change jobsites on a regular basis, and asking about the last few jobsites would likely elicit responses that described participant’s workplaces.

The final step in preparing the interview guide was a read through of the questions with a colleague to gain a time estimate for the interviews. The final interview guide used for collection is in Appendix B.

Data was collected through in person or over the phone semi-structured interviews. It was preferred that interviews took place in person. However due to scheduling difficulties, five interviews took place over the phone. After gaining consent from the study participants, the interviews were recorded using a digital recorder. Interviews were transcribed verbatim.

At different times during the interview process, the researcher asked participants if she was interpreting what they were saying correctly. For example, the researcher used the phrase "I hear you saying" to describe what she had interpreted. Or, the researcher stated "so you are saying…" and repeated what she had heard from the participant. Carlson (2010) explains this is a form of member checking that can take place throughout the research process. Member checking will be further discussed in section 6.3.1 regarding credibility of the qualitative research (p.146).

4.6 Data analysis

Data analysis for this thesis project began immediately after completion of the first interview. Analysis was completed in three phases (and several sub-stages). The data analysis was based on the constant comparative method utilized in grounded theory method (Glaser & Strauss, 1967) and tailored to this study and its purpose.

4.6.1 Phase 1: Simultaneous data gathering and generating potential nodes involved reading and listening to transcriptions of interviews. This initial stage allowed for familiarization with the data, and submersion into the data. The researcher listened to the audio file of the first interview prior to conducting the second interview. This assisted in reflecting upon how the

process went, and the researcher took note of several factors to consider for subsequent interviews (e.g. the researcher heard herself try to speak in times of silence, when perhaps a moment of silence may be necessary).

Maxwell (2013) describes the initial step in analysis to involve reading transcripts, listening to interviews and writing notes or memos on what is heard. These steps were essentially what the first phase of data analysis consisted of. The process of familiarization continued simultaneously while interviews were being conducted; audio files were listened to and transcripts were read as they were completed, all the while conducting more interviews. This allowed the researcher to begin to become immersed in the data.

During this process of familiarization, the researcher began keeping a running list of codes that seemed to be emerging from these documents and many of these codes became initial free nodes. Bazeley (2007) suggests striving at an early stage to think about or describe codes that may be used in later stages to lay a foundation for identifying key themes. After getting a sense of the data through familiarization, themes were listed as tentative ideas or potential nodes for the later phases of coding. This process continued throughout the data gathering phase until all interviews had been conducted, all transcripts had been read, and all interview recordings heard.

4.6.2 Phase 2: Coding and subgroup analysis involved coding, categorizing and connecting nodes, and subgroup analysis. NVivo 10 software was used as a means of organizing and coding data, as well as completing thematic analysis. Each transcript was imported into NVivo 10 as individual external documents. Codes identify themes and can be descriptive or interpretive, and in NVivo, codes are stored as nodes (Bazeley, 2007). A coding book was kept to operationally define each code, and can found in the findings section (Table 5, p.60).

Phase 2.1 initial open coding involved open coding, or creating free nodes (Bazeley, 2007) and allowed for exploring, breaking apart and sorting the data as a beginning analytic account (Charmaz, 2006; Straus & Corbin, 2008). Open coding is defined by Strauss and Corbin (1998) as "the analytic process through which concepts are identified and their properties and dimensions are discovered in data" (p.101). In grounded theory development, open coding is the initial stage completed before moving forward to further analysis (Glaser & Strauss, 1999).These nodes were an initial way to capture ideas, but creating them did not impose structure or connections (Bazeley, 2007). Much of the coding throughout this phase also resembled what Strauss and Corbin (1998) refer to as microanalysis, which is a detailed analysis used to generate initial codes. Microanalysis is discussed further below.

These definitions of coding refer to different terms (e.g. properties, dimensions) that are used interchangeable when referring to coding qualitative data. For example, coding could refer to uncovering various terms within the data such as properties, dimensions, ideas, hierarchies, relationships, magnitudes etcetera. It should be noted here that the researcher coded the data by uncover interesting and meaningful themes, meaning she sought to identify important pieces of data. No specific term (e.g. properties) was kept in mind when coding the data, rather the coding was meant to uncover any interesting piece of data regardless of how it could be classified.

To begin the initial coding process, the researcher decided on the first two interviews to be coded. The first interview to be coded fully was from participant three. Bazeley (2007) recommends choosing a first document to code that is typical in some way as it may have "significant influence in determining the categories you can create and the ideas you carry through the analysis" (p.61). This interview was chosen as it was recalled by the researcher as being typical, meaning several potential nodes from phase one of the analysis occurred in this

text (e.g. no smoking inside residential houses, work would be boring if I didn't smoke, family members smoke, etc.). Also, several demographic characteristics of this specific participant were similar to others participants (i.e. male labourer working in the residential sector). The second interview that was fully coded was from participant nine, who was different from the first case demographically (female skilled carpenter working in the industrial sector). In choosing a second document to code, Bazeley (2007) recommends a case that contrasts in some way to the first as this is also when a majority of nodes will likely be generated.

After completely coding transcripts from participants three and nine, the transcripts from participants one and seven were coded, respectively. Transcripts one and seven were chosen based on average length (pages in the transcript and minutes). The process to code these four transcripts was extremely meticulous and took substantially longer than was anticipated. Data was coded with one or two nodes at a time, meaning the entire transcript was read an estimated fifty to seventy five times to code node by node. This process took, on average, between ten to sixteen hours per transcript. This coding mirrored microanalysis, or microscopic examination of the data (Strauss & Corbin, 1998). Microanalysis is described as a very focused procedure that allows for examining "the specifics of the data" and breaking the data apart to later be reconstructed in a way that forms an "interpretive scheme" (Strauss & Corbin, 1998, p.65).

In some cases, once a transcript was coded for a particular node, key words would be searched in order to ensure no text was missed that ought to have been coded. The text search query in NVivo 10 was used to find a specific word or words related to a node. For example, after coding a transcript for the node 'coffee and cigarettes', the text search query was used to search within a transcript for all the occurrences of the word 'coffee'. These occurrences were then reviewed to ensure all data relevant to that node was coded.

After coding a transcript for all nodes, the highlighting function in NVivo 10 was used to view all the coding within the transcript (i.e. highlight coding for all nodes). This final review of the transcript allowed the researcher to code any data that belonged in a node but had not yet been coded.

Four transcripts were coded using these procedures previously outlined. After coding the first four transcripts, the researcher attempted a different coding method to determine if the process could be speed up. The alternative method was attempted after discussing coding approaches and progress with the researcher's primary advisor. The alternative method involved coding all transcripts with one node (i.e. reading the eight remaining transcripts for one node). This approach, however, was not faster. For example, reading through the remaining eight transcripts for the node 'physically demanding and long hours' took the researcher two and a half hours (reading each transcript for one node took anywhere from ten-25 minutes). At 104 nodes x eight transcripts (=832) x an average of seventeen minutes per node, this process would take more than 230 hours. All eight transcripts were coded with four different nodes before the researcher returned to the previous coding method. The previous method of coding (coding each transcript for all nodes) continued until all fourteen interviews had been coded.

Throughout the open coding process, nodes continued to emerge from subsequent transcripts despite earlier transcripts being fully coded. Following the conclusion of coding the fourteenth interview, the researcher returned to the first transcripts that were coded in order to code for nodes that were added throughout later open coding. For example, the node 'work would be worse without smoking' emerged from the data while coding the sixth transcripts (participant four). The researcher returned to the first five interviews that were coded to also code these transcripts for the node 'work would be worse without smoking'.

Maxwell (2013) states many accounts of qualitative data analysis distinguish coding and categorizing as the fundamental activities in analysis, or relate that coding *is* qualitative analysis. In this thesis, open coding was the first step in a process of breaking apart the data and rebuilding it in a way that was meaningful. After open coding, the researcher began conceptual integration of the categories into broader categories.

Phase 2.2 conceptual integration involved organizing and moving nodes into trees, where parent nodes served as connectors for subcategories or types of concepts (Bazeley, 2007). The first attempt at conceptual integration created various hierarchical groups. Some nodes were lumped together and filed under a new heading, while other nodes expanded to incorporate related nodes.

The researcher spent time reading over nodes and thinking about them individually and in relation to others. The process involved becoming familiar with each node as one piece of data (rather than a place to file snippets of interview data). When beginning to think about how these nodes would be linked, the researcher referred to Maxwell's (2013) application of a realist perspective to qualitative research, and specifically the differentiation between categorizing and connecting strategies. While grouping the data into a meaningful structure was the purpose of further analysis, categorizing the nodes (i.e. sorting based on similarities) was not the only goal; rather connecting the nodes to develop a story and identify links was desired (Maxwell, 2013). Every effort was made by the researcher to connect the data in a meaningful way, rather than simply sort similar data into groups.

After reviewing the nodes and thinking about how they could begin to be connected, the researcher began combining nodes in NVivo 10. This reminded the researcher of the coding process, as if this stage was one of coding the nodes. Connecting the nodes in NVivo 10 (through

dragging and dropping) began to be troublesome as there was such a long list of free nodes to sort (just over 100). A list of free nodes was transferred from NVivo 10 into Microsoft Word using the export function, in order to be able to cut and paste the text into various locations and lump the nodes in a manageable way. After spending some time reorganizing the list of nodes in Microsoft Word, the document was printed and the process of connecting nodes was continued by hand with paper and pencil. Trial and error was used to connect nodes, and often the researcher referred to the definition of the node and the data within the node to determine exactly how the nodes could fit together.

Axial coding is described by Strauss and Corbin as "the act of relating categories to subcategories along the lines of their properties and dimensions. It looks at how categories crosscut and link" (1998, p.124). Traditional axial coding refers to a coding procedure that revolves around a specific category (i.e. "coding occurs around the axis of a category", Strauss & Corbin, 1998, p.123). This process was drawn upon to connect nodes despite not having one core code (Bryant & Charmaz, 2007).

After the majority of codes had been connected to others, the structure was transferred to NVivo 10 through creating new top level nodes, and dragging and dropping nodes into various categories. This process of moving the nodes into trees created parent nodes, which served as connectors for subcategories (branches, twigs, leaves, sub-leaves) (Bazeley, 2007). Though some nodes had yet to be connected to others, the researcher concluded the first attempt at conceptual integration, because further categorization would not be as fruitful without reviewing the sensitizing concepts and research questions. However, delaying the review of these documents allowed the elaboration of the categories to emerge inductively from the data, rather than forcing structure on the nodes (Glaser & Strauss, 1999).

Phase 2.3 Review of emerging categories in comparison to sensitizing concepts and research rationale involved further axial and theoretical coding. Charmaz (2006) describes that theoretical coding involves specifying the types of relationships possible between the categories developed in previous phases; theoretical coding makes the analysis coherent and comprehendible. While predetermined coding families may be involved in the traditional emergent type of theoretical coding (Glaser, 1978), this type of coding can also involve other analytic categories that add clarity (Charmaz, 2006). Analysis continued after completing the first attempt at conceptual integration (the previous phase of analysis) and a coding structure was created that exemplified the relationships in the data. Reviewing the sensitizing concepts and research rationale assisted in developing high level analytic categories.

After reviewing the sensitizing concepts and original research rational (including purpose and questions), the researcher continued to categorize and connect themes. Nodes were dragged and dropped into various categories to find the best fit before deciding upon a node structure and writing a draft of the findings. As the findings were drafted, each tree structure was transferred from NVivo 10 into chart form and the nodes were arranged and ordered; prior to this, each tree was organized in alphabetical order in NVivo 10. Twigs, leaves and sub-leaves within the trees were rearranged during this transferring process, which required intently questioning the relationships between nodes that had been created, and if these nodes could be rearranged and ordered to greater represent the data in each node. Following this coding, subgroup analysis took place.

Phase 2.4 Subgroup analysis was the final step of phase 2 of the analysis. Within NVivo 10, transcripts were created as nodes with attributes and the matrix function was utilized. The matrix function allows for making comparisons between nodes and cases, or nodes and attributes

of cases; it is often referred to as a qualitative type of cross-tabulation (Bazeley, 2007). Matrix queries were conducted between nodes and groups of cases rather than conducting analysis across cases.

Five attributes were created in NVivo 10 as node classifications. The age category was originally planned to be broken into two categories including young adults (18-34) and older adults (35+), however this would have created a fairly uneven divide (nine participants would be considered young adults). Therefore, ten year increments were created to categorize participants into age groups. Skill level was determined by the Construction Secretariat's list of tradespeople (as stated when describing the sample). Skilled tradespeople included those who reported working a job that was included in the Construction Secretariat's list of trades, as well as two participants who worked as self-employed contractors. Unskilled workers were those who reported working a job that was not listed in the Construction Secretariat's list of trades. Participants were divided into a job sector category based on whether or not they worked in the residential sector or another sector, because most participants were employed in either one or another (i.e. residential or commercial/industrial). Participants who stated they worked in the residential sector referred to working on individual client's homes. Therefore, participants who worked in both the high rise residential and commercial/industrial sector were categorized into the other category.

Matrix coding was variable oriented and conducted by comparing groups of cases (using common attributes) to nodes (Bazeley, 2007). Nodes within each tree were used as the rows and attributes were used as the columns; roughly 10-15 nodes were analyzed at a time against one or two attributes. Results of these analyses were interpreted to determine if any noteworthy differences existed. Each node and attribute was interpreted by first comparing the number of

sources coded in each matrix and then comparing the number of coding references in each matrix. If a difference existed (i.e. if all or much of the data in a node was from one attribute category verses another), the researcher reviewed the narrative in each matrix to determine if in fact there were interesting differences among the data coded. Interpretations also took into account the number of participants categorized into each attribute value and common denominators were used (e.g. when comparing between genders).

4.6.3 Phase 3: Limited theory development was the final phase of analysis. Prior to this third phase of analysis, the researcher analyzed data without consulting any theories or models identified in the review of literature. While the sensitizing concepts and research rationale were referred back to, it was the intention of the researcher to not take into consideration predetermined theories or concepts. However, during this third phase of the analysis the researcher referred back to relevant social theories, models and concepts identified prior to data collection and analysis, and experimented with limited theory development.

Strauss and Corbin (1998) define a theory as "a set of well-developed concepts related through statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena". It should be noted that the development of a well saturated theory was not the intention of this project, but rather elaboration of the categories and conceptual ordering was intended, or what Strauss and Corbin (1998) refer to as a "precursor to theorizing" (p.20). Strauss and Corbin state "a well-developed theory is one in which the concepts are defined according to their specific properties and dimensions. What we call *conceptual ordering* also is the desired research end point of some investigators" (1998, p.20). The researcher's intent in this final phase of analysis was to review the previously considered social theories or concepts and attempt limited theory development and testing. However, this

process was only exploratory and did not 'force' social theories onto the data; or what Glaser and Strauss refer to as the proverbial "forcing of "round data" into "square categories"" *[sic]* (1999, p.37) . Charmaz (2006) also refers to the forcing of data into preconceived categories, and cites Glaser when stating "we must guard against forcing interview data into preconceived categories" (p.32).

To begin the limited theory development, the researcher reviewed the 'Social Contextual Model for Reducing Tobacco Use Among Blue-Collar Workers' developed by Sorensen, Barbeau, Hunt, and Emmons (2004). The model identifies modifying conditions and mediating mechanisms that "add to our understanding of the pathways through which factors such as occupation may influence tobacco use patterns" (Sorensen et. al, 2004, p.231). The researcher spent time reviewing aspects of this model that related to the data, and how the data could be presented to empirically verify or support characteristics of the model.

Next, the researcher continued with limited theory development by considering Pawson and Tilley's 'realist explanatory formula' that posits outcomes are the product of mechanisms and contexts (1997). This theory would suggest all outcomes (e.g. continued smoking) occur because of the right opportunities (mechanisms) in the right social and cultural circumstances (contexts) (Pawson & Tilley, 1997).

After considering the two previous theories, theory development would conclude with organizing data into a conditional/consequential matrix described by Straus and Corbin (1998). The matrix is used in analysis as a way of identifying and relating structure to process, as well as identifying lines of actions to follow through the data (Straus and Corbin, 1998). Use of the conditional/consequential allows for building and integrating an account of the data that specifies the nature of relationships between events and phenomena (Straus and Corbin, 1998). However,

as discussed in the findings section, theory development concluded after integrating the use of Pawson and Tilley's 'realist explanatory formula' (1997). This will be discussed in detail in section 5.2.6 Phase 3: Limited theory development (p.120).

5. FINDINGS

The findings section details results of the analysis of fourteen interviews conducted for this thesis project. The study sample is described first, including a description of participant demographics, occupation characteristics, and characteristics of the interviews and transcripts (section 5.1). Findings are presented in order by phase of analysis (section 5.2). The first subsection describes findings from phase one including familiarization with the data. Findings from phase two are then described including results from coding and sub-group analysis. Finally, findings from phase three are described including results from comparing data to relevant theories and concepts. The findings are followed by a separate discussion section (Section 6, p.129) that includes a review of the research questions and provides answers to them.

5.1 Sample

Participants in this study were recruited using an online classified website (http://www.kijiji.ca) and an online job search website (http://www.indeed.ca). Participants were a diverse group of construction workers from Southern Ontario. Fourteen individuals took part in the study. Ages of the participants range from 25 to 43, the average is 33. The sample is predominantly male; only two of fourteen participants were female. This does, however, reflect the typical gender divide in the male dominated construction industry (roughly 12% of industry was female in 2012, Statistics Canada, 2013). All interviews were conducted in English, and the majority of participants spoke this language solely. Annual income level ranged within this group of construction workers. There was a fairly even divide between two income levels ($30,000 to $50,000 annually and $50,000 to $75,000 annually). The following chart describes the demographics and characteristics of each study participant.

Table 2: Study participant's demographics by interview order (participant number)

Participant number	Age	Gender	Speaks second language	Annual income
1	26	Male	No	$50,000-$75,000
2	37	Male	No	$30,000-$50,000
3	28	Male	No	$50,000-$75,000
4	29	Male	No	$30,000-$50,000
5	30	Male	No	$50,000-$75,000
6	34	Male	No	$30,000-$50,000
7	32	Male	No	$50,000-$75,000
8	30	Male	No	$30,000-$50,000
9	27	Female	Yes - French	$30,000-$50,000
10	25	Male	No	$30,000-$50,000
11	43	Male	No	$50,000-$75,000
12	40	Female	No	$30,000-$50,000
13	43	Male	Yes - French	$50,000-$75,000
14	39	Male	Yes - French, Spanish	$75,000 or more

Various occupational characteristics were collected from study participants during the interviews including participant's job title, various responsibilities within this position, and whether the participant belonged to a union.

Job title refers to how each participant labeled themselves. For example, 'flat roofer' is what participant five called himself and 'carpenter apprentice' is how participant nine referred to herself. Throughout this thesis, participants are referred to according to how they titled themselves within the construction industry (i.e. the researcher also referred to participant five as a flat roofer).

Study participants were classified into a trade according to the Ontario Construction Secretariat's list of tradespeople

(http://www.iciconstruction.com/WHYUNION/construction_trades.cfm). Two participants who were self-employed contractors were considered tradespeople despite not falling into an Ontario Construction Secretariat trade as the researcher concluded this role required various skills above those of an unskilled worker. Job sector was determined by reviewing each participant's job descriptions in the interview transcripts. In some instances, participants named the sector in which they are employed. These data are summarized in the following chart.

Table 3: Study participant's occupational characteristics

Participant number	Job title	Trade	Union member (union)	Job sector
1	Labourer	N/A	Yes (Labourers Union)	Commercial
2	Owner (Self-Employed Contractor)	Self-employed Renovator/Contractor (not a OCS trade)	No	Residential
3	Labourer	N/A	No	Residential
4	Labourer	N/A	Yes (Masonry Union)	Residential
5	Flat Roofer	Roofer	No	High rise residential and commercial
6	High Rise Restoration Mechanic	N/A	No	High rise residential and commercial
7	Framer	N/A	No	Residential
8	Electrical Apprentice	Electrical Worker	Yes (International Brotherhood of Electrical Workers)	Commercial and industrial
9	Carpenter Apprentice	Carpenter	Yes (Carpenters Union)	Industrial
10	Labourer	N/A	No	Residential
11	Framer	N/A	No	Residential
12	Commercial Painter	Painter	No	Commercial
13	Owner (Self-Employed Contractor)	Self-employed Renovator/Contractor (not a OCS trade)	No	Residential
14	Concrete Finisher	Cement Mason/Concrete Finisher	No	Residential and commercial

Interviews with study participants took place in April and May of 2013. They varied in location and length. Interviews were, on average, 41 minutes long and transcripts were, on average, 22 pages long. The result was more than 300 pages of data. The following table presents characteristics of interviews and transcripts.

Table 4: Interview and transcript characteristics

Participant number	Date of interview	Location (interview format)	Interview length in minutes	Length of transcript in pages	Words in transcript
1	07-Apr-13	Tim Hortons, Stoney Creek (face to face)	47.08	31	10, 068
2	09-Apr-13	Guelph (Phone)	42.21	21	6,699
3	09-Apr-13	Niagara Falls (Phone)	23.42	16	4,306
4	09-Apr-13	Toronto (Phone)	30.31	16	4,475
5	10-Apr-13	Tim Hortons, Kitchener (face to face)	38.27	22	6,688
6	11-Apr-13	Toronto (Phone)	39.46	17	6,404
7	15-Apr-13	Tim Hortons, Guelph (face to face)	37.15	20	6,165
8	16-Apr-13	Tim Hortons, St. Catharines (face to face)	24.25	14	3,665
9	17-Apr-13	Tim Hortons, Welland (face to face)	54.46	32	10,498
10	18-Apr-13	Tim Hortons, Cambridge (face to face)	58.14	29	10,595
11	23-Apr-13	Tim Hortons, Cambridge (face to face)	41.45	20	6,848
12	24-Apr-13	McDonalds, Kitchener (face to face)	35.54	26	6,945
13	01-May-13	St. Catharines (Phone)	52.21	21	8,245
14	03-May-13	Tim Hortons, Waterloo (face to face)	48.06	27	10, 683
Average			**41**	**22**	**6,794**
Total			**572.01**	**312**	**81,533**

5.2 Data analysis

An audit of events and decisions made by the researcher was kept in a method and decision trail during the recruitment, data collection and analysis. Trustworthiness and rigour can be maintained, it has been argued, through the use of this tool (Koch, 2006) and its use supports academic rigour in qualitative research (Selamat & Hashim, 2008). Analysis was conducted by the researcher and each stage of analysis was reviewed by the investigators primary advisor. Use of a method and decision trail increased transparency in the analysis process. As stated by Koch, "readers may not share the author's interpretation but they should be able to follow the way in which the author came to it" (2006, 92). Refer to the discussion section for more information. The method and decision trail outlining all events and decisions made through the analysis is provided in the discussion section on page 157.

5.2.1 Phase 1: Simultaneous data gathering and generating potential nodes

The first phase of analysis involved familiarization with the data and submersion into the data. This began after conducting the first interview. After several interviews had been reviewed, a list of emerging themes began to be compiled (beginning with the eighth transcript). A list of 54 potential codes was compiled by the end of the familiarization process. Subsequently, using NVivo 10, free nodes were created. The definitions of these nodes were not added to NVivo 10 until open coding began, in order to allow the definitions to emerge after coding a number of interviews. The definitions of these nodes were modified throughout open coding to reflect the data being coding into the nodes. The list of the initial 54 codes is included in Appendix C.

5.2.2 Phase 2.1: Initial open coding

The 54 potential codes that emerged inductively during familiarization with the data were the first open nodes, and open coding began by coding data into theses nodes. During open

coding of the first four transcripts, these 54 nodes were edited to better suit data being coded into nodes (i.e. names and definitions of nodes were changed). New nodes were created throughout the open coding, and most open nodes were created during the coding of the first four transcripts (as suggested by Bazeley, 2007). Eighty-seven of the final 104 open nodes emerged during the coding of the first four transcripts.

The following table provides a description of the 104 open nodes that emerged from open coding. A brief description of the code is also provided, along with the sources (amount of transcripts the node is coded in) and the occurrences (the number of references in the data). The table is organized according to number of sources, with most frequently sourced nodes at the top.

