Mindful Physical Activity:
A Pilot Study In The Context Of Walking To Public Transit

by

Tanya Christidis

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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

Objective: To describe the effect of mindfulness on perceived health, perceptions of transit walking and transit walking behaviours by using qualitative and quantitative methods in hopes of assessing the feasibility of future mindfulness interventions in transit users.

Method: Fifty-three residents of Kitchener-Waterloo were recruited at transit stops and public buildings. All participants took part in a cross-sectional mixed-methods telephone survey, including qualitative questions designed by the researcher, quantitative questions from validated surveys and the Mindful Attention Awareness Scale. Both a qualitative measure and a quantitative measure of transit mindfulness were used. Four participants who scored low on transit mindfulness but walked more than 30 minutes per day took part in a qualitative interview.

Results: Walking to transit was perceived to be a good way to get exercise, but participants thought that the value of this exercise depends on the distance walked. Although the majority of study participants were mindful of the value of walking to transit they did not attain enough exercise doing so. Most observed associations between mindfulness, perceptions of transit walking, transit walking behaviours and perceived health were positive but did not reach significance, likely due to issues of statistical power and small sample size. Of the tested covariates age and gender appeared to influence the observed positive associations.

Conclusions: There is potential for successful mindfulness interventions with transit users who are older or female, especially when increased levels of transit walking are encouraged. Younger males could be targeted in future interventions, targeting their lack of mindfulness and adequate transit walking. Future research on mindfulness should focus on creating measures that can be used to measure mindfulness in daily life and also retain the Buddhist definition of mindfulness in-the-moment. Reliance on self-report measures should be avoided. The results of this study could be useful at the local level to design research that examines perceptions of transit and transit-related exercise as light rail is implemented to replace bus transit.

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Table of Contents

List of Figures

List of Tables

1.0 Introduction

Using public transit is often described as 'environmentally-friendly' behaviour, but is less often recognized as one that will benefit personal health. Individuals who take public transit average nearly half an hour of moderate physical activity a day walking to and from public transit stops (Besser & Dannenberg, 2005) , equivalent to about 2km of walking (Frank, Andresen, & Schmid, 2004); and this is the suggested amount for healthy living (CDC, 1996). Others have suggested that public transit users are more likely to achieve 10 000 steps of walking per day, independent of leisure time physical activity (LTPA) participation, which is 8 km per day and approximately four times the suggested amount of physical activity for a healthy lifestyle (Villanueva, Giles-Corti, & McCormack, 2008).

In 2004, 23.1% of Canadian adults were reported to be obese; a large increase compared to 1979 when only 13.8% reached the body mass index (BMI) threshold for obesity (Tjepkema, 2004). In the Region of Waterloo 20.2% of individuals living in the inner city and 17% of individuals living in the suburbs are classified as obese (Fisher, 2005). BMI has been shown to have a direct positive relationship with all-cause mortality (Lee, Manson, Hennekens, & Paffenbarger, 1993) and obesity is a predictor of cardiovascular disease incidence (Hubert, Feinleib, Mcnamara, & Castelli, 1983). As BMI increases, so too does an individual's likelihood of being sedentary in leisure-time pursuits, having diabetes, heart disease or high blood pressure and individuals with higher BMI's tend to eat fruits and vegetables infrequently (Lee et al., 1993).

A person's weight is reflective of the balance between calories ingested and calories expended (Bouchard et al., 2007) so an imbalance caused by higher caloric ingestion compared to caloric expenditure leads to weight gain. Physical activity is a variable component in the caloric balance (Bouchard et al., 2007) and as such, is a practical point for intervention.

In 2005, 52% of Canadians and Ontarians were considered active or moderately active (Statistics Canada, 2007b) and in the Region of Waterloo, there is a discrepancy between individuals living in the inner city and the surrounding suburbs, whereby individuals classified as physically active make up 55.8% and 53.5% of their communities, respectively (Fisher, 2005). Although the rates of obesity and physical inactivity are lower in the Region of Waterloo compared to Canada and Ontario, the obesity rate is still high compared to the Canadian rate from thirty years ago, leaving room for improvement (Tjepkema, 2004).

Since public transit use encourages walking, it should be related to overall health, and decreased levels of overweight and obesity. However, this is not the case. In Canada, individuals who have a low income or are part of a minority group have higher rates of transit use (Statistics Canada, 2007b) and an American study found that for these specific groups, walking to and from public transit can be used as predictor of obesity (Besser & Dannenberg, 2005). There is potential for improvement in the health of transit users and this study will bring to light the methods by which this can occur.

A recent study examined hotel-maids who reported being physically inactive, despite their labour-intensive jobs. When researchers illustrated to the workers that they were exercising all day through a mindfulness-based intervention, weight loss and other health benefits occurred without any changes in physical activity or diet (Crum & Langer, 2007). This research will focus on mindfulness in transit users, as preliminary work has shown parallels between transit users and the targeted group of hotel-maids, both groups acquire adequate amounts of physical activity by necessity but are at a higher likelihood of being overweight or obese.

Being mindful gives us unique control over our actions and allows for awareness, perspective and context to have significant effects on our body and health (Langer & Moldoveanu, 2000). The practice of mindfulness alone may lead to improvements in health. Using the Crum and Langer study as a framework, it is possible that increased mindfulness can encourage transit users to acknowledge the benefits of walking and as opposed to viewing it as a burden or neutral behaviour. This phenomenon has a similar mechanism to the placebo effect and studies have shown improved health outcomes from a variety of ailments through mindfulness techniques. Increased mindfulness in transit users has the potential to improve health through decreased weight, blood pressure or waist-to-hip ratio without changing diet or activity levels.

The foundation of this study is the 'population paradox', which posits that improving the health of the population is most effectively done by influencing a much larger group of low or moderate risk people on a very small level rather than creating more intense public health programs to benefit a small group of high-risk people. To address a problem, which is likely only targeted to high-risk individuals, many people who are not high-risk must change their behaviour only slightly for a slight improvement in personal health a large improvement in the health of the population overall. Shifting the entire population to a healthier state may be, according to the theory, more beneficial to society than trying to drastically change behaviour in groups at the tail ends of the normal distribution (Rose, 1981).

This is a pilot study involving an examination of the feasibility and appropriateness of an intervention that will change 'mindset' in transit users with respect to perceived exercise by testing the fundamental assumptions behind mindset and mindfulness theory. Recruitment occurred in Kitchener-Waterloo, which is approximately 100 km west of Toronto, Canada. These cities are the centre of the Region of Waterloo, which includes four periphery townships. The overall population of the Region of Waterloo is 500 000 with 450 000 residents living in the cities themselves. The Region of Waterloo is a unique place for this research to occur for two reasons; first, the Region of Waterloo has a significant body of research on the commuting and physical activity trends of the population to be used as a starting point. Second, the Region is embarking on a significant expansion of transit, making research like this, which can enhance the value of this development, an asset to the Region and a model for other cities with similar ambitions.

1.1 Public Transit Use

The results of this study can be used to support the local public transit system by demonstrating a potential for improved health among users of public transit. Also, insight will be gained into ways that public transit can work with public health to maximize the benefits of public transit for residents.

1.1.1 Public Transit Use In Canada

The proportion of Canadians using public transit increased from 10.5% in 2001 to 11.0% in 2006 (Statistics Canada, 2007b). Canadian census data from 2006 finds that this increase in ridership comes from individuals who are young, recent immigrants, low income workers without cars and individuals living in central neighbourhoods of larger Canadian cities. Car use is associated with working in a suburban municipality, living in the suburbs, working in the manufacturing sector and being over the age of 35 (Statistics Canada, 2007b).

It has been found that individuals without other means of transportation are more likely to take public transit (Statistics Canada, 2007b) and most Canadian Census Metropolitan Areas (CMAs) have seen an increase in public transit use among adults aged 25 to 34 (Statistics Canada, 2007b). Unfortunately, this age group is not the population who is projected to benefit the most from walking and transit related mindfulness based interventions, since leisure and purposeful walking in this age group is very high (Fisher, 2005).

1.1.2 Public Transit In Kitchener-Waterloo

In June 2006, the Ontario government proposed a public transit-supportive growth plan, entitled *Places to Grow: Growth Plan for the Greater Golden Horseshoe* (Government of Ontario, 2006). This plan has sparked public transit development and reurbanisation planning in the Region of Waterloo which is expected to increase from 500 000 residents in 2006 to 729 000 by 2031. The growth plan aims to curb sprawl by creating a compact urban form as the population grows, as opposed to the current trend of sprawled low-to-medium density land use (Hellinga & Cicuttin, 2007). The improved transit will also reduce traffic gridlock, revitalize the downtown (Region of Waterloo, 2009) and improve neighbourhood walkability (Schumilas, 2007).

Recent public transit improvements have been shown to have an impact on the residents of Kitchener-Waterloo. An express bus route was successfully put in place to increase ridership for light rail to be built in the near future. Over 5% of individuals using the express bus are users without cars, making trips

that were otherwise not taken and are doing so at least four times per week (Hellinga & Cicuttin, 2007). These extra trips are improving mobility and therefore enhancing quality of life, since extra public transit trips lead to more walking, increased physical activity and more access to facilities (Region of Waterloo, 2009).

Grand River Transit bus stops are within a five minute walk for 90% of residents of the tri-cities (Region of Waterloo, 2008). Research done outside of the Region of Waterloo has found that when transit users walk to and from public transit, a mean of 24.3 minutes per day of walking time is accumulated averaging 4 minute spurts (Besser & Dannenberg, 2005).

1.2 Walking

The population health framework emphasizes the impact of routine behaviours of everyday life shaping health outcomes across a social hierarchy (Dunn & Hayes, 2000) whereby there is a marked gradient by social class in terms of health outcomes. Mortality rises with lower occupational status for both genders and all ages (Black, 1981). It has been found that there are greater differences between lower income groups compared to higher income strata; that is, at a lower socio-economic status (SES) two individuals with incomes that differ by a certain amount will have markedly different mortality rates compared to two higher income individuals whose incomes vary by the same amount (Backlund, Sorlie, & Johnson, 1996). It is assumed that mindful walking for transportation has the potential to enhance health in individuals who are lower in the socioeconomic hierarchy.

Exercise is not exclusive to vigorous activities and includes moderate physical activities like walking, which has significant benefits. Moderate intensity exercise is the ideal way to decrease fat in the body, as the body oxidizes fat for energy during this type of activity and starts to use glycogen stores as intensity increases (Bouchard et al., 2007).

Both moderate and vigorous physical activity can prevent coronary heart disease by reducing risk factors like blood pressure, body weight, diabetes and cholesterol (Press et al., 2003) . Walking behaviour can improve mood (Lee et al., 2001) and decrease stress (Jin, 1992; Thayer, 1987) and is easily adopted, adhered to, convenient, and requires no special skills or equipment (Press, Freestone, & George, 2003).

Approximately 48% of Canadians are not engaged in adequate amounts of physical activity (Statistics Canada, 2007a). A focus on moderate forms of activity like walking and bicycling that can be worked into daily schedules is a promising way to decrease physical inactivity in most of the population. Individuals who cannot engage in vigorous physical activity may benefit the most. For example, persons who are overweight or obese, have a physical disability or are elderly (Frank & Engelke, 2005).

1.2.1 Walking To Public Transit

Walking to public transit is considered 'transportation related physical activity', which is separate from leisure, occupational and household related physical activity (Ewing, Schmid, Killingsworth, Zlot, & Raudenbush, 2003). It has been approximated that by walking to and from transit stops, transit users accumulate 24.3 minutes per day of walking (Besser & Dannenberg, 2005). This same study also found that approximately 29% of American public transit users achieve more than 30 minutes of daily physical activity based solely on walking to and from public transit (Besser & Dannenberg, 2005) and this

research has not been replicated on Canadian populations. Thirty minutes of walking per day is an established public health goal (CDC, 1996), equivalent to about 2 km of walking (Frank et al., 2004). Public transit users walk at the most modest estimation 8.3 min/day more than non-users, and although no statistics are available in a Canadian context, it has been suggested that this amount of daily walking could burn enough calories to eliminate weight gain in anywhere from 43-60% of the American population (Frank et al., 2004). In Canada, one-third of deaths from coronary artery disease, colon cancer and type II diabetes could be prevented if physical inactivity was eliminated (Katzmarzyk & Janssen, 2004).

These impacts are not limited to personal health, and there are macroeconomic effects as well. About 2.5% of direct health care costs in Canada were attributable to physical inactivity in 1999. A modest reduction of inactivity by 10% would save $150 million dollars in Canadian health care costs because of the benefits of physical activity as well as the subsequent reductions in obesity (Katzmarzyk, Gledhill, & Shephard, 2000).

Public transit users are more likely to achieve 10 000 steps of walking per day, which is 8 km per day and approximately four times the suggested amount of physical activity for a healthy lifestyle (Villanueva et al., 2008). Using public transit as a main transportation form increases overall walking because of incidental physical activity while performing other daily activities (Villanueva et al., 2008) like walking to purchase a lunch or run errands (Brown & Werner, 2007).

1.2.2 Who Walks (And Who Doesn't)

Interestingly, drivers participate in more daily minutes of leisure time physical activity (LTPA) than public transit users (Villanueva et al., 2008). Individuals who commute by car may find it more convenient to reach LTPA facilities with a car, or that driving gives them more free time to undertake LTPA after commuting – a compensatory behaviour for being inactive during the work day (Villanueva et al., 2008) . In contrast, individuals without cars may have less leisure time because of increased travel time and are more likely to use leisure time to engage in more relaxing activities, compared to individuals with high car availability and high income (Badland & Schofield, 2008). Some public transit users may consider their transport-related PA adequate physical activity for the day (Villanueva et al., 2008). This may be true, but higher body weights in transit users suggest that individuals could offset this by eating more, or eating less healthy food (Edwards, 2008).

These estimates of time spent walking to public transit and health outcomes are based on many assumptions, including the causal relationship and directionality between public transit use and walking. Public transit users could be individuals who enjoy living in urban environments and also enjoy walking, or they could be have no option but to use public transit and offset the required walking by exercising less. Although it is possible that obesity could be prevented or reduced by walking to public transit, obesity may hinder the use of public transit because of logistic difficulties. Encouraging public transit use as a way for obese persons to get exercise may be a moot point (Edwards, 2008). Conversely, obesity could be an outcome of living in a neighbourhood that is not conducive to purposeful walking, and the neighbourhood contributes to obesity, since walking for exercise is generally comparable between high and low walkability neighbourhoods (Abelsohn, Bray, Vakil, & Elliot, 2005).

There is clearly a gap between public transit users and non-users with respect to walking behaviours, and there are differences in health based on walking behaviours and neighbourhood design. Despite public transit users accumulating the highest levels of fat-burning moderate-intensity exercise while accessing public transit, this group is most likely to be overweight or obese; in fact walking to and from public transit is a predictor of obesity in both low-income groups and minorities (Besser & Dannenberg, 2005). This relationship between walking and being overweight is one that raises many questions, and will be the focus of future research, based on data from this pilot study.

1.2.3 Health And Walking In Kitchener-Waterloo

In 2005 the obesity rate in the Region of Waterloo was 20.2% in the inner city and 17% in the suburbs, although this does not qualify as a significant difference (Fisher, 2005) and this is slightly lower than the Canadian rate of 23.1% seen in 2004 (Tjepkema, 2004). There is a significant difference between urban and suburban neighbourhoods when considering rates of heart disease, high blood pressures and hypertension, with urban residents being more likely to have these diseases (Fisher, 2005).

Urban residents in the Region of Waterloo are no more likely than suburban counterparts to be physically active, and leisure walking is equivalent across all neighbourhoods (Fisher, 2005); meaning neighbourhood discrepancies between health outcomes is not related to reported amount of exercise. Besides leisure walking, purposeful walking or walking for errands is most likely in residents over the age of 35 in urban neighbourhoods (Region of Waterloo Public Health, 2007). Residents aged 35-49 have the highest rate of obesity and make up the largest proportion (18%) of urban dwellers (Region of Waterloo Public Health, 2007). The largest proportion of low income households in the Region of Waterloo live in

urban neighbourhoods and self-rated health is lower among urban dwellers than rural and suburban areas (Statistics Canada, 2007c).

This means that obesity, leisure walking, and vigorous physical activity are equal across neighbourhoods in the Region of Waterloo, but chronic disease incidence is higher in urban areas where residents are also more likely to be low income, describe their health as poor and also walk for transportation.

1.3 Mindfulness

Mindfulness is the idea that awareness, perspective and context are important when we act. It should increase perceived control through a heightened state of involvement (Langer & Moldoveanu, 2000), similar to the Theory of Planned Behaviour, which uses perceived behaviour control as well as attitudes and norms to predict behaviours (Ajzen, 1991). Mindfulness has recently been applied in a study of hotel-maids who reported being inactive, despite having labour intensive jobs. Increasing mindfulness by showing the hotel-maids that their full day of work was a full day of exercise led to weight loss and other health benefits without any self-reported changes in exercise or diet (Crum & Langer, 2007). Public transit users are analogous to this population in that walking to transit may not considered to be exercise and a shift in mindfulness to view it as exercise can have health benefits

1.3.1 What Are Mindset And Mindfulness?

Mindfulness is described as exerting unique control over personal actions, allowing for awareness, perspective and context to have significant effects on the body and health (Langer & Moldoveanu, 2000). Mindful awareness involves being in the present moment by simply paying attention to what is happening 'in the now' (Tacón, 2008). This includes openness to new ideas, understanding processes as opposed to striving for an outcome, and avoiding linear thinking (Langer, 1989).

The idea of mindfulness originated from Asia and is also called 'insight meditation'. It is the method by which Buddhism advises one to 'pay attention' during meditation (Kabat-Zinn, 2003a). Practicing mindfulness can range from a formal meditation that occurs for long periods of time on a regular basis to informal practices to induce continuous awareness in activities of daily living (Kabat-Zinn, 2003b). What separates mindfulness from meditation is that meditation is concentration based, trains participants to focus on a single stimulus without wavering attention and avoids awareness of the environment. Mindfulness encourages the observation of the dynamics of internal and external stimuli (Baer, 2003) with the focus on context and circumstances (Langer, 1989). It is assumed that mindfulness is a naturally occurring attribute, in which individuals differ in their willingness to be mindful and capacity to be mindful varies between people (Brown & Ryan, 2003).

1.3.2 How Mindfulness Works

There are several underlying assumptions to the concept of mindfulness; humans are largely unaware of their moment-to-moment experiences, awareness will provide a more vital sense of life and more

accurate perceptions, and more accurate perceptions of internal and external stimuli will enhance efficacy and create a greater sense of control – to name a few (Grossman, Niemann, Schmidt, & Walach, 2004).

The mechanism by which mindfulness works is largely unknown, as most research thus far has focussed on the use of mindfulness in a clinical setting, with intensive medical based interventions (Kabat-Zinn, 2003a). The following pathway has been suggested, with three components of mindfulness:

> 1) Intentions, which keep focus on one's purpose in life and the exercise itself
>
> 2) Attention, where one will observe the details of the present, both internally and externally
>
> 3) Attitude, which is having an open and judgement-free outlook while being attentive, so that mindfulness exercises do not become a quest for purely positive experiences or rejection of inner experiences (Shapiro, Carlson, Astin, & Freedman, 2006)

Under these three conditions, mindfulness should encourage a shift in perspective called 're-perceiving' of the moment-to-moment with clarity and objectivity rather than being overwhelmed by negative experiences (Shapiro et al., 2006). This is similar to the Theory of Planned Behaviour, in that perceptions are central in determining behaviour, either indirectly by influencing intentions, which lead to behaviour, or perceptions of control can lead directly to behaviour (Ajzen, 1991).

Re-perceiving can be considered a natural extension of human development whereby one can gain increased capacity for objectivity about internal experiences. To separate oneself from pain, for example, mindfulness therapy suggest that the mind must focus on the pain alone and use the sensation as a source of information, which then separates the body from being defined or controlled by the pain. This is not detachment or apathy, but a deep examination of the present moment. The pathway of greater attention and connectedness then leads to adaptive and flexible coping skills and self-regulation, and reassessment of one's values which will encourage healthy behaviours and better health.

Mindfulness training appears to alter anterior activation asymmetry in the brain, a region related to dispositional affect (Davidson et al., 2003). There is increased activation in response to positive and negative affect induction on the left side of the anterior (Davidson et al., 2003), which is associated with adaptive responses to negative and stressful events and faster recovery after negative events (Davidson, 2000). Mindfulness training creates lower levels of autonomic nervous system measures such as heart rate, in spite of anticipated stressors. This means that physiological reactions from stressors, among

mindful participants, decrease more quickly and more significantly than a control group (Goleman & Schwartz, 1976).

1.3.3 Mindfulness And Health

Mindfulness is highly associated with well being (Brown & Ryan, 2003) as it can increase the likelihood that changes in health are attended to (Zvolensky et al., 2006); however, the association between mindfulness and subjective perceptions of physical health has been largely unexplored (Zvolensky et al., 2006).

Perceived health and perceived health status may be related to mindfulness, as the perceptions may impact mental and physical health. Mindfulness is related to perceived global health, the perceived impact of health on physical aspects of life functioning, the perceived impact of health in mental aspects of life functioning and a decrease in both mood disturbance and stress (Brown & Ryan, 2003).

Mindfulness can reduce psychological symptoms and increase sense of control by developing detached observation and consciousness (Astin, 1997) and can be used to understand psychological vulnerability and resiliency for emotional coping and health behaviours (Zvolensky et al., 2006). Mindfulness can lead to decreases in emotional distress (Massion et al., 1995), physical and mental health-related consequences of chronic emotional stress (Massion et al., 1995) , anxiety (Kabat-Zinn, Massion, Kristeller, & Peterson, 1992), hostility, self-esteem, mood disturbance (Samuelson, Carmody, Kabat-Zinn, & Bratt, 2007), relapse for affective disorders (Astin, 1997; Teasdale et al., 2002) and decreases engagement in high risk health behaviours (Araas, 2008). These techniques have also been used with diseases that are not considered psychological in nature like psoriasis (Kabat-Zinn et al., 1998) and prostate cancer (Saxe et al., 2001). Long term effects of mindfulness training has been seen in anxiety patients up to three years after intervention (Kabat-Zinn et al., 1992; Miller, Fletcher, & Kabat-Zinn, 1995)

Mindfulness improves self-efficacy and coping skills (Araas, 2008), leading to less health disability and better self-rated health (Zvolensky et al., 2006). Research has shown that mindfulness is a promising technique for minority and low SES populations - who both feel, and are accurately described as ignored in medical practice, when suffering from medical and mental health conditions - to improve health and health-related quality of life (Roth & Robbins, 2004).

1.3.4 Mindset As A Unique Psychological Therapy

Many psychological models describe processes that are similar to mindset, but mindset is a distinct measure (Table 1). These theories and therapies do not have to be used exclusively; mindfulness and cognitive behavioural therapy (CBT) can be combined as an effective treatment for depression recurrence (Hamilton, Kitzman, & Guyotte, 2006) or relapse (Baer, 2003).

Along with these similar theories, there are also interventions in use that incorporate mindfulness training. Dialectical Behavioural Therapy for treating borderline personality disorder, Acceptance and Commitment Therapy and Relapse prevention although additional research is needed to determine the extent to which mindfulness training improves effectiveness (Baer, 2003).

It is clear that despite mindfulness having roots in Eastern philosophies, mindset theory shows many similarities to more classical Western cognitive theories on behaviour. Key differences from other cognitive therapies are emphasis on personal control and introspection along with present awareness.