Table 5: Open nodes from phase 2.1: Initial open coding

Name	Description	Sources	Occurrences
Following safety and no smoking policies	Safety regulations or rules that are followed; non-smoking policies that are followed	14	79
Dangerous job	Describes job as dangerous, dangerous aspects, tells of very dangerous or harmful experiences	14	78
"I guess it's social"	Seemed reluctant to agree that smoking is a social experience; After thinking about the question, agreed it is social to smoke at work	14	55
Smoking doesn't affect work	Smoking does not impact work that is completed	14	41
Age of starting smoking	The age participants stated they started smoking	14	17
Rarely use other tobacco products	Usually only smoke cigarettes, will have the occasional cigar or cigarillo. No use of chew tobacco	14	14
Can smoke anytime	Described being able to leave work to have a cigarette anytime, or smoke throughout the day while working; no policies	13	81
Desire to be a non-smoking	Workers described a wish or desire to not be a smoking anymore; talked about future quit attempts	13	52

Name	Description	Sources	Occurrences
Constantly changing jobsites, actual jobsite changing	Described changing jobsite very frequently, often a few times a month and other times even more; jobsites themselves are always changing and different	13	50
Smoke more at certain times	Described smoking more cigarettes at certain times such as after eating, when around others smoking or during specific work situations	13	49
Comfortable environment	The general environment on the jobsite is laid back, break and lunch times are not strict, bosses are easy going	13	44
Dusty, dirty job	The job involves being in dusty environments from various materials – concrete, fiberglass, drywall, mortal, tile. Also, the job involves inhaling a lot of dust from these materials	13	38
Routine to job	Days had a typical schedule, starting at the same time and breaking around the same time	13	36
Family smokes	Many family members also use tobacco	13	32
No worries about quitting	No fears or worries described about the quitting process, or cutting back	13	22
Smoking not discussed in Health and Safety	Smoking has never been brought up in the context of health and safety training	13	16
Addiction	Workers described an addiction to nicotine and tobacco	12	60
Smokes outdoors or outside at work	Described that smoking always took place outside, meaning outside of someone's home or the building being worked on	12	54
Stressful job	Describe the job as stressful, smoking helps relieve stress or stress gives participants the urge to smoke; smoke when stressed	12	53
Tobacco use very common	Smoking is described as very common on construction sites and many of the bosses smoke	12	52
A reason to take a break	Stopping for a cigarette is a reason to have a break, legitimizes break, something to do rather than stand around	12	46
Safety not valued	Abiding by safety regulations are not a priority	12	41

Name	Description	Sources	Occurrences
Don’t use masks, masks don’t work	Wearing proper masks is not common, they do not provide enough protection from all the dust workers are exposed to	12	40
Physically demanding and long hours	Participants describe how working in construction is a job that involves various physical challenges including heavy lifting	12	39
Way to socialize on breaks	Smoking occurred while workers were taking a break with others, talking about work or anything else	12	32
Various responsibilities	Participants describe that their job involves a range of construction activities (concrete, framing, drywall, measuring, painting, plumbing etc.)	12	31
Smoking with environmental hazards present	Smoking takes place when other hazards are in the air	12	31
Social outside of work	Smoking is described as a social experience outside of work	12	31
Break after completing a task, no set times	Breaks take place after finishing a task, not at a specific time	12	28
Worries or fears	Worries or fears about quitting	12	28
Use common sense regarding safety	Personal safety was regarded as second nature, or required using common sense	12	26
No assistance from workplace to quit	Workplace does not provide any assistance if an employee wants to quit	12	25
Outdoor space means ventilated, breathing fresh air	An outdoor space mean a worker is breathing fresh air and in a space that is highly ventilated	12	21
Smoking discussed in regards to policies or smoking areas	Smoking policies and designated smoking areas were discussed at the beginning of a new job	12	21
Alcohol and drug use	Use of drugs and alcohol is common on or near construction sites	11	61
Multitasking working and smoking	Working and smoking at the same time	11	48
Aids used in the past	Described the use of different quitting aids in the past	11	38
Little routine to the day	The work day does not usually follow a schedule and start/break times are constantly changing	11	38

Name	Description	Sources	Occurrences
Coffee and cigarettes	Cigarettes go hand in hand with drinking coffee	11	36
Production valued above safety	Workers believed their bosses valued work production and not losing money over worker safety	11	36
Larger companies have stricter policies and safety regulations	Bigger construction companies had more and stricter policies to follow, many more safety rules to follow	11	35
Can't smoke at certain times	Can’t smoke when both hands are being used, when working on intricate project, when working close to hands and can’t hold cigarette in mouth	11	30
Don't smoke around certain hazards	Smoking does not take place around certain workplace hazards	11	29
Health effects	Participants described the effects that smoking has on their health	11	27
No smoking around chemical hazards	Smoking did not usually take place around chemical hazards	11	25
Other reasons for starting smoking	Other reasons cited for starting smoking	11	16
Others smoking around me makes quitting or cutting back hard	Others smoking in the close vicinity at work makes quitting or cutting back very difficult	10	39
Negative views about smoking	Negative views or judgments about using tobacco (from various people)	10	25
Need will power	Will power was described as a key factor needed to make a quit attempt or stay quit	10	23
Gaining weight	Fear of gaining weight, using food as a replacement for tobacco when attempting to quit	10	16
Like job because it's outside	Enjoy their job because it allows worker to be outside	10	11
No smoking policies not followed	Many workers stated there were no smoking policies when inside buildings, but these were rarely followed	9	32
Working and smoking goes hand in hand	Smoking while at work on a construction site is very routine and the two seem to belong together	9	25

Name	Description	Sources	Occurrences
Would need a policy to quit	Smoking at work would need to be restricted at work to either a designated smoking area or completed prohibited from jobsites	9	21
Smoke when bored	Smoking is seen as something to do, would rather smoke a cigarette than do nothing; smoking keeps participant busy	9	20
Smoking is a habit	Smoking is engrained into the everyday routine of workers	9	19
Offered monetary incentive to quit, other incentives	When asked what could help to quit smoking, the workplace offering a monetary incentive would impact quitting; could be in the form of assistance to pay for quit aids	9	14
Enjoy job - positive benefits	Enjoys the positive benefits of the job such as stress relief from therapeutic work	9	14
Not social outside of work	Smoking outside of work is not a social experience	9	14
Would be more productive	If participant didn't smoke, would be more productive	9	13
Disposing of cigarette butts	Respectful of others property, throw out or collect cigarette butts	9	12
Designated smoking area policies not followed	If a company had a designated smoking area, the policy was rarely followed	8	33
Would need smoking to be completely banned, but won't happen	Smoking would need to be completed removed from society in order to make a quit attempts and remain smoke free	8	25
Differences among trades	The differences in smoking among various construction workers	8	23
Work would be worse without smoking	Not smoking at work would make the day hard, less enjoyable, and physical symptoms would have an effect on worker	8	20
Love and hate smoking	Workers described at different points that they both loves and hated smoking	8	20
Smoking in unfinished site	Smoking took place in buildings that were still in developing stages – usually meant the building was yet to be dry walled	8	18
Inside means being in a building; smoking still occurred	Despite the fact that an outdoor space was defined in various ways, a ventilated building was still considered inside, and smoking occurred here even if the participant inferred this was against policy or should not be taking place	8	14

Name	Description	Sources	Occurrences
Never used quit aids	Workers described quitting by cold turkey	8	12
Works mostly inside	Majority of work is completed inside	8	12
Works mostly outside	Majority of work is completed outside	8	11
No smoking in residential or client homes	Strict policy to not smoke in other people's homes, unless permission by home owner was given	7	19
Still need desire to quit	Participants described that workplaces could offer different aids but the smoker would still need to be ready and willing to quit	7	16
Rewarding to complete job and physically see it	Sense of satisfaction when seeing a completed job, or looking at the day's work and seeing changes	7	15
Taking a breather	Having a smoke break is a chance to catch your breath, take a break from the physically demanding job, de-stress	7	15
Boring without smoking	Being at work or working would be boring without smoking	7	13
Avoid smoking coworkers when trying to quit	Workers tended to stay away from smoking coworkers when attempting to quit and socialized with non-smoking colleagues; avoided taking break in company vehicle where smoking occurred	7	13
Freedom	Described that there is autonomy or freedom in job	7	13
Safety conscious around coworkers at work for paycheck	Caution was taken to be extra safe around coworkers who were not as careful or has less of a vested interest in the job	7	12
Partner smoking	Partner uses tobacco, workers smoke with their partners	7	12
Saving time	Describe smoking while working or disregarding smoking policies to save time or production	7	11
Recalled working in a factory with indoor no smoking policy	Workers compared their experience to previous work in a factory where they could only smoking on breaks; stated it was very difficult to be a factory employee because of this policy	7	10
Started smoking because it was cool	Reason for beginning to smoke was because it used to be cool, was portrayed differently during the time of initiation	7	7

Name	Description	Sources	Occurrences
Smoking in company vehicles	Smoking takes place in company vehicles, regardless of whether or not this is against company policy	6	16
Sharing cigarettes	A coworker is always willing to share a cigarette if another worker runs out. Even if a worker was quitting and did not buy cigarettes, colleagues would offer one	6	12
Way to have a discussion	When a discussion needs to take place (e.g. about a problem, task, next steps etc.), workers will have a cigarette and go back to work once finished smoking. A way to regroup	6	11
Tired from smoking	Using tobacco throughout the day causes workers to become tired, have less energy	6	10
Fear or worry is only positive	Don't have any fears or worries about quitting smoking, only excited about the positive aspects	6	8
Like that I can smoke at work	Participants described smoking at work as an aspect of their job that they liked	6	7
Changes to smoking through policies	Described the many changes that have taken place since he/she started smoking in relation to social aspects of smoking, especially because of smoke-free indoor policies	5	20
Knowledge of who to avoid when not following smoking policies	Workers described when they are not following smoking policies, certain coworkers or supervisor have to be avoided	5	13
Strong side effects to using quit aids, making them difficult to use	A negative reaction to quit aids, specifically medications, make them difficult to use when quitting	5	13
Personal problem	Smoking is seen as the employees 'problem' and not something the workplace should address or help the employee with	5	12
"Me time"	Taking a break to have a cigarette is seen as personal relaxation time	5	7
Male dominated job	Described the industry as a man's world, had to fit in with men	4	17
Injury Prevention	Workers stated their workplaces consistently try to prevent injury	4	11

Name	Description	Sources	Occurrences
Would not want coworkers affected by quit attempt	The worker did not think it would be fair to other smoking coworkers to implement a no smoking policy in order for him/her to make a quit attempt	4	10
Working through weather	Participants work through all weather conditions, have to show up to work no matter the weather	4	9
Benefits for medications	Participants described they had some kind of coverage of cessation aids in their medical benefits	4	8
Shouldn't be smoking in workplace	Acknowledged that smoking should not take place on worksite, smoking at work is against the law	4	6
Defined as smoker	Worker defined self as a smoker, something they are	4	5
Damage from workplace hazards, not tobacco use	Damage to lungs done from exposure to workplace hazards, not tobacco use	3	6
Outside of work, smoke when attention is elsewhere	When not at work, tobacco is used when attention is focused on something such as a video game, computer or working in shop or garage	3	4
Older people have quit	Describe that the non-smokers are older workers who have now quit	2	2

5.2.3 Phase 2.2: Conceptual integration

Phase 2.2 of the analysis involved organizing, categorizing and connecting nodes into a meaningful structure. This process was completed by hand and then electronically in NVivo 10. At the end of conceptual integration, 17 trees were created with 61 branches, 20 twigs and one leaf. The chart below illustrates the structure created.

Table 6: Tree, branch and twig structure after phase 2.2: Conceptual integration

Tree	Branch	Twig
Sporadic nature to job (added as a top level node)	Little routine to the day	Break after completing a task, no set times
	Constantly changing jobsites, actual jobsite changing	
Workplace descriptors or characteristics (added as a top level node)	Dusty, dirty job	
	Physically demanding and long hours	
	Various responsibilities	
	Dangerous job	
	Male dominated job	
	Routine to job	
	Working through weather	
	Work mostly inside	
Workplace and organization characteristics/contexts that facilitate tobacco use (added as a top level node)	Works mostly outside	
	Can smoke anytime	Smoking in unfinished site
		Smoking in company vehicles
	Multitasking working and smoking	
Reasons for smoking	Started smoking because it was cool	
	Smoke when bored	
	Addiction	
	Smoking is a habit	
	"Me time"	
	Other reasons for starting	
	Outside of work, smoke when attention is elsewhere	

Tree	Branch	Twig
Working and smoking goes hand in hand	Boring without smoking	
	Smoking doesn't affect work	
	Work would be worse without smoking	Stressful job
		Smoke more at certain times
Sociability of smoking (added as a top level node)	Tobacco use very common in workplace	Sharing cigarettes
		Would not want coworkers affected by quit attempt
	Tobacco use present in other setting (added)	Partner smoking
		Family smokes
		Social outside of work
	Reason to take a break	Way to have a discussion
		Taking a breather
		Way to socialize on breaks ➢ (leaf) "I guess its social"
Positive aspects of occupation (added as a top level node)	Rewarding to complete job and physically see it	
	Like job because it's outside	
	Comfortable environment	Freedom
	Enjoy job - positive benefits	
	Like that I can smoke at work	
Aids (added as a top level node)	Aids used in the past	Avoid smoking coworkers when trying to quit
	Never used quit aids	
	Offered monetary incentive to quit, other incentive	
	Benefits for medication	

Tree	Branch	Twig
Barriers to quitting, supports (added as a top level node)	No assistance from workplace to quit	Would need smoking to be completely banned, but won't happen
		Would need a policy to quit
		Others smoking around me makes quitting or cutting back hard
	Strong side effects to using quit aids, making them difficult to use	
	Need will power	
	Still need desire to quit	
	Personal problem	
Desire to be a non-smoking	Love and hate smoking	
	Fear or worry is only positive	
Thoughts about quitting (added as a top level node)	Worries or fears	Gaining weight
	No fears, worries about quitting	
Health effects	Tired from smoking	
Smokes outside	No smoking in residential/client homes	
	Recalled working in factory with indoor no smoking policy	
Smoking not discussed in Health and Safety	Smoking discussed in regards to policies or smoking areas	
Policies not followed (added as a top level node)	No smoking policies not followed	Knowledge of who to avoid when not following smoking policies
	Inside means being in a building; smoking still occurred	
	Designate smoking area policies not followed	
Safety not valued	Don’t use masks, masks don’t work	
	Production valued above safety	
	Smoking with environmental hazards present	

Tree	Branch	Twig
Following policies (added as a top level node)	Following safety and no smoking policies	
	Can't smoke at certain times	
	No smoking in residential or client homes	
	No smoking around chemical hazards	
	Don't smoke around certain hazards	
	Use common sense regarding safety	
	Injury Prevention	

5.2.4 Phase 2.3: Review of emerging categories in comparison to sensitizing concepts and research rationale

This phase of the analysis involved further axial and theoretical coding. The sensitizing concepts and original research rationale were reviewed to create a coding structure that exemplified relationships in the data. The final structure created includes six high level trees comprised of various branches, twigs, leaves and, in some cases, sub-leaves. These trees have been presented in the order that was most logical to the researcher and allows for telling the story of the participants. Data about workers' day-to-day and workplace experiences are provided first, followed by data regarding the reasons and mechanisms for workers' smoking behaviour, and finally data regarding quitting or cutting back is detailed. The six trees created were:

A. Day-to-day workplace experiences: features and aspects of the construction workplace that were not specifically related to smoking. This tree provides an introduction or overview to the participants and their workplace.
B. Experience of smoking: data related to the experience of smoking, including the experience of being a smoker in the construction workplace. This tree provides a bulk of information regarding the study purpose and insights into the experience of smoking for participants.
C. Reasons for smoking: data in these nodes were stated explicitly by participants. The nodes grouped in this tree were created from participants stating clearly their reasons for smoking (as opposed to Tree E, which includes mechanisms stated by participants and those identified by the researcher).
D. Sociability of smoking: a tree specific to the social nature of tobacco use on worksites was created separate from Tree C (Reasons for smoking) and Tree E (Mechanisms

associated with continues smoking) because of the large amount of nodes and data on this theme. This tree fell in between Tree C and E because it was stated explicitly as a reason for smoking, but could also be considered a mechanism associated with continued tobacco use.

E. Mechanisms associated with continued smoking: data and themes regarding aspects of the construction workplace that allow for continued tobacco use.

F. Experiences with quitting or cutting back: all data regarding past, present, and future attempts to quit and cut back. This tree was listed last to allow for acknowledging previous data as the contexts in which construction workers quit smoking or cut back (or attempt to).

These six trees will be described in detail here. For clarity, specific themes or nodes are underlined in the text (though the exact names of the nodes are not always used in these descriptions). A chart depicting the structure of each tree is provided in Appendix D (p.192).

A. Day-to-day workplace experiences

To learn about the participants' work environment and to encourage participants to begin talking about working in the construction industry, the researcher asked several introductory questions about participant's workplaces. Participants were asked to tell the researcher about their job, what they liked about it, and to describe the environment. Many of the findings in this section were elicited from these introductory questions.

Participants describe the construction workplace as dusty and dirty, and that the job involves long hours and hard physical labour. Every participant described their job to be dangerous to some degree. As a framer stated, "we do work hard. It's a hard job and it's dangerous and you have to be safety conscious".

The dangers of the construction industry were described by all participants, though not all participants noted that they or their employers place a high value on safety. While this wasn't a theme that emerged from each interview, most (12 of 14) participants described working for a company currently or in the past where safety is not valued, doing tasks that were unsafe, or not using proper safety equipment. A high rise restoration mechanic stated "generally I notice that our employers don't follow the [Ministry of Labour] laws very well, so that's always on my mind. I'm always trying to protect myself and protect others that are working around me". A labourer stated "safety wasn't a big concern. We didn't have to wear steel toes or hearing protection or hard hats or any of that shit". In some instances, it was described that quality of the job and production (including speed) was valued above safety. Though, as a labourer described it "depends on the company. There are a lot of companies that really don't care about you; they want it done cheap and quick".

Most (12) participants described the use of masks as not very common in their workplace, and when masks are used they tend to not work well or not be appropriate to the task. Several participants described that masks were optional and available, but it is the employee's decision whether or not to wear a mask. One labourer stated "they're [masks] optional because there's dust everywhere, so [on] almost all jobs they're optional… if you want to use them, it's up to you". A high rise restoration mechanic also spoke about employee responsibility, stating "I just refuse unless I bring my own special mask that actually has the screw on filters" and "I see a lot of companies, they try to get by that by just passing you a mask that's not rated for actually for what you're doing". Another participant stated "it's coming from the bosses not pushing down onto their people, giving the right equipment first of all and then second of all, letting them know it's their right to wear it" and that "they [employers] don't give you a mask… I think they

do have them, but they'd probably be like, 'Here's the mask,' and then onto the next person, try and get rid of [terminate] you as fast as possible".

Participants stated they did not wear masks for various reasons, such as not liking the feeling, finding it uncomfortable and hard to breathe, or feeling restrictive. When participants described breathing in hazardous substances at work, low use of masks was still common. A self-employed contractor stated "I'm sure that I've cooked my lungs just by breathing in drywall dust and breathing in concrete dust, breathing in this and that" and a labourer described "inhaling dust and concrete dust and fiberglass and stuff like that… I inhale a lot of dust. I don't wear masks. I don't know, it bothers me to wear the mask and so I'm like, eh [non-committal sound]". Other findings related to workplace hazards (e.g. workplace safety policies; integration of health protection and promotion) are further discussed in section B on the Experience of smoking.

Another feature which participants' described of their day-to-day work life was constantly changing jobsites, and the regularly changing scenery on a jobsite. This sporadic nature of the job translated into daily routine; many participants work varying hours (though longer in the summer) and take breaks at random. Two short breaks and a longer lunch were typical for most shifts, as stated by an electrical apprentice: "I usually take break around 10:00 and then lunch and then 2:30ish sometimes we stop [for a break]". However, swaying from this routine seemed normal, as a labourer explained "if you're having a stressful day, you can go out and have a break at 9:00 instead of waiting all the way till 10:00 or whatever".

Participants also described that breaks are often taken after completing a task rather than at a set time. A labourer stated "basically in a lot of construction jobs, you take a break when it's more or less convenient, rather than your breaks strictly at 10:00 or your lunch is strictly at 12:00". A painter stated "if we're in the middle of painting a wall, you can't stop or whatever"

and a self-employed contractor described “construction work is very task-driven…it [smoking] either helps to break up a task and to make a task into more manageable sections”.

Though participants described the daily routine on a construction site as constantly changing, some routine to the job was also talked about. A self-employed contractor described the routine as follows: “I generally like to be on site for about 8:00 in the morning and generally like to leave anywhere between four and five”. Routine was also described in terms of smoking breaks, as a painter stated “every 45 minutes to an hour, you’ll see people going out and having a smoke”.

In order to encourage participants to open up to talk about their job as a construction worker, the researcher asked about aspects of the occupation participants liked. Participants discussed the positive aspects of their job and features of their career that they liked, such as working outside: “I like that it’s outside in the summertime. Even in the wintertime, I still couldn’t see myself working inside”. Ten participants stated they enjoy working outside; the remaining four participants spend the majority of their day working indoors. Some participants described how working outside allowed for frequent tobacco use, as stated by a flat roofer: “that’s why I choose to work outside, not in factories, where I can smoke constantly”. Being able to smoke at work was described by some participants as an aspect of their job they liked: “I like that I can smoke at my job”.

The majority of participants believe the work environment is comfortable and relaxed. Seven participants spoke of a sense of freedom in their work: “That’s why I said you have the freedom. There’s no one behind you standing over your back…they’ll tell you ‘This is what I need done. Go and do it’”. This expressed sense of freedom also allowed for smoking cigarettes at will: “we can get out for our cigarette whenever we want”.

While the work environment is relaxed, the stresses of the job were also described and participants spoke of "stressful things that come about. Just like anything, construction is never perfect". This stressful nature of the occupation was described, in part, in relation to tobacco use (i.e. smoking as a stress reliever). While the emergence of this theme is discussed later in Section E: Reasons for Smoking, it should be noted that the workplace was described by the majority of participants as stressful. One participant stated "it would be different without smoking. I probably wouldn't be in the same industry anymore…I don't think I could handle it not smoking".

Many (ten) participants stated that the use of alcohol and drugs prior to coming to work or during work is commonplace, as stated by a labourer "there's a lot of guys who drink and necessarily don't stop at work". Participants even described their own use of marijuana and alcohol while on the job: "I smoke dope a bit at work too…even when I quit smoking cigarettes, I still smoked dope. I drank at work when I drank". Various other aspects of construction worker's experiences are discussed in detail in the following section.

B. Experience of smoking

The experience of smoking tree was the largest category structure created during this phase of the analysis (review of emerging categories in comparison to sensitizing concepts and research rationale). The tree structure, along with tree F. Experiences with quitting or cutting back, is comprised of a significantly larger number of nodes in comparison to other tress as these two trees contain the bulk of findings regarding construction worker's experiences. In order to describe the findings within this tree in a systematic way, this section will be broken up into subheadings that represent the seven branches in the tree. It should be noted that these branches

are in an order that was logical to the researcher and allowed for best describing the story of participants.

This section describing the experience of smoking is divided as follows. First, the individual tobacco use history provides an introduction to the participant's experience with tobacco. Next, three branches describe the changes to smoking through policies, negative views about smoking and the desire to be a non-smoker. These branches were all related to views or perceptions of the experience of smoking and important to bear in mind as they provided context for considering the experience of being both a smoker and construction worker, and the related health effects. After descriptions about these various experiences in the workplace, smoking experiences outside of work are discussed.

1. Individual tobacco use history

In order to gain an understanding regarding each participant's individual account of smoking, questions were asked related to personal smoking history and current smoking practices. Participants were asked about their age when they began smoking, with the majority stating they started to smoke in their teen years. Only two participants starting smoking at 20 years old or in their early 20s. Participants were asked if they used tobacco product other than cigarettes; all fourteen stated they only smoked cigarettes, and did not use chewing tobacco. Seven participants stated they smoke cigars or cigarillos on occasion, as a framer described "I smoke the odd Captain Black's once in a while, but no chew, no. Nothing else".

2. Changes to smoking through policies

Six participants stated they are affected by changes to smoking policies and the evolving public views of tobacco use. These participants described that the experience of being a smoker has changed since the time they began smoking. Indoor smoking policies, the advertisement of

smoking and the views others have about their smoking have all affected these participant's experience of smoking. A commercial painter stated "back in the day you used to be able to smoke in the coffee shops…you don't see too many smokers going to the coffee shop anymore unless it's summer and they're sitting outside". A high rise restoration mechanic stated "I guess it was just sort of cool at that time. It was just something new. I was young. It's different now, how they advertise it. When I was young, they didn't advertise it like that".

Several participants described that changing policies and the changing public perception of smoking have led to negative experiences as a smoker. A framer states his experience as a smoker in the health care system: "it's not like it used to be. I know it's, just like when I go to the hospital too now and you tell them you're a smoker, it's like, [snorts] you're in the back of the bus, man. It's just the way it is. I know that for a fact. I have a friend that she's a nurse and it's like, 'You're smoking and you come in with cold this, cough this, back of the bus, man.' It's not accepted at all any more". A self-employed contractor stated "smokers are becoming more and more ostracized". A participant also described the changes he has experienced regarding the social nature of smoking: "it's sort of a negative social experience now. Smoking cigarettes isn't like it was before… generally I don't even like people seeing me sitting in designated areas, grouped up with other people trying to kill themselves smoking. Socially, I don't think it's a positive anymore, whatsoever". Negative views about smoking, by participants themselves or others, also emerged as a theme related to the experience workers have had and continue to have with tobacco use.

3. Negative views about smoking

The majority of participants (10) talked about situations when they experienced people speaking negatively about smoking. Participants stated that smokers who have quit or non-

smoking coworkers frowned upon smoking breaks. An electrical apprentice stated "they'll just make a smart comment or something, you know…you get that attitude, too. It's like, 'Oh, he's going for a cigarette while we're still working'". A commercial painter stated "If you're working with a group of people that don't smoke, it's very uncomfortable to go have a smoke. You feel out of place and you feel like, you know? You stand out. And people do look down on people that smoke". A participant stated that smoking is "just bad…it's bad for business" and others sometimes hide their smoking: "You kind of hide the smoke because it's, you're in a really high-end house and you come in smelling like a…a factory, kind of thing. You really don't want to, so you kind of hide that aspect". Some participants had their own negative views about smoking, and some expressed not wanting to be a smoker any longer.

4. Desire to be a non-smoker

Several participants described their desire to quit smoking and be a non-smoker. Thirteen of the fourteen participants described this desire, and spoke of recent quit attempts, their current efforts to cut back, and quit attempts they have planned for the future. Some participants stated that they thought smoking was "disgusting. There's times when I'm out there and I'm smoking and I'm like, oh, this is nasty". A framer stated "I know I'm killing myself slowly. I know, I hate it, the smell on your clothes and your breath, your teeth, your lungs, your heart, everything, so much. I hate it". Two participants also stated they wanted to quit because of their children.

Some participants viewed quitting in a positive light, or stated that they did not have any fears or worries about quitting, only positive aspects of being a non-smoker to look forward to. Six participants spoke of positive outcomes, or seeing "more positives than negatives". A framer described that "when I give it up it's nothing but totally beneficial to me" and a self-employed contractor said "I've never had any worries or fears of cutting back. I've only had worries or

fears to keep on smoking. Like really, there's no fear of quitting smoking, I don't think anyways". A flat roofer described his thoughts about quitting: "No, I don't have worries. Why would I have a worry about quitting? I'd gain my weight back and you know, wouldn't have that filthy habit. I'd be saving money. My worry would be like, what am I going to spend my money on now? A new car? Down payment on a house?".

While some participants stated they no longer want to be a smoker, participants also spoke of times that they either liked or loved smoking, sometimes even described these two conflicting emotions in the same comment (i.e. loving and hating smoking). For example, a labourer described times at work when he looked forward to smoking, but also stated he wants to quit in the near future: "I don't mind smoking right now. Sometimes when you're at work, it's kind of like you look forward to something. You're like, let's get this done. A lot of guys say, 'Let's get this done and then we'll stop and have a smoke break.' It's, I don't know. As of right now, I don't have the [smoking] taking a negative effect on me as in my health, which is pretty big, but I can see myself kicking it not too long from now and moving on. But until I try, I won't know, right?". Another labourer also spoke of his conflicting views of smoking: "That's the hardest thing about quitting is being around people smoking or the smell of it – big time, even though it's disgusting it still gets you". The experience of being both a construction worker and a smoker will be described in detail in the next section.

5. Experience of being a smoker and a construction worker

Each participant discussed in much depth their experience of being a construction worker who smokes, especially related to safety and smoking policies in the workplace. All participants discussed various smoking and safety policies that are usually followed in the workplace. Safety was described as an important aspect of the construction workplace, and some even described

"safe is number one". Safety policies that were mentioned, though not described as being consistently followed included: wearing protective equipment, using protecting guard railings when working from a height, securely tying off safety harnesses when working at a height, and paying attention when using power tools. Smoking policies were also described, though these policies were not always followed. Policies included smoking away from flammable substances, smoking in designated smoking areas, not smoking in company vehicles and smoking outdoors or outside of client homes. A commercial painter described workplace policies as comparable: "the smoking [policy] is no different than having to wear your safety shoes. It's the same thing, and your hard hat".

Some participants noted that they use common sense regarding safety requirements and smoking policies. A labourer stated, when asked by the researcher if he smoked anywhere on a job site: "Common sense, yeah. You got to use common sense…if you think it's properly ventilated, that's kind of what I use. I just use my own…". Seven participants also described being more safety conscious around coworkers who "go to work just to get a paycheque, so they really don't care", and sometimes describing "your biggest threat is other people. You have to make sure not only what you're doing; you have to watch what everybody else around you is doing because it's very easily they could hurt you just as easily as you could hurt yourself". This common sense was described by some participants to also be used regarding smoking policies, specifically related to smoking outdoors.

Many participants (9) described times when they smoke outdoors from their workplace, regardless if it was a home being renovated or a partially built building. A labourer described the smoking policy to be "basically don't smoke inside; if you want to go have a smoke, go anytime

you want, just go outside" and a self-employed contractor described that "uh, you smoke outside…Don't smoke in the house…I don't even smoke in my own house".

Participants talked in some detail about times they are unable to smoke, for example when it would be hazardous; a flat roofer describes "The only time that you couldn't smoke is if we were using red primer, which is for torching. That's very flammable, so, very, very flammable, so you can't use it and smoke". Other participants stated they don't usually smoke around hazardous substances because they smoke outside of the space they are working in, though they could still be exposed. For example, one participant stated: "unless they're [hazardous materials] stuck on us. You tend to wipe your hands on your jeans a lot. But yeah…we smoke outside, we step away from our work site". Participants also described times when they found it difficult to smoke, such as when they were using both of their hands, working on an intricate project, or "if you're doing something important, you don't want to be distracted by your cigarette hanging out of your mouth or getting smoke in your eyes". A carpenter apprentice also described "pretty much any time you're working though, it can be inconvenient [to smoke] because usually when you're working, you forget about it and then you end up burning yourself".

Several participants discussed the differences among safety and smoking policies from company to company, and specifically the differences between large and small companies or projects. Eleven of the fourteen participants discussed that at larger companies, safety is valued above production. A labourer described this difference as follows "a lot of the bigger companies they have no choice. A lot of the smaller companies, they're in just to make a buck, right?". An electrical apprentice described "Usually the larger the project, the more safety rules there are. They usually get a little bit more strict. They're a little more serious about the project…there'd

be more people working there, so therefore there's more reason for a safety man to be around and monitoring".

When asked about health and safety training, thirteen participants said that smoking was not an issue raised in any training they had received. A framer stated he has never had health and safety training that dealt with smoking, and said "I've got health and safety training to deal with everything else". A concrete finisher discussed that he had not had health and safety training regarding smoking: "I don't think so, not whatsoever because I don't think it pertains to any of the issues that I safety train for. I have my Fall Arrest certificate. I have my WHMIS. I have the things that I need to be on my sites, but none of that pertains to smoking…[laughs]". The only participant to state that he has had health and safety training related to smoking was a labourer who stated "That have dealt with smoking…Yeah like don't smoke near flammable items and stuff but there isn't that many flammable items so other than like gas to fill the chainsaw or something like, that's about it". Participants described that smoking was mainly discussed regarding policies and designated smoking areas: "every job you go to you have an orientation, and there's always a smoking part, like where to go, if it's acceptable, if it's not, just that" though these policies may not be taken as seriously as other health and safety issues: "generally, smoking is talked about on the site. Everyone knows it's just something that maybe the boss will say and then you can go smoke anyways".

Many participants said that smoking and working on a construction site go "hand-in-hand". Nine participants talked about the association, one stated "a lot of people say it's part of the job". A labourer stated "I mean if you can use both your hands and have a cigarette in your mouth and you can do it outside, you're doing it. That's what you do". When asked by the researcher if smoking affects being able to do their job safely, all participants replied no and

many described that smoking doesn't have an effect on their work. A carpenter apprentice said "Usually if you just, the cigarette in your mouth, it doesn't impede anything". Some participants described the positive effects that smoking had on their work, such as contributing to less stress or helping the workday to pass at a faster pace. A labourer said "It makes my day fly by, actually…It makes me happier, it makes me work harder".

Several participants suggested that work would be worse without smoking. Participants spoke of the physical effects they would experience if they did not smoke (i.e. "It'd be hard to work. It'd make me tired and not concentrate") and the importance of smoking to their day. An electrical apprentice stated "I guess it's kind of important. If it was taken away, I'd have big difficulty dealing with my day" and a flat roofer said "If I can't smoke, I'm not working. And if I don't have smokes, that's when I shut 'er down for the day. I go home or I go to the store and buy them. If I don't have them, I don't work". Some participants also said that working or taking breaks would be boring without smoking. A labourer described his thoughts about the possibility of not smoking at work: "to me it might make the day longer. I might feel bored" and a self-employed contractor stated "what else are you doing while you're having a break? Standing there, twiddling your thumbs? Light up a smoke".

Participants talked about the other views they had about smoking at work. Seven participants suggested they save time by smoking while working, smoking on the jobsite despite there being a designated smoking area, or taking short smoke breaks rather than a full 15 minute break. A labourer stated "there are designated smoking areas [where] you were supposed to go to, but for example, it could be three blocks down, right, the smoking area...so versus getting in trouble for wasting all that time, you can just kind of go find a spot in the back, have a quick smoke, and then go back to work". Several participants also discussed beliefs that they would be

more productive if they did not smoke. Nine participants said they would be able to get more done at work if they were not a smoker, as a framer said "I suppose I'd be a better worker if I didn't smoke…there'd be the time saved, obviously".

Participants were also asked about their views regarding outdoor spaces on a jobsite, and when smoking should and shouldn't take place. Different definitions of an outdoor space on a worksite were offered by participants. Some participants stated they didn't see a "grey area. You're either in the structure or you're not in the structure". Others suggested that if an area is ventilated with "fresh air coming in", it is an outdoor space. Other participants defined indoor areas only when the building was finished (e.g. as sealed and climate controlled building). A framer stated "inside work…it's not really inside because the windows aren't installed, the wind's blowing, if it's raining, the rain's dripping through. It's still cold in there or hot in there or whatever".

Some participants stated they believed they should not be smoking at work. Four participants said that smoking should not take place on construction sites, or that they "know that it's law that you're not allowed to smoke at any working place at all, period. It's definitely overlooked in the construction industry".

6. Health effects

Eleven participants described the effects of tobacco use on their health. Some described their smoking causing weight loss and decreasing their appetite or eating. Others complained of the stains on their teeth. Many discussed the negative effects smoking had on breathing and that it increased coughing. A flat roofer stated "I've been hacking too much" and a concrete finisher even said "I just figured I've been smoking way too much. When you wake up in the morning and start coughing before you can start breathing, you know that you're smoking too much".

When asked how work would be different if she didn't smoke, a commercial painter stated "I could probably breathe a bit better (laughs), really".

Six participants also described that smoking caused a decrease in their energy level and stamina, or stated that they felt tired from smoking. When asked about how work may be different if he did not smoke, a labourer noted that he would "have more energy, that's for sure. Yeah, and I mean in that sense, maybe it does affect my work and I don't even know because I have less energy or I just feel bogged down from chain smoking all day".

7. Smoking behaviour outside of work

The sociability of smoking was a sensitizing concept identified in the review of literature. Katainen referred to the term sociability in her research regarding the meaning of smoking among manual workers, and states that smoking enhances sociability or the ability to be social (2011). No conclusive definition is provided by Katainen of the term 'sociability'. However, in the present study, sociability refers to the ability for smoking to be a social event, and the nature of smoking as it relates to being a shared and social practice. For example, smoking allows workers the ability to be social through taking a break and socializing. This is further discussed below in Tree D: Sociability of Smoking.

In addition to the social aspects of smoking at work, participants also described the social nature of smoking outside of work. Participants said that smoking allows for having a "social moment" and they tend to smoke more when getting together with friends, or socializing at a coffee shop or bar. As a concrete finisher noted "When you get together and you're a smoker and somebody's a smoker, what's the first thing you do? Let's go have a smoke, and you invite, it's an invitation…force of habit. Even though it's not a good habit, people still invite others to have a smoke". Most (13) participants described that they smoke with their family, including parents

and siblings, and six participants stated their partner is a smoker and they smoke with him/her outside of work.

Some participants (five) described smoking accompanying drinking alcohol outside of work. A labourer stated "with beer or whatever, cigarettes and beer go hand in hand, so if I'm drinking, then I'm smoking". A self-employed contractor stated "If I'm not drinking a beer, sometimes I won't be smoking. So there's some times they tie in together with something else". Participants (six) also said that smoking was often paired with drinking coffee outside of work, and this was sometimes a social encounter: "Anybody that comes over, they always come over for coffee and smoke".

Many participants (12) described times when smoking is a social experience outside of work. However, eight spoke of times when smoking is not social, or when they did not smoke with others outside of work. A labourer stated that "I don't usually smoke with anybody...all my friends live farther away". A self-employed contractor said "I smoke with me, myself, and I, all schizophrenic three of us. Yeah, no, I don't, actually most of my, since I moved...I don't have anybody here in [city] who is a smoker. So I don't hang out with anybody and smoke with anybody here in [city]". Other participants said they smoke less at home than they do at work, or that they are not as heavy of a smoker at home. A high rise restoration mechanic stated "I smoke more at work than I smoke at home. When I'm at home, I can have a pack of cigarettes last a lot longer". A labourer offered an explanation of why he does not smoke as much as home in comparison to work: "because I'm not stressed at home. I don't need to look for something else to bring me down. At home, I kind of look at it as I control what I want to do. At work, you really don't have any control; you're there to do a job. At home, I can control everything, so I

don't feel that level of stress or whatnot". Participants offered various opinions and explanations about why they smoke, which are discussed in the next section.

C. Reasons for smoking

To further understand the experience of smoking for each participant, questions were asked to elicit reasons why participants continue to smoke. It is understood by the researcher that physical dependence on nicotine and the countless physiological aspects of tobacco use come into play when exploring these explanations. However, questions such as 'why do you continue to smoke' elicited a great deal of information from construction workers on motives for continued tobacco use. These are discussed here.

The theme of addiction to smoking emerged from nine of the fourteen interviews. Seven participants described being addicted or highly addicted. A concrete finisher describes of "times when it's just like I'll tear my hair out because I want that cigarette", and, a flat roofer offers a comparison: "It's just something I need. It's like people and gas in cars; you need it to run it". Two other participants said that they did not feel physically addicted. A labourer states "To me, addictions are all in your head unless you're addicted to oxy [oxycodone] or something like that, you know what I mean? Smoking is big time in your head and I've been smoking for like nine years". A self-employed contractor said that "When I was younger, smoking was more of an addiction, whereas as I got older I didn't like it as much, so it became more of a social thing".

When asked by the researcher 'why do you continue to smoke?' only three participants stated they smoke because they are addicted. The four other participants who described being addicted, or at least smoking because of a drug effect, mentioned this at other points in the interview, for example when talking about needing a cigarette in the morning or about cravings. Many participants also spoke about having a physical reaction to not having a cigarette for a long

period of time and described becoming agitated or stressed when they were craving a cigarette. As an electrical apprentice stated “If I don’t get to have my smoke for at least two or three hours, then I start to get agitated and eventually I want to have a cigarette”. Participants also described their addiction in relation to stressful situations: “I don’t know if it’s a stress reliever or if it just brings that level of nicotine back up in your body that you’re okay to deal with things or just doesn’t bother you anymore”. Stress was identified by participants as a reason for continued smoking.

Several participants described using tobacco to relieve stress, stating they smoke because they are feeling stressed, smoke in stressful environments, and smoke to “get rid of some of the stresses of the day”. A high rise restoration mechanic stated that he is “pretty relaxed if I can smoke while I’m [at] the job site rather than getting stressed out when I’m doing that sort of work” and even stated “if I’m stressed, I’m smoking and it makes me think it’s okay then. I don’t know why”. This reason for smoking was common among participants, as nine stated they used tobacco to relieve stress.

Participants also described boredom as a reason for smoking, or smoking because it gave them something to do. Seven participants described smoking when they were bored at work, either on a break or while working. A self-employed contractor described how smoking on a break is something to do: “sometimes I’d have to say it’s something to do, and it’s a pretty bad excuse, but once you smoke long enough, you kind of, what else are you doing while you’re having a break? Standing there, twiddling your thumbs? Light up a smoke”. A labourer described being bored at work, and how smoking helped to reduce these feelings: “some days I do feel really bored and then I smoke and smoke and smoke, like chain smoke once in a while and then I don’t feel as bored anymore. It’s just something to do”.

Participants also described smoking when they felt bored outside of the work environment. Five participants spoke about these feelings of boredom as a reason for smoking. For example, a commercial painter stated "if I'm sitting around the house I'll smoke like a half a pack. So it's more out of boredom". Three participants said that they smoke when their attention is diverted, for example when playing cards or working on a computer. A high rise restoration mechanic stated "doing work on the computer I'm smoking quite a bit. I don't actually need my next cigarette, but for some reason, I guess I'm not as busy, that I'm at work with my hands and stuff, I seem to keep grabbing for another cigarette even though my mind, my body is saying oh my god, put that out; you don't even need it, like you're feeling sort of sick from it right now". Participants also described this passive type of smoking in relation to the theme of smoking as a habit.

Nine participants reported that they smoke, in part, because it is a habit. A labourer described that "a lot of times I'll catch myself with a smoke and like, I don't even want this smoke. I'll have a couple puffs and throw it out. It's just…it's maybe the connection. I see everybody smoking, so I'm like, kind of just force of habit, reach into my pocket, pull one out". This reason for smoking was also described in terms of a routine, as a labourer stated "I don't think it's an urge anymore. I think it's just habit now. I guess it's routine. I've just gotten to the point where it's like I don't need to, I just do. It's a routine now".

During the interviews, the researcher asked participants why they had begun smoking. Seven participants described starting smoking because it was cool, as a self-employed contractor recounts "we found a pack of cigarettes one day and we thought it was cool. We saw all the older kids in school smoking and we thought it was cool". Other participants (five) said that family members smoking was among the reasons they took up smoking. A labourer said "everyone in

my family smokes so I just, I guess for [the] social aspect" and another labourer said he started "because of my mom. She smoked a lot like when I was going to hockey. She'd have the windows up and I think that's when it started to catch on". Two participants stated they starting to smoke because of stress or other drug use. One participant noted that though he began smoking in high school, "it actually didn't catch on, and then when I did start working construction is more when it caught on because it was, oh, let's go for a coffee, let's go for a smoke, and you'd just be sitting there. At once, it's just like, okay, let me try that, and then you get hooked on it". The social nature of smoking on breaks, along with various other social aspects of smoking are discussed in the next section.

D. Sociability of smoking

One of the sensitizing concepts identified through the review of literature was the sociability of smoking. This theme and various subthemes emerged from the data, and all participants in the study described experiencing the sociability of smoking at work to some degree.

Participants discussed various aspects of the social nature of smoking. Some participants said that smoking allows for increased socialization, and that they "would smoke with anybody that's on the site that smokes". Participants reported that they socialized more with other smokers, as a concrete finisher said "ideally, smokers socialize when they're in their own little group" and that smoking was an act that brought workers together: "it definitely brings people together in a way…it brings the smokers together". Participants described that "smoking at work is very social" and that they smoke because others around them are smoking or smoke more around others that are smoking.

The sociability of smoking regarding break time at work was discussed in great detail by participants. The majority of participants (twelve) said that smoking provided a way to socialize on breaks. A commercial painter talked about socializing while smoking with construction workers from different companies: "I think actually with a lot of construction…there's like about five or six other different companies that are there [on worksites], different trades, and yeah. So they all get together and they're all smoking". Another participant compares socializing while having a smoke break to smoking alone: "you're working with a couple of guys, one of them says, 'let's go for a smoke' and they round up the crew of a couple guys and off you go for a quick smoke and everybody goes and chats at the same time, versus just going out there and smoking by yourself and looking at the wall". It was evident from the interviews that participants enjoyed being able to smoke and socialize. While twelve of the fourteen participants described smoking as a social experience on breaks (one even stating "of course, it's a social event"), ten were somewhat hesitant to describe smoking as social. Participants believed smoking as "somewhat social" or stated "I guess that's your social time for at work, right? It really is, I guess". It is not known why participants were hesitant to describe smoking as social, but this reluctance could be related to the fact that they thought of this association in a negative way. For example a labourer stated "It's kind of a social thing too, as stupid as that sounds".

In addition to describing smoking as a way to socialize on breaks, participants also described smoking as a reason to take a break or a reason to stop working and socialize. A framer reported "It's a reason to stop and chit chat and I don't know. It's just, everyone smokes". Twelve participants believed smoking was a reason to take a break, and some of even described smoking legitimizing or defining the break. As a labourer stated "I'm not smoking on my break, then I'm not having a break". A self-employed contractor even compared a break without a

cigarette to one with a cigarette: “We’d be working away and then ‘break time’, take a coffee and just stand around and do nothing. Whereas often you’d have a cigarette in your hand and your hands are busy and you’re talking away and whatever”. Using a cigarette as a reason to take a break and socialize was described by most participants to take place during both informal and scheduled breaks. As a commercial painter states “instead of us taking 15 minute breaks, we would have like take every hour, we’d go out to have a smoke instead of taking the fifteen”. A labourer described his experience as follows: “Say someone will come up to you, start asking you a question about work, they’ll either ask you for a smoke or go light one and you’ll just be ok, you’ll have a smoke and start talking, right? Again, another way to have a little break and whatnot”. Discussing work matters while smoking a cigarette also emerged as a theme related to the social nature of tobacco use.

Six participants described smoking that occurred when having a discussion about a problem, task or next step on the job. A framer stated “if we run into a problem or something, we’ll stop and the first thing you do is, if we’re like, ‘what are we going to do here? how are we going to do this?’ the first thing you do is you stop and you pull out a smoke while you go over a problem” and a self-employed contractor described that the “first smoke break of the morning when we get together is to discuss what the plan is for the day, what the plan of attack is, who’s taking care of what, and then we go do it…. basically it’s a break from work to plan out the next steps that we got to do”. Seven participants also described that they used their smoke break to catch their breath or “take a breather”. A labourer described that “a lot of times, too, for me I find the excuse to stop. If you just want, like oh ‘I want a smoke’ well, you can stop, take your breath, relax, put your tools down…a lot of times, I’ll find myself even having a smoke if I don’t want

one just to stop, catch my breath". It was apparent from participants that smoking in and around the construction site was a very common occurrence.

Most (12) of the study participants described tobacco use as very common in and around the workplace. Both coworkers and superiors smoke: "everyone in charge smokes too". Many participants stated that "everybody smokes", referring to their workplace, trade and/or the construction industry in general. A framer noted "on any framing crew or roofing, if you don't smoke, you're the odd man out" and a labourer stated "on a construction site, 95% of the guys smoke". It was further discussed that smoking is normal for construction workers: "It's so ingrained. If you're a construction worker, it's pretty much, you're pretty much a smoker. You got that label".

The high prevalence of tobacco use that was described by participants was also discussed in relation to sharing cigarettes. Six participants stated that they could always ask a coworker for a cigarette if they were in need of one, and that they would be willing to share their cigarettes with other workers who did not have one. When the researcher asked a carpenter apprentice if she is ever at work without cigarettes, she replied jokingly "no, because I can always ask somebody [laughs]". A framer said that "everyone smokes. You talk about it, you loan them, 'who's got them?' ", and a concrete finisher stated "if they know you're a smoker, they're not going to let you crave because they know what it's like too, right". A self-employed contractor discussed coworkers' wiliness to share cigarettes being a challenge when attempting to cut back: "If I didn't buy a pack of cigarettes or bring cigarettes with me because I was trying to cut back, somebody else had them. And from years of smoking together with guys, everybody gives cigarettes to everybody if they don't have them, and everybody offers cigarettes. Good friends, they've got their package open, handing them to you. So that could be kind of a problem when

you don't even have to ask and they're handing them right to you". Various other mechanisms that discourage quitting or cutting back and encourage continued smoking are discussed in the following section.

E. Mechanisms associated with continued smoking

Participants spoke of the difficulties they experienced when trying to quit smoking or cut back, and many described the various mechanisms that encourage continued tobacco use at work or outside of work. Most participants stated that smoking often took place in conjunction with another activity. In many cases, smoking took place when drinking coffee. Not only did smoking and drinking coffee emerge from the data as a common pairing (i.e. "if I'm not drinking a coffee, I won't always be smoking"), it was described by some as two staples in a construction workers life ("construction workers basically live off coffee and cigarettes, and it's true…It comes with it. I don't know what it is, but it just comes with it"). This combination, however, could be reinforced by the workday routine. As a labourer stated "if I'm headed to work in the morning, I grab a coffee and a cigarette….when I'm not working, I have a coffee and I don't have a cigarette with it ever".

Coffee breaks were reported as a time when workers smoke cigarettes. It was even discussed that coffee and a cigarette defined a break. A framer said "In Construction? [Laughs] Coffee and a cigarette, that's your break in the morning" and a flat roofer spoke of how one accompanies the other: "When coffee runs come, you want a coffee, you want a smoke. It goes hand in hand". This pairing of a coffee and a cigarette has been found, in this sample, as a mechanism for continued smoking, and one that is seen as triggering for continued smoking. A self-employed contractor states "you get a coffee and a whiff of a cigarette and you're trying to cut back and it smells kind of good, it's pretty easy to say yes".

An important mechanism related to the continued smoking in the workplace has to do with one of the sensitizing concepts identified through the review of literature: the dual threat experienced by construction workers, or the negative effect of occupational hazards compounded by tobacco use. A key theme that emerged from the data regarding this sensitizing concept was the use of tobacco while environmental hazards are present. Twelve of the fourteen study participants described smoking while in the presence of some kind of environmental hazards (e.g. dust, chemicals) and that the presence of these hazards did not deter from smoking. A high rise restoration mechanic states "I do think about smoking and inhaling particulate while I'm at the job site. I am aware, but it doesn't stop me, but I am aware that that could be dangerous". A concrete finisher explains "I'm not about to get up from my job and leave to have a cigarette when I'm knee deep in concrete with boots on and stuff like that. I'll just smoke right there and throw it in the concrete, bury it and away you go".

While participants seemed well aware of the dangers of smoking while these hazards were present, smoking continued. A labourer described a situation when "they're [coworkers] not supposed to smoke, like it actually could be dangerous, there's chemicals, and they'll be like, 'keep six [keep lookout], I'm going to smoke'. What can you do about that? He's telling you, I'm doing it; I'm not asking you, I'm doing it. Nothing you can do about that". A labourer stated "I don't know how to explain it. I find I smoke more when I smell chemicals. I don't know. It's strange". In one instance when a participant had a dangerous accident, smoking continued to take place around hazards: "I had the stuff on the far end of the stage and decided to go to the other end of the stage to have a smoke, which is completely wrong, and I still had a little bit of the alcohol on my glove, and my glove actually caught on fire, so I had to stamp that out". A few participants even expressed the view that environmental hazards in the workplace were more

harmful than their tobacco use. A self-employed contractor stated “It’s not the smoking that’s going to kill me; it’s the crap that I breathe in through my environment”.

An important mechanism related to continued smoking in the workplace was lax smoking policies. Participants noted varying policies, and that policies could be the requirement of a company, a specific site or the client (e.g. hospital with smoke-free grounds). Eight participants said that while there were smoking policies or designated smoking areas at their current workplace, they were not followed: “there are designated smoking areas you were supposed to go to, but for example, it could be three blocks down, right, the smoking area. So versus getting in trouble for wasting all that time, you can just kind of go find a spot in the back, have a quick smoke, and then go back to work”. Other participants discussed situations in which there were no smoking policies and they had the ability to smoke at anywhere and anytime time as long as it was outdoors. “There is no smoking policies. You can smoke anywhere as long it’s outside”. In some cases, policies were not supported by superiors: “The occasional time the foreman would say, ‘Go over there, sneak a smoke,’ which would be alright”. However, in other cases participants described smoking inside buildings, but trying to not be caught: “you do see it [smoking indoors] though. Yeah. Because everyone yells to each other, ‘The supervisor’s coming,’ or whatever”. Participants also noted that many policies existed but were not enforced. A flat roofer said “a new no-smoking policy is that you’re not allowed to smoke on the property. Nobody ever follows it”.

Many participants described that smoking policies were dependent on the state of the construction job (i.e. early, rough phases or finishing phases). Smoking often occurs in unfinished worksites. As a labourer stated “it was still kind of, like it [smoking] was accepted because there was no finishing work getting done, so everything could kind of be swept off and

cleaned up still. So it was okay there". Another labourer noted "usually in rough construction, people are smoking inside. Once it gets to finished carpentry, you can't, people aren't smoking inside anymore". The ventilation of a building was also a factor when participants described smoking inside a building: "if you're working on a floor where there was no windows installed, I wouldn't say it's outdoors, but I'd definitely say that smoking in there shouldn't be a problem because it's very well ventilated, especially when you're up on the 10th or 11th floor. The draft coming through there is intense". Despite being inside of a building, smoking still occurred and workers did not speak of policies that limited tobacco use in unfinished worksites.

In addition to policies varying from companies and worksites, participants described that the degree a policy was enforced varied between sites, companies and or superiors. For example, a labourer stated "they allowed smoking on the job site. Even though [company] tells you you weren't allowed to, that site they didn't give a shit as long as you were working. So yeah, I would smoke through the day". Due to the difference in policy enforcement among superiors, participants described knowing who to avoid when not following policies. For example, a labourer stated "you can tell when you're there what you can and can't do. Some companies are really, really strict, some don't care….or there's companies that are really strict but your boss, you'll see him standing there smoking, so that's kind of a sign that if he's doing it, go ahead guys". The various policies and varying degree of policy enforcement allowed for participants to continue smoking in and around jobsites, and during working hours.

Several other contextual factors related to the construction workplace or organization facilitated continued tobacco use among participants. One key facilitator described by participants was being able to smoke at any time, including on breaks and while working. When asked by the researcher about smoking policies, a labourer stated "If you want to smoke, go have

one" and a self-employed contractor stated "The smoking policy generally is smoke 'em if you got 'em". Participants described being able to take a break at any point for a cigarette: "I generally would smoke whenever you want, really. Although, you've got to get the job done, so you can't be smoking all day, but take your break when you want". Participants also stated that they could smoke throughout the work day: "I smoke while I'm working. I smoke whenever I like, pretty much, to a degree, as long as I'm following rules and whatnot of where we're working. There's no law that says you can't smoke if you're outside, so I do". When speaking about smoking at work, a framer stated "it's too, it's totally acceptable. That's the biggest thing".