Table 1: Comparison of Psychological and Mindfulness Theories and Techniques

Theory	Key resemblances to mindfulness	Key distinctions from mindfulness
Cognitive Behavioural Therapy	• transform thoughts, empirical validation, discourage emotional reactions • train patients in self-directed attention through sustained exposure to sensations, thoughts and emotions • desensitization of the conditioned responses is expected to occur to reduce avoidant behaviour • meta-cognitive changes should occur as they relate to mood and emotion • thoughts as temporary and benign, rather than an accurate reflection of reality, health, adjustment or worthiness (Baer, 2003; Hamilton et al., 2006)	• Western medical and psychological ethic, with states that improved quality of life requires change • CBT cannot be as easily taught to heterogeneous populations • CBT is defined by creating clear goals and challenging unhelpful thoughts to identify and eradicate unhelpful habitual thought patters • assumes pathology • emphasizes change as a prevention strategy aiming for acceptance (Hamilton et al., 2006)
Self-Regulation/ Approach Oriented Coping	• focus on internal and external stressors • looks for similar empirical outcomes (Zvolensky et al., 2006)	• no research has yet to examine unique variance of mindfulness compared to these two strategies (Zvolensky et al., 2006)
Positive Psychology	• examines relation to affect, negative and positive affectivity indices (Brown & Ryan, 2003)	• less predictive power of both positive and negative affect • less functional than mindset for measuring anxiety and depressive symptoms (Brown & Ryan, 2003)
Emotional Intelligence	• clarity of one's emotional state (Brown & Ryan, 2003)	• emotions can occur outside of awareness and behaviour can occur before being acknowledged. • not focussed on introspection or clarity in psychological states (Brown & Ryan, 2003)
Openness to Experience	• receptivity and interest in new experiences • contact with and assimilation of feelings and new ideas (Brown & Ryan, 2003)	• treats mindfulness as a dimension of personality • imagination, fantasy aesthetic interest are not incorporated (Brown & Ryan, 2003)
The Self Regulatory Executive Function Model (S-REF)	• uses elements similar to mindfulness to treat anxiety obsessive compulsive disorders, hypochondriasis and post traumatic stress disorder (Myers & Wells, 2005; Wells, 1999)	• focusing, switching and dividing attention externally, as opposed to internally • attention focussed on internal sensations is thought to exacerbate anxiety, so attention and focus should be externalized, to reduce fear of loss of control, anxiety symptoms, dissatisfaction with self, and negative cognition (Myers & Wells, 2005)
The Differential Activation Hypothesis DAH	• states that vulnerability to depressive relapse is activated by dysfunctional negative cognitions. • reduce focus on negative thoughts and moods, similar to re-perceiving in mindfulness training (Sheppard & Teasdale, 1996; Teasdale et al., 2002)	• the DAH does not explicitly concern itself with attitude, or consider it an essential part of mindfulness • uses key aspects of mindfulness techniques within the context of mental health only (Shapiro et al., 2006)
Reflective Consciousness (Self Awareness, Self Consciousness, Control Theory)	• highly aware of internal states • self-examination through cognitive operations • key elements of internal state awareness and self-reflections are conceptually similar to mindfulness (Brown & Ryan, 2003)	• define self-awareness as knowledge about the self, with no indicator of depth of or quality of knowledge or present awareness • concerned with public self-consciousness and the perceptions • reflective consciousness is concern with cognitive operations, rather than reflexive mindfulness which operates on feelings, thoughts and consciousness (Brown & Ryan, 2003)

1.3.5 Mindfulness And Similar Psychology

The Theory Of Planned Behaviour

The Theory of Planned Behaviour is similar to mindfulness, as mindfulness increases perceived control through a heightened state of involvement (Langer & Moldoveanu, 2000) and the theory of planned behaviour examines attitudes, norms and perceived behaviour control and how they lead to behaviours (Ajzen, 1991).

Intention to perform behaviours is central to the theory of planned behaviour. Intention indicates the motivating factors behind behaviour and as intentions increase, so too does the likelihood that behaviour is performed (Ajzen, 1991). Perceived behavioural control is the perception that one has regarding the ease or difficulty of performing the behaviour of interest, and this will vary by situation and action (Ajzen, 1991).

Perceived behavioural control can lead directly to behavioural achievement, because increases in perceived behavioural control have a direct impact of the effort put into performing an action and perceived behavioural control can be used as a measure for actual control (Ajzen, 1991). The theory of planned behaviour uses self-efficacy or perceived behavioural control and relates both of them to beliefs, attitudes, intentions and behaviour.

Self-Efficacy

Perceived self efficacy is the ability to produce and regulate life events (Bandura, 1982) , described as a cognitive assessment defined by a willingness and determination to initiate and stick with goals, despite physical or emotional hardship (Lightsey, Burke, Ervin, Henderson, & Yee, 2006; Tipton & Worthington, 1984). What makes efficacy different from mindfulness is that efficacy determines whether one will adopt exercise behaviours (Bandura, 1997) and is related to performance (Bandura, 1982), but mindfulness enhances behaviours that already occur, either because they are habitual or the person already has adequate self-efficacy to execute the desired action.

Imagery

Imagery has been described by appearance, energy or technique related aspects of exercise (Hausenblas, Hall, Rodgers, & Munroe, 1999) and determines exercise behaviour both directly and indirectly (Annett, Cripps, & Steinberg, 1995). Imagery provides performance accomplishment and vicarious experience, and relates back to self-efficacy (Annett et al., 1995; Bandura, 2000) from both an

internal (A. Bandura, 1982) and external perspective (Bandura & National Institute of Mental Health [NIMH], 1986).

Self-Esteem

Self-esteem differs from efficacy in that self-esteem is an affective assessment of self worth (Lightsey et al., 2006; Smith, Diener, & Wedell, 1989; Torrey, Mueser, McHugo, & Drake, 2000); self-esteem is more related to affect than to self efficacy (Chen, Langer, Raphaelson, & Matthews, 2004). For example, if one has high self-esteem, they tend to have less negative affect than those who have low self-esteem when responding to negative events (Moreland & Sweeney, 1984). Self-esteem and efficacy are related, although self efficacy can predict and may have a causal relationship in the development of self-esteem (Lightsey et al., 2006).

Locus Of Control

Another important psychological construct is locus of control. Locus of control is a generalized expectancy that remains stable (Ajzen, 1991). Locus of control can be split into both internal and external, whereby individuals with an internal locus of control sees life outcomes as coming from their own actions, while external locus of control gives the power to others (Norman, Bennett, Smith, & Murphy, 1998). Locus of control is different from perceived behavioural control, as it varies by situation and action whereas locus of control does not (Ajzen, 1991). This is applicable in the field of health where someone with an internal locus of control believes their health is the result of their own actions and performs more health behaviours. External locus of control for health reflects a belief that the medical profession protects your health and there is less responsibility on the individual to engage in healthy behaviours.

At low workloads, both groups have similar levels of perceived exertion, but higher workloads lead to a disproportionate increase in exertion from individuals with an external locus on control (Hassmén & Koivula, 1996). This means that groups with an external locus of control can be more successful with interventions that focus on low work load, like walking behaviours. These findings may also relate to low internal locus of control increasing the likelihood of being overweight and obese (Ali & Lindstrom, 2006).

What makes mindfulness and mindfulness-based interventions unique to these theories or constructs is that they surpass these theories by describing and actually creating health behaviour change. Mindfulness theory effectively states that increased attention leads to health outcomes, regardless of attitudes, social norms, perceived control, intentions, locus of control or behaviour. Mindfulness theory is not trying to introduce behaviours or actions, as these constructs are, but instead increases attention

and awareness during behaviours that already occur. Mindfulness interventions are most appropriate for transit users as the goal for an intervention would be enhancing existent behaviour, as opposed to increasing or starting new behaviours.

1.3.6 Physical Activity And Mindfulness

A recent study examined the placebo effect in relation to mindfulness among hotel-maids, a group whose job requires engaging in moderate or low-intensity exercise all day. Despite this constant activity, most had high blood pressure (BP), BMIs in the overweight and obese range, high percentage body fat and poor waist-to-hip ratio. Hotel-maids were then informed by the researchers that their work is considered exercise and that they were living active lifestyles that exceeded the suggested 30 minutes of moderate physical activity a day. Attendants were educated through posters (Appendix A), which included caloric expenditures for daily tasks, and a statement that exercise does not need to be hard or painful to be beneficial to one's health. Data was then collected one month later (Crum & Langer, 2007).

The intervention group lost an average of 2lbs over one month, lowered their systolic BP by 10 points and had healthier body-fat percentages in only four weeks, all significantly higher than changes seen in the control group. There were no reported changes in workload, food and drink consumption and no additional exercise reported outside of work, although the intervention group reported higher exercise levels at the end of the study (Crum & Langer, 2007). The change in exercise levels is reflective of the altered mindfulness of the participants and not an increase in exercise. It was found that health of the participants correlated with perceived level of exercise, as opposed their actual levels of exercise (Crum & Langer, 2007). The attendants were not receiving the benefits of their exercise prior to the intervention because they did not perceive it as such.

This study suggests framing physical activity as something that is easy to do, accessible, and a behaviour that is already part of one's daily routine. There are health benefits, even when there is no change in behaviour, since mindfulness has the power to moderate health without mediating behaviour changes.

This study's procedure and findings can be applied in a study of public transit and physical activity. Much like the hotel-maids, public transit users are meeting suggested daily physical activity levels, but are still likely to be overweight or obese. There is potential that informing public transit users of the benefits of walking to public transit could change their health without a change in their exercise level or health behaviours. Framing public transit-related physical activity in a positive way has the potential to lead to

better health. No study has been found to date that uses mindfulness interventions in this inadvertent and non-invasive way.

1.3.7 Self-Rated Health

Self-rated health is an inexpensive and simple way to collect data on the health status of a population. For this research, self reported health indicators and physical activity levels will be assessed, so the accuracy and objectivity of what the participants report is of the utmost importance. There is always the potential that self-reports are skewed to represent a participant's ideal self-perception and not necessarily that of reality.

There is a chance of overestimates of physical activity, this is most likely to happen when participants are nearly sufficiently active and still in good health (van Sluijs, Griffin, & van Poppel, 2007). Overestimation of physical activity is less likely in participants who are obese, who smoke and have intentions to increase physical activity levels (van Sluijs et al., 2007). Individuals who are overweight generally give accurate ratings of health related to physical activity because they do not make downward social comparisons that are typically seen in the participants who overestimate (Lechner, Bolman, & Van Dijke, 2006). Since this pilot study aims to gather data to create an intervention for individuals that may be overweight or rate their health as poor, inaccuracies in self-rated health are not a concern, as the population of interest rates their health accurately.

1.3.8 Mindfulness As A Placebo

A placebo is a therapy that is used deliberately for either a non-specific psychological or physio-psychological effect or to garner a presumed specific effect without a specific activity (Matarazzo, 1986). Placebos are inert (Figure 1), yet encourage health improvements through indirect or passive methods (Langer, 1989). Three components lead to the placebo effect: positive beliefs and expectations on the part of the patient; positive beliefs and expectations on the part of the physician or health care professional; and a good relationship between the two parties (Benson & Friedman, 1996).

The placebo effect was used in the hotel-maid study from the moderating role of mindfulness in the relationship between exercise and health (Crum & Langer, 2007). Similar to the definition of a placebo, mindfulness was used deliberately to garner a presumed specific effect without a specific activity (Matarazzo, 1986). Any process, by which a person takes initiative to heal oneself, and not delegate the task to a doctor, is using mindful healing via the placebo effect (Langer, 1989). Mindfulness was used to create expectations of health from daily exercise; which in turn led to better health.

2.0 Rationale And Goals

2.1 Rationale

Crum and Langer (2007) have examined mindfulness in how daily moderate intensity exercise that was otherwise not considered physical activity can induce positive health outcomes. Their study looked at hotel-maids engaging in their labour-intensive jobs. The researchers showed that the hotel-maids' mindsets were disconnected from their actual physical activity and it was assumed that sufficient physical activity was not being accumulated over the course of the day.

Physical activity is an important element to achieve and maintain health and there are inequalities in health and levels of physical activity. Since mindset or mindfulness is assumed to play a role in the outcomes of physical activity it was assumed that a transit user could be healthier through increased mindfulness of the amount of walking accumulated by taking transit. It has been found that transit users walk, on average, 24 minutes per day (Besser & Dannenberg, 2005). This is nearly the suggested amount of exercise per day for health, according to public health groups (CDC, 1996). There is potential for transit users to realise the full potential of their daily exercise through increased awareness of the health benefits of their daily activity. This creates potential for future interventions based on mindfulness, with transit users, to improve health without changing diet, leisure-time physical activity, or occupational exercise.

It cannot be assumed that public transit users in the Region of Waterloo are accumulating adequate exercise through transit walking, that they are similarly mindful as hotel-maids, or that they can be made mindful like the hotel-maids were. Hence, this pilot study is aimed to determine levels of transit walking, perceptions of transit walking, self-rated health and mindfulness among public transit users.

2.2 Process

A list was compiled of potential stakeholders who would have insight into what type of research would be beneficial to the Region and the public transit project. This list included the mayors of Kitchener-Waterloo, three regional councillors whose wards in Kitchener and Waterloo will include the public transit line, Manager of Growth Planning and Analysis for the Ontario government's Places to Grow Initiative, the Region of Waterloo Principal Planner, an Assistant Professor in Planning and Health Studies and Gerontology and a planner from the Region of Waterloo's Transportation Demand Management Planning group.

An email was sent to these stakeholders looking for opinions for a University of Waterloo graduate student trying to identify a thesis topic that would directly benefit the Region of Waterloo. An example of potential thesis topics was given along with an explanation as to why the stakeholders' opinions would be beneficial to the research. The list of potential thesis topics was attached to the email and the offer of feedback through telephone, email or meeting was put forth. There were email responses from both the mayors and a telephone conversation with the mayor of Kitchener, an email from the Planner from Places to Grow Initiative and a telephone conversation from the Region of Waterloo Principal Planner. A meeting with health and urban planners from the Region of Waterloo helped solidify thesis direction. See Appendix B for email communications and results of stakeholder interviews.

2.3 Goal

The primary objective of this thesis was to describe the association between mindfulness and perceived health of transit users. This was accomplished by using a mixed-methods approach and examining qualitative data, three different measures of mindfulness, self-rated health, the walking acquired by accessing transit, and perceptions of this transit walking. Through this pilot study, the validity of mindfulness measures was tested as well as the feasibility of future mindfulness interventions in transit users.

3.0 Methodology

3.1 Justification

The results from the Crum and Langer (2007) study suggest that mindfulness may act as a modifying step between physical activity and health. There are implications for future population health interventions to improve health in transit users and other groups who may partake in sufficient exercise through daily behaviours but do not perceive it as such. In this pilot test, we investigated whether mindfulness interventions are appropriate for public transit users (Figure 1).

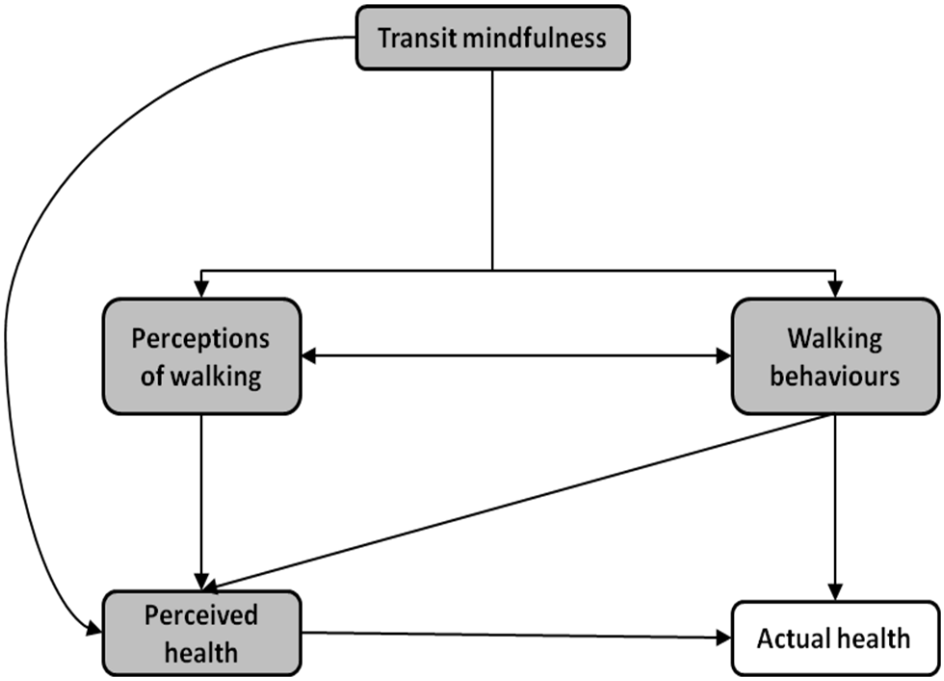

Figure 1: Full Conceptual Model

3.2 Objectives

1. Use qualitative methods to explore mindfulness and perceptions of physical activity in transit users
2. Use quantitative methods to analyze physical activity and mindfulness in transit users, and examine patterns within this data
3. Analyze qualitative and quantitative data together to get a holistic understanding of mindfulness and physical activity in transit users
4. Discuss the implications of this relationship

3.2.1 Sub-Objectives

a) Determine transit mindfulness among transit users
b) Compare different mindfulness measures
c) Determine public transit use among transit users
d) Identify biases and assumptions about public transit use among transit users
e) Determine physical activity levels among transit users
f) Identify perceptions of physical activity among transit users
g) Determine self-rated personal health among transit users
h) Determine variability in these responses based on descriptive data collected
i) Determine if mindfulness has the potential to influence the relationship between transit walking and health in transit users

See appendix C for each study sub-objective and corresponding survey question.

3.3 Recruitment Of Study Participants

3.3.1 Recruitment Summary

A convenience sample was recruited outside bus terminals and major transit hubs in Kitchener and Waterloo during daytime hours. A recruitment poster (Appendix D) was printed and displayed double-sided on a sandwich board, near where the researcher was standing. Approval for recruitment on city sidewalks within the Region of Waterloo was given from by-law authority at the Region of Waterloo. Recruitment inside Grand River Transit facilities was restricted and a request for exception was denied.

Participants were included in the study only if the study eligibility criteria were met. Participants were informed that the researcher would be calling on the telephone for the first survey (mixed-methods telephone survey) and this call depended upon the time and day specified on the consent form. Participants were also informed that they may be selected to take part in a second survey (qualitative interview) that occurred face-to-face at a later date. All participants were offered reimbursement for transportation and child care if required during the qualitative interview. Eligibility criteria excluded individuals under 18 to ensure income figures were accurate (Statistics Canada, 2007c). Participants had to be residents of the cities of Kitchener, Waterloo or Cambridge, conversant in English, have access to a telephone line or mobile telephone and assert public transit was their main form of transportation.

A minimum of fifty participants was set as a recruitment goal and if time permitted, one hundred participants were to be recruited to ensure more robust results. Participants who completed the half-hour mixed-methods survey were compensated with a $5 Tim Hortons gift card, mailed along with an appreciation letter after the survey. Participants selected for the second interview received a second gift card valued at $15 from Tim Hortons. Summaries were sent to participants after study completion.

3.3.2 Limitations Of Recruitment And Attrition

Recruitment occurred in January and again in April of 2010. Outdoor recruitment was slow in January, as it was cold and most people did not want to spend time outdoors to inquire about the study or fill out paperwork. The student researcher also struggled to stay outside for more than one hour at a time. Recruitment was therefore moved indoors during work hours to Kitchener Public Library and Kitchener City Hall.

The public spaces in Kitchener had an unexpectedly large amount of traffic from residents of nearby men's and women's residential shelters who signed up for the study. Although there were many recruits

from these addresses, most could not be reached. There were two reasons that this happened. First, recruits had given mobile telephone numbers with accounts that did not have enough money to receive calls. Second, some recruits gave land line numbers for the main telephone line at the shelters and had either left the shelter earlier than expected, or were not in the room with the telephone when the researcher called. A rough approximation is that 10 of the 55 recruits were living in temporary shelter. Of 55 participants recruited in January, only 32 participants completed the first survey and of these, only one was a participant living in a residential shelter.

Attrition in the first cohort of recruits made a second round of recruitment necessary. Uptown Waterloo, Charles Street Terminal and the University of Waterloo were the locations used. As well, posters were put up in Waterloo Public Library and the Working Centre's Queen Street Commons café. In April, 31 more participants were recruited at bus stops and five were recruited through posters. After the second round of recruitment only one of the new recruits, recruited outside of Charles Street Terminal, was living in a shelter. Eventually 26 more completed the mixed-methods survey. This round or recruitment was more successful for many reasons. The first is that the weather was unseasonably warm, putting most passers-by in good spirits, which then made them more willing to stop and read the recruitment sign or start a conversation with the student researcher. Since the weather allowed the student researcher to spend hours outside recruiting, potential participants could walk by, contemplate joining the study and then come back later and still find the student researcher. Finally, the recruitment in April occurred at transit stops, as opposed to public buildings, meaning that people waiting for busses were a captive audience for the researcher. Table 2 provides a summary of recruitment and attrition.

Table 2: Recruitment Schedule and Recruited Persons

Recruitment Location	Date	Hours	Recruits (n = 91)	Eventual Participants* (n = 58)
Charles Street Terminal	Jan. 5th at 12pm	1	3	2
Charles Street Terminal	Jan. 14th at 2pm	1	7	6
Kitchener Public Library	Jan. 19th at 9am	8	13	8
Kitchener Public Library	Jan. 20th at 9am	8	10	4
Kitchener City Hall	Jan. 21th at 9am	8	6	2
Kitchener City Hall	Jan. 22th at 9am	8	8	6
Kitchener Public Library	Jan. 23rd at 9am	5	8	4
Uptown Waterloo iXpress southbound	March 29th at 3pm	3	7	5
Uptown Waterloo iXpress northbound	March 31st at 7am	2.5	2	1
Uptown Waterloo iXpress southbound	April 7th at 1pm	1.5	2	1
Charles Street Terminal	April 12th at 7am	2	2	2
Uptown Waterloo iXpress southbound	April 14th at 3pm	4	9	9
Charles Street Terminal	April 15th at 4pm	2	8	6
University of Waterloo iXpress northbound	April 29th at 7am	2	1	0
Posters	-	-	5	2

*Eventual participants refers to recruits who completed the mixed-methods survey

3.4 Design

The first survey was cross-sectional, administered to all study participants, and used mixed-methods (i.e. both qualitative and quantitative assessments). The second survey was qualitative in nature, completed on a smaller subset of the participants who were chosen based on the results of the mixed-methods survey. Together, the two surveys allowed a thorough descriptive, inductive study.

3.4.1 Mixed Methods Survey

Of the 91 participants who were recruited, 58 participants completed the mixed-methods survey and 53 were included in the study. Five participants were excluded as their primary mode of transportation was stated as something other than transit, despite screening at recruitment with inclusion criteria.

The survey began with the Mindful Attention Awareness Scale (Brown & Ryan, 2003). Next were qualitative questions designed by the researcher; based loosely on Crum and Langer and qualitative survey design (Patton, 2002). These questions focussed on personal definitions, perceptions of, and actual exercise behaviours, as well as ideal physical activity levels and transit mindfulness. The quantitative survey questions followed and these questions focussed on physical activity, health behaviours and demographic data. To ensure reliability and validity of quantitative questions, the questions were taken from the Canadian Census (2001), International Physical Activity Questionnaire (2005), Canadian Community Health survey (2007a), and Crum and Langer (2007).

3.4.2 Qualitative Interview

Qualitative interview questions were designed by the researcher and feedback was obtained from a prominent qualitative researcher within the Faculty of Applied Health Sciences (AHS). Of the 53 participants recruited for the quantitative survey, seven participants were selected to take part in qualitative interviews and four participants agreed to be interviewed. The qualitative interviews focussed on mindfulness and participants were chosen based on low scores of transit mindfulness, i.e. stating that they do not think they get adequate exercise from transit walking, but reported high levels of transit walking in the quantitative survey. These criteria were used because the resultant group was walking a significant distance to and from transit but did not report thinking this was adequate exercise. This group was expected to be ideal for future transit mindfulness interventions. The in-depth qualitative interviews with this group provided a full account of their transit experience and knowledge of mindfulness, which may be useful in creating tailored interventions in the future.

For the qualitative interview, participants were interviewed in person. One participant was interviewed at the University of Waterloo and three were interviewed at the Working Centre's Queen Street Commons café in downtown Kitchener.