Participants spoke about their ability to multitask, or work and smoke a cigarette at the same time. A labourer stated "If I'm outside and I'm pushing a wheelbarrow or what else with a cigarette in my mouth, I can multitask. (Laughter)… I mean if you can use both your hands and have a cigarette in your mouth and you can do it outside, you're doing it. That's what you do". Multitasking, or working while having a cigarette was common among participants, with eleven of the fourteen reporting they smoke while doing their job.

Some participants noted that in recent years, construction companies have started to implement policies prohibiting smoking in company vehicles. However, six participants said that they smoke in company vehicles, despite it being against company policy. For example, a commercial painter said that "If you see one person light up, the whole van will light up. And really we're not even supposed to smoke in the company vehicles either, but a lot of the foremen take their vehicles home and that, so they consider them their vehicles I guess and they smoke in it".

Many participants described the ability to smoke anytime because they worked mainly outside: "I'm outdoors, generally outdoors you can smoke, so it's not like you're inside". A

framer discussed his perspective of the policy implications due to construction work being mainly outdoors: “the second point is we’re outside, we’re outside, and that’s where you’re supposed to smoke is outside. There’s nobody around…[Non-smoking coworker] is 100 feet away from me working with somebody else…How do you stop something like that when the rules are you have to be outside?”. Continued smoking occurred among most participants in this study, and most said they spend the majority of their day working outdoors and there is a lack of outdoor smoke-free policies.

F. Experiences with quitting or cutting back

The Experiences with Quitting or Cutting Back tree was the second largest structure created during this phase of the analysis (review of emerging categories in comparison to sensitizing concepts and research questions). In order to describe the findings within this tree in a systematic way, this section will also be broken up into subheadings that represent the three branches in the tree: beliefs about quitting, quit aids and methods, and barriers to quitting. These three branches are ordered in a way that was most logical to the researcher. Beliefs were important to consider prior to learning about aids used previously, and beliefs and previously used aids were important to consider when identifying ongoing barriers to quitting.

1. Beliefs about quitting

One of the sensitizing concepts identified during the literature review had to do with the potential fear of a loss that a construction worker might experience when quitting smoking. This fear could be related to losing smoking friends, or a worry that something will need to replace their smoking habit. During the interviews, participants were asked questions related to this phenomenon in order to understand their individual opinions and views about quitting. (e.g. if you were to quit/cut back, what might worry you?). When asked about their fears or worries

about quitting, thirteen of the fourteen participants stated they had none. A self-employed contractor said "I don't think I'd have any worries…I've never had any worries or fears of cutting back". A framer reported "All those worries are kind of superficial. They're not really, nothing's going to happen. It's the initial getting over the hump of like 'oh my god, what am I going to do in the morning when I can't smoke?' But once you're past those first couple days, couple weeks, it's kind of all the same".

While the majority of participants stated that they had no worries or fears about quitting, during further discussions, eleven participants described concerns that they have or could have if they attempted to quit. A labourer even described aspects that may concern him when quitting, but stated that he was not worried: "What worries me about quitting? Not having a smoke in my hand with my beer. That's about it. Maybe that I would replace cigarettes with food, but I already eat a lot anyways, so personally, I don't think anything worries me about quitting". Some of the worries that participants described included self-doubt, feelings of frustration, anger or stress, being short of patience, and not having a vice to turn to or fall back on. A framer described his experience of quitting: "to describe the feeling best… It's like when you're on a roller coaster, right before that first big hill when you're about to go down and it's like [sharp intake of breath]. That's the feeling you get and the longer you go [without smoking], the farther and fewer between the feelings are, but you still get them".

A specific fear stated by eight participants was gaining weight during the quitting process, or replacing cigarettes with food. A concrete finisher said "the only thing I would say is I'd probably put on weight. That would be the only thing that would scare me is the ten pounds that they ask for because I don't want any…". A labourer reported "if there's more to eat. That's the thing, smoking cuts down on your eating so if I didn't smoke, I'd eat more and then I just,

well, be fat. That's the sad truth, really, especially when you have been doing it for so long". Various aids that participants have used to assist them with addressing their challenges are discussed in the following section regarding quit aids.

2. Quit aids and methods

Participants were asked about the pharmaceutical and non-pharmaceutical aids they have used in the past or might use in the future when attempting to quit smoking or cut back. Only three participants stated they have health care benefits that cover nicotine replacement therapy or prescription medications, and one other was unsure if he had coverage. Nine participants described using quitting aids to assist during past attempts to quit or cut back; these participants described of the various methods that they had tried, though no one method emerged as common among participants. Two participants stated that they had used nicotine replacement therapy patches and one used nicotine replacement therapy gum, two participants used either a vapour cigarette or electronic cigarette, and four participants described using medications including Champix, Zyban or Wellbutrin. Some participants described having negative side effects to prescription medications, such as nightmares, nausea, confusion, or disorientation.

Other methods participants had used to quit included smoking lighter brands, not buying cigarettes as often, increasing physical activity, chewing gum, smoking at times "when I don't feel like having a cigarette", eating sunflower seeds, hypnotism, and smoking half of a cigarette at a time. Participants also described that they avoided smoking coworkers when attempting to quit.

Seven participants described that when they were attempting to quit or cut back, they avoided being around or taking a break with their coworkers who smoked, though this was not an easy task. A concrete finisher described how he "slowly, slowly just wean away from the guys

that are smoking. You don't want to be around the smell of the smoke. Somebody's smoking, if you smell that smoke, you want to have a smoke, right? It's the first thing that goes in your mind". And a self-employed contractor described times when he would not take a break with coworkers who smoke: "You keep on working, you forget about it. But it's not as easy as, you want a coffee and you want to talk to your buddy because he's been on the other side of the house working away and you work by yourself sometimes". Some participants said sometimes they would not even take a break and just continue working.

While participants described various methods they have used to assist in their past quit attempts or attempts to cut back, other participants also described quitting cold turkey, or never using quit aids. Three participants described they "don't believe" in nicotine replacement therapy; a framer stated "the nicotine replacement therapy doesn't follow logic. You can't quit nicotine by keep on putting nicotine in your body. It just doesn't [make sense]". Seven participants described never using a quit aid. A disparity exits between the number of participants who reported using quit aids (nine) and the amount of participants who reported not using quit aids (seven). This difference exists because some participants described never using quit aids, though they used non-medical methods to help quit or cut back (e.g. a self-employed contractor described he "never used any aides or anything", but stated when he was trying to cut back he switched to a lighter brand of cigarettes and did not go to the store to buy cigarettes). These participants may view quit aids as strictly medical, such as nicotine replacement therapy or prescription medications.

3. Barriers to quitting

Participants spoke in great detail about various reasons why quitting or cutting back is difficult and why they were unable to stay smoke-free during attempts in the past. Participants

were asked if they were aware of any assistance that is offered by their workplace for employees who are quitting or cutting back. Three participants described that they had benefits to cover prescription medications or nicotine replacement therapy; all other participants stated their work does not offer any kind of assistance for employees attempting to quit. A labourer stated "I've never heard of anything even remotely close to that. Maybe if you're working in a big company that really cares about their employees…maybe you'd get help if you were in the company for a while and whatever, but I think most people would say that's just a money pit for me". A concrete finisher described his opinion regarding any assistance from workplaces when quitting: "I don't imagine so. Not in our industry, anyways. You're hired to do a job. What you do with your personal business is your own business and if they start getting that personal in your business, then there's a serious problem". The notion that smoking is a personal matter emerged as a theme that will be discussed later in this section.

Participants were also asked how their workplace could assist them in the future if they wanted to quit or cut back, and many stated specific suggestions of assistance that could be offered. Six participants believed their work could offer benefits or monetary support for prescription medications or nicotine replacement therapy. Three participants described incentives that workplaces could offer to encourage participants to make quit attempts: "I think an incentive, something like that will get through to a lot more people that may not, it would make them think twice versus, 'Would you quit?' 'No.' 'Okay, here. I will give you this,' and make them stop and think, hey, maybe I can give this a shot". Of the three participants who suggested that workplaces offer incentives to assist employees when quitting smoking, one suggested a monetary type incentive and two did not specify the type of incentive.

Participants described that quitting or cutting back at work was more difficult because coworkers continue to smoke on breaks and or while working. Eleven of the fourteen participants described this challenge, some speaking of it in some detail. A labourer discussed his experience: “it was really aggravating because a lot of the guys I work with, they live on coffee and cigarettes, so it’s always like, I’m going to have a coffee break. You’re sitting beside someone drinking coffee and watching them smoke and you’re just basically sitting there staring at them smoke. It’s like, this isn’t fair”. A flat roofer stated the following: “I wanted to quit, but everybody smoked around me. It was really, really hard. If I could stick myself in a dark, dark room for a good month, I think I could do it, and with not letting me out, whatever. It’s like detox, right? I could probably do it. But when it’s around you constantly, you’re going to do it [smoke]”. Some participants reported they worked in close contact with a colleague (e.g. work partner) and stated they would need their coworker to quit in order for themselves to quit. A self-employed contractor said “It’d be really great if my partner quit because that would be motivation if he had been quit. And my partner and I certainly have talked about it over the years, but he’s more of a hardcore smoker than I am”. Many participants also described that they would need smoking to be restricted in some way (e.g. designated smoking area, smoke-free worksite) in order to quit.

Many participants described that in order for them to successfully quit, a company policy would need to prohibit smoking on worksites in some degree. Three participants believed a designated smoking area that was strictly enforced would help them during a quit attempt, five believed a smoke-free jobsite would assist them because others would not be smoking around them. Many of the participants who said that they would benefit from limiting smoking on the jobsite described how important enforcement was, as a labourer described: “If you had to go out

to your car OR if they enforced the smoking…designated smoking areas, because it would be a lot easier because you'd know don't go over there, that's where they smoke. I don't need to go over there" and another labourer described "I don't, I think one of the things they could do to help people quitting is not letting people smoke on the job site, being very strict about it".

While the need for smoke-free policies emerged as a theme, another related theme was that these policies are unrealistic. Ten participants said quitting would be easier without coworkers smoking in the vicinity. Six of these did not believe it was possible or did not want to prohibit smoking. Some participants even described they saw a need for a smoke-free policy (for themselves or coworkers to quit), but they do not want it implemented. Participants gave reasons why they would not want smoking prohibited on worksites; examples included thinking it would be unfair to smoking co-workers, not wanting smoking co-workers affected by a participant's quit attempt, and not believing workers would ever follow a policy. A concrete finisher said "there's no way in heck anybody should ever ask somebody to not smoke because they want to quit. That's your right to quit, but it's also their right to smoke" and a labourer said "because construction workers, some of them anyways, a lot of the older ones, they don't care. Their site's not supposed to [smoke], they don't care…I personally just don't think it could ever happen because there's always going to be, like they say, rules are made to be broken. Everywhere I go I see people, there's always going to be guys that take it into their own hands and do what they want to do". Some participants also expressed that they believed smoking was their own personal concern and employers or other coworkers should not be involved in a quit attempt.

The notion that smoking is a personal problem emerged from interviews with five participants. These participants described their smoking as either their own personal business or reported that their workplace would treat smoking as an employee's personal problem and would

not be involved with a quit attempt. A framer discussed his belief about how his employers would view a quit attempt: “it’s either ‘quit or shut up or whatever, that’s it. Don’t come and complain about it. Smoke or don’t. If you want to quit, quit; if you don’t, don’t. Don’t bug me about it. It’s none of my business, it’s not my problem, it’s not me’ you know? That’s exactly what they’d say”. An electrical apprentice reported, when asked how his workplace could assist him with quitting “I’m on the fence with that question because me, personally, I feel like I have to do it, but I think maybe for other people it could be beneficial”. A participant also stated, when asked if he or other coworkers may make a quit attempt if his employer was addressing tobacco use in the workplace: “here’s the thing, though. Then they’re forcing you to do something, forcing an action on you…everybody’s different, so basically you have to tailor it to everybody’s need if you’re going to bring it down to that kind of science and it just ain’t going to work in this industry. There’s just too many people that smoke for different reasons”. Participants also stated that despite all the assistance that could potentially be offered, an individual still needs willpower and a desire to quit.

Several participants spoke about the struggle to quit smoking, and that willpower, strong desire and personal strength is needed to succeed, in addition to a decision to quit and be a non-smoker. Ten participants spoke of the self-control or willpower needed when quitting. A framer said, when asked if it would help employees make a quit attempt if their employer was addressing tobacco use in the workplace: “that depends. I found with a lot of construction workers, I’ll see hard-headed, stubborn guys, so it all depends on the person. If you want to do it, you’ll do it, and if you don’t, no matter what anybody says or does is going to change you”. A commercial painter said that she thought more people may attempt to quit if they had access to quit aids: “I think you would see a lot more people trying the alternatives, but it is very

expensive for the alternatives and a lot of people don't have that willpower to do it [cold turkey]". Seven participants said regardless of any smoke-free policies implemented, quit aids offered or incentives offered, a construction worker still needs a desire to quit smoking if he or she is going to succeed. A self-employed contractor said, when discussing having access to nicotine replacement therapy, that "it is an option, but it first boils down to the individual saying yeah, okay, it's time to stop".

5.2.5 Phase 2.4: Subgroup analysis

After describing each tree and the various branches, twigs, leaves and sub-leaves in detail, the researcher continued to analyze data within NVivo 10 using the matrix function. The following chart depicts the breakdown of participant attributes and the number of participants in each category.

Table 7: Attributes, values, and amount of participants in categories

Attribute	Values	Number of participants
Age	20-29	5
	30-39	6
	40-49	3
Gender	Male	12
	Female	2
Skill level	Unskilled worker	7
	Tradesperson	7
Union membership	Union member	4
	Non-member	10
Job sector	Residential	8
	Other (includes high-rise residential, commercial and industrial)	6

The chart below summarizes the findings from matrix coding, and is organized according to the trees that were developed in earlier coding; each tree is divided according to the attribute categories. A description of the key findings from these subgroup analyses is provided following the chart.

Table 8: Subgroup analysis findings

Day-to-day workplace experiences (Tree A)			
Attribute category	**Node**	**Finding**	**Interpretation**
Skill level	Like that I can smoke at work	Unskilled workers more likely to report that they liked being able to smoke at work when compared to skilled tradespeople. Five of the seven unskilled workers described they liked that they could smoke at work, while only one of seven skilled tradespeople did	Unskilled workers (e.g. labourers) may appreciate and enjoy that they can smoke at their workplace. Skilled tradespeople may see this in a negative light, as a barrier to quitting smoking or want the commonplace nature of tobacco use in the workplace to change
Job sector	Safety not valued	All participants employed in the residential sector mentioned this theme, and five of seven participants employed in other sectors mentioned this theme. However, compared to participants from the residential section, participants employed in the other sectors spoke in more depth about the fact that their workplace does not provide and enforce a safe work environment	Safety may be of a bigger concern in commercial and industrial workplaces, whereas safety is of less of a concern in the residential industry (especially when compared to production). This could be related to the nature of the work (e.g. residential work may have fewer hazards than larger commercial or industrial sites). This could also be related to the size of the company as residential companies may have fewer employees (e.g. two or three), and therefore less safety concerns than companies responsible for tens or hundreds of workers
Job sector	Don't use masks, masks don't work	An even number of participants from each job sector category mentioned this theme (six of seven), but participants employed in sectors other than residential talked more about the theme (i.e. there was more data coded from these participants)	Participants from industries other than residential spoke about when and why they do not wear a mask, and specific examples (e.g. times when they work with and are exposed to specific environmental hazards). Participants in the residential industry simply stated they do not wear a mask, as if this was accepted and common. This could also relate to factors previously mentioned regarding differences in safety practices between job sectors

Experience of smoking (Tree B)			
Attribute category	**Node**	**Finding**	**Interpretation**
Age	Health effects	Theme emerged from eleven of fourteen interviews, and the three participants who didn't mention it were in the youngest (20-29) age category. Majority of data coded in this node was from participants aged 30 or order (30-39 and 40-49)	It is evident from this query that older participants are more concerned about the health effects of their tobacco use, compared to younger participants. Younger participants mentioned health effects such as decreased appetite and stained teeth, while older participants were very concerned about their health status (e.g. effects on breathing and lungs)
Age	Desire to be a non-smoker	Thirteen of fourteen participants described theme, one who did not was in youngest age category. Participants in 40-49 age category talked most about this theme, including their past, present and future attempts, or reasons why they want to quit	Participants who were older spoke in the most detail regarding how they plan to quit and why they want to be a non-smoker. These participants have been smokers for longer and may have more experience with quit attempts, and more reasons to quit (e.g. for family members)
Age	Fear or worry is only positive	Theme only emerged from participants in the two older age groups, not from participants 20-29	Older participants may believe the positive aspects of becoming a non-smoker (e.g. saving money, improved health) outweigh the adverse symptoms of the quitting process or negative aspects of remaining a smoker
Age	Boring without smoking	Theme only emerged from interviews with participants in 20-29 and 30-39 age categories	Younger participants are more inclined to believe their job would be boring if they did not smoke, whereas older participants may not view this as a worry. This could be because younger participants also reported using cigarettes in the workplace as something to do or a way to pass time (described below in Tree C)
Union membership	Health effects	Only one of four union members described this theme, and she spoke about her concern for having stained teeth or looking old. The theme emerged from interviews with all ten non-members, who described problems such as coughing and difficulty breathing	Interestingly, non-members of unions had greater concerns for their health than union members. This could be because non-members may not have medical coverage or assistance through a union.

Experience of smoking (Tree B)			
Attribute category	**Node**	**Finding**	**Interpretation**
Union membership	Smoke more when drinking	This theme only emerged from interviews with participants who were not members of a union	Members of a union did not report smoking more when drinking, while non-members smoke more when drinking. This could be related to amount of alcohol consumption (e.g. union members may drink less alcohol)
Job sector	No smoking in residential or client homes	Only participants employed in the residential sector described that they do not smoke in the homes of clients	Not surprisingly, only participants employed in the residential sector were affected by this theme (i.e. those employed in other sectors do not work in residential or client homes)
Job sector	Larger companies have stricter policies and safety regulations	Participants in residential sectors (seven of eight) were more likely to describe this theme, and in far greater detail (discussing variations in policies and regulations) than the participants from other sectors (four of six)	Participants employed in the residential sector described more variation in the size of the companies they worked for (e.g. companies with two employees or many employees) and variation among the safety and smoking policies in different workplaces. Companies with a small number of employees may not need to integrate as many safety and smoking policies as companies responsible for managing tens or hundreds of employees (as described by more participants in the other job sectors)
Job sector	Injury prevention	Participants employed in the commercial or industrial sectors were more likely to describe their work takes steps to prevent injury (three of six). Only one participant from the residential sector described this theme, and he spoke about it when talking about experiences working on high rise residential projects, not family homes	No participants from residential companies working on individual client homes described that their employer takes steps to prevent injuries. This could also be related to the lax safety policies in smaller, residential homes (as discussed above). Further, there may not be supervision or responsibility to anyone above that of the owner of the company (e.g. from the Ministry of Labour) regarding the conduct of small, residential construction companies

Reasons for smoking (Tree C)			
Attribute category	**Node**	**Finding**	**Interpretation**
Age	Addiction	Only participants aged 30-39 or 40-49 described feelings of addiction. The theme emerged from one interview with a participant aged 20-29, but he described not feeling addicted	Evidently, only older participants experience feelings of addition. Why this difference occurred is not known, but it could be speculated that younger participants may be hesitant to describe that they have a dependence on tobacco (i.e. fear of not being in control of tobacco use)
Age	Smoke when bored at work	Younger participants were more likely to report smoking when bored at work; theme emerged from interviews with four of five 20-29 year old participants and three of six interviews with 30-39 year olds. Did not emerge from interviews with 40-49 year olds	Younger participants use tobacco in the workplace to combat boredom, while older participants do not smoke due to boredom. Could be speculated that this is related to various factors (e.g. older adults increased desire to become smoke free, older adults tend to only smoke when experiencing cravings from addiction)
Gender	Addiction	Addiction as a theme only emerged from interviews with males, not with females	It is unclear why female participants did not describe feelings of addiction to tobacco. Could simply be related to the sample (i.e. only two female participants)
Skill level	Smoking is a habit	Tradespeople were more likely to smoke because it is a habit. Six of seven tradespeople raised this theme, while only three of seven unskilled workers spoke about it	Tradespeople may have deeply rooted routines that they are accustomed to, while unskilled workers (e.g. labourers) may be more apt to have constantly changing tasks and routines in the workplace
Job Sector	Smoke when stressed	Five of six participants employed in sectors other than residential described smoking when stressed, while only half (four of eight) employed in the residential sector described smoking when stressed	Participants in other sectors were more likely to smoke when stressed compared to those employed in the residential sector. This difference could be related to differences in the work environment, such as higher stress levels

Sociability of smoking (Tree D)			
Attribute category	**Node**	**Finding**	**Interpretation**
Skill level	Way to have a discussion	Tradespeople (four of seven) more likely to describe that smoking was a way to have a discussion, compared to unskilled workers (two of seven).	Tradespeople were more likely to smoke while having a work discussion, which could be related to the nature of the job and differences between daily routines of skilled workers versus unskilled workers. For example, skilled tradespeople may be more likely to run into challenges and need to problem solve with co-workers, while labourers may not complete tasks that require these types of breaks
Mechanisms associated with continued smoking (Tree E)			
Attribute category	**Node**	**Finding**	**Interpretation**
Skill level	Knowledge of who to avoid when not following policies	Unskilled workers (four of seven) were more likely to describe knowing who to avoid when not following policies, compared to tradespeople (one of seven)	This difference could be because of various reasons, and workers did not describe specifically why they have knowledge of who to avoid. It could be speculated that rather than knowing who to avoid when not following policies, skilled tradespeople may feel less pressure to avoid superiors or worry about repercussions (compared to unskilled labourers).
Union membership	Smoking in company vehicles	This theme only emerged from interviews with participants who were not members of a union	Union members may have stricter policies regarding smoking in company vehicles that are enforced and followed, or could simply not have company vehicles to smoke in

Mechanisms associated with continued smoking (Tree E)			
Attribute category	**Node**	**Finding**	**Interpretation**
Job Sector	Smoking policies not followed	Theme emerged from interviews with all participants employed in commercial or industrial sectors, and only two of eight interviews with participants from residential sector	Smoking policies in commercial or industrial sectors may be more strictly enforced. This could be related to the size of companies and jobsites in other industries, or the nature of the job (e.g. more dangerous job workplace hazards that cannot be smoked around). However, this could simply be related to the fact that there may not be smoking policies in the residential sector to be followed.
Job Sector	Designated smoking area policies not followed	Theme emerged from interviews with all participants from commercial or industrial sectors, only one participant from residential sector.	Differences related to following designated smoking area policies could also be related to size and nature of work in commercial/industrial industry versus residential industry. Alternatively, it could be simply because there are fewer designated smoking areas on residential jobsites
Experiences with quitting or cutting back (Tree F)			
Attribute category	**Node**	**Finding**	**Interpretation**
Skill level	Would need smoking to be completely banned, but won't happen	Five of seven unskilled workers described this theme, while only two of seven tradespeople described the theme	It is unclear why unskilled workers (e.g. labourers) were more likely to state that they would need smoking to be completely banned at work (despite not believing it will happen), compared to skilled tradespeople. This could be related to the differences in the daily routine of unskilled workers versus skilled tradespeople.

Many of the subgroup analyses produced interesting and noteworthy findings. These findings should not be interpreted as representative differences among the greater construction worker population. Nonetheless, the differences and variations are important to take into account when considering the policy and practice implications of this research. Not all results from the subgroup analysis will be described. While there were differences found between each attribute, most emerged in the age, skill level and job sector categories. These findings are presented below.

A. Age

The subgroup analysis identified differences between the participants in various age groups. These differences only emerged from two trees. Variations among participants in the three age groups existed regarding the experience of smoking and reasons for smoking. Participants in older age groups reported having greater concerns about the health effects from smoking, in comparison to participants in younger age groups. Further, the participants in younger age groups stated they were concerned about decreased appetite or stains on their teeth, while older participants were concerned for the health of their organs or ability to breath. Older participants talked at greater length about their desire to be a non-smoker including plans to quit and reasons for wanting to quit, in comparison to younger participants. Older participants also expressed that rather than having negative fears or worries about the quitting process, they were looking forward to the positive aspects of being smoke free.

Younger participants were the only to report that work would be boring if they did not smoke. Interestingly, younger participants were also more likely to report that they smoke at work because they are bored. Younger participants were also far less likely to report that they

smoke because they are addicted, this reason for smoking only emerged from interviews with participants in the two older age categories.

Findings from these analyses suggest there are differences between younger and older construction workers regarding the experience of smoking and reasons for smoking. Implications of these findings will be addressed in the discussion section.

B. Skill level

Interesting differences exist between participants who were unskilled workers (e.g. labourers) versus skilled tradespeople. One difference was found according to skill level in five of the six main trees.

Unskilled workers were more likely to report that they like being able to smoke at work, while only one skilled tradesperson liked this feature of his job. More skilled tradespeople than unskilled workers reported smoking due to habit. More skilled tradespeople also reported that smoking provides a way to have a discussion about work related matters, compared to unskilled workers. More unskilled workers reported knowing who to avoid when they are not following smoking policies, compared to skilled tradespeople. And finally, unskilled workers were more likely than skilled tradespeople to state they would need smoking to be banned on a workplace in order to quit, despite not believing that it will happen.

These findings identify that smoking is a different experience for skilled versus unskilled workers on a construction jobsite. Implications of these differences will be addressed in the discussion.

C. Job sector

Several differences among participants existed depending on the job sector in which they are employed in the construction industry. The majority of these differences were related to safety practices and smoking policies.

More participants employed in the residential sector reported that safety is not valued in the workplace, compared to participants from other sectors. Participants from the residential sector were more likely to state (but not discuss) that they do not wear a mask and masks do not work, compared to participants from other sectors who talked in much detail about why they do not wear a mask and examples of when they should be wearing a mask but do not. Participants from the residential sector were more likely to discuss that larger companies have stricter safety policies, compared to participants from other sectors. Residential workers also talked more about the variations in company size (e.g. companies with two or many employees). Half of the participants employed in sectors other than residential reported their company takes measures to prevent injury in the workplace, while only one participant from the residential industry spoke about this in terms of working on high rise residential buildings. These variations indicate that safety is more of a concern in commercial or industrial sectors rather than residential. This difference could be attributed to the amount of employees that companies in commercial or industrial sectors employ.

Participants employed in commercial or industrial sectors were more likely to report they smoke due to stress, in comparison to participants from the residential sector. All participants from commercial and industrial sectors reported times when smoking policies and designated smoking area policies are not followed, while only a few residential workers reported this theme. These differences could identify that smoking policies are more strictly enforced in sectors other

than residential, or perhaps that policies do not exist in the residential sector to be enforced or followed. Implications of these findings are discussed on page 169.

5.2.6 Phase 3: Limited theory development

To begin theory development, the researcher reflected upon the social contextual model developed by Sorensen and colleagues in 2004. It was determined that data could be presented as potential social contextual factors. The researcher organized these modifying mechanisms according to levels of influence. Potential modifying mechanisms represented in the data were found at all levels of influence except the community level.

After determining that data could be presented in a way that identified potential modifiable mechanisms and organizing according to level of influence, the researcher determined whether data could be represented in context-mechanism-outcome (CMO) configurations (Pawson & Tilley, 1997). It was determined, however, that there was no meaningful variation among the outcomes of participants. Each participant was a current smoker who had previously been unsuccessful in quitting or attempting to cut back. The researcher was therefore unable to tease out interesting differences in CMO configurations for successful and unsuccessful quitters.

Nevertheless, the researcher did observe contextual influences participants experience in their daily life, and the variations or mechanisms operating within them. These are presented in the charts below according to level of influence. The first two charts depict contexts and mechanisms that may be contributing to continued smoking among participants and deterring their attempts at quitting or cutting back.

Table 9: Potential contextual factors facilitating continued smoking

Level of influence	Node	Description	Illustrative quote
Individual context, intrapersonal	Addiction	Feeling a physical addiction to nicotine, having a craving	"I'm addicted. I've quit for ten months, I've quit for three months a couple of times. It's really been quite a battle, I'll tell you"
Individual context, intrapersonal	Smoke when bored at work	Feeling bored, needing something to do	"Some days I do feel really bored and then I smoke and smoke and smoke, like chain smoke once in a while and then I don't feel as bored anymore"
Interpersonal	Tobacco use very common at work	Smoking is the norm on a construction site	"if you don't smoke, you're the odd man out"
Organizational	Can smoke anytime	Construction workers can smoke at any time they want or need to	"I take advantage of that a lot because a lot of them [superiors] say, 'If you want to have a smoke, go ahead, stop [working]'"
Organizational	Works mostly outside	A majority, if not all of work time is spent outdoors	"a lot of times what'll happen is you'll go to a project and you'll be there for finish to end, so obviously when you start, you're outside and then when walls come up and roofs go on, you're now inside"
Organizational	No assistance from workplace to quit	Employer does not assist workers when making a quit attempt or cutting back	"Even in the places that I have worked in recent years, I've never found any places that said they'd help for that"
Organizational	Constantly changing jobsites, actual jobsites changing	Workers regularly change jobsites, and the actual sites change as construction progresses	"I go to different job sites all the time and it's always a new environment"
Organizational	Little routine to the day	Work days are not structured in a predictable way	"Normally our start times was like 7:30 or 8:00. Our first break was whenever we felt like"

Level of influence	Node	Description	Illustrative quote
Organizational	Routine to job	Not a "nine to five" job, but days do have a routine or pattern including starting around the same time each morning, complete tasks required for the day, working until tasks are done which sometimes leads late into the evening	"basically I come to work every day, I get assigned tasks, and I get the job done, I guess. I don't know….it's just we find out in the morning where we're going and then we just go"
Organizational	Break after completing a task, no set times	Break times are not rigid, breaks from working were taken to divide projects, when it is convenient	"If you want to go grab a quick bite, that's fine. There's no set times. It's like whenever you have time, go"
Organizational	Comfortable environment	Worksites often have a laid-back and relaxed environment; workers have a certain amount of autonomy in their job	"It's always in your hands. That's why I said you have the freedom. There's no one behind you standing over your back saying, they'll tell you, 'This is what I need done. Go and do it.'"
Organizational	Safety not valued	Safety is not of great concern or a main priority of companies	"I see a lot of companies, they try to get by that by just passing you a mask that's not rated for actually for what you're doing. So they'll give you some paper masks"
Organizational	Production valued above safety	Production is usually more important than being safe at work, sometimes depends on size of company (i.e. larger companies may place value on safety)	"Yeah, it's just not a priority. Their priority is making money, having the guys on-site, the work getting done, them getting paid"
Organizational	Dusty, dirty job	Worksites are very dusty and dirty environments to be in	"It's a construction site, so it's pretty dirty and dusty"
Organizational	Stressful job	Worksites can be a stressful environment	"The job atmosphere is very stressful"
Organizational	Working and smoking goes hand in hand	Smoking occurs regularly when working throughout the day or taking breaks; smoking and working commonly occur together	"I mean if you can use both your hands and have a cigarette in your mouth and you can do it outside, you're doing it. That's what you do"
Organizational	Smoking doesn't affect work	Smoking while working or being at work does not have an impact on or effect work	"I wouldn't say it does affect me, really. Yeah, I wouldn't say it really affects me too much…I wouldn't say smoking affects my work too much at all"

Table 10: Potential mechanisms facilitating continued smoking

Level of influence	Node	Description	Illustrative quote
Individual mechanism, intrapersonal OR Interpersonal	A reason to take a break	Smoking provides an opportunity to take a break, is the reason for a break	"You finish a small task, okay, I'm going to have a smoke…It's a reason to stop and chit chat"
Individual mechanism, intrapersonal	Smoke when stressed	Smoking relieves stress	"Smoking I guess is more of a stress-related thing too, so if I'm stressed, I'm smoking and it makes me think it's okay then"
Individual mechanism, intrapersonal	Smoking is a habit	Smoking is habitual, is a routine or regular practice	"I don't think it's an urge anymore. I think it's just habit now. I guess it's routine. I've just gotten to the point where it's like I don't need to, I just do. It's a routine now"
Individual mechanism, intrapersonal	Need will power	If making a quit attempt, a worker needs to demonstrate self-control and determination	"It's just really hard. It comes down to self-control. You got to either make it or break it"
Individual mechanism, intrapersonal	Still need desire to quit	Regardless of the help a workplace could offer, workers must be ready and willing to try to quit	"That's as far as it goes; you can only help. You can't push anyone to doing something they don't want to do, right?"
Individual mechanism, intrapersonal OR Interpersonal	Others smoking around me at work makes quitting back hard	Workers find it difficult to not smoke a cigarette when coworkers are smoking around them	"It's hard when you're doing your job and you look up and buddy's got a stop, pull a cigarette pack out of his pouch and lights a smoke, and you turn around and buddy over there is up on a lift, smoking"
Interpersonal	Coffee and cigarette go together; common among workers	Drinking coffee can be triggering, one pairs well with the other	"When I drink coffee, I like to have smokes, a couple"

Level of influence	Node	Description	Illustrative quote
Interpersonal	Way to socialize on breaks	Smoking provides a means of socializing; having a cigarette is an opportunity to socialize	"Some days you know when we take a little extra lunch or something like that, all we're doing is smoking and talking"
Interpersonal	Coffee break and cigarette	A break from working to have a coffee is a time to smoke	"When coffee runs come, you want a coffee, you want a smoke. It goes hand in hand"
Interpersonal	Sharing cigarettes	Co-workers are often willing to supply cigarettes when others are in need	"They've got their package open, handing them to you. So that could be kind of a problem when you don't even have to ask and they're handing them right to you"
Interpersonal	Family smokes	Smoking is common among workers families, or family members were smokers who have now quit	"I'd seen my parents, my grandparents smoke, trying to quit and how rough it was"
Interpersonal OR Organizational	Would not want coworkers affected by quit attempt	If a worker were to quit or cut back, they would not want their attempt to impact other smoking co-workers	"Would be easier to quit if nobody smoked at work, well, yeah, it probably would be, but is that fair to anybody else? No, it's not"
Organizational	Smoking with environmental hazards present	Smoking takes place on a worksite regardless of whether or not environmental hazards are present	"when I breathe in the dust, while I'm smoking, I cough and I have a hard time inhaling and it hurts my stomach more than not having the dust in my system"
Organizational	Smoking policies not followed	If a company policy limiting smoking in some way did exist, it was not enforced or followed	"So generally, everybody, they knew you could smoke, just not to make it obvious. And I guess everyone knew they could get written up about it, but it wasn't happening"
Organizational	Designated smoking area policies not followed	If a designated smoking area policy exists, it is not consistently enforced or followed	"[company]'s policy is you don't smoke on the roof, period. But that doesn't always fly"

Level of influence	Node	Description	Illustrative quote
Organizational	Smoking in unfinished site	Workers regularly smoke inside a structure when it is in the early construction stages	"So usually in rough construction, people are smoking inside. Once it gets to finished carpentry, you can't, people aren't smoking inside anymore"
Organizational	Multitasking working and smoking	Construction workers can smoke through the day as they work	"If I'm outside and I'm pushing a wheelbarrow or what else with a cigarette in my mouth, I can multitask. (Laughter)"
Organizational	Don't use masks, masks don't work	While masks are available, they are not regularly used. If masks are used, they do not provide adequate protection from hazards	"I don't know if it's law that you're supposed to. It's optional, you can; they're there if you want them…Not too many people do use them"
Organizational	Smokes outdoors or outside at work	Common for only policy on worksite regarding smoking is that smoking occurs outside	"No smoking in the buildings, just outside…Just smoke outside"
Organizational	Smoking not discussed in Health and Safety	Smoking is not addressed in terms of health and safety training	"No. I've had all kinds of other stuff, but nothing to do with cigarettes, absolutely. Never been brought to my attention at all"
Organizational	Smoking discussed in regards to policies or smoking areas	Smoking is addressed on worksites to inform employees of where smoking should and should not occur	"Just overall, like every job you go to you have an orientation, and there's always a smoking part, like where to go, if it's acceptable, if it's not, just that. It's never been pinpointed in something, just mentioned"
Organizational	Way to have a discussion	Smoking provides an opportunity for standing together and discussing a work matter	"And then yeah, and with work, see, work is funny. They've done, if we run into a problem or something, we'll stop and the first thing you do is, if we're like, "What are we going to do here? How are we going to do this?" the first thing you do is you stop and you pull out a smoke while you go over a problem"

The following charts depict potential contexts and mechanisms that could assist participants in their attempts to quit smoking or cut back, or nodes that described how a worker may be able to quit or cut back.

Table 11: Potential contextual factors for quitting smoking or cutting back

Level of influence	Node	Description	Illustrative quote
Organizational	Following safety and no smoking policies	Smoking and safety policies may be followed	"To a certain degree, yeah. They want you to wear your harness and stuff like that. Nobody wants to fall to their death"
Organizational	Can't smoke at certain times	Smoking does not occur around certain hazards or at various specific times	"Are there times at work that smoking doesn't fit? Sure. When you're working in someone's house and they don't smoke, then obviously it doesn't fit...Any time you're using both of your hands, which is a lot of times in construction"
Organizational	Larger companies have stricter policies and safety regulations	Bigger companies (vs. small companies with very few employees) have more policies and are stricter regarding enforcement	"Production in other companies is really big. Safety kind of goes down a little bit, once you're at big companies then safety is number one"
Societal	Negative views about smoking	Public views about smoking have become very negative	"I don't like to smoke while I'm working too much. Even if you're allowed to, it kind of, it's just bad representation of yourself if you're smoking on the job site all the time and every time your boss sees you, you've got a cigarette hanging out of your mouth"

Table 12: Potential mechanism for quitting smoking or cutting back

Level of influence	Node	Description	Illustrative quote
Individual mechanism, intrapersonal	Desire to be a non-smoker	Workers describe that they want to successfully quit and no longer be a smoker	"I wish I could not xxxxxxx (expletive) smoke at work. I wish I could just not smoke. I got a quit date set; I'm quitting on my birthday in May"
Interpersonal	Avoid smoking coworkers when trying to quit	Workers will spend less time around their smoking co-workers when attempting to quit	It's slowly, slowly just wean away from the guys that are smoking. You don't want to be around the smell of the smoke. Somebody's smoking, if you smell that smoke, you want to have a smoke, right?"
Organizational	Would need a policy to quit	A policy limiting smoking in some way would assist in successfully quitting or cutting back	"I think one of the things they could do to help people quitting is not letting people smoke on the job site, being very strict about it"
Organizational	Would need smoking to be completely banned, but won't happen	In order to successfully quit, smoking would need to be banned from worksites; workers had little confidence in this ever happening	"I **know** that it's law that you're not allowed to smoke at any working place at all, period. It's definitely overlooked in the construction industry, and do I think they should enforce it? No"

The researcher had considered using the conditional/consequential matrix described by Straus and Corbin to build and integrate an account of the data that specifies the nature of relationships between events and phenomena (1998). This analytic tool assists in tracing the "often intricate web of connections that exists between contextual factors and actions/interactions" and allows for developing "explanatory hypotheses about these relationships" (Strauss & Corbin, 1998, p.191). The researcher did not attempt to conceptualize the data in a conditional/consequential matrix as it was also deemed to be forcing.

As Pawson and Tilley (1997) describe "an action is causal only if its outcome is triggered by a mechanism acting in context". The data did not provide any clear indication that participants' continued smoking was triggered by specific mechanisms operating on or off a worksite, therefore attempting to connect data and illustrate relationships using these theories was deemed not appropriate at this time (i.e. given the limitations of the interview data).

It was at this stage when the researcher determined further attempts at theory development would require forcing the data into a predetermined theory. Glaser and Strauss describe that "to preconceive relevance is to force data, not to discover from data what really works as a relevant explanation" (1999, p.142). They also describe the impact a researcher can have on the development of theory: "a sociologist often develops a theory that embodies, without realizing it, [her] his own ideas and the values of [her] his occupation and social class, as well as popular views and myths…when the theory does not fit well, the consequences are a typical forcing and distorting of the data" (Glaser & Strauss, 1999, p.238-9). The researcher consulted with the primary advisor, and determined that progressing any further with this stage would lead to full blown theory development. Attempts at limited theory development were concluded. What emerged from this final phase of analysis was a potential set of contextual factors and modifying mechanisms that may be impacting the tobacco use behaviour of construction workers on or off jobsites.

6. DISCUSSION

This section discusses various aspects of the study including the results, methodological considerations and practical implications. The original research purpose and questions are addressed and answers to specific questions are provided. Findings are also discussed in the context of the current body of literature regarding smoking among construction and blue-collar populations. The methodological strengths and limitations, as well as the researcher's ontological and epistemological perspectives that were employed in this study are discussed. Finally, implications of the findings are discussed and closing remarks are made.

6.1 Addressing original research rationale

6.1.1 Reflecting on the research purpose

The purpose of this thesis project was to better understand construction worker's experiences and meaning of smoking. It was clear from interviews with fourteen construction workers involved in the study that smoking is a complex experience, and participants discussed a variety of different meanings of smoking at work. While differences existed and no consistent, specific answers to these questions emerged, common themes and factors related to the experiences and meaning of smoking among these workers emerged.

A. Experiences of smoking

For the construction workers involved in this study, smoking was initiated at a young age; most started smoking before the age of nineteen. Most of the participants belong to a family with a history of tobacco use. Family members such as parents and grandparents, as well as partners are smokers. In some cases, family members used to be smokers but have now quit. Smoking is a social experience outside of work for most of the participants, and smoking takes place with family, friends, or when socializing in a bar or coffee shop. When participants are not

at work, they smoke most often when they are socializing with other smokers. While smoking is social for most participants outside of work, several also experience times when smoking isn't social. For example, participants smoke by themselves at home.

Smoking is very common in the construction workplace and many workers believe that smoking and working go hand-in-hand. However, smoking sometimes fluctuates throughout the day or occurs more at certain times (e.g. when around other smokers, when on breaks, after eating lunch). Every participant in the study believes their smoking behaviour does not have an effect on their ability to do their job or their work performance, though some did find it hard to work if they did not have cigarettes (e.g. when they ran out).

Workers experience different workplace smoking policies depending on their job in the industry, the jobsite they are working on, or the boss's attitudes towards smoking (e.g. if s/he is a smoker). Workers cannot smoke at certain times (e.g. in the presence of hazardous substances) and do not smoke inside of client homes, but policies are not always enforced by management or followed by workers. For example, workers stated that they have smoked at work around hazardous or flammable substances. The hazards or effects of smoking were not issues raised in the health and safety training that construction workers received. Smoking was only talked about in regards to maintaining a safe distance from flammable substances, or mentioned regarding where workers are to smoke and not smoke when orientating to a new jobsite.

Workers were asked about how they define indoor versus outdoor spaces on jobsites. There was no clear definition of an indoor or outdoor space on a jobsite, and gray areas exist regarding smoking in unfinished building structures. For many construction workers, an indoor space means being inside of a structure regardless if there are doors or windows installed. However, smoking still occurred inside of these unfinished buildings. Smoking usually occurred

inside buildings until they were in the finishing stages, meaning dry walling or finished carpentry was installed. According to most workers, an outdoor space meant working in a space that was ventilated and not yet sealed, (i.e. fresh air could move in and out). Some, however, did not see any gray areas, and believed that an outdoor space was a space outside of a structure (e.g. no walls or roof).

While a structured daily routine does exist to an extent (e.g. morning and afternoon breaks), workers have a fair amount of freedom in their job, and autonomy to decide when to smoke or when their breaks will occur. Many workers can smoke at any time during the day, and can multitask smoking and working. The common presence of tobacco was a challenge for many workers trying to quit. This common presence is also related to the social nature of tobacco use on a construction site. These challenges will be discussed more in the following section that provides answers to specific research questions.

It is also important to note that participants had different experiences of smoking depending on their age, skill level or job sector in the construction industry. Older participants reported greater health concerns related to smoking. Younger participants were more likely to cite boredom as a reason for smoking. Unskilled workers were more likely to report that they would need smoking to be banned on a workplace in order to quit, despite not believing that it will happen. Skilled workers were more likely to report that smoking provides a way to have a discussion about work matters. All participants from commercial and industrial sectors reported times when smoking policies and designated smoking area policies are not followed, while only a few residential workers reported this. These differences could identify that smoking policies are more strictly enforced in sectors other than residential, or perhaps that policies do not exist in the residential sector to be enforced.

While these are just some of the important differences among subpopulations within this study, they identify that different construction workers will have different needs regarding smoking and quitting. Different characteristics of construction workers will be important to consider when designing and tailoring cessation interventions (as discussed in the implications and significance of the study).

B. Meaning of smoking

Participants did not share one meaning of smoking. For some participants, smoking means everything to them at work while other stated it means nothing. It is clear from this study that smoking has a different meaning for different construction workers. However, some common views did emerge.

Immediately after the researcher posed the question 'what does smoking at work mean to you?', many construction workers were uncertain about what smoking at work meant to them and some had to pause to reflect on the questions before offering their answer. For many workers, smoking is an opportunity to take a break from work, a chance to be social, or it is an opportunity to relax. For others, smoking means a great deal as it is the way they deal with the stresses of the day and their day is better because of smoking. However, for others, smoking has a negative meaning, or means "nothing" because it is not something they want to continue to do. Smoking also gave a few workers a sense of freedom, or a chance to have "me time".

It is clear from the multitude of answers provided by participants that smoking is a complex issue among construction workers. Many factors influence the smoking behaviour of construction workers, including multi-level factors from intrapersonal to societal factors. The implications of these findings for practice and research will be discussed in the subsection below regarding implications. However, it should be noted that in addition to multi-level evidence

based interventions, a greater understanding of this complex population is needed if interventions are to have a chance at being effective (as described by Sherriff & Coleman, 2012).

6.1.2 Responding to the research questions

This research was guided by four research questions which make up the subsequent four subcategories; an answer to each question will be discussed.

A. What factors are associated with the social experience of tobacco use on a construction site?

It was clear from all participants that smoking is a social experience on construction worksites. For the majority of participants, smoking is a reason to take a break and socialize with other workers. Smoking provides a means of socializing on breaks, it is a reason to stop and chit chat. Also, on a construction worksite, coffee and cigarettes are often consumed at the same time. For most workers, coffee and cigarettes go hand in hand, especially during coffee breaks. However, while most workers find smoking to be very social, they were reluctant at first to state that smoking was social and often said “it’s social, I guess”. For some participants, the social nature of smoking is facilitated when having a discussion regarding work. If a work issue needs to be discussed, or if a co-worker runs into a problem or has a question, these matters tend to be discussed while having a cigarette together.

According to most participants, tobacco use is very common on construction sites and the majority of their colleagues smoke. Smoking is a common and shared practice. Sharing cigarettes is also common among some workers, and colleagues would loan cigarettes and could always borrow a cigarette from each other if they did not have one. Some workers stated this constant presence of smoking or the engrained nature of tobacco use to be a challenge when cutting back or quitting; this will be discussed below.

B. What are the contextual cues, antecedents and consequences of smoking in this setting?

For the construction workers involved in this study, several factors act as antecedents or cues that trigger smoking. For most workers, the work environment is stressful. Stress could be caused by daily frustrations related to the job or tasks that are not progressing smoothly, and stress causes workers to crave a cigarette and smoke. For many workers, smoking is stress relieving in the workplace.

Some workers experience boredom at work or have a desire for the work day to pass by at a faster pace, which causes them to smoke. Experiencing boredom was a cue for smoking for some participants. For many, smoking also takes place because it is habitual. Some workers smoke throughout the day while they are working because it is a habit, and they have routines that involve smoking. For example, workers stated they habitually pause from their work for a moment to light a cigarette and then return to work. This habit was sometimes cued by others on the worksite smoking a cigarette. For many participants, being around coworkers who are smoking triggers a craving for a cigarette.

Factors associated with the social nature of smoking act as cues or antecedents to smoking for construction workers involved in the study. For many workers, taking a break from working and socializing is a cue for smoking and workers want to smoke at this time. Drinking coffee also acts as an antecedent to smoking a cigarette for many workers, and coffee goes hand in hand with smoking.

Several consequences of smoking in the construction worksite setting were identified, and these included both positive, reinforcing factors and negative factors that were experienced by workers because of their tobacco use.

Three positive, reinforcing consequences were found. First, all participants of this study believe their smoking behaviour does not have an effect on their work performance or the quality of work they do. Workers do not believe their tobacco use impacts whether or not they do their job safely, and workers did not speak of any negative consequences that their smoking could have on their work.

Second, workers stated they are addicted to nicotine, cigarettes and smoking. Workers who spoke of being addicted to smoking or needing to smoke could satisfy their craving by smoking while at work.

A final positive consequence of tobacco use in the workplace is related to the social nature of smoking, as smoking allows for socializing or having a work discussion. An outcome of worker's tobacco use is that they are able to socialize with their coworkers while taking a smoke break, or discuss a work matter while having a cigarette. When attempting to quit or cut back, some workers struggled with not being able to socialize with their colleagues as they were avoiding being around other smokers.

Three negative consequences or aspects of smoking in the construction worksite setting were identified. Despite continuing to smoke, most participants stated a desire to be a non-smoker. These participants experienced times when they did not enjoy smoking and some had plans to quit. Some workers also had a desire to quit because of the negative health effects of smoking; detrimental health effects were a second negative consequence of smoking. For example, several workers experience coughing and trouble breathing. A third negative consequence experienced by workers was the negative views of smoking by either themselves or others. Workers experienced other people passing negative judgments because they were

smokers, and some did not like others seeing them smoking regularly. Despite these negative consequences, all workers in this study continued smoking.

C. What are the main reasons and underlying mechanisms that affect tobacco use related behaviours including smoking, smokeless tobacco use and quitting tobacco use, for the study population?

When asked what kinds of tobacco the study participants used, all stated they only smoke cigarettes at work; none use chewing tobacco. While some participants occasionally smoke a cigar or cigarillo, this usually takes place outside of work.

Participants provided several reasons why they smoke, or explanations for how and why their smoking behaviour continues to take place at work. For many construction workers, smoking goes hand in hand with working on a construction site. Many workers complete their daily tasks while smoking cigarettes; some stated that they do this because it is a habit or decreases stress, while others had no reason other than because it is "what you do". Most construction workers are able to smoke throughout the day because there are no smoking restrictions on jobsites.

Most workers can smoke anytime while at work, and they can either go for a smoking break or just smoke while continuing to work. Further, many workers discussed their work day as being flexible, meaning they were able to take a smoke break whenever necessary or use a smoke break as a way to break up daily tasks. For many workers, instead of taking breaks at specific times during the day, their break times (including smoke breaks) are when it is most convenient or when a small task has been completed.

Most construction workers involved in the study work on jobsites that do not have smoking restrictions, or if a policy does exist it was not known about and not followed. Most

workers are able to smoke without limitations even in areas where environmental hazards are present, though many workers avoid dangerous or flammable hazards when smoking. For example, workers regularly smoke outside on the jobsite where there are no hazards present. Other workers spend the majority of time working outdoors, which makes it possible to smoke at any time while working.

D. What supports for reducing tobacco use would construction workers find helpful and/or use?

Construction workers were asked several questions regarding supports for quitting smoking or cutting back, and how workers could be better supported during attempts to reduce tobacco use. Aside from two participants who are employed by a company that offers monetary assistance for prescription medications, all workplaces did not offer any type of support or assistance to employees who were making a quit attempt (or if they did offer supports, workers were unaware of them). Many participants even stated they work in an environment that is unsupportive of quitting or cutting back, for example some bosses may be smokers that do not support or enforce smoke-free policies.

Workers have experienced different barriers when they attempt to quit, such as lack of support in the workplace, or being around other smokers. Some participants believe workplace smoking policies could assist during the quitting process (discussed in more detail below). Workers made suggestions about how workplaces could be more supportive of employees attempting to quit, and what supports or changes to their work environment might make quitting easier. Workers only described the supports they may find helpful in the context of their workplaces (i.e. no mention of community assistance or help from public health practitioners,

though this was not specifically asked). Three major suggestions were made, and these are summarized in the table below.

Table 13: Cessation supports that could be offered by employers/workplaces

Type of support	Description	Exemplary quote
Incentive	A workplace could offer employees some sort of incentive (e.g. monetary) for quitting smoking; Incentive would be a way to encourage workers to attempt to quit	"I think that would make a drastic difference. I think, because I don't care who you are, anybody, if you can get something for nothing, you're going to at least take a shot at it, right? Whether you succeed or not, different story, but I think that would change everywhere drastically because who doesn't want to get something for nothing, basically"
Medical coverage for quit aids	Workplaces could offer monetary support (through a benefits package) for construction workers to explore different methods of quitting smoking	"Pay for it…Like whatever the, like if it's a drug or fake cigarette or whatever the case may be, or help contribute towards it"
Limiting smoking on worksites	Workplaces could limit tobacco use on worksites through different methods. Examples included smoke-free jobsites, designated smoking areas, or limiting smoking to only take place on breaks (not while working). Strict enforcement must take place to ensure the policy is followed, not just implemented	"I think one of the things they could do to help people quitting is not letting people smoke on the job site, being very strict about it…If they made people go off of the property and smoke in their vehicles, it'd probably be a lot easier for people quitting"

An important theme related to smoking on jobsites should be noted, as it emerged from interviews with several participants. The majority of participants find quitting or cutting back challenging when at work on a construction site because other coworkers are smoking around them. Participants find it challenging to see other people smoking when they are trying to quit. Because of the common presence of tobacco on worksites, workers who were making a quit

attempt avoided their colleagues who smoke by not going on breaks or socializing less with smokers.