3.5 Measures Of Mindfulness In The Mixed-Methods Survey

There were three measures of mindfulness included in this study. The primary measure of mindfulness was the qualitative measure of mindfulness (QLTM) from the mixed methods survey, described in full below. Participants were asked if transit walking is a form of exercise. Responses were generally consistent and easily dichotomized.

There were however two other measures of mindfulness, one was a quantitative measure of mindfulness (QNTM) that was created by the researcher. Participants were asked to agree or disagree based on a 7-point scale to the statement: I think I am getting adequate exercise from walking to and from public transit. Higher scores indicated agreement and lower scores indicated disagreement. For this study – all individuals who disagreed, were neutral or agreed slightly (responses of 1-5) were grouped as 'low transit mindfulness' and individuals who agreed or strongly agreed (responses of 6-7) were grouped as 'high transit mindfulness'.

The other and third measure was the Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003), completed at the beginning of the mixed-methods telephone survey. The MAAS (Brown & Ryan, 2003) uses 15 statements based on both general and specific statements about day-to-day life (Carlson & Brown, 2005). The questions are included in Appendix E, Table E.1, as questions i-xv. The scale measures one's tendency to be aware of the present in everyday life (Baer et al, 2009) by asking participants to say how frequently their behaviours match the statements based on a scale from 1 to 6. Higher scores indicate higher levels of mindfulness (Carlson & Brown, 2005). This scale was chosen out of practicality; the scale and the method of scoring was available in full on the internet, it was shorter in length than many others and there was literature showing at a modest attempt to validate the scale (Carlson & Brown, 2005; MacKillop & Anderson, 2007).

3.6 Qualitative Questions In The Mixed-Methods Survey

Following the administration of the MAAS, seven open-ended qualitative questions (Table 3) were asked next, before the quantitative questions to ensure that results were not framed by more direct questions regarding mindfulness and transit use. When Crum and Langer (2007) asked hotel-maids to list ways that they get exercise, mindfulness was defined by whether or not their work was mentioned. In this study this question was also used, but was considered 'personal exercise behaviours'.

Definition of exercise, exercise imagery and personal exercise behaviours (Table 3) were analyzed together to get a deeper understanding of how one perceives their own physical activity and the physical activity done by others. These perceptions of exercise were examined alongside a participant's ideal physical activity level and their stated purpose of exercise in hopes of finding consistencies or discrepancies between their goals, the underlying intentions of the goals, and actual behaviours.

Qualitative perceptions of walking were determined in order to contrast the results with the qualitative measure of transit mindfulness, which is effectively a measure of perceptions of transit walking. The mindfulness measure, QLTM, asked participants openly if walking to transit is a form of exercise. This measure was the primary measure of transit mindfulness in this study.

Although the measure of personal exercise behaviours was most similar to Crum and Langer's (2007) measure of mindfulness, this was not used as a measure of mindfulness in this study. The rationale being that in Crum and Langer's (2007) study, the hotel-maids were accumulating adequate exercise on a daily basis at their workplace. Since this pilot study is also determining whether or not transit users are accumulating a full day's exercise through transit walking, it is presumptuous to think that all mindful transit users who are mindful will necessarily say that walking is as a way that they get exercise. Instead, the QLTM measure is measuring whether transit walking, in general, is considered exercise. If participants are mindful according to this measure, then there is potential for improved health by increasing transit walking behaviours or among those who are not mindful, by increasing mindfulness.

Table 3: Qualitative Questions from the Mixed-Methods Survey

Measure	Survey Question
Definition of Exercise	When you think of exercise or people exercising, what do you consider exercise to be?
Exercise Imagery	When you hear people talk about exercise, what kinds of things do you think of?
Personal Exercise Behaviour	Can tell me about ways that you get exercise on a daily basis?
Ideal Physical Activity Level	In an ideal world, what would your physical activity level be?
Exercise Purpose	Is this ideal based on health ideals, or do you enjoy physical activity in itself, regardless of the health effect?
Qualitative perceptions of walking	Is walking a form of exercise?
Qualitative transit mindfulness/QLTM	Is walking to transit a form of exercise?

3.7. Major Variables In The Mixed-Methods Survey

As shown in table 4, the major variables are those included in the study's conceptual model (Figure 1).

3.7.1 Conceptual Model Variables

Table 4: Conceptual Model Variables and Survey Questions by Study Objective

Study Variables	Measure	Survey Question
Determine transit mindfulness	Qualitative Transit mindfulness/ QLTM	Is walking to transit a form of exercise?
Determine transit walking behaviours	Transit trips per week*	How many public transit trips do you take per week?
Determine transit walking behaviours	Distance walked from home to bus stop*	When you walk to your transit stop in the morning, what distance do you think you travel?
	Distance walked from bus stop to destination*	When your transit trip is complete, how far do you think you walk to your destination?
	Any other walking related to transit use*	Is there any other walking you do that is directly related to transit access?
Perceptions of transit walking	Perceptions of transit walking as a form of physical activity	Walking to transit is a good way of getting exercise: Strongly agree = 7, Agree = 6, Agree slightly = 5, Neutral = 4, Disagree slightly = 3, Disagree = 2, Strongly disagree = 1
Perceived health	Self-rated health	In general I would say my health is: Excellent = 5, Very good = 4, Good = 3, Fair = 2, Poor = 1

*These measures were used to calculate the transit walking behaviours measure. To aid in approximating distances, for the measure of transit walking, examples of distances between local landmarks were given, for instance: 250 meters is the distance from Kitchener city hall to Kitchener Charles St. bus terminal and 500 meters is the distance from Kitchener City Hall to King St. S and Victoria St. S.

Qualitative Transit Mindfulness/QLTM This was the primary measure of mindfulness used in this study (Table 4). QLTM was categorized as low (responses of 'No') or high (responses of 'Yes' or 'Depends on the distance').

Transit Walking Behaviours Participants reported transit trips per week and approximated the amount of transit walking on a typical transit trip (Table 4). The mean of these transit walking behaviours was used to determine categorization. Participants were grouped as 'meets transit walking criteria' if they were above the mean and grouped as 'does not meet transit walking criteria' if they did less than this amount.

Perceptions Of Transit Walking Responses to the question about the perceived benefits of transit walking were categorized (Table 4). Individuals who agreed or were neutral

(responses of 4-7) were considered to perceive walking to transit as an adequate form of exercise. Those who disagreed (responses of 1-3) were considered to perceive walking to transit as an inadequate form of exercise.

Self-Rated Health Participants were asked to rank their health on a five-point scale (Table 4). All individuals who rated health as 'poor' or 'fair' (responses of 1-2) were grouped as 'poor self-rated health'. Individuals who rated health as 'good', 'very good' or 'excellent' (responses of 3-5) were 'good self-rated health'. This categorization is based on that used by the Region of Waterloo Health and Community Survey (Statistics Canada, 2007c)

3.7.2 Covariates Considered For The Model

Table 5 identifies the potentially important covariates based on the literature review, as well as correlations that were observed in the data. These covariates were gender, age, education, self-esteem, body mass index (BMI), income, confidence, location, spirituality and smoking status. The fully-adjusted model controlled for gender, age, education and self-esteem. The number of covariates included in the adjusted model was kept to a minimum because of concerns about sample size and power. Three variables were considered influential but were not included in the adjusted model. BMI was highly correlated with age ($r = 0.47$, $p < 0.01$). Many participants did not disclose their household income ($n = 10$; 19%), and because of this income was not included in the fully adjusted model. Confidence was related to self-esteem ($r = 0.40$, $p < 0.01$) and education ($r = 0.41$, $p < 0.01$). Results of the regression analyses controlling for BMI, income and confidence are included in Appendix I.

Table 5: Study Covariates, Survey Questions and Categorizations

Measure	Survey Question	Question Source	Categorization
Gender	Inferred by researcher at recruitment	-	Female or Male
Age	What is your age?	Census Questionnaire (Statistics Canada, 2001)	Based on median age of Statistics Canada groupings. 'Young' if under age 50, 'Old' if over age 50.
Education	How would you describe your education? Some high school or less =1, High school diploma =2, Trade certificate =3, college diploma = 4, University certificate at or below bachelor's level = 5, University degree or certificate above bachelor's degree = 6	Census Questionnaire (Statistics Canada, 2001)	'Low education' group for individuals who had not completed high school, had only a high school diploma, had a trade certificate or college diploma. 'High education' included university graduates or higher.
Self-esteem	How much do you agree with the following statement? I see myself as someone who has high self-esteem Strongly agree = 7, Agree = 6, Agree slightly = 5, Neutral = 4, Disagree slightly = 3, Disagree = 2, Strongly disagree = 1	Canadian Community Health Survey (Statistics Canada, 2007a)	Based on the response distribution, participants who agreed were grouped (5-7) as 'high self-esteem' and individuals who disagreed or were neutral (1-4) were grouped as 'low self-esteem'.
Body Mass Index (BMI)	What is your current height in either feet or centimetres?	-	BMI within the normal range 18.5 – 24.9 was considered 'normal'. Any BMIs at or above 25 were put into the 'overweight' category. No participants were underweight (BMI <18.5).
	What is your best estimate of your current weight in either pounds or kilograms?	-	
Income	What is your best estimate of the total income, before taxes and deductions, of all household members from all sources in the past 12 months?	Canadian Community Health Survey (Statistics Canada, 2007a)	The mean income for a transit user in the Region of Waterloo is $18 962 (Statistics Canada). Participants who reported a higher income were grouped as 'moderate income' and individuals who reported a lower income were grouped as 'low income'.
Confidence	Over the last week how confident did you feel? Not confident at all = 1, Less confident = 2, Neutral = 3, More confident = 4, Very confident = 5	Harvard Health Survey (Crum & Langer, 2007)	Based on response distribution, 'high confidence' was individuals who responded positively and 'low confidence' was individuals who responded negatively or were neutral.
Location	Inferred by researcher based on address provided for remuneration	-	Kitchener, Waterloo or Cambridge
Spirituality	Do spiritual values play an important role in your life?	Canadian Community Health Survey (Statistics Canada, 2007a)	Yes (= 1) or No (= 0)
Smoking	During the past week how many cigarettes a day did you smoke?	Harvard Health Survey (Crum & Langer, 2007)	Smokers smoked at least one cigarette in the last week. Non-smokers reported smoking no cigarettes in the past week.

Study questions included in Appendix E. Gender, education, confidence, self-esteem, age, BMI and income were included separately in all regression analyses. Gender, age, self-esteem and education were controlled for in the adjusted models.

3.8 Analysis Of The Mixed-Methods Survey

Qualitative data from the mixed-methods survey was transcribed and coded. Responses were reported as frequencies. QLTM was coded based on the most frequent responses and was dichotomized based on the interpretation of these responses (Yes = 1, Depends on the distance = 1, No = 0). All responses that were not stated as 'Yes', 'No', or 'Depends on the distance' were interpreted in the context of these three categories and coded accordingly. QLTM was used as the primary measure of mindfulness in the Chi-square, correlation, and logistic regression analyses. All other qualitative data were examined either through the frequency tables or transcripts of the participants were analyzed individually.

For each question in the MAAS, respondents were asked to indicate based on a scale from 1 to 6, how frequently they acted mindfully and the scores for all 15 of the questions were averaged. This average was considered the MAAS score and was treated as a continuous variable. The distance walked as a result of transit use per week was calculated based on approximations by participants. The distance walked from one's house to their most frequently used transit stop was added to the distance walked from their last transit stop to their destination and this sum was multiplied by the number of one-way transit trips taken per week. Any incidental walking related to transit was added to this value and the resultant value was used to indicate 'transit walking behaviours'.

All quantitative data was analyzed using SAS 9.1. Categorical variables were reported as response counts and percent frequencies. Continuous variables were reported as means and standard deviations.

Chi-square and correlation analyses were used to examine associations among conceptual model variables and covariates. These analyses determined which covariates to include in the logistic regression analyses. To test the conceptual model and the associations between conceptual model variables (Figure 1), logistic regression was used, controlling for selected covariates. These analyses were conducted for each of the three measures of mindfulness.

3.9 Analysis For The Qualitative Interview

Qualitative interviews were audio-taped, transcribed verbatim and analyzed manually by the researcher. The interviews were performed to determine biases towards transit use in transit users and determine the potential for future interventions in transit users (Table 6). These questions were expected to result in responses that were easily transcribed with little interpretation; this was the case. The modest sample size did not allow for exploration of themes or saturation.

Table 6: Select Questions and Prompts from the Qualitative Interview by Study Objective

Determine biases and assumptions about public transit use	
i. Why transit is personally used	Could you describe why you take transit? Probes: Do you have a car? Is transit more convenient? Is transit more affordable?
ii. Preferred method of transportation	In an ideal world, what means of transportation would you use to get around? Probes: Would you rather be taking a car?
iii. Why others use transit	Could you maybe think of reasons that people take public transit?
iv. Feelings towards public transit	How do you think people feel, in general, about taking public transit? Probes: Are there positive or negative feelings associated with taking public transit? How do you feel about taking public transit?
v. Feelings about people taking public transit	How do you think they feel about people who take public transit? Probes: What do you think about people who take public transit?
Determine transit mindfulness	
i. Whether mindfulness has ever been reflected upon	Have you ever considered your mindset?
ii. Current mindfulness while walking to transit	What do you think your mindset is while walking to transit? Probes: What do you think about when you are walking to the transit stop?
iii. Value of mindfulness	Do you think mindfulness is a positive or negative thing to have in your life?
Determine if mindfulness has the potential to influence the relationship between transit walking and health	
i. Whether increased mindfulness could make walking enjoyable	What would you expect to happen if you started to consider walking to transit stops as a form of exercise? Probes: Do you think you could be healthier if you shifted your mindset?
ii. Required change for mindfulness shift	Can you foresee a reason for your mindset about public transit to change? Probes: In what way would your mindset change while taking public transit?
iii. Expected impact of change in mindfulness	Do you expect that a different mindset about transit use would impact the way you feel when you take transit? Probes: Is there a way you can view walking to public transit that would change the way you feel?

Full qualitative interview script included in Appendix E. Table E.3

4.0 Results

4.1 Study Sample

As shown in Table 7, the majority of the study participants were women (n = 33; 62%) and the average age was 41 years (SD = 15). Twenty-three participants (43%) had attended college or university and 33 participants (62%) reported having high self-esteem. The average BMI was considered overweight as indicated by the value of 26.4 (SD = 5.4) and the average income was $46 743 (SD = 38 661). Thirty participants (57%) reported high confidence. Kitchener residents (n = 38; 72%) comprised the majority of the sample population along with individuals who considered themselves to be spiritual (n = 39; 74%) and non-smokers (n = 44; 83%).

Table 7: General Characteristics of the Study Sample

Nominal Variables	Subcategories	n	% of sample				
Gender		53	100	-	-	-	-
	Male	20	38	-	-	-	-
	Female	33	62	-	-	-	-
Education[1]		53	100	-	-	-	-
	Low education	30	57	-	-	-	-
	High education	23	43	-	-	-	-
Self-esteem[2]		53	100	-	-	-	-
	Low self-esteem	20	38	-	-	-	-
	High self-esteem	33	62	-	-	-	-
Confidence[3]		53	100	-	-	-	-
	Low confidence	23	43	-	-	-	-
	High confidence	30	57	-	-	-	-
Location		53	100	-	-	-	-
	Kitchener	38	72	-	-	-	-
	Waterloo	15	28	-	-	-	-
Spirituality[4]		53	100	-	-	-	-
	Not spiritual	14	26	-	-	-	-
	Spiritual	39	74	-	-	-	-
Smoking[5]		53	100	-	-	-	-
	Non-smoker	44	83	-	-	-	-
	smoker	9	17	-	-	-	-
Continuous Variables	**Subcategories**	**n**	**% of sample**	**Mean**	**Median**	**Mode**	**SD***
Age (years)[6]		53	100	40.98	37.00	24.00	15.03
	Young	33	62	-	-	-	-
	Old	20	38	-	-	-	-
Body Mass Index (BMI)		53	100	26.39	25.28	-	5.44
	Normal weight	24	45	-	-	-	-
	Overweight	29	55	-	-	-	-
Income (annual household income)[7]		43	81	46742.79	38000.00	60000.00	38661.00
	Low income	10	19	-	-	-	-
	Moderate income	33	62	-	-	-	-
	Missing	10	19	-	-	-	-

* SD = Standard Deviation, [1] Education: high school /trade certificate or college/university, [2]Self-esteem: agree or disagree on self-esteem measure, [3]Confidence: agree or disagree on confidence measure, [4]Spirituality: yes or no on spirituality measure, [5]Smoking: non-smoker or smokes at least one cigarette per week, [6]Age: above or below 50 years, [7]Income : above or below 18 962 CAD. Full distribution table included in Appendix F, Table F.1.

4.2 Results From The Qualitative Questions In The Mixed-Methods Survey

Seven qualitative questions were asked as part of the mixed-methods survey in hopes of creating a better understanding of transit mindfulness and perceptions of exercise and walking. See responses in Appendix F, Tables F2-F8.

Participants were asked to consider what exercise is and to define exercise. When asked 'what do you consider exercise to be?' (definition of exercise) most individuals said 'walking' (n = 22), or anything that is physical movement (n = 22). When participants were asked how they get exercise (personal exercise behaviours), the most common response, again, was 'walking' (n = 42) and very a small group cited transit walking (n = 6). Personal exercise behaviour and definition of exercise where contrasted along with responses to the question 'when you hear people talk about exercise, what things do you think of?' (exercise imagery). Many participants said 'walking' (n = 23) and a nearly equal number of participants listed more typical fitness regimes i.e. going to the gym (n =22) or running (n = 22).

When participants were asked what their ideal physical activity level would be, most listed the same types of fitness and exercise goals; being more active (n = 26), exercising more often (n = 10), doing any sort of exercise (n = 7). Most participants (n = 23) said that the purpose of exercise is health-related (exercise purpose) and was not seen as enjoyable. What was considered enjoyable was 'physical activity' (n = 12) or 'being physically active'.

Walking was considered to be exercise (qualitative perceptions of walking) by nearly all participants (n = 50), with a few expressing doubts saying it is not ideal for exercise (n = 3). No one said that walking is not exercise. Walking to transit was considered exercise (QLTM) by the majority of the participants (n = 31), but there was doubt among a small group (n = 9) that was not present when walking as exercise was discussed broadly.

4.3 Distribution Of Conceptual Model Variables

Figure 1 shows the five variables of the conceptual model; four of which were measured in this model. QLTM, transit walking perceptions and transit walking behaviours are considered explanatory variables and self-rated health is an outcome variable. Actual health was not measured in this study.

4.3.1 Mindfulness

Qualitative Measure of Transit Mindfulness/QLTM

As stated previously, walking to transit was considered to be exercise by over half of the respondents (n = 30; 57%). Although there was a group who said 'No' (n = 8; 15%), there was a larger group who said transit walking can be exercise, but it 'Depends on the distance' (n = 15; 28%). As seen in table 8, participants who thought transit walking was exercise or that it was distance dependant were categorized as 'high QLTM' and were the majority group. Those who did not think walking to transit was a form of exercise were categorized as 'low QLTM'. According to the cross-tabulations, participants who were transit mindful were also less likely to walk adequate amounts to and from transit but viewed this transit walking as adequate and had poor self-rated health. Participants who were transit mindful were more likely to be female, overweight, with high self-esteem and low education. There was an equal likelihood that the participants who were considered mindful be young or old. The self-rated health result was distorted by zero participants ranking low in QLTM and self-rated health.

Table 8: Key Measures of Transit Mindfulness

Main variables	Subcategories	n	% of sample
		53	**100**
Qualitative measure of transit Mindfulness	Low QLTM	8	15%
	High QLTM	45	85%

Transit mindfulness = 'Is walking to transit a form of exercise?'

QLTM was related to QNTM ($r = 0.27$, $p = 0.05$; $\chi^2 = 5.04$, $p = 0.02$) but was not related to MAAS scores or any of the other conceptual model variables.

Quantitative Transit Mindfulness/QNTM

Transit users who were high on the QNTM measure accounted for 26 participants (55%) in the sample and were less likely to meet transit walking criteria but were more likely to perceive their transit walking

as adequate. The high QNTM group was more likely to be rate their health positively, be female, overweight, older, and had lower education and high self-esteem.

QNTM had a positive and significant relationship with transit walking perceptions ($r = 0.42$, $p<0.01$; $\chi^2 = 3.20$, $p = 0.07$) but was unrelated to the other variables in the model (Figure 3). QNTM was positively and significantly related to self-esteem ($r = 0.29$, $p = 0.04$), BMI ($r = 0.31$, $p = 0.03$; $\chi^2 = 4.34$, $p = 0.04$), confidence ($r = 0.24$, $p = 0.09$; $\chi^2 = 3.31$, $p = 0.07$) and age ($r = 0.25$, $p = 0.07$; $\chi^2 = 5.64$, $p = 0.02$) in the correlation and Chi-square analysis (Figure 4).

Mindful Attention Awareness Scale/MAAS

The average score for the Mindful Attention Awareness Scale was 3.96 (SD = 0.92), and participants above this score were considered 'high MAAS' – effectively meaning they were mindful. Those who scored below the mean of 3.96 were considered 'low MAAS' or not mindful. Twenty-four participants were considered mindful according to MAAS scores. The high MAAS group was less likely to meet transit walking criteria but were equally likely to perceive their transit walking as adequate and inadequate. High MAAS participants were more likely to perceive their health positively and be female while having a normal BMI, high education and high self-esteem. Participants in this group were also equally likely to be young or old.

The MAAS scores were significantly related to transit walking behaviours in the negative direction ($r = -0.24$, $p = 0.09$; $\chi^2 = 1.22$, $p = 0.08$). This means that higher MAAS scores are related to lower levels of transit walking behaviours. MAAS mindfulness scores were positively and significantly related to spirituality in correlation and Chi-square analyses ($r = 0.26$, $p = 0.06$; $\chi^2 = 4.38$, $p = 0.04$) and had a significant relationship with BMI ($\chi^2 = 3.01$, $p = 0.08$) in the Chi square analysis.

4.3.2 Transit Walking Behaviours

Forty-one participants (77%) reported walking every day. The average distance walked exclusively to and from transit was 9.72 km/week (SD = 10.29) or approximately 24.3 minutes per weekday. As shown in Table 9, twenty of the participants met or exceeded this level of transit walking and their transit walking behaviours were considered adequate (38%), or categorized as 'meets transit walking criteria'. Of individuals meeting transit walking criteria, 12 (23%) walked from 10-20 km/week, and four (8%) participants walked 20-30 km/week. There was an equally small group of four (8%) people who walked more than 30 km/week. Within the group who did not meet transit walking criteria, 13 of them (25%) walked from 4-8 km/week and 20 people (38%) walked less than 4 km/week. Only 20 of the participants

(38%) met transit walking criteria. Participants whose transit walking behaviours met criteria were more likely to perceive their transit walking as adequate exercise but rated their health poorly and were no more likely to be mindful (according to the QLTM measure) than participants who did not meet transit walking criteria. Participants who met transit walking criteria were also more likely to be young males with low self-esteem, higher education and a slightly increased likelihood of being overweight.

Table 9: Key Measures of Transit Walking Behaviours

Main variables	Subcategories	n	% of sample
		53	**100**
Transit Walking Behaviours (km/week)	Does not meet transit walking criteria	33	61
	Meets transit walking criteria	20	39

Transit walking behaviours: criteria based on average distance walked to transit by transit users (Besser, 2005), does not meet transit walking criteria = <9.7 km/week, meets transit walking criteria = >9.7 km/week

4.3.3 Perceptions Of Transit Walking

Participants who strongly agreed, agreed or agreed slightly that transit walking is exercise accounted for seven (13%), two (4%) and three (6%) of the participants, respectively. Neutral respondents were the second largest group with 10 participants (19%). Seven individuals (13%) disagreed slightly and nine disagreed (17%). The most frequent response was 'strongly disagree', which was stated by 15 participants (28%). The 31 individuals (58%) who did not consider walking to transit to be adequate exercise were the majority of the participants (Table 10). Individuals perceiving transit walking as adequate were more likely to be meeting transit walking criteria, rated their health positively and were high QLTM. This group also tended to be young, male, and overweight with low education and high self-esteem.

Table 10: Key Measures of Transit Walking Perceptions

Main variables	Subcategories	n	% of sample
		53	**100**
Perceptions of Transit Walking	Perceived transit walking as inadequate	31	58
	Perceived transit walking as adequate	22	42

Perceptions of transit walking: 'Walking to transit is a good way of getting exercise', strongly agree = 7, strongly disagree = 1, perceived as inadequate 1-3, perceived as adequate 4-7

4.3.4 Perceived Or Self-Rated health

Individuals who rated health as 'excellent', 'very good' or 'good' accounted for 7 (13%), 17 (32%) and 22 (42%) of the participants, respectively. These respondents comprised the self-rated health category 'perceived to be good'. Health was reported as 'fair' by four study respondents (8%) and 'poor' by three study respondents (6%). Self-rated health that was categorized as 'perceived to be poor' incorporated individuals who ranked health as 'fair' or 'poor'. Overall, 46 participants (87%) rated their health positively (Table 11). Good self-rated health was more likely among participants who met transit walking criteria and perceived their transit walking to be adequate exercise. Those who rated health poorly were more likely to be mindful, but this statistic is distorted by zero participants ranking low on QLTM and poor self-rated health. Those with better self-rated health were more likely to be young, female, with high education, high self-esteem and a normal weight BMI.

Table 11: Key Measures of Self-Rated Health

Main variables	Subcategories	n	% of sample
		53	**100**
Self-Rated health	Perceived to be poor	7	13
	Perceived to be good	46	87

Self rated health: 'In general I would say my health is', excellent = 5, poor = 1, perceived to be poor 1-2, perceived to be good 3-5

4.4 Relationships Among Conceptual Model Variables

Results of correlation analyses using the original ordinal and continuous measures are included in Appendix G, and Chi-square analyses based on the dichotomous or binary measures are found in Appendix H. All three measures of mindfulness were examined through these analyses, but the qualitative measure of mindfulness (QLTM) was the primary measure of mindfulness used. The measure of transit walking behaviours ($r = 0.42$, $p<0.01$; $\chi^2 = 10.74$, $p < 0.01$) was positively and significantly related to transit walking perceptions and this relationship reached statistical significance. As seen in Figure 2, the remaining relationships failed to achieve statistical significance.

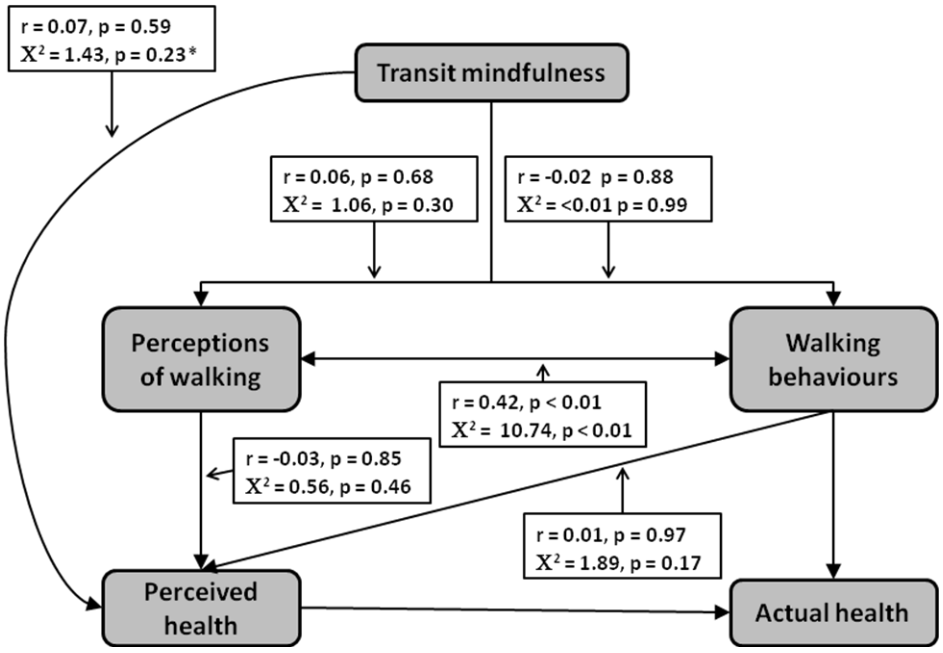

Figure 2: Conceptual Model with Pearson's r and Chi-square Results

*25% of cells in this analysis did not have an expected count of 5

4.4.1 Relationships Among Conceptual Model Variables and Covariates

QLTM was negatively correlated with education ($r = -0.44$, $p < 0.01$) and income ($r = -0.26$, $p = 0.09$) Transit walking behaviours were significantly and positively correlated with education ($r = 0.27$, $p = 0.05$) and were significantly related to age in the Chi-square analysis ($\chi^2 = 4.30$, $p = 0.04$). Perceptions of transit walking had positive and statistically significant relationships with self-esteem ($r = 0.39$, $p<0.01$),

smoking (r = 0.28, p = 0.04; χ^2 = 5.87, p = 0.02) and spirituality (r = 0.30, p<0.05; χ^2 = 3.16, p = 0.08) for both the correlation and Chi-square analyses, with the exception of self-esteem which was not significant in the Chi-square analysis.

Self-rated health was positively related to self-esteem (r = 0.23, p = 0.10; χ^2 = 3.90, p = 0.05) and income (r = 0.33, p = 0.03; χ^2 = 7.36, p = 0.01) in the correlation and Chi-square analysis. Self-rated health was significantly related to education (χ^2 = 6.18, p = 0.01), smoking (χ^2 = 3.83, p = 0.05), and location (χ^2 = 3.18, p = 0.07) in the Chi-square analysis only. Statistically significant findings are presented in Figure 3, and relationships among covariates as well as relationships between covariates and conceptual model variables that did not meet significance are found in Appendices G and H.

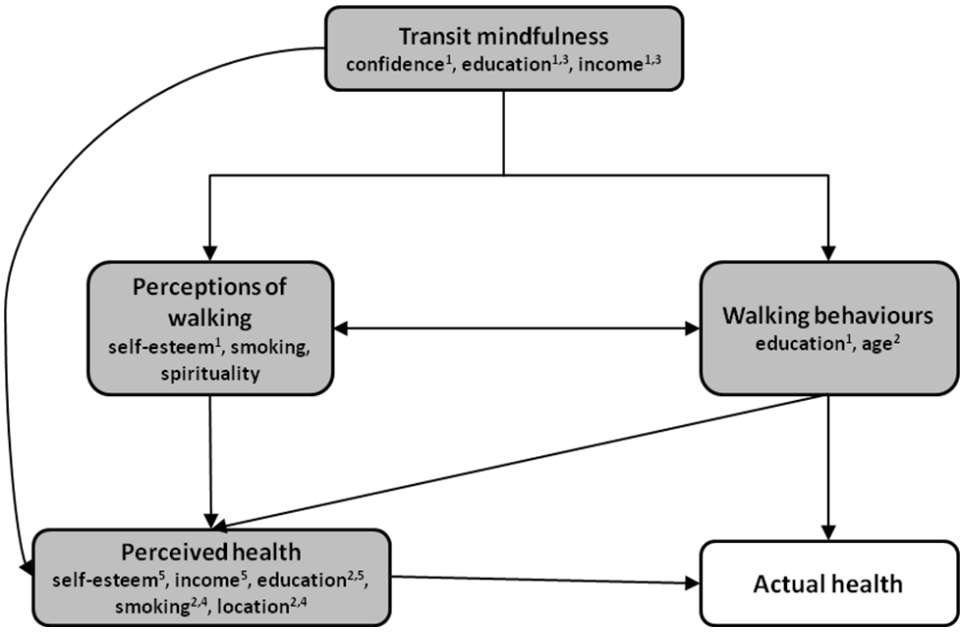

Figure 3: Covariates Related to Conceptual Model Variables

Listed covariates reached significant relationships with the conceptual model variables in both the correlation and Chi-square analysis unless otherwise specified. Results of correlation analyses included in Appendix G. Results of the Chi-square analyses included in Appendix H. [1] significant in correlation only, [2] significant in Chi-square only, [3]negative correlation, [4]25% of cells in this analysis did not have an expected count of 5, [5]50% of cells in this analysis did not have an expected count of 5

4.5 Testing The Conceptual Model

4.5.1 Does Mindfulness Relate To Transit Walking Behaviours?

Table 12: The Association between Transit Mindfulness and Transit Walking Behaviours

Variable	Response			Adjusted OR for				
			Crude OR	**Gender**	**Age**	**Education**	**Self-esteem**	**Gender, Age, Education, Self-esteem**
Transit Mindfulness QLTM	Does not meet transit walking criteria	OR	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-
	Meets transit walking criteria	OR	1.01	1.15	1.02	1.21	1.09	1.59
		95% CI	0.21 – 4.78	0.23 – 5.67	0.20 – 5.14	0.24 – 6.01	0.23 – 5.26	0.29 – 8.63

Odds ratios adjusting for BMI, income and confidence as well as full logistic regression analysis using QNTM and MAAS are included in Appendix I.

As seen in Table 12, QLTM was not associated transit walking behaviours (crude OR = 1.01, 95% CI 0.21 – 4.78). As seen in Table 12 and Figure 4, there was a positive association, albeit insignificant, between QLTM and walking greater distances to transit throughout the day after adjusting for gender, age, education and self-esteem (adj. OR = 1.59, 95% CI 0.29 – 8.63).

Controlling for gender increased the magnitude of the odds ratio (adj. OR = 1.15, 95% CI 0.23 – 5.67) although this association did not reach statistical significance. When controlling for age, the odds ratio increased in magnitude (adj. OR = 1.02, 95% CI 0.20 – 5.14) very slightly and was not a statistically significant outcome. Controlling for education also increased the magnitude of the odds ratio, albeit insignificantly (adj. OR = 1.21, 95% CI 0.24 – 6.01). Self-esteem increased the magnitude of the odds ratio (adj. OR = 1.09, 95% CI 0.23 – 5.26) but this did not achieve statistical significance.

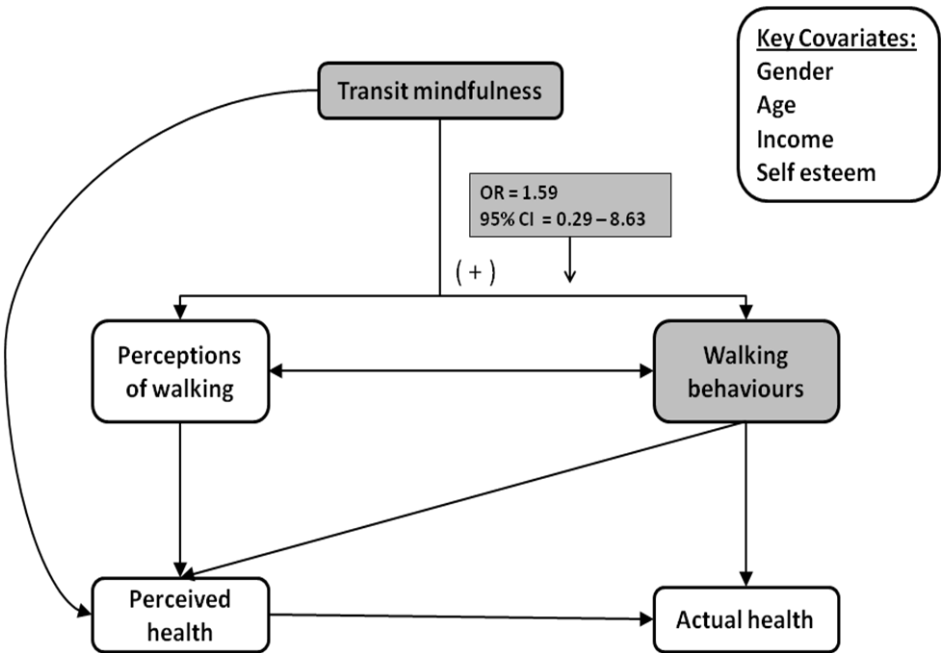

Figure 4: The Association between Transit Mindfulness and Transit Walking Behaviours adjusted for Correlates (Odds ratio and 95% Confidence Interval)

While data is not shown, the crude odds ratio suggested increased QNTM is associated with reduced transit walking behaviours (crude OR = 0.77, 95% CI 0.25 – 2.35) although this association did not achieve statistical significance. This odds ratio is potentially confounded, as seen by the reversal from a negative association in the crude odds ratio to a positive association in the model that adjusted for age (adj. OR = 1.16, 95% CI 0.34 – 3.96). The fully adjusted model suggests that QNTM increases the likelihood, albeit insignificantly, of walking greater distances to transit throughout the day compared to individuals who are not mindful after adjusting for age, gender, education and self-esteem (adj. OR = 2.89, 95% CI 0.62 – 13.55) and this value was likely influenced by the effect of age.

MAAS scores were also negatively associated with transit walking behaviours (crude OR = 0.53, 95% CI 0.17 – 1.64) although the association was not statistically significant. Controlling for education increased the magnitude of the odds ratio in the negative direction (adj. OR = 0.33, 95% CI 0.09 – 1.23) but did not reach significance. The fully adjusted model did not reach significance when adjusted for age, gender, education and self-esteem and was influenced by the effect of education (adj. OR = 0.26, 95% CI 0.06 – 1.06).

4.5.2 Does Transit Mindfulness Relate To Perceptions Of Transit Walking?

Table 13: The Association between Transit Mindfulness and Perceptions of Transit Walking

Variable	Response			Adjusted OR for				
			Crude OR	**Gender**	**Age**	**Education**	**Self-esteem**	**Gender, Age, Education, Self-esteem**
Transit Mindfulness QLTM	Perceived transit walking as inadequate	OR	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-
	Perceived transit walking as adequate	OR	2.40	2.52	2.42	2.36	2.21	2.22
		95% CI	0.44 – 13.20	0.45 – 14.08	0.44 – 13.44	0.42 – 13.20	0.39 – 12.47	0.37 – 13.21

Odds ratios adjusting for BMI, income and confidence as well as full logistic regression analysis using QNTM and MAAS are included in Appendix I.

As seen in Table 13, there is evidence for a positive association between QLTM and perceptions of transit walking (crude OR = 2.40, 95% CI 0.44 – 13.20) although the odds ratio did not achieve statistical significance. This result was expected and the model suggests that participants who were mindful according to the QLTM measure were more likely to perceive walking to transit as a form of exercise.

The magnitude of the odds ratio increased when controlling for gender (adj. OR = 2.52, 95% CI 0.45 – 14.08) but this also did not reach significance. The magnitude of the odds ratio also increased after adjusting for age (adj. OR = 2.42, 95% CI 0.44 – 13.44), but did not reach significance. When adjusted for education (adj. OR = 2.36, 95% CI 0.42 – 13.20) the magnitude of the odds ratio decreased and remained statistically insignificant. The odds ratio also decreased when controlling for self-esteem (adj. OR = 2.21, 95% CI 0.39 – 12.47) and this association did not reach significance. As seen in Table 13 and Figure 5, once these four covariates were controlled for, the resultant odds ratio was lower in magnitude that the crude odds ratio, but there remained a positive association (adj. OR = 2.22, 95% CI 0.37 – 13.21).

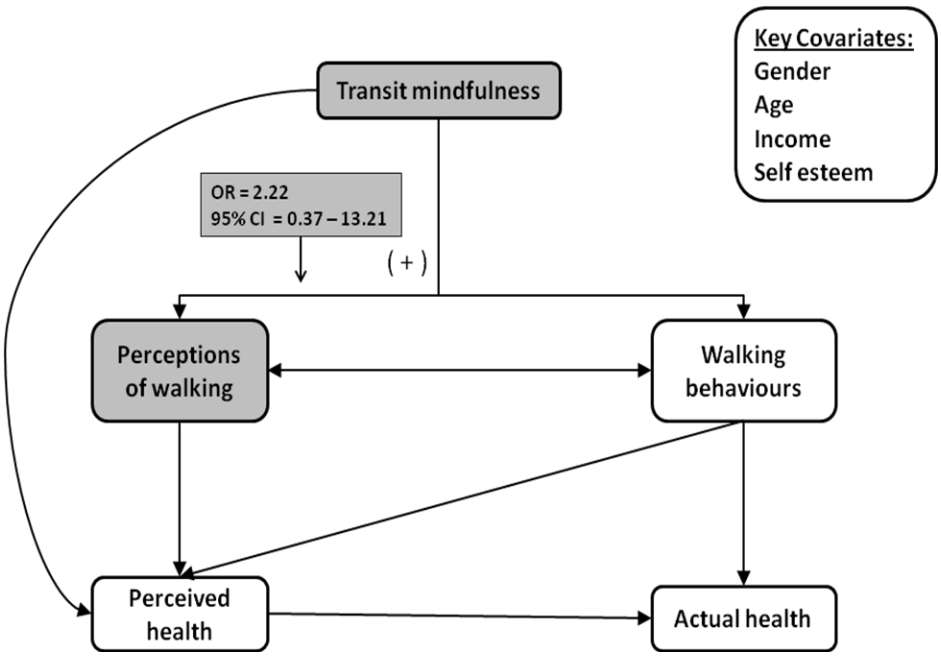

Figure 5 : The Association between Transit Mindfulness and Perceptions of Transit Walking adjusted for Correlates (Odds ratio and 95% Confidence Interval)

Although the data is not shown here, the association between QNTM and perceptions of transit walking (crude OR = 2.77, 95% CI 0.90 – 8.85) was also a positive one that did not achieve statistical significance. Statistical significance was achieved when age was adjusted (adj. OR = 3.93, 95% CI 1.10 – 14.07) and the effect of age strongly influenced the increase in the odds ratio seen with the fully adjusted model (adj. OR = 3.76, 95% CI 0.92 – 15.33) which controlled for age, gender, education and self-esteem.

The association between the MAAS and perceptions of transit walking was unexpectedly negative (crude OR = 0.99, 95% CI 0.33 – 2.96) albeit statistically insignificant, although this odds ratio can also be interpreted as being a lack of an association. Controlling for self-esteem increased the magnitude of the odds ratio in the negative direction (adj. OR = 0.88, 95% CI 0.28 – 2.72) but did not reach significance and did not influence the fully-adjusted odds ratio (adj. OR = 0.99, 95% CI 0.31 – 3.16) which was also statistically insignificant and controlled for age, gender, education and self-esteem.

4.5.3 Does Transit Mindfulness Relate To Self-Rated Health?

Table 14: The Association between Transit Mindfulness and Self-Rated Health

Variable	Response			Adjusted OR for				
			Crude OR	**Gender**	**Age**	**Education**	**Self-esteem**	**Gender, Age, Education, Self-esteem**
Transit Mindfulness QLTM	Perceived to be poor	OR	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-
	Perceived to be good	OR	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
		95% CI	<0.01 – >999.99	<0.01 – >999.99	<0.01 – >999.99	<0.01 – >999.99	<0.01 – >999.99	<0.01 – >999.99

Odds ratios adjusting for BMI, income and confidence as well as full logistic regression analysis using QNTM and MAAS are included in Appendix I.

It was expected that statistical findings would suggest a positive relationship between QLTM and self-rated health, however as seen in Table 14 the outcome of the statistical analysis (crude OR = <0.01, 95% CI <0.01 – >999.99) suggest that this cannot be calculated. Appendix J shows that the cross-tabulations between these two variables leave zero participants who are low QLTM and rate their health as poor. Having a value of zero in the analysis skews the odds ratio and makes interpretation impossible. As seen in Table 14 and Figure 6, adjusting for gender, age, income and self-esteem have no effect on the odds ratio.

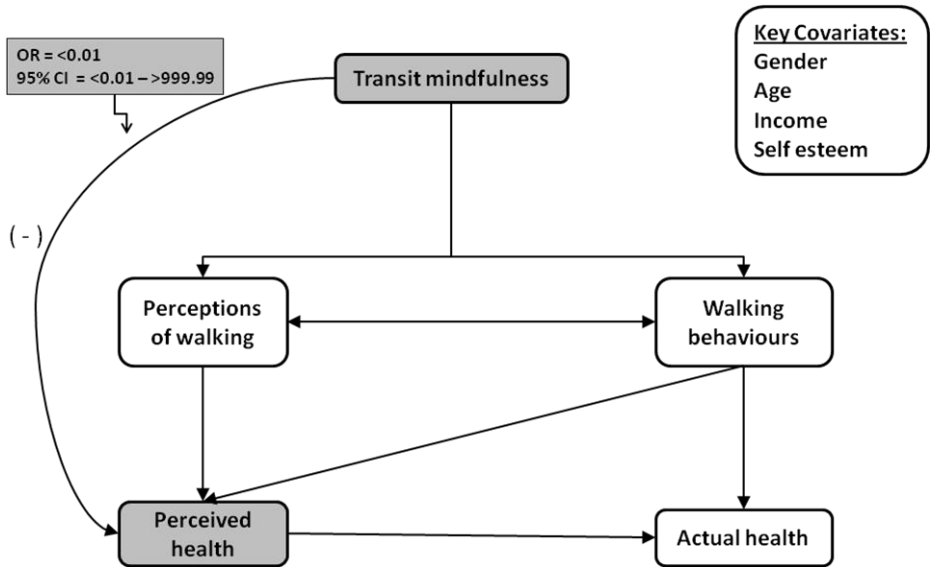

Figure 6: The Association between Transit Mindfulness and Self-Rated Health adjusted for Correlates (Odds ratio and 95% Confidence Interval)*

*The odds ratio between QLTM and self-rated health could not be calculated based on available data and cannot be interpreted.

While not shown here, the association between QNTM and self-rated health was positive but not statistically significant, (crude OR = 1.33, 95% CI 0.27 – 6.64). The magnitude of the odds ratio increased when age was controlled for (adj. OR = 2.00, 95% CI 0.35 – 11.61) but did not reach statistical significance. Controlling for education (adj. OR = 2.07, 95% CI 0.37 – 11.53) also led to an increase in the magnitude of the odds ratio, but was not statistically significant. Including self-esteem in the model resulted in a negative association (adj. OR = 0.93, 95% CI 0.17 – 5.12) that was also statistically insignificant. The fully adjusted model controlled for age, gender, education and self-esteem (adj. OR = 2.26, 95% CI 0.21 – 24.14) and remained a positive association but was not statistically significant.

The association between MAAS and self-rated health was positive (crude OR = 2.29, 95% CI 0.40 – 13.04) but not statistically significant. A decreased odds ratio resulted by controlling for education (adj. OR = 1.61, 95% CI 0.26 – 10.13) but was not statistically significant. Controlling for self-esteem also decreased the magnitude of the odds ratio (adj. OR = 1.85, 95% CI 0.31 – 11.23), and this association did not reach statistical significance. The fully-adjusted odds ratio was lower in magnitude that the crude

odds ratio (adj. OR = 1.34, 95% CI 0.19 – 9.23) and did not reach statistical significance after controlling for age, gender, education and self-esteem.

The results of the regressions with QNTM and MAAS suggest that individuals who were mindful showed an increased likelihood of rating their health positively, which is the result that was expected in the analysis with QLTM (Figure 6).

4.5.4 Do Perceptions Of Transit Walking Relate To Self-Rated Health?

Table 15: The Association between Perceptions of Transit Walking and Self-Rated Health

Variable	Response			Adjusted OR for				
			Crude OR	**Gender**	**Age**	**Education**	**Self-esteem**	**Gender, Age, Education, Self-esteem**
Perceptions of transit walking	Perceived to be poor	OR	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-
	Perceived to be good	OR	1.92	1.96	1.78	2.92	1.47	1.36
		95% CI	0.34 – 10.96	0.34 – 11.21	0.31 – 10.34	0.37 – 14.32	0.24 – 9.04	0.17 – 11.01

Odds ratios adjusting for BMI, income and confidence are included in Appendix I.

As seen in Table 15, there is evidence that perceptions of transit walking and self-rated health are positively associated (crude OR = 1.92, 95% CI 0.34 – 10.96). This suggests that individuals who perceive walking to transit as a form of exercise are more likely to report positive self-rated, and this was expected to be the case.