Despite the fact that workers find quitting or cutting back harder on construction worksites because they are in the presence of smokers, some workers did not want their smoking coworkers affected by their quit attempts. For example, some workers believed that it would not be fair to their colleagues if smoking was limited on jobsites. Other workers even stated that even though it may be easier to quit smoking if it was restricted, they did not want their smoking coworkers to be impacted by such policies. This belief could be related to the socially engrained nature of tobacco use on a construction site, meaning workers would not want to be responsible for changes to smoking norms at work. These findings also suggest that a culture may exist on the construction worksite that facilitates continued use of tobacco.

While the cessation aids suggested by participants were discussed in the context of workplace support, the supports could be helpful for construction workers if offered by others with an interest in decreasing tobacco use among construction workers. For example, if construction workers believe medical quit aids and incentives would be helpful when attempting to quit or cut back, these aids could be offered by public health practitioners. However, further researcher would be needed to confirm this suggestion. It is also important to consider that workers described their workplace as the providers of these cessation supports, therefore workers may be more motivated to attempt to quit when their workplace is also addressing tobacco use (as discussed by Sorensen et al., 2004; Barbeau et al., 2006). This will be discussed below when reflecting upon the sensitizing concept regarding the integration of health promotion and protection interventions in workplaces.

6.2 Contextualizing the findings in the current body of literature

6.2.1 Reflecting back to the sensitizing concepts

Six sensitizing concepts were identified through the review of literature. These concepts were identified *a priori* to assist during data collection and analysis. The sensitizing concepts also provide a point of reference for later reflection following data collection and analysis.

A. Tobacco use in home life

It was identified in the review of literature that regular smokers consume tobacco across all social settings, and partners and or family members may affect tobacco use (Okechukwu, Nguyen & Hickman, 2010). Participants in this study were asked several questions regarding their use of tobacco outside of the construction environment, and most workers belong to families and social circles that included smokers (e.g. partners, siblings, parents, friends). While smoking does not always have to be a social experience outside of work, (i.e. participants smoke alone at home), many participants smoke with others in their home or when out at a bar or coffee shop. Okechukwu, Dutra, Bacic , Ayadi and Emmons (2013) examined the influence of work and household related variables such as partner smoking status in blue-collar workers, and found household related variables to be predictors of smoking status and cessation. The authors state efforts to decrease smoking in blue-collar populations, which are mainly focused on work-related factors, should incorporate household factors (Okechukwu, Dutra, Bacic, Ayadi and Emmons (2013). Findings from the present study also suggest that factors external to the work environment should be considered when making attempts to decrease smoking among construction worker populations, as household factors such as partner smoking status may impact worker's tobacco use. Further, the social nature of smoking outside of the construction workplace should also be considered when making efforts to decrease smoking among

construction workers, as this social nature of tobacco use across different settings appears to be influencing workers' smoking.

B. Non-permanent, dispersed nature of work

Several characteristics of the construction workplace were identified in the review of literature. Workers may have non-permanent contracts, and frequently change employers and jobsites (Peretti-Watel, Constance, Seror & Beck 2009; Ham et al., 2011). This is consistent with the findings in this study, as most participants stated they frequently change jobsites and the actual jobsite is consistently changing. Jobsites may include various setting that are indoor, outdoor or mixed (Ham et al., 2011). Participants from this study work on a broad range of jobsites (e.g. old and new homes, commercial buildings) that are inside, outside and both. However, there are uncertainties and inconsistencies regarding the classifications of jobsites as either indoors or outdoors.

Carlan and colleagues(2012) state "complex networks are operating in the construction sector" (p. 227) and the non-traditional organization of work (e.g. structural characteristics like multiple employers and various sub and sub-subcontractors on one jobsite) can lead to multi-directional and blurred lines of communications. Workers who participated in this study experience varying degrees of smoking policies that may or may not be followed or enforced. Some participants stated policies and their enforcement depend in the employer, the jobsite, the task (e.g. working with hazardous substances), or supervisors. These findings (especially the confusing nature of tobacco policies on jobsites) have practical implications that will be discussed in section 6.5 regarding implications and significance of the study. However, it should be noted here that several participants from this study spoke of the widespread use of tobacco on constructions sites and that it impacts their ability to make a quit attempt. As mentioned

previously, several participants suggested smoking on jobsites be limited or restricted in some way.

C. Dual threat of occupational hazards and tobacco use

It was identified through the review of literature that blue-collar workers who are exposed to workplace hazards are more likely to be smokers, and workers may be more motivated to quit smoking or cut back if they are exposed to workplace hazards (Sorensen et al., 1996a; Barbeau et al., 2006; Chin et al., 2012). All participants stated they are exposed to various hazards on the job, and they believe their job is dangerous. Most participants in this study reported using tobacco while in the presence of environmental hazards, such as concrete dust or paint. Several also stated they smoke on worksites despite the existence of policies such as designated smoking areas. For most participants, the only enforced smoking policy was that smoking must not occur in client homes or in close proximity to flammable or extremely flammable substances.

Despite the fact that participants were asked if and how their smoking behaviours change around environmental hazards, no themes emerged related to this concept. For example, a theme did not emerge regarding whether or not workers may be more interested in quitting if they are exposed to environmental hazards. This may, however, indicate that participants from this study do not have increased motivation to quit specifically because they are exposed to environmental hazards (though the majority of workers did describe they have a desire to quit).

D. Integrating health promotion and protection

It is evident in the literature that workplace cessation interventions tailored to blue-collar workers are enhanced when health protection methods (e.g. protection from environmental hazards) are integrated (Sorensen et al., 2004; Sorensen & Barbeau, 2006; Okechukwu et al.,

2009). Participants were asked if they or their colleagues would be more likely to quit or cut back if their employer addressed workplace hazards, but there were no common themes that emerged regarding this concept. Almost to the contrary, many workers stated that regardless of their workplaces efforts to assist with quitting, a worker still needs a desire to quit and/or willpower, and some even stated smoking is their own personal problem and not an issue for the workplace.

Workers were also asked how their workplace could offer supports or be more supportive of employees who want to quit. These suggestions were already discussed, but it should be noted that participants did not mention any other community supports that would assist them with quitting. All supports were discussed in workplace contexts, and this finding may speak to the interest workers have in their employers addressing tobacco use or simply the fact that the interviewer and participants were speaking about the workplace. Despite the fact that the question probed on how workplaces could provide support, no other supports were mentioned in the interviews.

These findings suggest that workers may not want to be explicit in stating that would they would be more likely to quit if their employers addressed tobacco use and other health protection issues. However, when discussing other issues (e.g. supports that workplace could offer), it is clear that construction workers believe there are ways the employer can support employee cessation attempts. This could be related to the fear some workers have regarding the effects of their cessation attempts on coworkers (i.e. they do not want their smoking coworkers affected by their quit attempts). While the construction workers from this study may truly believe organizational changes can assist them with quitting smoking or cutting back, they may be hesitant to state this explicitly.

E. Sociability of smoking

The review of literature indicated that smoking among manual workers is a shared social practice, a habit, or deeply rooted in daily routines (Katainen, 2010; Katainen, 2011; Laurier, McKie & Goodwin, 2000). The findings from this study are consistent with the literature. For construction workers involved in this study, smoking is a very social experience. Smoking is very common on construction sites, and represents a reason to take a break and a way to socialize on breaks. Smoking also takes place for many workers because it is a habit.

Bordieu's notion of habitus is important to consider. Bourdieu defines the habitus as the reason for an individual's practices to be "sensible and reasonable…In short, the habitus, the product of history, produces individual and collective practices…" (1977, p. 79-82). It could be suggested that this notion could be a key reason why construction workers experience their smoking at work as habitual or a routine practice. Katainen refers to this notion in her work, and suggest smoking and other harmful health behaviours raise questions about human behaviour (e.g. "to what extent is our behaviour guided by deeply rooted habits?" 2010, p. 1088). Katainen also states "habits need to be compatible with the context and the external conditions of action, as well as one's habitus" (p. 1089). While it could be speculated that habit and routine is a reason why construction workers continue to smoke on construction sites, it is important to note that these behaviours are maintained as an everyday practice via routine mechanisms in a sustained and predictable working context.

For many workers involved in this study, smoking is social to an extent that it hinders efforts to quit or cut back. Efforts to create a more supportive environment for employees who are making an attempt to quit or cut back (through suggestions previously mentioned such as

smoke-free workplace policies) may address these challenges. See more in section 6.5 regarding significance and implications.

F. Fear of a loss

The review of literature identified that workers may view quitting smoking as a loss, and workers may fear losing their smoking friends (Thompson, Thompson, Thompson, Fredickson & Bishop, 2003). This was not consistent with the findings from the present study, and no themes related to quitting representing a loss or losing smoking friends emerged. While participants were open about avoiding smoking co-workers while attempting to quit, they did not express this theme as a fear during the quitting process but merely a method to assist during the process. Thompson and colleagues (2003) also identified a fear of failure that smokers may have, which was evident in the findings of the present study. While many workers stated outright that they do not have worries or fears about quitting, they eventually described what might worry them. Some workers stated they have a fear of failure, or worries about coping with feelings of agitation or stress.

It was also identified in the review of literature that workers may be concerned with replacing smoking with an alternative habit, for example cessation may result in weight gain from an increased intake of food (Bott, Cobb, Scheibmeir & O'Connell, 1997). Findings from this study were consistent, and several participants stated they worry about gaining weight when quitting smoking.

These findings suggest workers may be hesitant to state they have fears or worries about quitting smoking or cutting back, though they do in fact have several concerns about this process. Providing supports, through methods suggested by these participants (e.g. supportive

work environments or pharmaceutical supports for coping with withdrawal symptoms) may alleviate these concerns, but further research is needed to confirm this suggestion.

G. Tobacco use provides structure

A final sensitizing concept identified through the literature review referred to the ability of tobacco use to provide structure to daily routine, and serve as a way to legitimize a break (Katainen, 2011; Laurier, McKie & Goodwin, 2000). Findings from this study are consistent with this concept, as most construction workers who participated in the present study believe smoking is a reason to take a break. Some participants even stated smoking is a way to take a breather from working, or that smoking takes place in conjunction with having a work discussion. However, findings from this study do not support the notion that daily routine is structured around tobacco use, rather smoking breaks take place when it is most convenient.

6.3 Methodological strengths and limitations of the study

6.3.1 Credibility of the qualitative research

There is much discourse and debate in academic literature about the criteria with which qualitative research should be evaluated. Patton (2002) makes reference to traditional scientific research criteria before describing different ways of evaluating qualitative research. He begins with stating "One way to increase the credibility and legitimacy of qualitative inquiry among those who place priority on traditional scientific research criteria is to emphasize those criteria that have priority within that tradition. Science has traditionally emphasized objectivity, so qualitative research inquiry within this tradition emphasized procedures for minimising investigator bias" (p.544-545). However, Patton then goes on to describe that the "criteria you choose to emphasize in your work will depend on… [among other things] your philosophical and methodological orientation" (2002, p.551). Janesick (2000) refers to the work of others (e.g.

Lincoln and Guba, 1985) and suggests "replacing validity, generalizability, and reliability with qualitative referents" (p. 393). Lincoln and Guba's (1985) four criteria for evaluating qualitative research mirror criteria used in more quantitative, positivist research. However further criteria have also been suggested by, among others, Glaser and Strauss (1999), Charmaz (2006) and Spencer, Ritchie, Lewis and Dillon (2003).

Lincoln and Guba (1985) suggest that the trustworthiness of a study can be evaluated with four criteria. Credibility can be determined through prolonged engagement, persistent observation, triangulation, or peer debriefing; transferability can be established through the use of thick descriptions; dependability can be determined through audits; and confirmability through audit trails (Lincoln and Guba, 1985).

In addition to these criteria based off of more positivist methods of establishing rigour, others criteria specific to qualitative and grounded theory research have also been suggested. Glaser and Strauss (1999) identified four criteria for practical application of grounded theory, and state that a theory "must closely *fit* the substantive area in which it will be used…it must be readily *understandable* by laymen concerned with this area…it must be sufficiently *general* to be applicable to a multitude of diverse daily situations…it must allow the user partial *control* over the structure and process of daily situations as they change over time" [italics in original source] (p.237). These criteria, however, are not completely relevant here as a sociological theory was not developed.

Charmaz (2006) suggests four criteria for evaluating more constructivist grounded theory. She suggests establishing credibility (can readers form independent assessments and agree with the claims?), originality (does the theory challenge, extend, or refine current ideas,

concepts and practices?), resonance (do the categories portray fullness of the studied experience?) and usefulness (how does the work contribute to others, knowledge, the world?).

The British Government's Chief Social Researcher's Office published a framework for assessing quality in qualitative research (Spencer, Ritchie, Lewis & Dillon, 2003). The four guiding principles state "that research should be **contributory** in advancing wider knowledge or understanding; **defensible in design** by providing a research strategy which can address the evaluation questions posed; **rigourous in conduct** through the systematic and transparent collection, analysis and interpretation of qualitative data; **credible in claim** through offering well-founded and plausible arguments about the significance of the data generated" [bold in original source] (Spencer, Ritchie, Lewis and Dillon, 2003, p. 6).

While there are various criteria that could have been used to ensure trustworthiness or rigour of this study, the researcher used several different methods to maintain credibility through the entire research process. The researcher does agree, to an extent, with the criteria suggested by Lincoln and Guba (1985), however other criteria unique to the qualitative method of inquiry (that do not solely reflect criteria used to evaluate more quantitative, positivist research) should also be used to assess the credibility of this study.

When initially proposing this thesis project, the researcher was transparent about her individual perspectives and how these could affect the research. Throughout the study, the researcher remained aware of the potential impacts of her biases, and attempted to remain open minded to the various perspectives of others involved in this project. As Koch (2006) states, "self-awareness of the researcher is essential" (p.92). Remaining open and transparent about the researcher's biases was facilitated during the data collection and analysis phases by recording annotations and memos that documented reflective comments and internal dialogue. In addition,

a detailed audit/decision trail was maintained to document and discuss "explicitly decisions taken about the theoretical, methodological and analytic choices throughout the study" (Koch, 2006, p.92). While some have argued the ability of a decision trail to enhance credibility (Cutcliffe & McKenna, 2004), others suggest this method of transparently documenting research decisions increases trustworthiness and academic rigour of qualitative research (Koch, 2006; Selamat and Hashim, 2008; Carcary, 2009). These tools have increased the credibility, dependability and confirmability of the findings (Lincoln and Guba, 1985). The method and decision trail is included at the conclusion of this section on methodological strengths and limitations of the study (p.157).

A limitation to the present study is that member checks were not conducted. Member checks would have been a crucial step in the research process had the purpose of this study been to collaborate with a workplace (workers and management), conduct interviews and develop an intervention. However the purpose here was to identify relevant themes for use by practitioners and researchers, therefore members checks were not seen as critical. Despite this consideration, the researcher did conduct member checks throughout the data collection process. During the interviews, the researcher asked participants if she was hearing correctly what they were saying. For example, the researcher stated "I hear you saying…" to describe what she had interpreted. This process allowed for participants to confirm that the researcher was on the right track and understanding the narrative correctly (Carlson, 2010).

The methods used for data analysis and interpretation were established collaboratively with the researcher's primary advisor, who conducted consistent checks of the data analysis at each stage. This systematic and transparent conduct contributes to the study's rigour (Spencer, Ritchie, Lewis & Dillon, 2003). Further, much of the study design is based on the grounded

theory method, which will be discussed below in section 6.3.2 on grounded theory approach. By integrating various features of the grounded theory method, the study design was able to address the questions posed and is defensible in design (Spencer, Ritchie, Lewis & Dillon, 2003). For example, saturation of the categories and theoretical sampling were used to ensure no new data or theoretical insights were being discovered from subgroups within the sample. This saturation of the categories ensures transferability (Lincoln and Guba, 1985) and resonance (Charmaz, 2006).

The transferability (Lincoln and Guba, 1985), usefulness (Charmaz, 2006) or contribution (Spencer, Ritchie, Lewis & Dillon, 2003) of the study will be discussed in section 6.5 regarding the implications and significance of the study. However, to maintain these features, thick descriptions of the experiences of participants were documented to facilitate lessons being drawn from the findings and applied to the field (Lincoln and Guba, 1985).

6.3.2 Grounded theory approach

This thesis project used a qualitative, inductive approach to inquiry that included various aspects of the grounded theory method. Sensitizing concepts, as described by Charmaz (2003) and Bowen (2006) were used to inform the researcher about productive lines of inquiry prior to data collection and analysis. Purposive, maximum variation and theoretical sampling methods (Glaser & Strauss, 1999; Patton, 2002; Maxwell, 2013) were used to deliberately select participants that would provide rich descriptions about the purpose and questions central to the inquiry. Reflective practices such as memos (Glaser & Strauss, 1999) were used to document the research and analysis process. Open coding as described by Strauss and Corbin (1998) was the initial stage of data analysis. Inductive analysis was used through the beginning phases of data

analysis, and *a-priori* theories were only referred back to after substantial categories had been developed.

The data for this project was coded exhaustively at each stage of analysis, and the researcher is satisfied that all significant codes are included in the category structure presented here. Forcing the data into predetermined structures was avoided in order to allow findings to emerge (Glaser, 1978; Glaser & Strauss, 1999). Data analysis was concluded at the point where forcing the data would have occurred (Glaser & Strauss, 1999).

6.3.3 Ethnographic orientation

Patton (2002) defines the foundational question of ethnography as "what is the culture of this group of people?" (p.81). Chambers speaks about applied ethnography in which "individuals bring ethnographic knowledge to bear on particular human problems" and defines ethnography as "varieties of inquiry that aim to describe or interpret the place of culture in human affairs" (in Denzin & Lincoln Eds., 2000, p.852). It could be argued that the purpose of this research project (understanding construction worker's experiences and meaning of smoking) could have been answered using an ethnographic orientation. However, many defining characteristics of ethnographic inquiry were **not** employed in this study as it was determined by the researcher and her advisory committee that a grounded theory approach would be appropriate to answer the research questions.

Ethnographic studies often rely primarily on data that has been collected in the natural environment through observations and "does not rely totally on what people say, but sees, visualises and creates a picture through first-hand experience" (Lambert, Glacken and McCarron, 2011, p.21). Pink, Tutt, Dainty and Gibb (2010) argue for the use of ethnographic methods when conducting research on construction sites or with construction workers. The authors state that a

good ethnographer immerses themselves in deep learning, and "what is learned goes beyond what could be said in an interview and can only be known by being there, as events unfold (Pink, Tutt, Dainty & Gibb, 2010, p. 658). As mentioned previously, it was determined for several reasons that collecting data through semi-structured interviews was most appropriate (e.g. the nature of the research questions, practical time constraints). The approach to inquiry typically utilized in grounded theory method was more suited to answer the research questions proposed for this study.

6.3.4 Recruitment and sampling

This research project was originally designed to be a collaborative effort that included local public health practitioners from Ontario health units. Due to circumstances beyond the control of the researcher and advisory committee (e.g. government delays in program funding, partnership deterioration, and progress in program implementation) and practical time considerations for this thesis, collaboration with these local health units was not feasible. After exploring other options (refer to Table 14: Methods and Decision Trail), participants were recruited using an online advertisement website and job search website. Other researchers exploring relevant issues in similar populations have also had challenges with study recruitment.

In a qualitative study regarding the needs of smokers who work as routine and manual workers on building sites, Sherriff and Coleman (2012) define construction workers as a "hard-to-reach sample" and state "participants were recruited by diverse strategies in collaboration with the National Health Service (NHS) Tower Hamlets, including working with the local authority and local cancer prevention foundations" (p. 126). Further, in a study exploring motivations and supports for cessation in builders and renovators, Bondy and Bercovitz (2013) state "most of the available literature [regarding residential and other construction workers] is based on

convenience samples and individual workplaces" (p. 630). The present study utilized maximum variation sampling to recruit a diverse sample of individuals from various locations, jobs, worksites, trades, and job sectors.

Maxwell (2013) states that one of the goals of purposive sampling is to adequately capture the heterogeneity of the population, ensuring a range of variation in the sample. Patton (2002) further describes that this method of sampling "aims at capturing and describing the central themes that cut across a great deal of variation. For small samples, a great deal of heterogeneity can be a problem because individual cases are so different from each other. The maximum variation sampling strategy turns that apparent weakness into a strength by applying the following logic: Any common patterns that emerge from great variation are of particular interest and value in capturing the core experiences and central, shared dimensions of a setting or phenomenon". (p.235). Maximum variation sampling was used for this thesis project because the researcher and advisory committee viewed factors such as construction trade and job sector as important dimensions of variation within the construction industry.

While maximum variation sampling allowed for exploring similarities among a diverse sample of fourteen construction workers, the method did not allow for producing results that are generalizable to a broader construction worker population. However, this was not an inherent goal of the project. Patton (1990) states that an individual using a "maximum variation sampling strategy would not be attempting to generalize findings to all people or all groups but would be looking for information that elucidates variation and significant common patterns within that variation." (p.172). While these results do not represent generalizable findings, they do provide practical implications and transferable lessons for practitioners and researchers. This sampling method allowed for achieving highly detailed findings (Patton, 2002), thus contributing to the

transferability of the findings. Refer to section 6.5 regarding the implications and significance of the study for more on this.

Following the conduction of the twelfth interview, the researcher noted that saturation of the emerging categories had begun to take place. Charmaz (2006) states "categories are 'saturated' when gathering fresh data no longer sparks new theoretical insights, nor reveals new properties of these core theoretical categories" (p. 113, quotations in original). The researcher noted that by the twelfth interview, new data was not adding any new themes. However, Charmaz and others (e.g. Dey, 1999) have criticized the notion of theoretically saturated categories for different reasons, such as stopping before all the data is coded because saturation was reached. As described previously, two additional interviews were conducted after the twelfth interview, and no new themes (especially related to the research questions or sensitizing concepts) emerged from these interviews. Further, data collected for this project was coded exhaustively at each stage of analysis, and the researcher is confident that all significant codes are included in the category structure.

A. The study population

As mentioned above, the sampling methods utilized in the present study allowed for recruiting a sample that was very diverse. Thirteen of the fourteen study participants stated they had a desire to quit smoking. These participants spoke of previous quit attempts, their current efforts to cut back and plans for future attempts. While this could be considered to be a non-representative sample, it should be noted that among Canadian smokers in 2011, almost two thirds were seriously considering quitting in the next six months and nearly half had made at least one quit attempt in the past year (CTUMS as cited in Tobacco Use in Canada: Patterns and Trends, 2013 Edition by Reid et al.). Using a sample of individuals with greater intention and

desire to quit in this instance may have yielded data with richer and thicker descriptions of the quitting process, potential supports etcetera. Regardless, the methods of sampling (purposive and theoretical, not representative) allowed for recruiting a diverse sample of individuals that provided rich data and highly detailed findings. As noted in the methods section, the data were gathered in a purposeful manner and theoretical saturation (or adequacy) rather than representativeness of the entire construction worker population was more critical to answer the study questions.

6.3.5 Data collection

The data used for this thesis was collected solely by the primary researcher, and consisted of fourteen interviews conducted in person or over the phone with construction workers living and working in Southern Ontario. There are both strengths and limitations to these methods.

The primary researcher was the only interviewer. With permission from each participant, interviews were audio recorded and then transcribed verbatim through a confidential third party transcription service. Interviews were conducted either in person (n=9) or over the phone (n=5). Interviews that took place in person were in a public location chosen by the participant. If interviews were unable to take place in person, they were conducted over the phone. In an interesting article that reviewed the literature (albeit limited) regarding telephone interviews, Novick (2008) stated the "absence of visual cues via telephone is thought to result in loss of contextual and non-verbal data and to compromise rapport, probing, and interpretation of responses. Yet, telephones may allow respondents to feel relaxed and able to disclose sensitive information, and evidence is lacking that they produce lower quality data". When reviewing the literature on this topic one study was found to have shown that in person and over the phone interviews yield similar findings (Sturges & Hanrahan, 2004). However, there is no conclusion in

the literature about whether or not telephone interviews yield the same results as in person interviews. While it not possible to confirm objectively that there were no differences in the data collected in person versus over the phone, the researcher conducted all interviews in a similar manner (i.e. opening the conversation with the same script, using the same interview guide, reviewing the sensitizing concepts after all questions had been asked, closing the interview with the same script) and no apparent differences were evident to the researcher (e.g. in interview length).

There was some concern by the researcher and advisory committee that during the qualitative interviews, participants may be influenced by the researcher's purpose and provide answers that may be socially desirable. The possibility of a social desirability bias or that participants were influenced by demand characteristics (Orne, 1962) cannot be completely avoided. To minimize the possibility of participants providing answers that do not honestly reflect their views, the researcher informed each participant that the purpose of the interview was only to gain an understanding of their experiences with using tobacco and what it means for them. Also, participants were reminded prior to beginning the study that the researcher has no expectations, and there are no right or wrong answers; participants were reminded that the researcher was only looking for honest opinions and thoughts. The participants had no ongoing relationship with the researcher, and all interviews were anonymous and private. There is no reason to believe that excessive bias of a particular variety was introduced by the approach taken.