Controlling for gender increased the magnitude of the odds ratio slightly (adj. OR = 1.96, 95% CI 0.34 – 11.21) but did not reach statistical significance. Controlling for age decreased the magnitude of the odds ratio (adj. OR = 1.78, 95% CI 0.31 – 10.34) and statistical significance was not attained. When education was controlled for (adj. OR = 2.92, 95% CI 0.37 – 14.32) there was a large increase in magnitude of the odds ratio but this was not statistically significant. When self-esteem was included in the model (adj. OR = 1.18, 95% CI 0.38 – 3.68) the magnitude of the odds ratio decreased and did not reach statistical significance. As seen in Table 15 and Figure 7 adjusting for all four covariates resulted in an adjusted odds ratio that was lower in magnitude than the crude odds ratio (adj. OR =1.36, 95% CI 0.17 – 11.01).

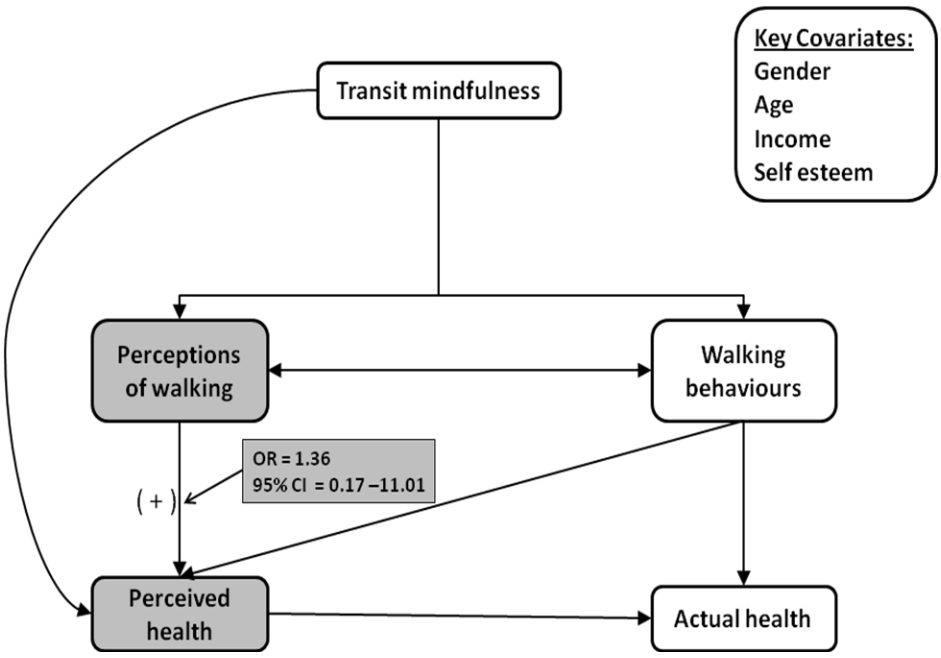

Figure 7: The Association between Perceptions of Transit Walking and Self-Rated Health adjusted for Correlates (Odds ratio and 95% Confidence Interval)

4.5.5 Do Transit Walking Behaviours Relate To Self-Rated Health?

Table 16: The Association between Transit Walking Behaviours and Self-Rated Health

Variable	Response			Adjusted OR for				
			Crude OR	**Gender**	**Age**	**Education**	**Self-esteem**	**Gender, Age, Education, Self-esteem**
Adequacy of transit walking (km/wk)	Perceived to be poor	OR	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-
	Perceived to be good	OR	4.22	4.73	3.52	3.20	5.96	3.54
		95% CI	0.47 – 37.99	0.50 – 44.32	0.37 – 33.46	0.33 – 31.42	0.61 – 58.71	0.28 – 44.14

Odds ratios adjusting for BMI, income and confidence are included in Appendix I.

As seen in Table 16, there is evidence for a positive association between transit walking behaviours and self-rated health (crude OR = 4.22, 95% CI 0.47 – 37.99). This association was expected and suggests that those transit users who walked more were more likely to rate their health positively.

When covariates were included in the model, the odds ratio increased in magnitude when self-esteem was controlled (adj. OR = 5.96, 95% CI 0.61 – 58.71) but did not reach statistical significance. The odds ratio increased in magnitude when gender was controlled for in the model (adj. OR = 4.73, 95% CI 0.50 – 44.32) but did not reach statistical significance. The odds ratio decreased when controlling for age (adj. OR = 3.52, 95% CI 0.37 – 33.46) albeit insignificantly. Controlling for education decreased the magnitude of the odds ratio (adj. OR = 3.20, 95% CI 0.33 – 31.42) but statistical significance was not achieved. As seen in Table 16 and Figure 8, there was a decrease in the magnitude of the crude odds ratio once all four covariates were controlled (adj. OR =3.54, 95% CI 0.28 – 44.14).

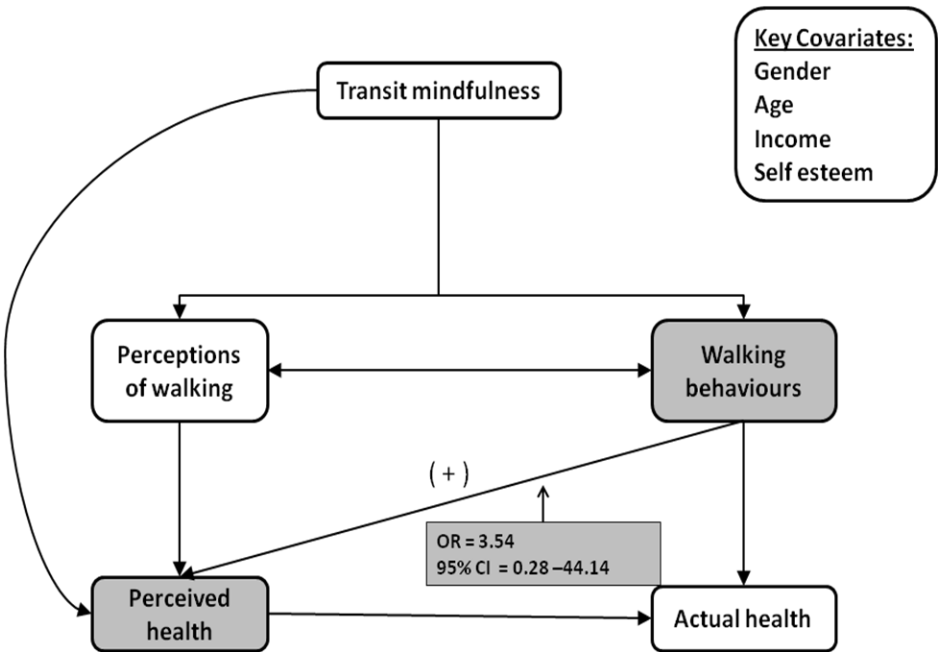

Figure 8: The Association between Transit Walking Behaviours and Self-Rated Health adjusted for Correlates (Odds ratio and 95% Confidence Interval)

4.6 Elaboration Of The Impact Of Covariates Using Qualitative Results

4.6.1 Gender

When people talk about exercise, what do you think of? *Walking, going to the gym is the best, cycling, household chores, daily errand.*

How do you get exercise on a daily basis? *Walk, go to the gym, walk to the bus.*

In an ideal world what would your activity level be? *Be more physically active.*

What is this ideal based on? *I like it and am also aware and health conscious.*

Controlling for gender typically led to an increase in the magnitude of the odds ratios in the regression analysis. Study participants tended to be females who were mindful and rated their health positively. This female participant was QLTM mindful based on study criteria but also declared herself a person who is aware. She described herself as health conscious, which implies she is mindful (of her health) and is possibly healthier as a result. Female respondents in the study did not meet transit walking criteria and accurately did not perceive this transit walking as adequate. This is consistent with the way this female participant states that transit walking is a way that she gets exercise, but it is third in the list after other forms of walking and going to the gym.

4.6.2 Age

When people talk about exercise, what do you think of*? For young people the gym, for older people it's walking and incorporated into lifestyle*

The relationships tested in the conceptual model were influenced by age. It was found that older participants had lower levels of transit walking, a lower likelihood to perceive transit walking as exercise and poor self-rated health, but were more mindful than the younger participants. The open-ended qualitative portion of the study survey gives another avenue to analyze the effect of age.

An older participant, age 56:

What do you consider exercise to be? *Anything that makes you move*

When people talk about exercise, what do you think of? *Running, going to the gym*

How do you get exercise on a daily basis? *Don't get much, I walk*

A younger participant, age 32:

What do you consider exercise to be? *A physical workout, walking, household work, going to the gym for two hours is a real workout*

When people talk about exercise, what do you think of? *Jogging and walking*

How do you get exercise on a daily basis? *The gym three times a week, jog. I walk to the bus every day so I am walking everyday.*

The interaction between mindfulness and age starts to become clear. Both the participants define exercise as physical movement. However, when asked about personal exercise, the older participant plays down walking behaviour as being inadequate. The younger participant is more active via traditional fitness activities, but still perceives walking to transit every day as a good way to get exercise. With these two participants as an example, increased age is related to a lower likelihood of perceiving transit walking as exercise.

4.6.3 Education

How do you get exercise on a daily basis? *Walking a lot because I take public transit*

In an ideal world what would your activity level be? *Would like to exercise more if I had more time, to lose weight, be in better shape*

What is this ideal based on? *I like to be active but I can't go to the gym or play sports. Life is too busy. I need to rest in my spare time*

Is walking to transit a form of exercise? *Yes*

This participant had gone to trade school and was categorized as 'low education'. Participants with low educational attainment ranked high for QLTM. This participant appears mindful by agreeing that transit walking was exercise and actually listed transit walking as their mode of getting exercise on a daily basis. This is also consistent with the finding that individuals with less education perceive their walking to transit as adequate i.e. 'walking a lot' because of taking public transit. Participants with low education also walked less and had lower self-rated health. This participant says that they needed to increase their exercise levels to 'lose weight 'and be in 'better shape'. This has proven to be a difficult goal since the participant feels they are too busy to fit exercise beyond transit walking into daily life.

4.6.4 Self-Esteem

Self-esteem tended to influence the logistic regression analyses that included mindfulness by decreasing the magnitude of the relationships. It has been found in other research studies that mindfulness is related to self-esteem (Samuelson et al, 2007; Zvolensky et al., 2006). Self-esteem was correlated with perceptions of transit walking, and self-rated health. Participants who were mindful according to all three mindfulness measures were more likely to have high self-esteem. The following quotations are from participants considered to have high self-esteem.

Participant A:

How do you get exercise on a daily basis? *Walking around to appointments or the bus station*

Is walking to transit a form of exercise? *Yes, to the grocery store too*

Participant B:

What do you consider exercise to be? *Peace of mind, a safe spot, getting away and reflecting on daily tasks and the future.*

Is walking to transit a form of exercise? *Depends, but yes it is because your body is working*

Participant A was mindful of the value of walking to transit, but also while running errands. Participant B defined exercise not by behaviours but by the mindset one must be in to be exercising and was also mindful of the value of walking to transit for exercise. Through these quotations, it appears that participants with high self-esteem are mindful.

4.7 Qualitative Interviews

The qualitative interviews gave insight into many of the perceptions of public transit that will be useful for future research. Ten participants were identified through predetermined criteria and interviews occurred with four participants. Transcripts of the full interviews are included in Appendix K and the following are meaningful excerpts from the interviews.

Interview #1

The first interviewee was an educator and a new transit user. He had recently lost his car because he could not afford to replace it.

How do you think people, in general, feel about taking public transit?

I think in my experience most of them loathe it. . .

What do you think about people who take public transit?

What is my overall impression? Umm it seems to me that a lot of the people, well I'm stating the obvious; these are people with really low income for the most part. And there are exceptions. But in general they are very low income. I often see really, I mean low income, and then I see people that are really destitute or handicapped. So I think a lot of people taking the bus are there for a sheer lack of alternatives - which I think I have already alluded to. Or students who I guess aren't destitute per se, but are low income.

The last time we talked, we discussed public transit use. Could you maybe think of reasons that people take public transit?

They no longer have cars, like in my case; they get a car repair bill that is too big so they scrap the car. So lack of a car. I would say that most of the people in this town are taking the bus because they don't have a car. And the reason I say this is because I think public transportation in this city and Canadian cities in general is quite overpriced and inefficient by global standards certainly compared to most Asian or European cities Canadian public transit is very decrepit and overpriced. So I would say that most people, myself included are taking it because they either lost their automobiles or can't afford one. Which is really too bad.

What do you think your mindset is while walking to transit?

It's not the walk that bothers me. I like the walk. It's the bus ride that I can take or leave. I usually just listen to music or tune out. Because I just don't like the whole experience.

Do you consider your walking to transit as exercise?

A light form of exercise, yeah. Cause its only ten minutes at the most. In and of itself it would not constitute an exercise regime.

This participant demonstrated negative stereotypes associated with transit users and specified that he becomes less mindful when he is taking transit. He said that transit in Kitchener-Waterloo is inadequate compared to European and Asian cities and implied that he would be an enthusiastic transit-user in another city. It did appear that this transit user was mindful of the value in transit walking but did not think it is adequate as an exercise regime.

Interview #2

The second interviewee was a mother who had recently immigrated to Canada

Does exercise have to occur in a certain location?

No no no. It should be part of every little second of your life. Even if you just go shopping, you are going to exercise. That is daily exercise. You shouldn't have to go specifically to burn all your calories at the gym or specific environment. You should do that before you even get there. Like, even if you go to the gym you should walk or run there, not take your car.

Are there positive or negative associations with taking public transit?

Oh, I took it from the time I was born. My parents grew me up with mass transit from back home. So I have respect for the people that are driving the bus, they have such a huge responsibility. On top of that, especially here in Kitchener they are coming on the clock, plus back home I had to wait for two or three buses until I could get on the bus because they were so full. Here it is much more convenient and easier. Like when I first came to Canada I saw they have the travel thing for the strollers and I was amazed. I was like 'Wow, what kind of world is it here?' Back home you had to carry your own kid, you couldn't take a stroller into a bus. No way. So for me, it's such a plus. It's so convenient.

Do you consider your walking to transit as exercise?

Sometimes. It depends. If I have to take a further bus it is exercise for sure, it is more than 2km to get to that bus station. But it's good – I don't mind. Even in winter time I know I just have to leave earlier. It's a good way. It is exercise. Any movement, even when you walk is exercise. Walking to your desk, going to the washroom – is it exercise? Probably not but still you are

walking. You burn some calories when you do that. So it is an exercise. Depends on how the human being categorizes that. I know people that cannot do that, so they are probably not exercising a lot. It depends. It is physical activity for sure, you have to get up you have to move your feet, and you have to walk, so it is exercise.

Is what you're saying that there is a difference between people that do acknowledge it as exercise and those who don't?

For sure. And in my opinion it is an exercise no matter what others try to twist my mind. It is an exercise in my mind because you have to put some effort to get there.

This participant appeared to be very mindful of the holistic nature of an active lifestyle. If we look at interviewee #1 and contrast with Interviewee #2, Interviewee #1 compares Kitchener-Waterloo to wealthy metropolises around the world and is frustrated by the poor service from Grand River Transit. Interviewee #2 is thrilled by what is offered by Grand River Transit, having grown up with much worse service in Eastern Europe.

Interviewee #2 is mindful of the potential for exercise in every action but when asked specifically about transit walking claims that it depends on the person. This is mindfulness theory; implying that categorizing all of your movement as exercise is the determining factor in making it exercise.

Interview #3

The third interviewee was on social assistance and had recently found permanent housing.

You mentioned exercise already, when you hear people talk about exercise what kinds of things do you think of?

Physical exertion. Runners, people who cycle, people who walk. I do a lot of walking and I cycle when I have a bike. But I need to actually do weight training and do proper exercise.

In an ideal world, what would your physical activity level be?

Weight training and swimming and sauna to detox. Treadmills and stuff. Get back up to my optimum weight and be in good shape. Get my blood count back to where its supposed to be for nutrients.

How do you think people, in general, feel about taking public transit?

I think they don't mind it. I don't hear too much negative.

Do you have positive or negative associations with taking public transit?

No. It's positive.

What do you think your mindset is while walking to transit?

Where the hell is the bus? Or whatever my mind happens to be thinking about at the time. I don't really think about the bus when I'm going to the bus stop. I know I'm going to the bus stop. But I don't really have to think about it because my feet are taking me there and I just have to wait for the bus,

This interviewee accumulated a significant amount of walking exercise but due to many other factors did not think that this is enough for good health. Poor health in this case was due to many other factors related to homelessness and food insecurity, as opposed to a lack of mindfulness or exercise regimen that does not include weight training and vigorous physical activity. Interviewee #3 though that the average transit user is content with the available service which is a contrast to the opinions of interviewee #1. This discrepancy between values and judgements placed on transit use may be a result of being part of different socio-economic groups.

Interview #4

Interviewee #4 worked in a call centre and could not afford to buy a car.

When you hear people talk about exercise what kinds of things do you think of?

I generally think of 'at the gym' with weights, treadmill, the exercise balls. Things like that.

The last time we talked, we discussed public transit use. Could you maybe think of reasons that people take public transit?

In this day and age people take transit only because it's much cheaper than having a car. Especially with gas prices and that. The city itself is way too big to support walking. And there's a lot of places where the sidewalks are horrible and you just can't walk. Like on some of the side streets, there is no sidewalk. So to get anywhere people take the bus for cost reasons and stuff like that.

How do you think people, in general, feel about taking public transit?

Embarrassed, actually. Because it's sort of a status symbol of generally people that can't afford a car and stuff like that and have to rely on somebody else. So it's like I know a lot of people that have cars and they would rather not go out than take the bus. Like if we're going out drinking

they would make sure they have enough money for a taxi, because they just simply will not get on the bus. They nickname it 'The Loser Cruiser'

So you don't think of yourself as someone who is present in the moment?

The way you described it is being aware of yourself, and generally half the time I don't know what I'm going to be doing with that, because I generally tend to react to things instead of actually doing things.

What do you think your mindset is while walking to transit?

Everyone is thinking 'I hope I didn't miss my bus'. I am worried 'I hope I didn't miss my bus' or 'I hope it isn't late'. Generally, that's about it.

Interviewee #4 was similar to interviewee #1 as both thought that transit use was not a choice, but a necessity for individuals who could not afford a car. As stated in this interview 'embarrassed' was used to describe how transit users feel about their own transit use. This interviewee did not list walking as a physical activity and did not appear to be mindful. He claims that it is impossible to see the value in walking to the bus stop because the stress associated with this task and the consequences of being late for the bus are overwhelming.

5.0 Discussion

Crum and Langer's study of hotel-maids (2007) suggested that mindfulness may act as a modifying step between physical activity and health. According to this rationale, future population health interventions can improve health in the general population as well as transit users who may partake in sufficient exercise through daily behaviours but do not perceive it as such. In this pilot test, we investigated whether mindfulness interventions are appropriate for public transit users.

Through qualitative approaches, it was found that walking to transit was considered exercise, but some participants said that this label depends on the distance walked. There are biases towards low-intensity exercise and exercise that occurs intermittently throughout the day. Through quantitative approaches it was found that participants were not walking adequate distances to qualify their transit walking as sufficient daily exercise, which is a key difference between this study and the hotel-maids (Crum & Langer, 2007). Future interventions can try to encourage transit users to walk to beyond the closest bus stop in order to get a sufficient amount of daily exercise through walking to transit.

The majority of transit users were transit mindful (QLTM), rated their health positively, perceived their transit walking to be adequate exercise, but did not walk adequate amounts to and from transit to meet daily exercise requirements (61%). There was evidence for positive associations between transit mindfulness (QLTM) and perceptions of transit walking, transit walking behaviours, and self-rated health. Despite the majority not meeting transit walking criteria, there was some preliminary evidence that individuals who are mindful walk longer distances to transit, and those who walk longer distances to transit have higher self-rated health. A finding that is worth further investigation was that older participants had high transit mindfulness, poor self-rated health and inadequate exercise behaviour through walking, potentially making this group an ideal candidate for future interventions that encourage walking. A second intervention idea would be to target residents who are accumulating adequate exercise through transit walking but are not mindful. In this case, the population of interest would be younger males.

This is the first research thus far that has built on the findings of the hotel-maid study (Crum & Langer, 2007) however new approaches to the application of mindfulness are appearing in the literature. A key difference between the studies is that transit users were more mindful than the hotel-maids but were not walking adequate distances for transit walking to be considered exercise. To contrast, the hotel-maids were not mindful of the fact that their workload was in fact, adequate daily exercise.

The examination of different measure of mindfulness, qualitative portions of the mixed-methods survey and the qualitative interviews were strengths of this study that helped interpret the quantitative analyses. This research was limited by sample size, statistical power, recruitment and attrition. Another limitation is the construct of mindfulness, which was used as a conceptual model variable. The transit mindfulness measures created for this study (QLTM and QNTM) were satisfactory measures of transit mindfulness and were better suited to this research on perceptions of transit walking than the general mindfulness measure (MAAS).

This research first proposes some suggestions for future mindfulness interventions; for analysis of operational measures of mindfulness, groups to target for recruitment, and ideas for better surveying techniques and survey measures. Suggestions for future research within the Region of Waterloo, for research on transit users, and research in the field of mindfulness are discussed.

5.1 Descriptive Findings

5.1.1 Transit Mindfulness

According to the QLTM measure, which asked transit users directly if walking to transit is exercise the majority of the participants (n = 45; 85%) were mindful of the exercise accumulated by walking to transit. This result is consistent with another question in the qualitative portion of the mixed-methods survey which was open-ended and asked participants to describe how they get exercise. A similar number of transit users listed walking as a way that they get exercise on a daily basis, according to the measure of perceived exercise behaviours in the mixed-methods survey (n = 42; 79%). A much smaller group (n = 6; 11%) specifically referred to transit walking as a way they are accumulating exercise. Although no studies have looked at mindfulness in transit users, about four-fifths of this sample can be considered mindful of the value of walking, generally and transit-related.

Crum and Langer's (2007) measure of mindfulness is similar to the measure of perceived exercise behaviours, and the hotel-maids had a baseline level of mindfulness that was much lower (26%) than transit users. This discrepancy may be the result of public health messages that promote walking, as opposed to housework for exercise. It may be that the homogenous group of low income American women who were recruited by Crum and Langer (2007) would have been transit-mindful. Since this study examined a heterogeneous mix of Canadian transit users, these populations are different by nature and the discrepancy in mindfulness could be a result of demographic differences as well.

Of the 53 participants, 26 (55%) were considered mindful according to the quantitative transit mindfulness/QNTM measure, and these results are described in more detail below. The average MAAS mindfulness score in this population (m = 3.96, SD = 0.92) was lower than other populations tested with this scale; a large adult sample in the United States (m = 4.22, SD = 0.63) (Brown & Kasser, 2005), a small sample of cancer patients in the United States (m = 4.27, SD = 0.64) (Brown & Ryan, 2003), a small sample of adults in Alberta, Canada (m = 4.08, SD = 0.74) (Carlson & Brown, 2005) and a small sample of cancer patients in Alberta, Canada (m = 4.45, SD = 0.77) (Carlson & Brown, 2005).

The qualitative data from this study implies that this study population is more mindful than the hotel-maids however the MAAS scores imply that the study population is less mindful than the general population. These measures of mindfulness range from very specific measures of transit mindfulness to very broad measures of mindfulness, and do not appear to be measuring the same thing, nor are they

measuring the same populations. This discrepancy between populations and between measures can explain the differences found in measures of mindfulness.

5.1.2 Transit Walking Behaviours

The average distance walked per week for transit users in this study, according to self-report was 9.72 km/week. This figure is identical to other research on transit users which tracked transit walking through pedometers (Besser & Dannenberg, 2005). The identical results are a statistical anomaly but these findings do confirm the notion that transit users can accumulate adequate exercise through transit walking alone and that self-reported walking is reasonably accurate when compared to a pedometer. Future research should use the figure of 9.72 km/week as an indicator that a sample of transit users is representative or as a constant in calculations involving the distance walked by transit users.