Table 14: Method and decision trail

Phase in project	Description of event or phase	Decision trail
Discontinue pursuing collaboration with public health units	• Work with potential health units halted by various obstacles, and ultimately insufficient time to continue to pursue collaboration	• Pursued collaboration with two public health units through winter term • Among other difficulties in proceeding with research collaboration, one health unit advised that collaboration would require lengthy administrative processes as work was viewed as a structured placement or practicum. While this technically may not have been necessary, other recruitment methods began to be investigated • Changes to partner construction company at other health unit caused continued setbacks (other major setback included program uncertainty and delays in funding). Alternative recruitment methods began to be investigated as timing became an issue
Testing interview guide	• Talked through interview guide with member of the construction industry • Rehearsed interview to gain time estimate	• Interview guide was read through entirely with a site supervisor in the construction industry. This process allowed tailoring questions and wording • Mock interview was conducted with colleague in casual setting to have an estimate of how long interview would take. Interview lasted 30 minutes; felt confident interview would be good length, could describe to participants that interview would last about an hour

Phase in project	Description of event or phase	Decision trail
Investigated alternative methods of recruitment	• Explored possibility of collaborating with construction unions	• Discussed with committee member the option to work collaboratively with unions for data collection. Advised against this method given time allotted for recruitment and data collection (i.e. not enough time to build relationship, gain buy in etc.)
	• Explored opportunity to recruit construction workers on campus at University of Waterloo	• Contacted Plant Operations regarding recruiting construction workers on school campus; told by representative this is not feasible. Discussed with primary research advisor that exchange may have been more fruitful with his involvement
	• Explored recruiting via social media and websites	• Discussed option to recruit via online advertisement website with advisory committee. Explored sampling method in literature
	• Decided of use of online websites	• Settled on online recruitment method, especially given time constraints
Recruited study participants, began conducting interviews	• Posted advertisement	• Study recruitment began, posted advertisement to online advertisement website and online job search website
	• Began conducting interviews	• First interview was conducted in person, began simultaneously collecting data while conducting phase 1 of analysis
Limited eligibility criteria after 12th interview	• Checked in with committee regarding limiting eligibility criteria	• After conducting twelve interviews, study sample consisted of seven unskilled workers and five tradespeople
		• After connecting with committee and receiving support to limit criteria, the study participants were screened for skill level
	• Process resembles theoretical sampling	• Theoretical sampling involves reflecting on the data that has already been collected and then determining what subgroups to continue collecting data from (Glaser & Strauss, 1999). At this point, sample already consisted of many unskilled workers
		• Two final interviews were conducted with participants who are considered tradespeople

Phase in project	Description of event or phase	Decision trail
Phase 1 Simultaneous data gathering and generating potential nodes	• Listened to interviews and read through transcripts several times • Created running list of free nodes • Confident in theoretical saturation by 12th interview	• Through listening to audio recordings of interviews and reading transcripts, themes emerged and a running list of free nodes was drafted • Concluded data collection after the 14th interview as new themes related to sensitizing concepts/research questions did not emerge from 13th or 14th interview
Phase 2.1 Initial open coding	• Coded four transcripts fully for every code • Re-checking transcripts for key words • Final read through to code data not yet coded • After coding four transcripts for every code, attempted different coding method • Returned to previous coding method • Finished coding interviews for all nodes	• Read through entire transcripts for one or two nodes (60+ times). Process took anywhere from 10-16 hrs per transcript • Often, once reading a transcript for a code was complete, would search for key words to be sure nothing was missed (e.g. coffee) • After coding the transcript by nodes, completed final read through with coding highlighted. Coded any data still to be coded • Coding transcripts was extremely time consuming; Experimented with other coding methods to see if process was faster. Tried coding all remaining transcripts (eight) with one code at a time • Returned to coding method that involved reading one transcript repeatedly for different nodes (60+times) as it was faster • Completed coding of 104 open nodes in fourteen transcripts and then returned to transcripts coded at the beginning of the process to code nodes that were added later in this stage of analysis (i.e. added after finishing completely coding other transcripts)
Revised printed timeline	• Originally worked according to timeline. Initial coding (phase 2.1) took dramatically longer than expected	• Working according to a timeline was causing unnecessary stress related to the coding process • Scrapped timeline in order to spend ample time on coding and avoid unnecessary stress related to the speed of the process

Phase in project	Description of event or phase	Decision trail
Phase 2.2 Conceptual integration	• Lump nodes into broader categories	• Reviewed nodes to get initial sense of how to connect categories • Organizing node structure took several attempts as nodes were arranged and rearranged in different groups to find the best fit
	• Began grouping electronically	• Initially started dragging and dropping in NVivo, then tried Microsoft Word Document; concluded that rearranging nodes electronically was too challenging at this stage
	• Completed majority of process with paper and pencil	• Printed list of open codes, and hand wrote categories with sub-nodes using pencil and eraser • After majority of categories were created, transferred structure to NVivo (i.e. electronically dragging and dropping nodes into each other)
	• Settled on structure	• An initial structure of 17 trees, 61 branches, 20 twigs and one leaf was created
	• Structure emerged from data	• Though not a final structure yet, this stage was finished as grouping couldn't continue without reviewing sensitizing concepts or research questions/purpose. Review would provide more guidance about conceptual integration • Did not consult sensitizing concepts or research questions/purpose during this phase to allow first attempt of conceptual integration to emerge from data

Phase in project	Description of event or phase	Decision trail
Phase 2.3 Review of emerging categories in comparison to sensitizing concepts and research rationale	• Reviewed sensitizing concepts and original research questions and purpose • Further coding based on theoretical coding process (Charmaz, 2006) • Ordering nodes within each tree and describing trees in findings	• After reviewing sensitizing concepts, there was a need for large nodes to be broken apart to address differences within one node (e.g. smokes outside was broken into smokes outdoors at home and smokes outdoors at work) • Nodes were organized in a chart according to sensitizing concepts to gain an idea of how nodes were related to these concepts (i.e. concepts on one side of chart and all related categories and nodes on other side). This assisted with grouping nodes into higher conceptual categories • Node categories were grouped together in NVivo, and continued to be dragged and dropped and rearranged until a structure was created that organized the data into six high level trees. Each tree was comprised of various categories that related to each other • Each tree structure was transferred into chart form and the nodes were rearranged to find the order that best represented the relationships between each node (Nvivo organizes alphabetically) • Settled on organization of codes into six main trees comprised of 33 branches, 58 twigs, 31 leaves and eight sub-leaves

Phase in project	Description of event or phase	Decision trail
Phase 2.4 Subgroup analysis	• Matrix coding	• The Nvivo Matrix coding function was used to analyze data within groups according to population descriptors • Groups of cases were compared using attributes, rather than conducting cross case analysis • Five descriptors used: age, gender, skill of worker, union membership, employment sector
	• Analysis was completed using 5 categories	• Income was the only population descriptor not used; concluded little variation among income levels would not provide increased insight for answering research questions • Matrices were created in order of six trees. Nodes in each tree were broken up and coded against one or two descriptors at a time • Differences were determined by qualitative content, and by comparing number of sources coded, number of coding references. Common denominators were used to make appropriate comparisons
	• Saved analyses with differences	• After determining whether or not differences in nodes and descriptors existed, the matrix analysis was saved in NVivo and described in the findings section

Phase in project	Description of event or phase	Decision trail
Phase 3 Limited theory development and testing	• Reviewed social-contextual model (Sorensen et al., 2004)	• Studied various aspects of the model and spent time determining how data from this study could be presented in a way that exemplified characteristics of the model • Considered different factors: model classifies multi-level modifying conditions and mediating mechanisms • Determined that data could be presented by multi-level social contextual factors: data could be divided into intrapersonal, interpersonal, organizational and societal levels • No factors were found to be influential at the neighbourhood/community level
	• Reviewed context-mechanism-outcome configurations (Pawson & Tilley, 1997) in relation to data.	• Reviewed Pawson and Tilley's "realist explanatory formula" that posits outcomes are the product of mechanisms and contexts (1997, p. 56). • As a beginning approach to determine if data could be represented in context-mechanism-outcome (CMO) configurations, the researcher determined the outcomes • No variation was found among the outcomes: all participants were current smokers who had previously attempted to quit without success • With no variation in the outcomes (i.e. successful vs. unsuccessful quitters), the researcher could not determine interesting differences in CMO configurations • However, it was determined by the researcher that data could be categorized into potential contextual influences and facilitating mechanisms. These data could be organized according to the levels of influence determined in the previous step
	• Reviewed conditional/consequential (C/C) matrix described by Straus and Corbin (2008).	• Given that data was not presented in CMO configurations (linking outcomes as products of mechanisms in context), the researcher deemed that presenting data in the C/C matrix would be forcing • As the C/C matrix is a tool to present connections and relationships, it was deemed inappropriate to force such relationships onto the data

6.4 Reflecting on the researcher's ontological and epistemological perspectives

In the second edition of the Handbook of Qualitative Research, Denzin and Lincoln (2000) address criteria for evaluating qualitative research, and speak of the debate among researchers as to what constitutes "good interpretation". They conclude that regardless of a researcher's interpretation or views of the social world, "there seems to be an emerging consensus that all inquiry reflects the standpoint of the inquirer, that all observation is theory laden, and that there is no possibility of theory-free knowledge. We can no longer think of ourselves as neutral spectators of the social world." (P.871-2). Despite the researcher's best efforts to approach this project with an open mind, there is little chance that the work presented here has emerged without influence. Our ontological views about the nature of the world and epistemological views about how we come to know it influence our approach to inquiry, and as researchers we must be transparent about these views and perspectives. As Creswell (2007) states, good research requires the writer to make explicit the various assumptions, paradigms and frameworks utilized; at a minimum we must acknowledge that these factors influence how we conduct our inquiry.

This thesis project was the researcher's first attempt at major inquiry. While the orientation used to approach this study will be discussed, it should be noted that a new researcher can only describe her current perspectives and assumptions while acknowledging that these views may continue to evolve. This project was performed with theoretical sensitivity and openness. While the researcher may commit to adopting a specific perspective, it is hoped she will continue to conduct inquiry with similar candidness.

The researcher's assumptions are in line with that of a critical realist perspective, though she does not claim to be a fully committed critical realist. Maxwell states critical realists "retain

an ontological realism (there is a real world that exists independently of our perceptions, theories, and constructions) while accepting a form of epistemological constructivism and relativism (our understanding of this world is inevitably a construction from our own perspectives and standpoint)" (2012, p.5).

Through maintaining an ontological realist approach, this research was approached under the assumption that an objective reality exists regardless of our attempt to know it or understand it, and the entities that make up this world are independent of our human nature or interpretations. These assumptions are also based on a constructivist interpretation, as the researcher assumes what we know about reality is shaped by our perceptions and social experiences. Each person's understanding of the world is a construction from personal standpoints and perspectives. It is imperative to be transparent about this assumption, as this research project was approached with the view that each study participant understands his or her world through their own social experiences, and participants know their reality through their perception of it. Despite these declarations, it should be noted the researcher is very accepting of the fact that there is no one correct belief about the world and each individual views her/his world differently. In no way do these assumptions supersede the worldview of any other individual, they merely provide a reference for the current approach to research.

The axiological perspectives used to approach this research also reflect an ontological realist and epistemological constructivist (critical realist) framework. The world exists independent of individual constructions of it, however each individual understands the real world from their own perceptions and based on their own values. As Blumer (1969) states with his description of symbolic interactionism: individuals act based on meanings they ascribe to things, these meaning arise from social interaction, and are handled in and modified through

interpretations. Each participant's views and beliefs were valued in this project, as they affect how the participants construct their reality. The purpose of the research was to gain an understanding about participant's experiences and meaning of being a construction worker and a smoker. Without appreciating the views and perspectives of the participants, the purpose of the project could not have been achieved.

Our values impact how we construct our world, and each individual is free to construct their reality at will. As Crotty (2003) states "All reality, as meaningful reality, is socially constructed. There is no exception" (p.54). Both the researcher's and participant's values were honoured here. However, interpretations and judgements were made throughout this discussion section as a critical realist perspective allows for making rational judgments, while appreciating different worldviews and honouring participant's values. Remaining open about the researcher's assumptions has allowed for transparency in this researcher, especially when making judgements and interpretations.

6.5 Implications and significance of the study

6.5.1 Significance and implications for policy and practice

This research study is, to the best of the researcher's knowledge, the first attempt at understanding the experiences and meaning of smoking in a Canadian construction worker population. Previous research has attempted to understand these phenomenons in construction worker populations in other countries (e.g. Finnish population by Katainen 2010, 2011; British population by Sherriff & Coleman, 2012), and many of the findings from the present study are consistent with findings presented in the published literature. This study is limited by the small sample size and should not be interpreted as prevalence of worker knowledge, attitudes or

behaviours at a population level. Nonetheless, the findings are rich and therefore have important implications for policy and practice.

First, it is evident from the findings that construction workers believe their workplaces can support employees in their attempts to quit smoking, through incentives or medical coverage for quit aids. These supports may also be helpful if offered by others with an interest in assisting this population to reduce tobacco consumption (e.g. public health practitioners), but more research would be needed to confirm these findings.

Second, it is evident that workers experience various workplace smoking policies that are inconsistently enforced. The findings suggest workers would be more supported when making a quit attempt if smoking was limited or prohibited on jobsites in some way. However, workers do not want to be responsible for changing social norms on worksites. These findings suggest comprehensive and multi-level approaches to promoting worker health should involve various stakeholders (e.g. workers, workplace supervisors, union representatives, occupational health and safety, public health practitioners and policy makers). Enforcement of a tobacco policy on a construction site is paramount, and findings from this study suggest that a policy needs to be strictly enforced in order for workers to follow it. Construction workers from the present study also believe quitting smoking is harder when coworkers are smoking in the vicinity, and a workplace policy that limits or prohibits smoking on jobsites would address this challenge. It is evident from these findings that comprehensive policy development involving various stakeholders is a necessary step to begin to combat the use of tobacco on construction worksites and the culture that may be facilitating this continued use.

Third, it is evident from the subgroup analysis conducted in the present study that construction workers are a complex subpopulation of the broader blue-collar workforce. The

construction industry is made up of various sub-subpopulations and variations emerged from this research among workers of different ages, skill level and job sectors. These findings indicate that workers within the construction industry have different experiences of smoking, and therefore different cessation needs. These needs should be considered in the designing and tailoring of cessation interventions if they are to be effective for different types of construction workers. However, further research will be needed to further understand the differences among various subgroups within the construction worker population, and tailor interventions within the construction industry depending on these characteristics.

Finally, it is evident from the findings that there are various factors (mechanisms and contexts) affecting construction workers smoking on and off worksites. These reasons are influential at multiple levels, from intrapersonal to organization. Workers provided various intrapersonal and interpersonal reasons for continued smoking. The intrapersonal reasons stated included habit, addiction, stress, or feeling bored. Interpersonal factors included that tobacco use is very common at work and a way to socialize on breaks, or that a cigarette goes hand in hand with a coffee break. However, these intrapersonal and interpersonal factors are facilitated by organization level factors that allow for continued smoking in the workplace. Organizational level factors that workers cited for continued smoking included having little routine in the day and being able to smoke anytime, believing that smoking does not affect or impact work or work performance, working outside or in unfinished buildings, and little enforcement of smoking policies. These factors represent important considerations for practitioners working with construction worker populations, and also identify interesting lines of inquiry for researchers conducting further investigations regarding tobacco use in this population. Nevertheless, further

research is necessary to confirm these findings and their influence among construction worker populations.

6.5.2 Implications for future research

While this study has identified practical considerations, there is still much to be understood about tobacco use among construction workers. Further studies are needed in order for policy makers, practitioners and researchers to assist this population in their efforts to discontinue and reduce tobacco use. This study has identified several of these implications.

Analyses for the present study were not conducted at a behavioural level, and the findings that resulted do not speak directly to the behaviour of construction workers. While interesting contextual cues, antecedents and consequences of smoking in the construction workplace were identified, in-depth behavioural analysis was not a focus of this research. Further behavioural research is needed to explore the antecedents, behaviours and consequences of smoking for the construction worker population in a workplace setting. Applied behavioural analysis, focus group interviews and/or ethnographic studies may be informative.

Furthermore, studies utilizing qualitative and quantitative methods are also needed. The present study collected data that was self-reported through in-depth interviews. An ethnographic study involving construction workers and specifically a study with participant observations would add to body of research regarding the use of tobacco on construction sites. Qualitative research employing focus groups is also needed to provide group data that could speak to the social norms and cultural patterns operating in construction workplaces.

Further, this study focused solely on construction workers who do not hold administrative or supervisory roles (though two self-employed contractors were included in the sample). Further

studies involving supervisors, managers and other administrators will be necessary in order to understand how different groups within the construction industry are affected by tobacco use and the various approaches to decrease use. Understanding these needs will also require the involvement of both smokers and non-smokers.

Quantitative studies are also needed to assist in developing quantitative estimates about tobacco use behaviour (smoking and quitting) and the multi-level factors that predict smoking among construction workers as well as preferences for various interventions. For example, quantitative methodology (e.g. survey methods) could provide evidence regarding the acceptability of interventions for the construction worker population. Intervention development, utilizing both quantitative and qualitative methods, should involve participatory evaluation and a community based participatory approaches. The involvement of various stakeholders is necessary, including workers, employers, occupational health and safety committees, researchers and practitioners. Interventions should be developed to take into consideration the sociocultural aspects that are operating in construction workplaces. The role of various contextual factors enabling smoking and smoking cessation should be explored collaboratively with key players to ensure interventions are appropriate and may be tailored to various construction worksite settings.

Clearly, further research and learning through collaborative intervention development are necessary to address the high and persistent rates of tobacco use among construction workers. This research confirms the need for a multi-level sociocultural theory of intervention, and intervention theories relevant to influence the entire habitus of smoking culture in construction workplaces.

6.6 Closing remarks

This study identifies that there are various factors (mechanisms and contexts) affecting construction workers smoking on and off worksites. The experience is a complex one and different workers have different meanings of smoking. While more research is necessary to continue to combat the persistently high rates of tobacco use among construction workers, this research contributes substantially to knowledge about construction workers who are smokers and meaning making on construction sites.

REFERENCES

Abrams, D.B., Boutwell, W.B., Grizzle, J., Heimendinger, J., Sorensen, G. & Varnes, J. (1994). Cancer control at the workplace: The working well trial. *Preventive Medicine, 23,* 15-27.

Bang, K.M. & Kim, J.H. (2001). Prevalence of cigarette smoking by occupation and industry in the United States. *American Journal of Industrial Medicine, 40*(3), 233-239.

Barbeau, E., Krieger, N. & Soobader, M.J. (2004a). Working class matters: Socioeconomic disadvantage, race/ethnicity, gender, and smoking in NHIS 2000. *American Journal of Public Health, 94*(2), 269-278.

Barbeau, E., Li, Y., Calderon, P., Hartman, C., Quinn, M., Markkanen, P., Roelofs, C., Frazier, L. & Levenstein, C. (2006). Results of a union-based smoking cessation intervention for apprentice iron workers (United States). *Cancer Causes and Control, 17,* 53-61.

Barbeau, E., Li, Y., Sorensen, G., Conlan, K., Youngstrom, R. & Emmons, K. (2001). Coverage of smoking cessation treatment by union health and welfare funds. *American Journal of Public Health, 91*(9), 1412-1415.

Barbeau, E.M., DeLaurier, G.F., Kelder, G., McLellan, D., Sorensen, G., Balbach, E.D. & Levenstein, C. (2007). A decade of work on organized labor and tobacco control: Reflections on research and coalition building in the United States. *Journal of Public Health Policy, 28,* 118-135.

Barbeau, E. M., McLellan, D., Levenstein, C., DeLaurier, G.F., Kelder, G. & Sorensen, G. (2004b). Reducing occupation-based disparities related to tobacco: Roles for occupational health and organized labor. *American Journal of Industrial Medicine, 46,* 170-179.

Bazeley, P. (2007). *Qualitative data analysis with NVivo.* Thousand Oaks, CA: Sage Publications.

Blumer, H. (1954). What is wrong with social theory? *American Sociological Review, 18,* 3-10.

Blumer, H. (1969). *Symbolic interactionism: Perspective and method.* Englewood Cliffs, NJ: Prentice-Hall.

Bondy, S. & Bercovitz, K. (2011). Non-smoking worksites in the residential construction sector: Using an online forum to study perspectives and practices. *Tobacco Control, 20,* 189-195.

Bondy, S. & Bercovitz, K. (2013). "Hike up yer skirt, and quit." What motivates and supports smoking cessation in builders and renovators. *International Journal of Environmental Research and Public Health. 10,* 623-637.

Borkan, J. (1999). Immersion/crystallization. In Crabtree, B. & Miller, W. (Eds.), *Doing qualitative research (2nd edition).* Thousand Oaks, CA: Sage Publications.

Bott, M.J., Cobb, A.K., Scheibmeir, M.S. & O'Connell, K.A. (1997). Quitting: Smokers relate their experiences. *Qualitative Health Research, 7*(2), 255-269.

Bourdieu, P. (1977). *Outline of a theory of practice.* New York, NY: Cambridge University Press.

Bourdieu, P. (1984). *Distinction: A Social Critique of the Judgement of Taste.* Cambridge, MA: Harvard University Press.

Bowen, G.A. (2006). Grounded theory and sensitizing concepts. *International Journal of Qualitative Methods 5*(3), 12-23.

Bryant, A. & Charmaz, K. (Eds.). (2007). *The SAGE handbook of grounded theory.* Thousand Oaks, CA: Sage Publications.

Cahill, K., Moher, M., & Lancaster, T. (2008). Workplace interventions for smoking cessation. *Cochrane Database of Systematic Reviews, 4*, 1-86.

Calvert, G., Luckhaupt, S., Lee, S.J., Cress, R., Schumacher, P., Shen, R., Tak, S.W. & Deapen, D. (2012). Lung cancer risk among construction workers in California, 1988-2007. *American Journal of Industrial Medicine, 55*, 412-422.

Canadian Public Health Association. (2010). *12 great achievements.* Retrieved on October 19, 2012 from http://www.cpha.ca/en/programs/history/achievements.aspx.

Carcary, M. (2009). The research audit trail – Enhancing trustworthiness in qualitative inquiry. *The Electronic Journal of Business Research Methods, 7*(1), 11-24.

Carlan, N.A., Kramer, D.M., Bigelow, P., Wells, R., Garritano, E. & Vi, P. (2012). Digging into construction: Social networks and their potential impact on knowledge transfer. *Work, 42*(2), 223-232.

Carlson, J.A. (2010). Avoiding traps in member checking. *The Qualitative Report, 15*(5), 1102-1113.

Centers for Disease Control and Prevention. (2011). C*urrent cigarette smoking prevalence among working adults, United States, 2004 – 2010.* Retrieved on November 2, 2012 from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6038a2.htm.

Chambers, E. (2000). Applied ethnography. In Denzin, N.K. & Lincoln, Y. S. (Eds.), *Handbook of qualitative research (2nd edition).* Thousand Oaks, CA: Sage Publications.

Charmaz, K. (2003). Grounded theory: Objectivist and constructivist methods. In Denzin, N.K. & Lincoln, Y.S. (Eds.), *Strategies for qualitative inquiry (2nd edition).* Thousand Oaks, CA: Sage Publications.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis.* Thousand Oaks, CA: Sage Publications.

Chin, D., Hong, O., Gillen, M., Bates, M. & Okechukwu, C. (2012). Cigarette smoking in building trades workers: The impact of work environment. *American Journal of Industrial Medicine, 55*, 429-439.

Claessen, H., Arndt, V., Drath, C. & Brenner, H. (2010). Smoking habits and occupational disability: A cohort study of 14 483 construction workers. *Occupational and Environmental Medicine, 67*, 84-90.

Construction Sector Council. (2009). *Fast facts.* Retrieved on October 19, 2012 from http://www.csc-ca.org/en/media/facts.

Creswell, J.W. (2007). *Qualitative inquiry & research design: Choosing among five approaches (2nd edition).* Thousand Oaks, CA: Sage Publications.

Creswell, J.W. (2013). *Qualitative inquiry & research design: Choosing among five approaches (3rd edition).* Thousand Oaks, CA: Sage Publications.

Crotty, M. (2003). *The foundations of social research: Meaning and perspective in the research process.* Thousand Oaks, CA: Sage Publications.

Cutcliffe, J.R. & McKenna, H.P. (2004). Expert qualitative researchers and the use of audit trails. *Journal of Advanced Nursing, 45*(2), 126-135.

Denzin, N.K. & Lincoln, Y.S. (2000). Part V: The art and practices of interpretation, evaluation and representation. In Denzin, N.K. & Lincoln, Y. S. (Eds.), *Handbook of qualitative research (2nd edition).* Thousand Oaks, CA: Sage Publications.

Dey, I. (1999). *Grounding grounded theory: Guidelines for qualitative inquiry.* San Diego, CA: Academic Press.

Dong, X.S., Wang, X., Daw, C. & Ringen, K. (2011). Chronic diseases and functional limitations among older construction workers in the United States: A 10-year follow-up study. *Journal of Occupational and Environmental Medicine, 53*(4), 372-380.

Drennan, J. (2003). Cognitive interviewing: Verbal data in the design and pretesting of questionnaires. *Journal of Advanced Nursing, 42*(1), 57-63.

Fujishiro, K., Stukovsky, K.D., Roux, A.D., Landsbergis, P. & Burchfiel, C. (2012). Occupational gradients in smoking behavior and exposure to workplace environmental tobacco smoke: The multi-ethnic study of atherosclerosis. *Journal of Occupational and Environmental Medicine, 54*(2), 136-145.

Glaser, B.G. (1978). *Basics of grounded theory analysis.* Mill Valley, CA: Sociology Press.

Glaser, B.G. & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research.* New York, NY: Aldine De Gruyter.

Glaser, B.G. & Strauss, A.L. (1999). *The discovery of grounded theory: Strategies for qualitative research.* New York, NY: Aldine De Gruyter.

Glasgow, R.E., Sorensen, G., Giffen, C., Shipley, R.H., Corbett, K. & Lynn, W. (1996). Promoting worksite smoking control policies and actions: The community intervention trial for smoking cessation (COMMIT) experience. *Preventive Medicine, 25,* 186–194.

Goldman, R.E., Barbeau, E., Hunt, M.K., Acevedo-Garcia, D., Emmons, K.M., Gagne, J. & Sorensen, G. (2008). Perceptions of health promotions and cancer preventions among adults in working-class occupations and neighborhoods. *Health Education & Behavior, 35*(6), 777-790.

Grant, R.W. & Sugarman, J. (2004). Ethics in human subjects research: Do incentives matter? *Journal of Medicine and Philosophy, 29*(6), 717-738.

Groeneveld, I.F., Proper, K.I., van der Beek, A.J., Hildebrandt, V.H. & van Mechelen, W. (2011). Short and long term effects of a lifestyle intervention for construction workers at risk for cardiovascular disease: A randomized controlled trial. *BMC Public Health, 11*(1), 836.

Grosch, J.W., Alterman, T., Petersen, M.R. & Murphy, L.R. (1998). Worksite health promotion programs in the U.S.: Factors associated with availability and participation. *American Journal of Health Promotion, 13*(1), 36-45.

Guba, E.G. & Lincoln, Y.S. (1989). *Fourth generation evaluation.* Newbury Park, CA: Sage Publications.

Ham, D.C., Przybeck, T., Strickland, J.R., Luke, D.A., Bierut, L.J. & Evanoff, B.A. (2011). Occupation and workplace policies predict smoking behaviors. *Journal of Occupational and Environmental Medicine, 53*(11), 1337-1345.

Health Canada. (2010). *Government of Canada encourages healthy living in Canadians through smoking cessation program.* Retrieved on December 5, 2012 from http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/_2010/2010_09-eng.php.

Health Canada. (2011). *Canadian tobacco use monitoring survey (CTUMS) 2011*. Retrieved on October 16, 2012 from http://www.hc-sc.gc.ca/hc-ps/tobac-tabac/research-recherche/stat/ctums-esutc_2011-eng.php.

Hunt, M.K., Lederman, R., Stoddard, A.M., LaMontagne, A.D., McLellan, D., Combe, C., Barbeau, E. & Sorensen, G. (2005). Process Evaluation of an integrated health promotion/occupational health model in WellWorks-2. *Health Education & Behavior, 32*(1), 10-26.

Industry Canada. (2011). *Definition; Construction (North American industry classification system 23).* Retrieved on October 19, 2012 from http://www.ic.gc.ca/cis-sic/cis-sic.nsf/IDE/cis-sic23defe.html.

Janesick, V. (2000). The Choreography of qualitative research design: Minuets, improvisations, and crystallization. In Denzin, N. K. & Lincoln, Y. S. (Eds.), *The Handbook of Qualitative Research* . Thousand Oaks, CA: Sage Publications.

Katainen, A. (2010). Social class differences in the accounts of smoking – striving for distinction. *Sociology of Health & Illness, 32*(7), 1087-1101.

Katainen, A. (2011). Smoking and workers' autonomy: A qualitative study on smoking practices in manual work. *Health, 16*(2), 134-150.

Koch, T. (2006) Establishing rigour in qualitative research: The decision trail. *Journal of Advanced Nursing, 53*(1), 91-100.

Lambert, V., Glacken, M. & McCarron, M. (2011). Employing an ethnographic approach: key characteristics. *Nurse Researcher, 19*(1), 17-24.

Laurier, E., McKie, L. & Goodwin, N. (2000). Daily and lifecourse contexts of smoking. *Sociology of Health & Illness, 22*(3), 289-309.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry.* Beverly Hills, CA: Sage Publications.

Lundh, L., Hylander, I. & Törnkvist, L. (2012). The process of trying to quit smoking from the perspective of patients with chronic obstructive pulmonary disease. *Scandinavian Journal of Caring Sciences, 26*(3), 485-93.

Maxwell, J.A. (2012). *A realist approach for qualitative research.* Thousand Oaks, CA: Sage Publications.

Maxwell, J.A. (2013). *Qualitative research design: An interactive approach.* Thousand Oaks, CA: Sage Publications.

McLeroy, K.R., Bibeau, D., Steckler, A. & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education & Behavior, 15,* 351-377.

McVea, K., Miller, D.L., Creswell, J.W., McEntarrfer, R. & Coleman, M.J. (2009). How adolescents experience smoking cessation. *Qualitative Health Research, 19*(5), 580-592.

Minian, N. (2008). *Cessation services in Simcoe Muskoka. Ontario Tobacco Research Unit: Evaluation news 2008 Feb (3).* Retrieved on November 8, 2012 from http://otru.org/wp-content/uploads/2012/06/OTRU_news3_web.pdf.

Ministry of Labour. (2011). *Construction Sector Plan 2011-2012.* Retrieved on November 2, 2012 from http://www.labour.gov.on.ca/english/hs/pdf/sp_11cons.pdf.

Novick, G. (2008). Is there a bias against telephone interviews in qualitative research? *Research in Nursing & Health, 31*(4), 391-398.

Okechukwu, C., Bacic, J., Cheng, K.W. & Catalano, R. (2012). Smoking among construction workers: The nonlinear influence of the economy, cigarette prices, and antismoking sentiment. *Social Science & Medicine, 75*, 1379-1386.

Okechukwu, C.A., Dutra, L.M., Bacic , J., Ayadi, A. & Emmons, K.M. (2013). Home matters: Work and household predictors of smoking and cessation among blue-collar workers. *Preventative Medicine, 56*(2), 130-134.

Okechukwu, C., Krieger, N., Sorensen, G. & Barbeau, E. (2009). MassBuilt: Effectiveness of an apprenticeship site-based smoking cessation intervention for unionized building trades workers. *Cancer Causes and Control, 20*, 887-894.

Okechukwu, C., Nguyen, K. & Hickman, N.J. (2010). Partner smoking characteristics: Associations with smoking and quitting among blue-collar apprentices. *American Journal of Industrial Medicine, 53*, 1102-1108.

Ontario Construction Secretariat. (n.d.). *Construction Trades.* Retrieved from http://www.iciconstruction.com/WHYUNION/construction_trades.cfm.

Ontario Tobacco Research Unit. (2013). *Current Cessation Projects*. Retrieved from http://otru.org/research-evaluation/cessation/current-cessation-projects/.

Orne, M.T. (1962). On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. *American Psychologist, 17*(11), 776-783.

Patton, M.Q. (1990). *Qualitative evaluation and research methods (2nd edition).* Newbury Park, CA: Sage Publications.

Patton, M.Q. (2002). *Qualitative research and evaluation methods (3rd edition)*. Thousand Oaks, CA: Sage Publications.

Pawson, R. & Tilley, N. (1997). *Realistic evaluation.* Thousand Oaks, CA: Sage Publications.

Peretti-Watel, P., Constance, J., Seror, V. & Beck, F. (2009). Working conditions, job dissatisfaction and smoking behaviours among French clerks and manual workers. *Journal of Occupational and Environmental Medicine, 51*(3), 343-350.

Pink, S., Tutt, D., Dainty, A. & Gibb, A. (2010). Ethnographic methodologies for construction research: knowing, practice and interventions. *Building Research Information, 38*(6), 647-659.

Poland, B., Frohlich, K., Haines, E., Mykhalovskiy, E., Rock, M. & Sparks, R. (2006). The social context of smoking: The next frontier in tobacco control? *Tobacco Control, 15*, 59-63.

Public Health Agency of Canada. (2012). *What makes Canadians healthy or unhealthy? Key determinant 4. Employment / working conditions.* Retrieved on October 18, 2012 from http://www.phac-aspc.gc.ca/ph-sp/determinants/determinants-eng.php#employment.

Quintiliani, L., Stoddard, A., Lederman, R., Harden, E., Wallace, L. & Sorensen, G. (2012). Dissemination of a tobacco cessation program for unionized workers. *Family & Community Health, 35*(3), 246-255.

Ringen, K., Anderson, N., McAfee, T., Zbikowski, S.M. & Fales, D. (2002). Smoking cessation in blue-collar populations: Results from an evidence-based pilot program. *American Journal of Industrial Medicine, 42*, 367-377.

Roddy, E., Romilly, N., Challenger, A., Lewis, S. & Britton, J. (2006). Use of nicotine replacement therapy in socioeconomically deprived young smokers: a community-based pilot randomised controlled trial. *Tobacco Control, 15*(5), 373-376.

Rüge, J., Ulbricht, S., Schumann, A., Rumpf, H.J., John, U. & Meyer, C. (2008). Intention to quit smoking: Is the partner's smoking status associated with the smoker's intention to quit? *International Journal of Behavioral Medicine, 15*(4), 328-335.

Ryan, K. Gannon-Slater, N. & Culbertson, M.J. (2012). Improving survey methods with cognitive interviews in small- and medium-scale evaluation. *American Journal of Evaluation, 33*(3), 414-430.

Selamat, M.H. & Hashim, A.H. (2008). A qualitative decision trail in the hermeneutic analysis: Evidence from the case study. *International Journal of Business and Management, 3*(3), 41-55.

Sherriff, N.S. & Coleman, L. (2012). Understanding the needs of smokers who work as routine and manual workers on building sites: Results from a qualitative study on workplace smoking cessation. *Public Health, 127*(2), 125-133.

Sorensen, G. & Barbeau, E.M. (2006). Integrating occupational health, safety and worksite health promotion: opportunities for research and practice. *La Medicina del Lavoro, 97*(2), 240-257.

Sorensen, G., Barbeau, E., Hunt, M.K. & Emmons, K. (2004). Reducing social disparities in tobacco use: A social-contextual model for reducing tobacco use among blue-collar workers. *American Journal of Public Health, 94*(2), 230-239.

Sorensen, G., Barbeau, E., Stoddard, A.M., Hunt, M.K., Goldman, R., Smith, A., Brennan, A.A. & Wallace, L. (2007). Tools for health: The efficacy of a tailored intervention targeted for construction laborers. *Cancer Causes and Control, 18*, 51-59.

Sorensen, G., Barbeau, E., Stoddard, A.M., Hunt, M.K., Kaphingst, K. & Wallace, L. (2005). Promoting behavior change among working-class, multiethnic workers: results of the healthy directions—small business study. *American Journal of Public Health, 95*(8), 1389-1395.

Sorensen, G., Emmons, K., Stoddard, A.M., Linnan, L. & Avrunin, J.S. (2002a). Do social influences contribute to occupational differences in quitting smoking and attitudes towards quitting? *American Journal of Health Promotion, 16*(3), 135-141.

Sorensen, G., Himmelstein, J.S., Hunt, M.K., Youngstrom, R., Hebert, J.R., Hammond, S.K., Palombo, R., Stoddard, A. & Ockene, J.K. (1995). A model for worksite cancer prevention: Integration of health protection and health promotion in the WellWorks project. *American Journal of Health Promotion, 10*(55), 62.

Sorensen, G., Pechacek, T. & Pallonen, U. (1986). Occupational and worksite norms and attitudes about smoking cessation. *American Journal of Public Health, 76*(5), 544-549.

Sorensen, G., Stoddard, A., Hammond, S.K., Hebert, J.R., Avrunin, J.S. & Ockene, J.K. (1996a). Double jeopardy: Workplace hazards and behavioral risks for craftspersons and laborers. *American Journal of Health Promotion, 10*(5), 355-363.

Sorensen, G., Stoddard, A., Hunt, M.K., Hebert, J.R., Ockene, J.K., Avrunin, J.S. & Hammond, S.K. (1998). The effects of a health promotion-health protection intervention on behavior change: The WellWorks study. *American Journal of Public Health, 88*(11), 1685-1690.

Sorensen, G., Stoddard, A. M., LaMontagne, D., Emmons, K., Hunt, M. K., Youngstrom, R., McLellan, D. & Christiani, D. C. (2002b). A comprehensive worksite cancer prevention intervention: Behavior change results from a randomized controlled trial (United States). Cancer Causes and Control, 13(6), 493-502.

Sorensen, G., Stoddard, A.M., Quintiliani, L., Ebbeling, C., Nagler, E., Yang, M., Pereira, L. & Wallace, L. (2010). Tobacco use cessation and weight management among motor freight workers: Results of the gear up for health study. *Cancer Causes and Control, 21*, 2113-2122.

Sorensen, G., Thompson, B., Glanz, K., Feng, Z., Kinne, S., DiClemente, C., Emmons, K., Heimendinger, J., Probart, C. & Lichtenstein, E. (1996b). Work site-based cancer prevention: Primary results from the working well trial. *American Journal of Public Health, 86*, 939-947.

Spencer, L., Ritchie, J., Lewis, J. & Dillon, L. (2003). Quality in qualitative evaluation: A framework of assessing research evidence. London, United Kingdom: Government Chief Social Researcher's Office.

Statistics Canada. (2013). *Employment by industry and sex*. Retrieved July 12, 2013 from http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/labor10a-eng.htm.

Statistics Canada and Human Resources and Skills Development Canada. (2011). *National occupation classification.* Retrieved on October 30, 2012 from http://www5.hrsdc.gc.ca/noc/english/noc/2011/pdf/Printable_NOC2011_version_E.pdf.

Sterling, T.D. & Weinkam, J.J. (1990). The healthy worker effect: The need to reevaluate a broad spectrum of occupational risks. In L.A. Cox Jr. & P.F. Ricci (Eds.), *New Risks: Issues and Management, Advances in Risk Analysis.* New York, NY: Plenum Press.

Stich, C. & Garcia, J. (2011). *Analysis of the young adult ontario workforce.* Retrieved on October 16, 2012 from http://otru.org/wpcontent/uploads/2012/06/otru_special_ may2011.pdf.

Stokols, D. (1996). Translating social ecological theory into guidelines for community health promotion. *American Journal of Health Promotion, 10,* 282-298.

Strauss, A. & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory (2rd edition).* Thousand Oaks, CA: Sage Publications.

Strauss, A. & Corbin, J. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory (3rd edition).* Thousand Oaks, CA: Sage Publications.

Sturges, J.E. & Hanrahan, K.J. (2004). Comparing telephone and face-to-face qualitative interviewing: A research note. *Qualitative Research, 4*(1), 107-118.

The Conference Board of Canada. (2013). *Smoking cessation and the workplace: Briefing 1—Profile of tobacco smokers in Canada.* Retrieved on June 18, 2013 from http://www.conferenceboard.ca/temp/ad0f5373-c5e8-49e0-b648-473b97e97c23/13-267_smokingcessation-brief1_cashc.pdf.

Thompson, B., Thompson, L.A., Thompson, J., Fredickson, C. & Bishop, S. (2003). Heavy smoking: A qualitative analysis of attitudes and beliefs concerning cessation and continued smoking. *Nicotine & Tobacco Research, 5*(6), 923-933.

Tiede, L., Hennrikus, D., Cohen, B., Hilgers, D., Madsen, R. & Lando, H. (2007). Feasibility of promoting smoking cessation in small worksites: An exploratory study. *Nicotine & Tobacco Research, 9*(Supp 1), S83-S90.

Walsh, D.C., Jennings, S.E., Mangione, T. & Merrigan, D.M. (1991). Health promotion versus health protection? Employees' perceptions and concerns. *Journal of Public Health Policy, 12*(2), 148-164.

Williams, S.J. (1995). Theorising class, health and lifestyles: Can Bourdieu help us? *Sociology of Health and Illness, 17*(5) 577-604.

World Health Organization. (2012). *Why tobacco is a public health priority.* Retrieved on December 5, 2012 from http://www.who.int/tobacco/health_priority/en/.

Zhu, S.H., Lee, M., Zhuang, Y.L., Garnst, A. & Wolfson, T. (2012). Interventions to increase smoking cessation at the population level: How much progress has been made in the last two decades? *Tobacco Control, 21,* 110-118.

Appendix A: Advertisements for study recruitment

Are you a construction worker?
Do you smoke or use tobacco products?

Researchers from the University of Waterloo are interested in your opinions about smoking and tobacco use.

UNIVERSITY OF WATERLOO | SCHOOL OF PUBLIC HEALTH AND HEALTH SYSTEMS

Do you:

- **Work in the construction industry?**
- **Smoke or use tobacco at work?**

If so, please contact:
Researcher: Beverley Hoekstra
Phone: 519-888-4567 ext. 36396
Email: bev.hoekstra@uwaterloo.ca

Participation will consist of a one hour (in-person or phone) interview and study participants will receive a $50 Tim Hortons gift card in appreciation of their time.

Construction Worker who Smoke or Use Tobacco at Work Needed for University of Waterloo Research Study

Researchers from the School of Public Health and Health Systems at the University of Waterloo are looking for construction workers to participate in a study about smoking and tobacco use.

Participation will involve a one hour interview and all study participants will receive a $50 Tim Hortons gift card in appreciation of their time.

In order to participate, you must:

- work in the construction industry
- consider yourself a smoker, and smoke or use tobacco while at work
- be between the ages of 18 and 64

This research project has been reviewed by, and received ethics clearance through, the University of Waterloo's Office of Research Ethics.

If interested, please contact:
Beverley Hoekstra at 519 888-4567 ext. 36396 or bev.hoekstra@uwaterloo.ca

Appendix B: Interview guide

Preamble: Good morning/afternoon. Thank you for agreeing to participate in this project. The purpose of this interview is to get a better understanding of your experiences with using tobacco, and what it means for you. First, I am going to ask a few questions to get to know you and your work, and then I would like to talk about smoking.

You can refuse to answer any questions, and if you want to stop the interview or stop participating in this study at any time, please just let me know. Do you have any questions before we begin the interview? *(Answer if needed)*

Great, well again, let me thank you for agreeing to participate in this study. As there are really no right or wrong answers, and because I don't have any expectations about your answers, I am really looking for you to tell me your honest opinions and thoughts. Any information you provide will be very helpful. First, I am going to ask a few questions to get to know you in relation to your work.

Turn on Audio Recording.

Section 1: Getting to Know You

1) How long have you worked in the construction industry?

2) What is your job title? Could you tell me a bit about your job?

    a) What do you like about your job?

3) Could you describe your workplace?

    a) What is the environment like? The working conditions?

    b) Do you work mostly inside, outside or both?

4) How often do you change job sites?

    a) Tell me about your last 3 job sites.

5) What were the smoking policies?

    a) Are these strict formal policies?

    b) Were they enforced?

6) Do your workdays follow a schedule? Is this strict or does it change? Why?

    a) How is the day structured/arranged?

7) What are your supervisors/bosses like? What do you think is most important to them at work?

a) Do you think your supervisors/bosses value being fast at your job or being safe or both?

8) I'd like to talk a bit about workplace hazards. What are your biggest risks at work?

a) What hazards are you exposed to? Are you exposed to chemical hazards?

b) Do your smoking habits change around chemical hazards? How?

c) Do your smoking habits affect whether or not you do your job safely?

9) How do you define an outdoor space on a job site?

a) For example, if you can only smoke outside, how do you define this?

10) Have you had any health and safety training that dealt with smoking at work?

a) If your work has offered OR would offer this, how would this affect your smoking?

b) If yes – What did you learn?

c) If no – What would you want to learn in training that dealt with smoking at work?

Section 2.1 Smoking and the Construction Workplace

Now that we have started to discuss smoking, I have a few questions about your smoking habits.

1) Could you describe your tobacco use/smoking?

a) When did you start smoking? Why did you start smoking?

b) How much do you smoke?

c) What kind of tobacco do you use? For example, cigarettes, cigars, chew tobacco etc.?

d) What kind of cigarettes do you smoke? I.e. Light or heavy? Brand?

d) Why do you continue to smoke?

2) Could you describe your smoking when you are at work?

a) When and where do you smoke at work? On breaks? While Working?

b) Do you smoke with others at work? Who?

c) How does smoking affect your work day?

d) Why do you smoke at work?

e) Are there any times at work that smoking does not fit?

3) What give you an urge to smoke at work?

4) Do you think smoking is a social experience at work?

a) For example, do you get to have a break with co-workers and talk while smoking?

5) What does smoking at work mean to you?

a) How does smoking affect you while you are at work?

6) How would work be different if you didn't smoke?

7) I'm curious how you think construction workers who are travelling between many jobsites a day (i.e. electricians) may have different experiences/ Do you notice them on your jobsites? How do you think this is different for them.

Section 2.2 Smoking and Other Settings

Now that we've talked about smoking at work, I would like to talk about smoking outside work.

7) What are your smoking habits outside of work?

a) Could you describe your smoking at home?

b) Does anyone in your home smoke?

c) Who else do you smoke with outside of work?

d) Who else in your family smokes?

8) Where do you smoke most often outside of work?

9) Do you think smoking is a social experience outside of work?

Section 3: Quit Attempts

Now that we have talked a bit about your work and smoking, I would like to talk a bit about quitting and cutting back. (*Use quit vs. cut back depending on participant's use)*

1) Have you tried to quit recently? (***If yes***, continue. ***If no***, skip to question 3)

a) How did you try to quit? Did you use anything to help?

b) Did that help work? What didn't work?

2) What was it like at work while you were trying to quit?

3) What makes quitting at your workplace harder?

4) What would make quitting easier at work?

a) What would help you at work if you wanted to stop smoking or cut back?

5) Does your workplace offer help for someone who wants to quit smoking or cut back?

a) How could your workplace help you?

6) If you were to try to quit, what might worry you about quitting?

a) What are your fears about quitting? (E.g. changes to social relationships, physical or psychological symptoms)

Those are all the interview questions I have for you. Is there anything else you would like to tell me?

I have two final questions about you, but feel free to tell me if you don't want to answer them.

1) Could you state your age?

2) Do you speak any other languages?

3) I am going to list some income levels; could you tell me the one you fall into?

a) < $30,000; $30,000-$50,000; $50,000-$75,000; $75,000 or more?

b) *If declined to answer* – Okay, not a problem at all.

Thank you very much for taking the time to speak with me today. Should you think of anything else you have to say, please do not hesitate to contact me. If I think of other questions, would it be alright for me to contact you?

If yes – what is the best way to contact you? Phone or email?

If no – alright, not a problem at all.

I would like to send you a follow up letter. Where can I send this to? *(email or address)*

Obtain participant information (last page of informed consent).

If a participant refuses: Not a problem at all. *Provide participant with generic feedback letter.*

I would also like to send you a summary of the results of the study once it is completed in August of 2013. Would you like to receive this?

If yes - Where can I send this to? *(email or address) Obtain participant information.*

If no – alright, not a problem at all.

In recognition of your time spent with me to complete this interview, here is your Tim Horton's gift card. *Provide study participant with gift card.*

Again, thank you for your time.

Appendix C: Initial codes generated from phase 1: Data gathering and generating potential nodes

1) Dirty, dusty job
2) Physically demanding
3) Comfortable environment
4) Does various jobs
5) Whatever the conditions are, you work in them (weather etc)
6) Routine to job
7) Enjoy seeing the job done at end of day
8) Other people at work for the paycheck
9) Coffee and cigarettes belong together
10) Larger company means more safety, stricter rules
11) Safety – common sense
12) Safety not covered in health/safety training
13) Production most important
14) Ventilated means outdoor, fresh air
15) Know who to avoid when not following policies
16) Smoke because building not near finishing stages
17) No smoking inside residential houses
18) No smoking policies indoors – not followed
19) DSA's – not followed
20) Still smoke inside – don't consider it outside

21) Windows – some consider outside

22) Actually shouldn't be smoking – not smoking at workplace

23) Started smoking because it was cool – different when you were young

24) Smoking in company vehicles

25) Smoking doesn't affect work, if you do your job safely but not around chemical hazards

26) Reason to take a break

27) Taking a "breather", get a breath of fresh air

28) Talk about a problem, think, talk about next steps while having cigarette

29) Take a break after finishing a job

30) Break when convenient

31) Smoke together, while talking about work (think about work, talk about problem) or other things

32) Work does not assist with quitting

33) Work would be boring if I didn't smoke

34) "me time"

35) Tired from smoking

36) Addicted

37) Goes hand in hand with cigarette

38) Desire to not smoke

39) Hate smoking, but like it

40) Family members smoke

41) I smoke when I'm bored – something to do, doing something

42) I smoke when my attention is on something (computer, video games, working in shop)

43) Doesn't think it is social…reluctantly agreed

44) Changes to social smoking outside of work – can't smoking in restaurants/bars etc. anymore

45) Incentive to quit

46) Others smoking around me makes quitting/cutting back hard

47) Sharing cigarettes

48) Alcohol and drug use

49) Need will power

50) Compare to factory work (couldn't smoke in factory)

51) Fear/worry is a positive

52) Gaining weight

53) Masks don't work, don't wear them

54) "Smoking and construction don't mix, but they do go hand in hand"

Appendix D: Tree structure after phase 2.3: Review of emerging categories in comparison to sensitizing concepts and research rationale

Tree A: Day-to-day workplace experiences

Branch	Twig	Leaf
Workplace characteristics	Dusty, dirty job	
	Physically demanding and long hours	
	Dangerous job	
	Male dominated job	
	Stressful job	
Safety not valued	Production valued above safety	
	Don't use masks, masks don't work	
Non-permanent, dispersed nature of work	Little routine to the day	Break after completing a task, no set times
	Constantly changing jobsites, actual jobsite changing	
Routine to job		
Positive aspects of occupation	Like job because it's outside	
	Like that I can smoke at work	
	Comfortable environment	Freedom
	Enjoy job - positive benefits	
	Rewarding to complete job and physically see it	
Alcohol and drug use		
Various responsibilities		
Working through weather		
Works mostly inside		

Tree B. Experience of smoking

Branch	Twig	Leaf
Individual tobacco use history	Age of starting smoking	
	Rarely use other tobacco products	
	Defined as smoker	
Changes to smoking through policies		
Negative views of smoking		
Desire to be a non-smoker	Fear of worry is only positive	
	Love and hate smoking	
Experience of being a smoker and a construction worker	Following safety and no smoking policies	Use common sense regarding safety ➢ Safety conscious around coworkers at work for paycheck
		Smokes outdoors or outside at work ➢ So smoking in residential or client homes ➢ Recalled working in a factory with indoor no smoking policy
		Can't smoke at certain times ➢ Don't smoke around certain hazards ➢ No smoking around chemical hazards
		Larger companies have stricter policies and safety regulations
	Integrating health promotion and protection	Smoking not discussed in Health and Safety ➢ Smoking discussed in regards to policies or smoking areas
		Injury prevention
	Working and smoking goes hand-in-hand	Smoking doesn't affect work
		Work would be worse without smoking
		Boring without smoking
		Smoke more at certain times
	Views about smoking at work	Use of time ➢ Saving time

Branch	Twig	Leaf
		➢ Would be more productive
		Outdoor space means ventilated, breathing fresh air
		Shouldn't be smoking in workplace
		Older people have quit
		Differences among trades
	Disposing of cigarette butts	
Health effects	Tired from smoking	
Smoking behaviour outside of work	Social outside of work	Family smokes
		Partner smokes
	Paired with drink	Smoke more when drinking
		Coffee and cigarette at home
	Not social outside of work	
	Doesn't smoke a lot at home	
	Smokes outdoors at home	

Tree C. Reasons for smoking

Branch	Twig	Leaf
Addiction		
Smoke when stressed		
Boredom	Smoke when bored at work	
	Smoke when bored outside of work	
Outside of work, smoke when attention is elsewhere		
Smoking is a habit		
Me time		
Reasons for starting smoking	Family smoked	
	Other reasons for starting smoking	
	Started smoking because it was cool	

Tree D. Sociability of smoking

Branch	Twig	Leaf
Way to socialize on breaks	I guess it's social	
A reason to take a break	Way to have a discussion	
	Taking a breather	
Tobacco use very common at work	Sharing cigarettes	

Tree E: Mechanisms associated with continued smoking

Branch	Twig	Leaf
Coffee and cigarettes go together; common among workers	Coffee break and cigarette	
Dual threat or occupational hazards and tobacco use	Smoking with environmental hazards present	
	Damage from workplace hazards, not tobacco use	
Smoking policies not followed	Designated smoking area policies not followed	Smoking in unfinished site
	Inside means being in a building; smoking still occurred	
	Knowledge of who to avoid when not following smoking policies	
Workplace and or organizational contexts that facilitate tobacco use	Can smoke anytime	Multitasking working and smoking
		Smoking in company vehicles
	Works mostly outside	

Tree F. Experiences with quitting

Branch	Twig	Leaf
Beliefs about Quitting	No worries about quitting	
	Worries or fears	Gaining Weight
Quit Aids	Aids used in the past	NRT or medications used in the past
		Avoid smoking coworkers when trying to quit
	Benefits for medications	
	Never used quit aids	
Barriers to Quitting	No assistance from workplace to quit	Incentives that could be offered
	Others smoking around me at work makes quitting or cutting back harder	Would need a policy
		Would need smoking to be completely banned, but won't happen
		Would not want coworkers affected by quit attempt, not possible to implement
	Personal problem	
	Need willpower	
	Still need desire to quit	