5.1.3 Perceptions Of Transit Walking

Perceptions of transit walking are assumed to mediate the relationship between transit mindfulness and self-rated health. In this study of transit users, 22 participants (42%) considered their transit walking to be adequate exercise (is transit walking a good way to get exercise?) and this measure was similar to QNTM (do you get adequate exercise through transit walking?) which again dealt with perceived transit walking, and 26 participants (49%) were considered transit mindful according to this measure.

The correlation and Chi-square analyses between these two variables did not reach significance. The regression analyses between these two variables nearly reached significance, and considering the sample size of this study, this can be interpreted as a relationship. It is possible that these variables are related because they are measuring the same thing. If an individual thinks that transit walking is good exercise, they likely consider their own transit walking to be good exercise and the connection is self-serving. The QNTM measure is likely a poor measure of mindfulness but it appears to be a good measure of perceptions of transit walking. The redundancy between these two variables can be examined in future research to determine which of the two is most accurately describing perceptions of transit walking.

5.1.4 Self-Rated Health

Self-rated health can be used to predict mortality (Sargent-Cox et al., 2010) but it can also be used as a prevention tool by identifying vulnerable populations (DeSalvo et al., 2005) and monitoring their health status (Miilunpalo, 1990). There were no data available on the health status of transit users in the

Region of Waterloo or Canada. Research in the Region of Waterloo found that self-rated health was higher in women, the young, the educated and individuals living in households earning over $30 000 per year (Statistics Canada, 2007c). Among Region of Waterloo residents participating in this study, self-rated health was higher in women, younger participants, and ones with higher education and higher income. The group of Waterloo Region transit users rating their health positively appears to represent the demographic profile of the Region of Waterloo. This consistency can be use in future research. It may be speculated that within a study population, the groups who perceive their health positively will be the same groups that rate their health positively in the general population.

5.1.5 Demographic Data

This study recruited residents of Waterloo Region who were transit users. The characteristics of the study sample were generally similar to demographic data collected by the Region of Waterloo. Waterloo residents were a slightly larger group of transit users in this study (n = 15; 28%) than expected based on census data (21%) (Statistics Canada, 2007c) and this is likely a difference caused by selection and attrition bias. The majority of study participants were female (n = 33; 62%) and this is consistent with the percentage of transit users in the Region of Waterloo who are women (60%) (Statistics Canada, 2007c).

The majority of transit users in the Region of Waterloo are under 35 years old (62%) (Statistics Canada, 2007c) and in this study that age group was not as proportionately large (n = 23; 43%). In the Region of Waterloo, 8% of transit users are over the age of 55 (Statistics Canada, 2007c) but in this study 26% (n = 14) of participants were over 55. This study sample is slightly older than expected, and this may be a result of exclusion criteria, whereby transit users under the age of 18 were not included in the study, especially since transit users in the Region of Waterloo are typically under 35.

Most transit users have a household income of less than $30 000 (Statistics Canada, 2007c) and in this study income was higher than expected with a median value of $38 000. Transit users in the Region of Waterloo typically only have a high school diploma (Statistics Canada, 2007c) but university graduates accounted for 41% (n = 22) of the sample. The study sample had more university graduates than expected for the general population in Ontario, and for transit users in the Region (Statistics Canada, 2007c).

Although there are no specific data on BMI of transit users in the Region of Waterloo, 46% of residents in the Region of Waterloo are classified as normal weight (Statistics Canada, 2007c) compared to 45%

(n = 24) of the study sample. There was no data on self-esteem or spirituality released from the Canadian Community Health survey, which was the resource on which these constructs were measured and these data cannot be compared to local or national averages (Statistics Canada, 2007a).

Based on available data, this small sample appeared to be representative of Kitchener-Waterloo transit users. The discrepancies in residency, income and education may be a result of the specific times and locations that were chosen for recruitment, inclusion and exclusion criteria used, and random variation.

5.2 Comparing Measures Of Mindfulness

This pilot study used three measures of mindfulness in an attempt to determine which types of measures could most accurately describe mindfulness. Both a qualitative and quantitative measure of transit mindfulness was created by the researcher for this study. The third measure of mindfulness was a general mindfulness scale found in the literature. This means several measures of mindfulness were used, to then determine how mindfulness varies based on the way it is being measured. Future research can use the information from this study to decide what type of measure should be used to assess mindfulness. A study looking at mindfulness in general, may choose to use a scale like the MAAS, but research looking at mindfulness during a specific activity may want to use a more specific measure. A benefit of using the Mindful Attention Awareness Scale on a sample of transit users adds to the body of research on this general mindfulness measures. So far, published data shows that the scale has been validated with large general populations (Brown & Kasser, 2005; Carlson & Brown, 2005) and cancer patients (Brown & Ryan, 2003; Carlson & Brown, 2005) only.

Although the measure of perceived exercise behaviours in the mixed-methods survey was the same measure of mindfulness used by Crum and Langer (2007) the results of this study support the decision to not use this as the primary measure of mindfulness. Since most transit users were not getting enough exercise through transit walking, most were not citing transit walking as a way that they get exercise. In future mindfulness research, qualitative mindfulness measures like this one should be used exclusively with populations similar to the hotel-maids, who are in fact accumulating adequate exercise through the activity of interest.

Based on the three mindfulness measures, the majority of the participants were considered mindful according to QLTM, a small majority was considered mindful according to the QNTM and the majority were not considered mindful according to the MAAS. None of the mindfulness measures single-handedly supported the conceptual model and only one measure had a statistically significant relationship with another conceptual model variable, and this is when it was age-adjusted only. Regressions with QLTM resulted in odds ratios that both increased and decreased when adjusted for covariates. Crude odds ratios that included QNTM always increased in magnitude when adjusted and regressions with MAAS always had a decreased magnitude of the odds ratio when adjusted. The MAAS measure had tighter confidence intervals than the other measures.

Future pilot research on groups similar to transit users, who may or may not be accumulating adequate exercise through the activity of interest, should consider using a measure of mindfulness similar to the

QLTM measure which was phrased to be specific to the behaviour of interest but did not define mindfulness by partaking in these behaviours. By using this measure, one's capacity to be mindful was assessed. In this case, transit users can be mindful of the value of walking to transit even if they are not walking enough for this to be exercise.

5.3 Results Of The Open-Ended Survey Questions

Including open-ended questions on the survey allowed for a more complete understanding of quantitative measures like transit mindfulness and perceptions of transit walking, as well as helping to understand the confounding effect of age in the quantitative analysis. The open-ended survey questions were helpful in understanding how participants of different ages defined exercise for themselves and others. Insight into the rationale used when participants think about exercise and transit walking was also a beneficial outcome.

Individuals considered walking to be exercise, but had a perception that others around them were not only walking, but also partaking in vigorous exercise as their main source of physical activity. Walking to transit was considered to be exercise by over half of the respondents. Although there was a group who said 'No' – transit walking is not exercise, there was a larger group who said it can be qualified as exercise, but it 'Depends on the distance'. Exercise was also perceived as something that must happen for certain durations at the gym and cannot be accumulated gradually throughout the day.

When participants were asked what their ideal physical activity level is, most listed these same fitness and exercise goals: being more active exercising more often and starting to exercise. It may be that there is a perceived hierarchy of exercises. Although walking is certainly exercise, perhaps it is not 'real' exercise or is not at a level of intensity that makes individuals feel like they are doing something good for their body. This discrepancy in responses is the lack of mindfulness that was expected in this research; although walking is seen as a type of exercise, it is seen as a secondary form of it and participants did not think that they were getting real exercise.

It appears that transit users do not consider transit walking to be exercise and it is also perceived as an insufficient way to meet basic exercise requirements throughout the course of the day. This is insight that can be used for future transit mindfulness interventions. Knowing that these are the perceptions held by transit users, intervention resources can focus on the amount of exercise that can be accumulated through walking to transit and highlight that fat-burning best occurs during walking and not via vigorous activity. It may also be important to note in an intervention resource that exercise does not have to occur all at the same time to benefit the body.

5.4 Qualitative Interviews

The qualitative interviews in this study were less fruitful than expected, but led to important findings. A problem with the qualitative interviews was that the questions were formed as a step-by-step argument for mindfulness and transit use that expected interviewees to follow the logical progression. Interviewees seemed unwilling and unprepared to answer these types of questions. Open, exploratory interviews would have been better suited to this research, but this would have been a risky choice with a novice interviewer. This style of interview may have also required interpretation of the interviews, which would require triangulation and more participants to reach saturation in themes and categories, both of which were impractical due to limitations of time and funding.

An unforeseeable issue was discovered during the qualitative interviews, and this was that the interviewees thought the student researcher was working on behalf of Grand River Transit. Although this increased tangential discussion in the interviews, this unintentional deception may have increased objectivity of responses in all aspects of the study among all participants, as there was no expectation for questions about mindfulness and health behaviours.

Although the qualitative interviews had tangential conversations, unexpected information was introduced, which will be of value in future transit research. Grievances from the interviewees alluded to the fact that transit use has many negative assumptions and values attached to it and these may be difficult for transit users to overcome, regardless of mindfulness. The expectation of this research was to find that transit users are, or at least have the potential to reflect positively on their transit walking but this does not seem to be the case. It appears that in a small city like Kitchener-Waterloo, transit use is rarely a choice of convenience or lifestyle but a necessity for individuals who cannot afford to travel in their own vehicle. Perceptions and biases appear to depend largely on personal experience with other transit systems as well as group norms. It appeared that two interviewees had a strong distaste towards transit, and these kinds of perceptions may be deep-rooted, which means future mindfulness interventions could potentially be ineffective. The results of the qualitative interviews may have been different in a larger city where transit is relied on for convenience and ease of transport as opposed to a smaller city like Kitchener-Waterloo, which as some interviewees implied, is only used by people with financial constraints.

The qualitative interviews were essential for helping to understand the perceptions and motivations behind transit use and future research could build on the findings from this pilot study. The interviews

would have been more enlightening if a more open and exploratory method was used to pursue unanticipated topics (Patton, 2002) and future research should adopt this approach, using the results of these interviews to create prompting questions based on themes like the negative stereotyping introduced in these interviews.

5.5 Pathways Of The Conceptual Model

The conceptual model led the quantitative analysis that looked for associations between key study variables. Analyses examined whether transit mindfulness was associated individually with perceptions of transit walking, transit walking behaviours and self-rated health. As well, whether perceptions of transit walking and transit walking behaviours were each associated with self-rated health. There is some evidence that the conceptual model is valid, through positive associations between variables. It is important to note that of all conceptual model pathways tested, using three different measures of mindfulness, only one analysis has a result that could be considered a significant association. This was the relationship between QNTM and perceptions of transit walking, and when controlling for age this relationship was significant, that is the confidence interval reached 95% significance, making it statistically significant. The relationship found in the Chi-square and correlation analysis between perceptions of transit walking and transit walking behaviours supports the premise of the study rationale. Since perceptions of transit walking were related to actual transit walking behaviours.

As expected, there is evidence that individuals who were transit mindful were more likely to perceive transit walking as exercise, walked further distances for transit and rated their health positively. It is worth exploring, in a larger study, whether mindfulness acts on self-rated health through variables that are both tangible, like transit walking behaviours, and intangible characteristics like perceptions of transit walking. If mindfulness has a direct effect on health through positive psychology and also through the perceptions of our own behaviours, it is potentially an essential trait that augments several pathways to good health.

There is preliminary evidence that transit mindfulness influences self-rated health, and also evidence that both perceptions of transit walking and actual transit walking behaviours are important elements in this pathway. Future research should test whether the associations between these four conceptual model variables are statistically significant relationships. In addition, future research can examine whether transit walking behaviours and perceptions of transit walking mediate the relationship between mindfulness and self-rated health.

5.6 Effects Of Covariates

Gender had a strong influence on analyses that included either mindfulness or transit walking behaviours or both, although these adjusted odds ratios did not reach significance. This may be an effect of women being the majority of participants. Women also tended to be more mindful, did not walk adequate amounts to transit for it to qualify as exercise, and perceived it as such. Despite this, women tended to rate their health positively. Future interventions on transit users may want to focus on women, as Crum and Langer (2007) did. Since women tended to be mindful already, small increases in transit walking behaviours could lead to even better self-rated health.

Adjusting for age in logistic regression analyses mostly increased the magnitude of the odds ratios. This influence may be the result of a generation gap where external factors lead to a discrepancy between age groups and their definitions of mindfulness and exercise, exercise capabilities and regimes. This is consistent with the literature, which has found that older people may not recognize walking as a form of exercise (Lee, Avis & Arthur, 2007). Older participants were mindful, had poor self-rated health, did not meet transit walking criteria and did not perceive their exercise as adequate. Future interventions could target older transit users with information stating that walking is exercise in hopes that this encouragement will increase walking that could lead to improved health, which would be augmented by pre-existent mindfulness.

Controlling for education increased and decreased the magnitudes of odds ratios, with no consistent patterns to be found. Education was used as a proxy for income measures since not all participants were willing to disclose their household income. Participants with lower levels of education tended to be more mindful although participants with more education walked further distances and rated health better. These associations were also seen when income was examined in the cross-tabulations. Future research should aim to recruit a more homogenous sample to determine the effect of education and income on mindfulness. Transit users with less education tend to be mindful, so future interventions that encourage walking behaviours could potentially improve health.

According to all three measures of mindfulness, participants who were mindful were also more likely to have high self-esteem. Self-esteem was correlated with two of the conceptual model variables (perceptions of transit walking and self-rated health) and when adjusted for in regressions, had a tendency to reduce the magnitude of the odds ratios. There is potential that questions of: mindfulness, perceptions of transit walking and self-rated health could all be measuring constructs similar to self-

esteem. The associations found between these variables are consistent with findings that mindfulness, self-esteem and perceived health are related (Samuelson et al, 2007; Zvolensky et al., 2006). In fact, if mindfulness is a type of placebo, placebos are thought to enhance the effects of exercise by an increase in self-esteem from expected results (Desharnais, Jobin, Cote, Levesque, & Godin, 1993). The relationship between mindfulness and self-esteem alludes to the overlap between mindfulness and perceived behavioural control or self-efficacy, which has a strong, potentially causal relationship with self-esteem (Lightsey et al., 2006). Since mindfulness in this study is a perception of one's behaviours, then this makes sense: a person with high self esteem may have a can be more likely to interpret behaviours positively. A better measure of mindfulness may not result in the overlap between these variables. When mindfulness is defined in a traditional Buddhist way, as mindfulness in the moment, the concept is certainly a unique form of positive psychology and would not measure, in effect, self-efficacy or self-esteem with regards to the perceptions of transit walking behaviours.

These four covariates showed influence on the conceptual model variables. Future research can aim to determine the relevance and effect of these covariates as well as others (BMI, confidence, income) with a larger sample. Future research can also target populations that were found to be mindful, like women, older people and those who have less education and encourage these groups to walk more. For example, walking to the next bus stop could potentially increase daily transit walking to meet criteria, leading to better health that is augmented by pre-existent mindfulness.

5.7 Results Compared To Crum and Langer's Hotel-Maid Study

The results of this pilot study show that age has a significant influence on mindfulness and should be considered influential in future research in this field. Other covariates that influenced relationships among explanatory variables were gender, income and self-esteem. The relationship with age is a particularly interesting finding when we consider the Crum and Langer (2007) study of hotel-maids.

This study had randomly assigned hotels (n=7) to either the intervention group or the control group and found that mindfulness in the intervention group increased significantly through the course of the study (perceived amount of exercise $p < 0.01$). At the beginning of the study, the groups did not differ significantly by any of their measured demographic variables. Since the workplace was the point of intervention the two groups did not differ based on socio-economic variables, which is important, as transit mindfulness research found income and education to be influential covariates. Another influential covariate in transit users was gender, but the groups of hotel-maids were also matched on gender (they were all women). The most influential covariate in the sample of transit users was age and this was the only variable that differed significantly in the groups of hotel-maids (mean age of intervention group = 34.1, SD = 9.2 ; mean age of control group = 42.4, SD = 12.5) and was therefore controlled for in all analyses.

Given that age influenced transit mindfulness, it would be a logical suggestion to mindfulness researchers to control for age in future research. It is important to note that there has been no original research published based on Crum and Langer's (2007) hotel-maid study so far. The hotel-maid study controlled for age for a different reason, but these transit user findings serve to validate the intervention results – surely the results from the hotel-maid study cannot be accounted for by the confounding influence of age and no other covariates examined in transit users had the potential to inflate results of the Crum and Langer (2007) study, as they were found to be adequately matched.

Crum and Langer (2007) did not report measures of self-esteem and it would be of interest to see if self-esteem was related to mindfulness among the hotel-maids. Future research in mindfulness should consider the overlap between these two variables (Samuelson et al., 2007; Zvolensky et al., 2006) when assessing mindfulness or creating new mindfulness measures.

This study was chosen as a model because physical activity among the hotel-maids and transit users appeared to be similar to transit users; these groups were both accumulating exercise through daily tasks. These groups were also potentially similar in terms of socio-economic status. The strength of the

results based on controlling for age are an important finding but there were still several flaws in Crum and Langer's design (2007). First, the measure of mindfulness was based on whether participants listed their job as exercise, but there are other behaviours that are worthy of mentioning which would imply mindfulness. For example, walking to transit or to work, taking care of children, or doing housework are all similar behaviours. It may be that a hotel-maid who listed housework as exercise would have been considered mindless but one that listed job-related housework would have been considered mindful.

Second, it is not clear that the intervention increased mindfulness or that the results found were a direct effect of increased mindfulness. The mindfulness intervention was information about exercise and burning calories and increased knowledge about the poster content in the post-intervention survey does not imply that one is mindful. If mindfulness means that one is exerting unique control over personal actions (Langer & Moldoveanu, 2000) then it is not clear that knowledge that housework burns calories is in-the-moment mindfulness. It was expected that weight loss occurred due to mindfulness based on self-reported physical activity and caloric consumption, but the study handout (included as appendix A) which was the intervention resource included specific values for calories burned while exercising. The subtlety of this information could have made the women more conscious of nutritional labeling and food consumption without their knowledge. Further, the hotel-maids were only followed for one month and their weights may have been significantly different between the two time points but that does not mean it was weight loss beyond regular monthly fluctuations in weights.

Finally, the hotel-maid study (Crum & Langer, 2007) used a randomized control trial design whereby seven hotels were assigned to be in either the intervention or control group. Data analysis was done based on a sample size of 84 participants, but the level of randomization was at the hotel level, so the sample size is actually much smaller (n = 7). It may be that statistical analysis at the appropriate level may have found no results at all.

Future interventions in mindfulness should consider the effect of age when designing studies and analyzing the data. It is also important to also consider the limitations of the design used by Crum and Langer's hotel-maid study when interpreting their results and designing interventions based on their findings.

5.8 Limitations Of This Study

5.8.1 Cross Sectional Design

This study was cross-sectional because of limitations of time and funding. With a longitudinal design, temporal trends could have been examined. For example, whether transit walking behaviours precede transit walking perceptions, whether transit walking behaviours precede self-rated health or whether mindfulness precedes self-rated health. The temporal relationship between transit walking behaviours and perceptions of transit walking is particularly interesting. Longitudinal research on transit users and perceptions of transit use would surely be informative, especially in the Region of Waterloo where transit is being improved in the near future. Locally, future research can examine whether perceptions of transit walking change as available transit transforms from buses to light rail, and as transit hubs encourage residents to walk further distances to access this improved transit.

5.8.2 Recruitment And The Sample Recruited

It was difficult to recruit participants for this study. Initially, recruitment was supposed to occur in the Charles Street bus terminal, but access to this space was denied. Since transit users waiting for busses are a captive audience, this location would have probably been more successful. Instead, recruitment occurred at bus stops, outside of the bus terminal and inside public buildings. Public buildings were ideal for recruiting over long periods of time, as the researcher could remain indoors during bad weather, could leave recruitment materials safely on display is she needed to step away for a minute, and could stay at the post for hours on end while seated. A flaw was that passers-by were not always transit users, and in this case, most people in public buildings during work hours in downtown Kitchener did not have jobs, were very low income and these characteristics led to complications which produced a very high attrition rate.

Recruitment outside of the bus terminal and at bus stops was a better way to access transit users specifically, but low transit use in the Region of Waterloo means that there are never large groups of people at transit stops. Transporting the recruitment sign, accessing recruitment forms, and standing outdoors for more than one hour at a time were all difficult aspects of bus stop recruitment. It also seemed that recruits had difficulty filling out paperwork while standing outdoors, even with a clipboard to write on. Future research with transit users should make access to indoor transit hubs a priority before proceeding with research. This would lead to a captive audience, and also an established and comfortable work environment for the researcher.

With a sample size of 53, another limitation of the study was heterogeneity. Crum and Langer (2007) recruited only hotel-maids who all had the same income, work hours, and socio-economic status. This study had a diverse sample of transit users, making analyses difficult. When measures were dichotomized and examined in cross tabulations, there were several instances where no participants fell into certain groups. The results of some analyses are numerical figures cannot be interpreted. A way to prevent this in future research in both mindfulness and transit use may be using more strict inclusion and exclusion criteria during recruitment, however considering the difficulties encountered to recruit participants, researchers may want to be cautious when setting strict timelines for study recruitment.

Groups worth focussing recruitment on may be young males who are overweight, as they walk adequate distances, are not mindful. Both young people and men were poorly represented in the study sample. Although there are other groups who will benefit from targeted interventions in the future these groups, women and older residents specifically, were well represented in the recruited sample.

5.8.3 Sample Size

As pilot research into the feasibility of mindfulness interventions with transit users, this study set a sample size of 50 as a goal. Crum and Langer's (2007) study size for a quasi-experimental design intervention (n = 84) was not much larger. It was suggested by a researcher doing exploratory work (personal communication, October 5, 2009) that 25 participants is adequate for a study with this scope. Of course, the most important factor was feasibility based on time and financial constraints. A larger sample would have surely given more robust quantitative results, but the large effect size attained by Crum & Langer (2007) is likely not attainable with transit-users as a population, or with a study design less confounded that the hotel-maid study.

There was an attrition rate of 42%, leading to an eventual sample size of 53 participants. With more time and a larger budget, a study sample of 100 could have been attained leading to more robust statistical results. In cases like income measures, where 19% of respondents declined to answer, it became difficult to extrapolate from the statistics based on data for 43 people.

There was a lack of power in this study and more odd ratios could have been interpreted as significant if a 95% CI criteria was not used, although correlations and Chi-squares were considered significant at α = 0.10. Also, with a larger sample, possible interaction and mediation could have been tested for. The lack of power in this study was from a small sample size and new measures that were inadequate. Based on the associations between conceptual model variables in this study and the supporting literature, there is

evidence that the conceptual model is correct. Better measures and a larger sample size in future research may result in statistically significant relationships.

There were some benefits to the sample size, as it allowed for the use of a mixed-methods survey, which was an essential element to the study, which enhanced the interpretation of quantitative information. Further, the small sample size made data input a more manageable task. This was important because data needed to be analyzed soon after the mixed-methods surveys were completed so that potential participants for the qualitative interviews could be selected and contacted. Since only ten participants fit the criteria for the qualitative interview, all participants could have feasibly been interviewed if they were interested in participating.

Future pilot work with modest expectations for sample size should consider using a mixed-methods approach, as comprehensive research can be done with a relatively small sample size and a variety of methods. Using a significance level of $\alpha = 0.05$ and a modest medium effect size, future transit interventions should aim for a final sample size of about 382 participants, which, by attrition rates found in this study, may require 660 recruits (Appendix L).

5.8.4 Mindfulness As A Construct

This study had three measures of mindfulness which appear to have little overlap between them, which was consistent with other mindfulness literature that found either no correlation or weak correlation between different measures of mindfulness (Carmody & Baer, 2008).

The first measure of mindfulness in this study was a qualitative measure of mindfulness, the second was a quantitative measure and the third was the MAAS mindfulness measure (Brown & Ryan, 2003). The results of this study show that the qualitative and quantitative measure of mindfulness created by the researcher was more consistently related to other conceptual model variables. This may be a result of what Grossman (2008) defines as 'biases of inventory developers' whereby the operational definitions of mindfulness in the literature 'often seem to correspond more closely to the researcher's own prior academic interests than to a deep understanding of Buddhist concepts'. It may be that the measures created for this study had the best outcomes because they were designed to measure transit mindfulness as opposed to general mindfulness or that the measures are not actually measuring mindfulness. For example, perceptions of transit walking were closely related to transit mindfulness. It may be that 'transit mindfulness' in this study is another form of 'perceptions of transit walking' and is

not a measure that fully articulates the idea of in-the-moment mindfulness. This construct validity is a limitation of this study.

Grossman (2008) cites construct validity acts as a serious limitation to most mindfulness research. This limitation can be seen in work by Langer (Langer, 1989; Langer & Moldoveanu, 2000; Crum & Langer, 2007) who started the academic research on mindfulness. Past work by Langer (Langer & Imber, 1979; Langer & Imber, 1980; Langer & Chanowitz, 1981; Langer & Piper, 1987; Crum & Langer, 2007; Delizonna, Williams & Langer, 2009) defined participants as mindful by their inclusion in a study's intervention arm. If a group received a prompt that was to make them more mindful, then this group was described as 'mindful' and differences between the 'mindful 'and 'mindless' groups were compared on key study variables. Mindfulness has been defined by Langer as exerting unique control over personal actions, allowing for awareness, perspective and context to have significant effects on the body (Langer & Moldoveanu, 2000) and health but the research does not include operational definitions of what mindfulness is, and there have been no direct measures of mindfulness that captures mindfulness in-the-moment.

Self-report scales have been created to capture the general tendency to be mindful in daily life (Baer, 2009) based on definitions of mindfulness. Scales of mindfulness include but are not limited to: the Langer Mindfulness Scale (Bodner & Langer, 2001) Freiburg Mindfulness Inventory (Bucheld, Grossman & Walach, 2001), the Mindful Attention Awareness Scale (Brown & Ryan, 2003), the Kentucky Inventory of Mindfulness Skills (Baer et al., 2004), the Cognitive and Affective Mindfulness scale (Feldman, Hayes, Kumar, Greeson & Laurenceau, 2007), the Southampton Mindfulness Questionnaire (Chadwick, Hember, Mead, Lilley & Dagnan, 2005), the Philadelphia Mindfulness Scale (Cardaciotto, Herbert, Forman, Moitra & Farrow, 2007), the Five-Facet Mindfulness Questionnaire (Baer, Smith, Hopkins, Krietemeyer & Toney, 2006), and the Toronto Mindfulness Scale (Lau et al., 2006). These scales aim to validate the mindfulness construct but in doing so have trivialized the concept and altered the original meaning (Grossman, 2008). In attempting to make mindfulness a valid construct, it appears that mindfulness scales lose the 'essence' of the in-the-moment mindfulness that is being measured. It may also be that more mindful people are more self-critical and would therefore have lower scores of mindfulness, making a true assessment of mindfulness nearly impossible. The current available measures of mindfulness require introspection and if this is the case then a non-mindful person would not assess themselves accurately.

There has been criticism of mindfulness as a construct (Grossman, 2008) and there has been much difficulty in developing tools to define and assess mindfulness (Baer & Walsh, 2009). Despite using three measures of mindfulness in this study it is difficult to say if any are better or worse than the rest. This research can be used to add to the body of literature of mindfulness, as the reliability of the MAAS was tested, as well as the validity of transit mindfulness measures. Mindfulness research is in need of clear and valid operational definitions as well as reliable measures. Future research should examine construct validity by comparing the results of mindfulness scales with the broadly-defined measures of mindfulness in the literature but should be mindful of the traditional Buddhist concept while doing so.

5.9 Implications For Future Research

5.9.1 Talking To Stakeholders

Preliminary interviews with stakeholders were an indispensable step taken by the researcher. These interviews were a starting point for the research and led the choice of a research question. This rooted the research so that it would be of interest to stakeholders in the Region of Waterloo. It was assumed that this step increases the likelihood that stakeholders will have a vested interest in research findings and will use study findings to guide programming or funding decisions, which, may eventually improve the health of local residents.

Stakeholders were enthusiastic to give feedback and were interested in learning the eventual results of this study. However, one of the limitations to this study was not being granted access to the Region of Waterloo facilities. Access to the bus terminal could have reduced selection bias, attrition bias and led to a larger sample size which would have created more robust quantitative findings. All of these are limitations of the study, and limit the relevance of study findings to the stakeholders. Ironically, the stakeholders that were interested in shaping the study were unwilling to support the study in its implementation. This is certainly a challenge in doing research with stakeholders in mind. Although this was never discussed, conceivably, access may have been granted if the research purpose and methods conformed to specific demands of the decision-makers. However, this could have compromised the objectivity of results and the relevance of the results to a student's thesis requirements or the academic literature that the research is building on. A suggestion for future researchers in this situation may be to propose during stakeholder interviews that special permissions be granted to the researcher from local government if research is being done with their interests in mind, even if a study design has yet to be determined.

5.9.2 Survey Measures

There were four conceptual model variables and these measures could potentially be improved in future research.

To validate measures of transit walking behaviours, pedometers and travel diaries would be an excellent addition to future research on transit walking behaviours as transit walking measures were based on self reported distances and approximated times. This data could create more accurate measures of transit walking behaviours which could then be used to calculate calories burned during transit walking. Not only would this be interesting as research findings, but giving this data back to participants could be part

of a future mindfulness intervention study. For example, based on this study's mean values a hypothetical participant would weigh 167 lbs and spends 121 minutes each week walking to and from transit. This person burns 712 calories per week (University of Maryland, n.d.) or the equivalent of 11 lbs worth of calories per year. This type of resource would be similar to the poster created by Crum and Langer (2007) but would be a personalized and more meaningful resource.

It could reasonably be argued that perceptions of transit walking were not a uniquely different measure than the quantitative measure of transit mindfulness. Perceptions of transit walking determined whether walking to transit is considered good exercise, in general and the QNTM measured whether personal transit walking is considered good exercise. Future research should not choose between these two measures, but can examine both to determine variability based on whether perceptions of transit walking change when the question is framed from an individual or general population level.

There are two possible improvements for a measure of mindfulness. A future transit study that used a brief survey at recruitment may determine mindfulness by asking participants what they are thinking at that moment. Research that would occur with committed participants could give a device that has been set to beep at random times during the day, with the expectation that participants write down their feelings in a journal at that moment. If mindful awareness involves paying attention to what is happening 'in the now' and being in the present moment (Tacón, 2008) then responses based on these measures could capture mindfulness, as it is defined, if a participant shows insight to attention, perspective and context (Langer & Moldoveanu, 2000) of the present moment.

Future research on transit mindfulness can also use more objective measures of health, using Crum and Langer (2007) as a guide. Their researchers manually measured the participants' weight, body fat percentages, body mass index, waist-to-hip ratio and blood pressure (Crum & Langer, 2007).

5.9.3 Groups To Target

The results of this pilot study indicate that future mindfulness interventions targeting transit users would be valuable, especially when the effect of age is considered.

One option is an intervention that could be tailored towards populations that are mindful but are not getting adequate exercise. An example of this would be older and female transit users. Interventions could encourage walking to the next bus stop or getting off the bus a stop early to increase transit walking. This would emphasize the value in walking regardless of the purpose, distance, and current personal fitness level. If older and female transit users are mindful but do not reach physical activity

criteria, future interventions could also encourage these groups to see the value in and increase their levels of transit walking, walking for errands and housework. Older participants especially would benefit from this type of intervention since their health tends to be rated more poorly. This type of intervention may want to focus on the idea that transit stops are designed in a way to reduce walking which would shift the blame away from the individual toward the built environment and the Region of Waterloo.

Since this approach would not use victim-blaming it may be a more successful approach to encourage walking to the next bus stop. It may be empowering for transit users to feel as if they have to personally fight against the convenient design of transit routes to maintain their health. Inclusion criteria for a study like this would want both men and women over 50 who have an annual income below $30000, do not report exercise and use public transit as their main method of transportation.

A second option worth considering is an intervention similar to Crum and Langer (2007) which could be targeted towards populations that are accumulating adequate exercise through transit walking but are not mindful, like younger males. This group currently rates their health positively, but this is likely an effect of age, as this group tends to be overweight. These findings were consistent with data from the Region of Waterloo – purposeful walking is highest in the region by those who are over 35 and residents between 35 and 49 have the highest likelihood of obesity. By being more mindful, transit walking could be perceived as exercise and this would lead to improved self-rated health. Mindfulness interventions implemented among young men in good health may have the capacity to maintain good health as age restricts ones capacity to do physical activities beyond walking and also lead to a healthier body weight in the meantime. Inclusion criteria for this type of study would ask for men who were under 50 and used transit as their main method of transportation.

Exclusion criteria in this study were lenient and allowed for most transit users to take part in the study. If either of these suggestions is to be used in future interventions, inclusion criteria should be stricter so that a homogeneous population similar to Crum and Langer (2007) is recruited. Or, a population of low income middle-aged women that is similar to Crum and Langer (2007) could be recruited to compare mindfulness of different behaviours. Ideally, participants would have similar demographic characteristics and if possible, be homogeneous based on measures found in the conceptual model as well.

5.9.4 Study Recruitment

Based on Statistics Canada (2007c) figures, the sample from this study had higher income and education than average for transit users in the Region of Waterloo. This sample may have been more representative if recruitment occurred inside of the bus terminal as opposed to the sidewalk outside, as well as during the evening instead of daytime hours. Recruiting at transit hubs during daytime hours seemed to have attracted commuters who tended to be older, more educated, and higher income. This may not have been the case if surveying occurred at recruitment, as attrition rates were high among lower income recruits. A problem with surveying or recruiting transit users near bus stops is that potential recruits likely do not have more than a few minutes to spare before their bus arrives. Morning rush hour, for example, was found to be a bad time to recruit participants as most were worried about being late for work and most residents were unwilling to take the time to fill out a consent form, let alone complete a brief survey. Based on the recruitment in this study, the best times to recruit were in the afternoon and the best locations were outside or around transit hubs.

5.9.5 Survey Implementation

According to Statistics Canada (2007b), transit users tend to be lower income. In this study, very low income individuals were difficult to contact, leading to study attrition. Future studies should be hesitant to rely on telephone contact if representation of very low income individuals is a priority. Although email or communication through the Internet was not explored and a means of communication, it is likely that this group does not have reliable access to the Internet and this would also be an unsuccessful way to contact very low income individuals. If possible, future studies of transit users may be most effective if using simplified surveys that can be completed at recruitment in a matter of minutes. Recruits can then be contacted by telephone to answer a longer version of the survey, which can also be used to check for reliability of measures or to gather data on attrition rates. This attrition data can be used to design surveys with stratified sampling to ensure representative samples are found. It should be noted that the survey in this study was longer than necessary given the scope of the pilot study, but future interventions may find all study questions useful and relevant.

5.10 Suggestions For Future Research

5.10.1 In The Region Of Waterloo

There were many lessons learned in this study that can be used in future research on transit users in the Region of Waterloo. Recruitment would be most successful in the afternoon at transit hubs. Interventions to increase mindfulness among those who walk sufficient amounts but are not mindful could be beneficial for younger males but recruitment must also target this group, as they were not well-represented in this sample. Older residents and women should not be difficult to recruit, and these groups would benefit from interventions that encourage increased walking throughout the course of the day. Inclusion and exclusion criteria should reflect the interventions being tailored to specific of groups of transit users.

There are many study designs to be considered and this will depend on research questions, but considering attrition rates it may be of value to implement a brief survey at recruitment to gather baseline data and also to measure in-the-moment mindfulness. As the Region of Waterloo embarks on a light-rail project that will modernize transit, it may be of value to use the information from this study to lead future work that looks at placement of transit stops. Hubs that are placed in high-density areas may increase transit walking, as a resident may be willing to walk to the light-rail if the time saved by using the new transit system outweighs the extra time it takes to walk to the transit hub. Perceptions of transit walking could change because of this, and perceptions of transit as well. If this is the case, an increase in mindfulness, likely with the help of mindfulness interventions, has potential to increase health in residents alongside these changes in the built environment.

5.10.2 In Public Transit

Future research on transit users may find the suggestions for the Region of Waterloo, stated above, to be helpful. A temporal design would certainly be superior to cross-sectional. Recruitment will likely be most efficient near transit hubs in any city and the value in the short survey at recruitment should be expected elsewhere. Any city embarking on improvements to transit may want to consider examining changes in perceptions of transit and transit walking behaviours of regular transit users who are affected by transit improvements compared to those that are not. Other cities may not have the same demographic profile of transit users that the Region of Waterloo does and so specific groups worth targeting here may not be relevant elsewhere. It can be expected that groups worth targeting will be those who are mindful but do not accumulate sufficient exercise as well as those who are not mindful

but are accumulating sufficient exercise by walking to transit, although the demographics of these groups in other regions are unknown. The average transit walking distance of 9.72 km/week should be used as an indicator of sample representativeness, as this same value was found in other research of transit users (Besser & Dannenberg, 2005).

5.10.3 In Mindfulness Research

Future research in mindfulness that is looking at specific sub-populations may want to start with a pilot study like this one. Although Crum and Langer (2007) rightfully assumed that hotel-maids were getting enough exercise but were not mindful of it, this was not the case with transit users. Transit users were mindful but were not accumulating enough exercise through transit walking. It may be of interest to recruit a sample that is similar, demographically to the hotel-maids and determine their transit mindfulness or mindfulness according to one of the many mindfulness scales.

The qualitative measure of transit mindfulness (QLTM) was appropriately suited for this population and the scope of the pilot study, as it measured mindfulness of the value in transit walking overall, which does not depend on current walking but suggests that if transit walking were to meet criteria, which would be perceived as adequate and participants would be mindful of its value. Any future research in mindfulness should include a specific mindfulness measure that represents the behaviour or mindset of interest. Also, including a mindfulness scale in a survey can serve as a relevant contrast to the specific mindfulness measure and also helps to build upon research in the burgeoning field of mindfulness scales.

Mindfulness may be best measured by asking people what they are thinking about at that moment or supplying recruits with basic technologies where they can receive random reminders to log what they think about or perceive at that moment. Although there is no literature to date showing that these measures have been used, they may be a large improvement over current measures that do not capture the essence of the Buddhist concept of mindfulness.

6.0 Conclusions

Using a representative sample of residents from Kitchener-Waterloo, Ontario who were recruited at transit hubs, this study examined whether transit users were mindful of the exercise they accumulated while walking to transit. Transit mindfulness influenced perceived health and perceptions of transit walking. Most analyses did not reach significance due to a lack of power, even after adjusting for select covariates, but there is promise that future research can find significant relationships. Future research should focus on populations that are mindful but are not accumulating adequate exercise as well as populations that are not mindful but are accumulating adequate exercise.

Results supported the need to create better measures of mindfulness that capture the true meaning of in-the-moment mindfulness that was adapted from Buddhism. The results of the analyses with three different mindfulness measures in a population of transit users, who have not yet been examined, will be of use to researchers in mindfulness and positive psychology.

The findings on health and perceptions of transit users as well as their transit walking behaviours can be used by health or urban planning researchers and regional health units. For example, transit stops are placed frequently to encourage transit-use but this may be reducing the amount of exercise a transit user can get throughout the course of the day.

In terms of applied mindfulness research hotel-maids were meeting exercise criteria every day, but not all transit users are getting adequate exercise through transit use. The value in pilot research was being able to determine if the assumption that a population is not mindful of their adequate exercise is in fact true. In transit users, this was not necessarily the case. Future applied mindfulness research should test these assumptions before proceeding with interventions. If transit users cannot be engaged with mindfulness interventions, there is less of a chance that mindfulness interventions can be used for other groups who are not as active throughout the day. If transit mindfulness is indeed a similar construct to mindfulness in general, then there is also no reason to restrict future interventions to transit users.

At the local level, there is an opportunity for interesting research. Through the qualitative component it was also found that transit is perceived as undesirable and a ‘worst-case scenario’ when choosing a mode of transportation. It may be of interest for the Region of Waterloo or any other city that will be implementing flashier and more efficient transit to see if these negative perceptions of transit diminish

and whether walking to transit increases when an advanced light-rail, rapid-bus, streetcar or subway transit line is created.

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Appendices

Appendix A: Crum And Langer Poster

The Surgeon General *strongly advises that all adults should accumulate at least 30 minutes of physical exercise per day.*

Did you know . . .

YOUR WORK IS GOOD EXERCISE!

It's true! Exercise does not need to be hard or painful to be good for your health. You can get the same results by doing active housework! It is simply a matter of burning calories and using your muscles. All you have to do is move around enough every day to burn at least **200 calories**. According to the American College of Sports Medicine. . .

Changing linens for 15 minutes burns 40 calories!
Vacuuming for 15 minutes burns 50 calories!
Cleaning bathrooms for 15 minutes burns 60 calories!

So, assuming that it takes you about ----- to clean one room, cleaning ---- in any given day is the equivalent of getting a 1 hour gym workout!!
NOW THAT'S GOOD WORK!

THE BENEFITS OF AN ACTIVE LIFESTYLE

- ☐A HEALTHY WEIGHT
- ☐A HEALTHY HEART
- ☐LESS LIKELY TO GET SICK
- ☐LESS FAT
- ☐MORE STRENGTH
- ☐MORE CREATIVITY
- ☐LESS ANXIETY
- ☐BETTER MOODS
- ☐LESS DEPRESSION
- ☐BETTER SLEEP
- ☐LOWER RISK OF DIABETES, HYPERTENTION, AND OTHER CHRONIC DISEASES!

This means that if you are actively vacuuming, changing linens, or cleaning for at least 2 hours a day, you are fulfilling the Surgeon General's recommendations for an active lifestyle. Now that is good work!

The time it takes to burn 200 calories is different for each person. The calories reported above are for the average 140 lb woman. We do not want you to stop doing other exercise that you may be doing outside work. We just want you to be aware that a day cleaning rooms is a good source of daily exercise.

Congratulations on leading an active lifestyle!

Appendix B: Contacting Stakeholders

B.1 Letter to Stakeholders

My name is Tanya Christidis and I'm a Masters student at the University of Waterloo in Health Studies. In an attempt to do research that I am not only passionate about, but that also is applicable to real world problems, I am looking to study the effects of the Region of Waterloo's LRT public transit plans on the health of our residents. For example: whether or not there are health benefits of LRT development and whether or not these effects are equally distributed, or whether individuals in greatest need of public transit access recognize the potential for public transit to increase their quality of life.

To ensure that my findings and results will be relevant to decision-makers in the Region, I am asking for your input on the potential thesis topics I am considering. Your opinions on what the most pertinent research will be to assess and evaluate the public transit system will guide the study that I perform. Since you are involved with the 'Places to Grow' planning, your opinion is invaluable.

I am asking if you could help me by reading the short list of potential topics and tell me which topics are of interest to you and the Region, but also things that I may have missed and you think would be important information to obtain.

If you would like to assist me in creating mutually beneficial research topics, I have attached a file for you to read and I would be more than willing to receive your input through email, telephone or a meeting.

Thank You

B.2 Info to Stakeholders

Knowing that perceptions of benefits is a stronger indicator of support than actual benefits, are there differences between the perceived gains/losses to health from public transit development?

- Based on individual income
- Based on neighbourhood inequality
- Based on current public transit use
- Based on physical activity level
- Based on current health status/ chronic disease status
- Based on age/gender

Knowing that public transit has the potential to reduce or exacerbate health and well being, are these effects equitably distributed amongst the populations that they intend to serve?

- Based on individual income
- Based on neighbourhood inequality
- Based on current public transit use
- Based on physical activity level
- Based on current health status/ chronic disease status
- Based on age/gender

Knowing that public services like public transit can reduce barriers for travel to those with lower incomes and fewer mode options are less affluent members of the population aware of the intentions of public transit planners, and do they recognise the potential for improved quality of life and health with this development?

- As qualitative interviews
- Based on current health
- Based on physical activity
- Based on community engagement or political awareness
- Based on income
- Based on perceived income disparity
- Based on neighbourhood
- Based on employment status
- Based on location of employment

Knowing that public transit plans serve to provide service to established mixed-use communities as well as developing communities, are there health differences between two neighbourhoods under consideration as public transit hubs and are there barriers to developing communities that would prevent health improvement with increased public services?

- Based on physical activity
- Based on car use/walking levels
- Based on neighbourhood layout
- Based on neighbourhood services
- Based on income
- Based on ethnicity/culture
- Based on gender
- Based on employment

B.3 Stakeholder Interview Results

A Region of Waterloo Planner

- Don't do #3
- It is well acknowledged that this is not the case
- Things like the iXpress were started regardless of public approval and approval comes with time and increased use
- Opinions of people are irrelevant
- Opinions of funders make the difference
- Talk to Pat Fisher from the region
- Walkability, Urban density
- Public transit, Health

A Member of Ontario's 'Places to Grow' Program

- #4 draws a real relationship to how cities are built
- does public transit really work or is the urban design the key
- are they both the keys... ?
- Do you need them both?

A Mayor within the Region of Waterloo

- question 1 (first choice) and question 4
- of use for policy makers

A Mayor within the Region of Waterloo

- Read Vital Signs (released Oct 7)
- #3 is good if looking at the lower income groups
- Ensure there is no bias when looking at groups who have now started to have the green shift
- Seeing public transit as a status symbol is a new thing that may not last
- 3a is good
- 4a want to know if it simply reduces more future demand for roads
- Look at population growth projections
- When does public transit use become a status symbol for high income people?
- How does the perception change as you move up the ladder?
- How can we prevent increased car use as low income people move up the ladder?
- What incentives keep people using public transit as SES changes?
- Free public transit?
- Would ridership change if public transit were free?
- What is the cost? What is the appetite?
- With better access and routes, 30% of Canadians would use public transit
- Current capacity is for 10%
- No infrastructure for growth
- Try to be future oriented
- Ensure proper baseline stats
- Talk to Director of Public transit Planning

Appendix C: Measures, And Survey Questions By Study Objective

Determine public transit use	
i. Regular means of transportation	What is your usual method of transportation?
ii. Adequacy of walking to and from the bus stop for exercise	I think I am getting adequate exercise from walking to and from public transit every day. Do you strongly agree, agree, agree slightly, are you neutral, disagree slightly, disagree or strongly disagree?
iii. Transit trips per week	How many public transit trips do you take per week?
iv. Amount of walking trips to the bus stop	For how many of those trips do you walk to the bus stop?
v. Amount of time spent walking to the bus stop	How much time do you spend walking to the bus stop every day?
Determine biases and assumptions about public transit use	
vi. Describe why transit is personally used *	Could you describe why you take transit?
vii. Preferred method of transportation *	In an ideal world, what means of transportation would you use to get around?
iii. Transit adequacy for exercise	Walking to public transit a good way of getting exercise. Do you strongly agree, agree, agree slightly, are you neutral, disagree slightly, disagree or strongly disagree?
ix. Reasons for public transit use*	Could you maybe think of reasons that people take public transit?
x. Feelings towards public transit*	How do you think people feel about taking public transit?
xi. Feelings about people taking public transit*	How do you think they feel about people who take public transit?
Determine self-rated personal physical activity and health	
i. Self-rated health	In general would you say your health is excellent, very good, good, fair or poor?
ii. Described personal health*	How would you describe your general health and well-being?
iii. Described lifestyle *	Can you tell me about your lifestyle?
iv. Exercise levels	On a scale of 1-10, with 10 being a large amount and 1 being none, how would you describe the amount of exercise you got during the past 30 days?
v. Engagement in vigorous activity	Do you partake in vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?
vi. Weekly vigorous activity	During the last 7 days, on how many days did you partake in vigorous physical activity?
vii. Time spent in vigorous activity	How much time did you spend doing vigorous activities on one of those days?
iii. Engagement in moderate activity	Did you partake in moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis?
ix. Weekly moderate activity	During the last 7 days, on how many days did you do moderate physical activities?
x. Time spent in moderate activity	How much time did you usually spend doing moderate physical activities on one of those days?
xi. Engagement in walking	Do you partake in walking behaviours?
xii. Weekly walking activity	During the last 7 days on how many days did you walk for at least five minutes at a time?
iii. Time spent walking	How much time did you usually spend walking on one of those days?
iv. Inactivity level	During the last 7 days, how much time did you spend sitting on a week day?
xv. Height	What is your current height? In either feet or centimetres
vi. Weight	What is your best estimate of your current weight
vii. Stress	How stressful would you consider most days of your life? If we count 5 as extremely stressful, 1 as not at all stressful and 3 as moderately stressful, where would you put yourself?
iii. Self-esteem	I see myself as someone who has high self-esteem. Do you strongly agree, agree, agree slightly, are you neutral, disagree slightly, disagree or strongly disagree?
ix. Anxiety	Over the last 7 days how anxious did you feel?
xx. Confidence	Over the last week how confident did you feel?
xi. Gym membership	Are you a member of a health club or gym? Yes or no? If so, during the last 7 days how many days did you go to the gym?
xii. Diet	During the past month how would you describe the amount you ate? During the last month did you change your diet and eating habits for any of the following reasons? During the past week how many {servings of fruits and vegetables, caffeinated beverages, alcoholic beverages, glasses of water, sugary foods} did you have each day?

iii. Smoking	During the past week how many cigarettes a day did you smoke?
iv. Current and previous health diagnoses	Has a doctor ever told you that you have any of the following?
Determine perceptions of physical activity and health	
i. What constitutes exercise*	When you think of exercise or people exercising what do you consider exercise to be?
ii. Whether exercise is necessary for health	It is necessary to exercise to be healthy. Do you strongly agree, agree, agree slightly, are you neutral, disagree slightly, disagree or strongly disagree?
iii. Described definition of exercise*	When you hear people talk about exercise what kinds of things do you think of? / Do you think of exercise as part of a healthy lifestyle?
iv. Described personal exercise*	Can tell me about ways that you get exercise on a daily basis?
v. Ideal physical activity level*	In an ideal world, what would your physical activity level be?
vi. Intentions of physical activity*	Is this ideal based on health ideals or do you enjoy the activity in itself regardless of the health effect?
vii. Whether daily exercise is adequate	I think I am getting adequate exercise for health every day. Do you strongly agree, agree, agree slightly, are you neutral, disagree slightly, disagree or strongly disagree?
Determine mindfulness and potential power of mindset	
iv. Knowledge of mindfulness as a concept*	Have you ever heard of mindset?
v. Whether mindfulness has ever been reflected upon*	Have you ever considered your mindset?
vi. Current mindfulness while walking to transit*	What do you think your mindset is while walking to transit?
vii. Value of mindfulness *	Do you think mindfulness if a positive or negative thing to have in your life?
iii. Mindfulness in other transit users*	What do you think people's mindset is about public transit?
ix. Spirituality	Do spiritual values play an important role in your life? Yes or no?
Determine whether mindfulness can make a difference in transit related walking	
iv. Whether a mindfulness could make walking enjoyable *	What would you expect to happen if started to consider walking to transit stops as a form of exercise?
v. Required change for mindfulness shift*	Can you foresee a reason for your mindset about public transit to change?
vi. Expected impact of change in mindfulness*	Do you expect that a different mindset about transit use would impact the way you feel when you take transit?
Determine whether mindfulness will make a difference in overall health	
i. Effect of shift of mindfulness on health*	Do you expect that a different mindset about transit would impact your health and well being?
ii. Expected outcomes*	If a mindset shift were to lead to health outcomes, what might those outcomes be?
Determine variability in these responses based on descriptive data collected	
i. Car ownership	Which of these best describes you? Yes I have a car, no but I have access to a car, or no I have no car and also have no access to a car?
ii. Education	How would you describe your education?
ii. Marital Status	What is your marital status? Married, living common law, widowed, separated, divorced, or single and never married?
v. Cultural/Racial background	How would you describe your primary cultural and racial backgrounds
v. People in household	What is the number of people in your household
vi. Income source	I am going to list potential sources of income, and would like you to tell me which of these is your main sources of income
ii. Income	What is your best estimate of the total income, before taxes and deductions, of all household members from all sources in the past 12 months?
ii. Employment status	What is your current employment status? Unemployed, part time or full time?
x. Job satisfaction	How satisfied are you with your job? If we say 1 is very satisfied and 5 is very dissatisfied, with 3 as neutral feelings, where would you put yourself?
x. Age	What is your age
xi. Country of Birth	What is your country of birth?
ii. Field of employment	What kind of business, industry or service are you involved with?

The * indicates a question from the qualitative part of the survey, all questions are from the quantitative survey unless otherwise specified

Appendix D: Recruitment Materials

D.1 Inclusion/Exclusion Criteria

1. Do you take transit as your primary means of transportation?
2. Are you a resident of Kitchener, Waterloo or Cambridge?
3. Are you over 18?
4. Do you have difficulty walking 3 city blocks?
5. Do you speak basic English?
6. Do you have a home telephone line or mobile telephone?

D.2 Recruitment Poster

Department of Health Studies and Gerontology

University of Waterloo

PARTICIPANTS NEEDED FOR RESEARCH IN COMMUNITY HEALTH

We are looking for volunteers to take part in a study of transit use and physical activity. As a participant in this study, you would be asked to: *receive a call from the researcher and take part in a telephone interview. You may be asked to take part in a second interview, which would be a face-to-face meeting with the researcher.*

Your participation would involve *one or two* sessions, which will be approximately *30* minutes each.

In appreciation for your time, you will receive a $5 Tim Hortons gift card.

The original text (see above) was used on a sandwich board when recruitment was done in person. The text was changed to read 'TRANSIT USERS NEEDED FOR RESEARCH IN COMMUNITY HEALTH' when this poster was put up at the Working Centre's Queen Street Commons café in downtown Kitchener and Waterloo Public Library in uptown Waterloo to ensure that transit users were the only residents contacting the student researcher. The expected time was also changed, from 30 minutes to 20 minutes, as this became a more accurate representation once surveying began.

D.3 Information Letter

January 1, 2010

Title of Project: Mindful physical activity: A pilot study in the context of walking to public transit

Faculty Supervisors:
Janice Husted and Kelly Anthony Department of Health Studies and Gerontology
(519) 888-4567 Ext. **35129 and 32802**

Student Investigator:
Tanya Christidis Department of Health Studies and Gerontology
(519) 888-4567 Ext. **36786**
tchristi@uwaterloo.ca

You are invited to participate in a study that concerns the health of the residents of Kitchener, Waterloo and Cambridge. As a participant in this study, you will be asked take part in a telephone interview focussing on transit use and physical activity, along with the mindset of public transit users.

The following are some examples of the types of questions you will be asked:

- During the past week how many caffeinated beverages did you drink each day?
- How stressful would you consider most days of your life?
- Describe why you take public transit

In addition, you will be asked to provide some background information about yourself such as age and education. The telephone interview will be audio-recorded for the purpose of data collection. The researcher may re-contact you a few weeks after this telephone interview requesting to meet with you face-to-face. You are free to decline this second interview, and will still receive reimbursement for taking part in the telephone interview. Both of these interviews should each take about 30 minutes of your time. The face-to-face interview can take place at the University of Waterloo or a quiet place in a community facility.

Travel expenses and child care for the interview session will be reimbursed by the researcher. As a token of appreciation, you will receive a $5 Tim Hortons gift card for taking part in the first telephone survey, and a $15 Tim Hortons gift card for the second telephone survey. These gift cards will be mailed to you after the completion of each survey.

Participation in this study is voluntary, and you may decline to answer any questions presented during the study if you so wish. Further, you may decide to withdraw from this study at any time by advising the researcher, and may do so without any penalty. All information you provide is considered completely confidential; indeed, your name will not be included or in any other way associated, with the data collected in the study. The interest of this study is in the average responses of the entire group of

participants, you will not be identified individually in any way in any written reports of this research. Excerpts from your interview may be used, but will be removed of all direct or indirect personal identifies.

Personal information and your name will never be used in data analysis or in reports. Data collected during this study will be retained for one year, in a locked office at the University of Waterloo to which only researchers associated with this study have access. After one year, all data will be confidentially destroyed. There are no known or anticipated risks associated to participation in this study.

I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. However, the final decision about participation is yours.

If you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes at this office at (519) 888-4567 Ext. 36005 or ssykes@uwaterloo.ca.

Thank you for your interest in our research and for your assistance with this project.

D.4 Consent Form

ID #	

I agree to participate in a study being conducted by Dr. Janice Husted, Dr. Kelly Anthony and Tanya Christidis of the Department of Health Studies and Gerontology, University of Waterloo. I have made this decision based on the information I have read in the Information-Consent Letter and have had the opportunity to receive any additional details I wanted about the study. I understand that I may withdraw this consent at any time by telling the researcher without penalty.

I also understand that this project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo, and that I may contact this office if I have any concerns or comments resulting from my involvement in the study.

Name: _____ Telephone Number: (_____)_____

Signature: _____ Date: _____

Witness Signature: _____

Best day to contact (circle all that apply): M T W Th F Sa Su

Best time to contact (circle all that apply):

Morning (9am – 12pm) Midday (12pm-3pm) Afternoon (3pm-6pm) Evening (6pm-9pm)

If selected for the face-to-face survey, I would need reimbursement for child care: Yes No

Address (to mail giftcard): _____

_____

_____

_____

D.5 Feedback Letter

University of Waterloo Department of Health Studies and Gerontology
January 1, 2010

Dear Resident**,**
I would like to thank you for your participation in this study. As a reminder, the purpose of this study is to examine transit use and physical activity, along with the mindset of public transit users. This data was collected in hopes that we can now understand our residents better and create health programs that are tailored to the needs of Waterloo Region, so that we are all healthier in the future.

Please remember that any data pertaining to you as an individual participant will be kept confidential. Once the results for this study are complete (approximately Spring 2010) you will be receiving information regarding the conclusions. I plan on sharing this information with the research community through seminars, conferences, presentations, and journal articles as well.

As with all University of Waterloo projects involving human participants, this project was reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. Should you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, Ext., 36005.

If you ever have any questions, please do not hesitate to contact me or one of my faculty supervisors at either of the telephone numbers listed at the bottom of the page.

Faculty Supervisors:
Janice Husted and Kelly Anthony
Department of Health Studies and Gerontology
(519) 888-4567 Ext. **35129 and 32802**

Student Investigator:
Tanya Christidis Department of Health Studies and Gerontology
(519) 888-4567 Ext. **36786**
tchristi@uwaterloo.ca

D.6 Ethics Approval

Ethics approval was obtained from the University Of Waterloo Office Of Research Ethics prior to recruitment and contact with participants. Informed consent will be obtained from each participant prior to data collection.

Participants were informed of the following upon recruitment and before the telephone interview commences:

- Participation in this study is completely voluntary
- None of the information provided will be shared with anyone other than the researcher
- Participants may withdraw at any time
- Names will only appear on the consent forms, which will kept in a locked cabinet and separate from the data, and used only to contact participants with permission
- All consent forms, electronic, and paper data will be kept secure and confidential and destroyed one years after the study has ended
- No individual will be identified by name in the thesis or resulting publications

Participants were given the contact information for the ORE as well as the Faculty Supervisors if they had any concerns. Feedback and appreciation letters were mailed to participants after the interview along with remuneration.

To ensure confidentiality, names were replaced with a unique identification code after recruitment. Once contact information was used to contact the participant for the telephone interview, this personal information was no longer used and the number identifier is what the researcher used to distinguish participants. Any tapes made of interviews were labelled only by this random number. Confidential and personal data was locked away and names were only seen by the researcher for mailing summaries and remuneration and the single telephone interview. Data analysis was done using numerical identifiers for participants and all data will be destroyed one year after study completion. No direct or indirect identifiers were used in the data analysis.

All qualitative surveys and audio recordings were labelled only by the random identifying number. These were locked in a filing cabinet which only the student researcher and faculty supervisor have a key to, in an office with the same security. Data will not be sent to other institutions or liked with other data sets. Consent forms with personal information along with random number identifiers will be secured in a different locked filing cabinet from the number identified written records and audio recordings.

Appendix E: Surveys

Table E.1: Telephone Interview Script for Mixed-Methods Survey

Question	Answers
Hi, my name is Tanya Christidis and I am a Master's student in the Department of Health Studies and Gerontology at the University of Waterloo. I am currently conducting research under Drs. Kelly Anthony and Janice Husted and I'm doing a study that is exploring the relationships between health behaviour and transit use in the Region of Waterloo. I met you a few weeks ago, and you agreed to be part of this telephone survey. If you're still interested and have about 30 minutes to spare, I'd like to ask you some questions. • If available, proceed with survey • If interested in rescheduling, do so _____ • If uninterested in partaking, do not call back.	
Alright, before we start I want you to know that this telephone interview will be tape-recorded for the purpose of data collection. Participation in this study is completely voluntary, and you may decline to answer any questions presented during the interview if you so wish. Also, you may decide to withdraw from this study at any time by telling me, and may do so without any penalty. All information you provide is considered completely confidential and your name will not be included or in any other way associated, with the data collected in the study.	
I'm going to start by asking you a few questions about your Day-to-day experiences. I'm going to read some statements and then ask you to indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item. I will ask you to indicate how frequently something happens based on a scale of 6, with almost always on one end and almost never on the other.	
i. I could be experiencing some emotion and not be conscious of it until some time later. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
ii. I break or spill things because of carelessness, not paying attention, or thinking of something else. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
iii. I find it difficult to stay focused on what's happening in the present. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
iv. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
v. I tend not to notice feelings of physical tension or discomfort until they really grab my attention. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
vi. I forget a person's name almost as soon as I've been told it for the first time. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
vii. It seems I am 'running on automatic,' without much awareness of what I'm doing. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
viii. I rush through activities without being really attentive to them. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
ix. I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
x. I do jobs or tasks automatically, without being aware of what I'm doing. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
xi. I find myself listening to someone with one ear, doing something else at the same time.	1 Almost always 2 Very frequently

Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
xii. I drive places on 'automatic pilot' and then wonder why I went there. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
xiii. I find myself preoccupied with the future or the past. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
xiv. I find myself doing things without paying attention. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
xv. I snack without being aware that I'm eating. Would you say this happens almost always, very frequently, somewhat frequently, somewhat infrequently, very frequently or almost never?	1 Almost always 2 Very frequently 3 Somewhat frequently 4 Somewhat infrequently 5 Very infrequently 6 Almost never
1. Now, I am going to ask you some different types of questions. In general would you say your health is excellent, very good, good, fair or poor?	5 Excellent 4 Very good 3 Good 2 Fair 1 Poor
2. I'm going to ask you, how you feel about the following statement. It is necessary to exercise to be healthy. Do you strongly agree, agree, agree slightly, are you neutral, disagree slightly, disagree or strongly disagree?	7 Strongly Agree 6 Agree 5 Agree Slightly 4 Neutral 3 Disagree Slightly 2 Disagree 1 Strongly Disagree
3. I'm now going to ask you how much you agree or disagree with the following statement: I think I am getting adequate exercise for health every day. Do you strongly agree, agree, agree slightly, are you neutral, disagree slightly, disagree or strongly disagree?	7 Strongly Agree 6 Agree 5 Agree Slightly 4 Neutral 3 Disagree Slightly 2 Disagree 1 Strongly Disagree
4. For the next few questions, I am not going to ask you to answer from a list of options, and instead to answer in your own words. When you think of exercise or people exercising what do you consider exercise to be?	
5. When you hear people talk about exercise what kinds of things do you think of? / Do you think of exercise as part of a healthy lifestyle?	
6. Can tell me about ways that you get exercise on a daily basis?	
7. In an ideal world, what would your physical activity level be?	
8. Is this ideal based on health ideals or do you enjoy the activity in itself regardless of the health effect?	
9. Is walking a form of exercise?	
10. Is walking to transit a form of exercise?	
11. On a scale of 1-10, with 10 being a large amount and 1 being none, how would you describe the amount of exercise you got during the past 30 days?	10 (a great deal) 9 8 7 6 5 4 3 2 1 (none)
12. What is your usual method of transportation? By this I mean, which of these do you use more than the rest? Do you use a car as the driver, a car as the passenger, Public transit, Walking, Biking, Motorcycle, Cab, or perhaps something I haven't mentioned?	Car as driver Car as passenger Public transit Walking Biking Motorcycle Cab
13. Do you partake in vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling? Yes or no?	1 Yes 0 No
14. (If yes for Q13) During the last 7 days, on how many days did you partake in vigorous physical activity?	___days per week
15. (If yes for Q13) How much time did you usually spend doing vigorous physical activities on one of those days?	_____hours per day _____minutes per day
16. Did you partake in moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? This does not include walking. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Yes or No?	1 Yes 0 No (skip to Q19)
17. (If yes for Q16) During the last 7 days, on how many days did you do moderate physical activities?	___days per week
18. (If yes for Q16) How much time did you usually spend doing moderate physical activities on one of those days?	___hours per day __minutes per day
19. Do you partake in walking behaviours? This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure. Yes or No?	1 Yes 0 No (Skip to Q22)
20. (If yes to Q19) During the last 7 days on how many days did you walk for at least five minutes at a	_____ days per week

time?	
21. (If yes to Q19) How much time did you usually spend walking on one of those days?	___hours per day ___minutes per day
22. How much time do you spend walking to the bus stop every day?	_____ minutes
23. How many public transit trips do you take per week?	_____/week
24. For how many of those trips do you walk to the bus stop?	_____/week
25. When you walk to your transit stop in the morning, what distance do you think you travel? I can give you some examples of distances if you'd like. For example: 0.25 km ((0.15miles) = Kitchener city hall to Kitchener Charles St. bus terminal and 0.5km = Kitchener City Hall to King St. S and Victoria St. S	Approximately _____ km or mi
26. When your transit trip is complete, how far do you think you walk to your destination?	Approximately _____ km or mi
27. Is there any other walking that you do that is directly related to transit access?	(If yes) What distance do you cover? Approximately _____ km or mi (If no, go to Q28)
28. Think about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television. During the last 7 days, how much time did you spend sitting on a week day?	_____ hours per day _____minutes per day
29. Again, I want to know how you feel about the following statement: I think I am getting adequate exercise from walking to and from public transit every day. Do you strongly agree, agree, agree slightly, are you neutral, disagree slightly, disagree or strongly disagree?	7 Strongly Agree 6 Agree 5 Agree Slightly 4 Neutral 3 Disagree Slightly 2 Disagree 1 Strongly Disagree
30. The next statement is: Walking to public transit a good way of getting exercise. Do you strongly agree, agree, agree slightly, are you neutral, disagree slightly, disagree or strongly disagree?	7 Strongly Agree 6 Agree 5 Agree Slightly 4 Neutral 3 Disagree Slightly 2 Disagree 1 Strongly Disagree
31. What is your current height? In either feet or centimetres	_____ft _____inches OR _____cm
32. What is your best estimate of your current weight	_____ lbs or kg
33. Has a doctor ever told you that you have any of the following? I will list of the diagnoses and you can just say Yes or No. Anxiety Disorder, Arthritis, Gastrointestinal Disorder , Asthma, Injuries: Back, Arms, Legs, Chronic Pain, Diabetes, Repetitive Strain Injury, Depression, Sleeping Disorder, High Cholesterol, Hypertension, Dizziness, Fainting, Eating Disorder , Or something I have not mentioned	(enter answers here)
34. How stressful would you consider most days of your life? If we count 5 as extremely stressful, 1 as not at all stressful and 3 as moderately stressful, where would you put yourself?	5 extremely stressful 4 quite a bit stressful 3 moderately stressful 2 slightly stressful 1 not at all stressful
35. How much do you agree with the following statement: I see myself as someone who has high self-esteem. Do you strongly agree, agree, agree slightly, are you neutral, disagree slightly, disagree or strongly disagree?	7 Strongly Agree 6 Agree 5 Agree Slightly 4 Neutral 3 Disagree Slightly 2 Disagree 1 Strongly Disagree
36. Over the last 7 days how anxious did you feel? If we treat 1 as not anxious, 5 as very anxious and 3 as neutral anxiety, where would you put yourself?	1 Not anxious at all 2 Less anxious 3 Neutral 4 More anxious 5 Very anxious
37. Over the last week how confident did you feel? If we say 1 is not confident, 5 is very confident and 3 is neutral, where would you rank yourself?	1 Not confident at all 2 Less confident 3 Neutral 4 More confident 5Very Confident
38. Do spiritual values play an important role in your life? Yes or no?	1 Yes 0 No (Go to Q40)
39. (If yes to 38) To what extent do your spiritual values give you strength to face every day difficulties? A lot, some, a little or not at all?	1 Not at all 2 A little 3 Some 4 A lot
40. Are you a member of a health club or gym? Yes or no?	1 Yes 0 No (Go to Q42)
41. (If yes to Q40) If so, during the last 7 days how many days did you go to the gym?	_____ days per week
42. Let's shift to information about more everyday things. During the past month how would you describe the amount you ate? If 5 is much more than normal, 1 is much less than normal and 3 is the same, where would your eating habits be?	1 More than normal 2 A bit more than normal 3 About the same 4 A bit less than normal 5 Less than normal
43. Did you change your diet or eating habits in the last month? Yes or no?	1 Yes 0 No
44. During the last month did you change your diet and eating habits for any of the following reasons? I will list them off and you tell me which you changed. Lower calories, lower fat, higher	

fibre, lower salt, more friends and vegetables, higher calcium, lower cholesterol, or perhaps something I haven't mentioned yet.	
45. During the past week how many cigarettes a day did you smoke?	0 1 2 3 4 5 6 7 8 9 10 or more
46. During the past week how many servings of fruits and vegetables did you eat each day	0 1 2 3 4 5 6 7 8 9 10 or more
47. During the past week how many caffeinated beverages did you drink each day?	0 1 2 3 4 5 6 7 8 9 10 or more
48. During the past week how many alcoholic beverages did you drink each day?	0 1 2 3 4 5 6 7 8 9 10 or more
49. During the past week how many glasses of water did you drink each day?	0 1 2 3 4 5 6 7 8 9 10 or more
50. During the past week how many sugary foods did you eat each day? This includes pop, candy, donuts, cookies, pastries, ice cream, and other desserts	0 1 2 3 4 5 6 7 8 9 10 or more
51. I'm now going to ask some more personal questions. I want to emphasize that this information is purely for research and your name will not be associated with your answers, but a random number ID code that is completely anonymous. If you do not want to answer any of these questions, please let me know. First off, What is your age	_____years
52. What is your marital status? Married, living common law, widowed, separated, divorced, or single and never married?	Married living common-law widowed Separated divorced single, never married
53. What is the number of people in your household	_____
54. How would you describe your education? Some high school or less, high school diploma, a trade certificate, a non university certificate or diploma, a university certificate at or below bachelors levels, or a university degree or certificate above a bachelors level?	1 less that high school 2 high school 3 trade certificate 4 college 5 university 6 above university
55. What is your current employment status? Unemployed, part time or full time?	0 No (skip to Q58) 1 Yes part time 2 Yes full time
56. (If employed) How satisfied are you with your job? Very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied or very satisfied	1 Very satisfied 2 Satisfied 3 Neither satisfied nor dissatisfied 4 Dissatisfied 5 Very dissatisfied
57. (If employed) What kind of business, industry or service are you involved with?	
58. I am now going to ask you about your car ownership status. Which of these best describes you? Yes I have a car, no but I have access to a car, or no I have no car and also have no access to a car?	2 Yes own 1 No but have access 0 No and have no access
59. I am going to list potential sources of income, and would like you to tell me which of these is your main sources of income: Wages and salaries Income from self-employment Dividends and interest (e.g., on bonds, savings) Employment insurance Worker's compensation Benefits from Canada or Quebec Pension Plan Retirement pensions, superannuation and annuities Old Age Security and Guaranteed Income Supplement Child Tax Benefit Provincial or municipal social assistance or welfare Child support Alimony Or something I have not mentioned	
60. What is your best estimate of the total income, before taxes and deductions, of all household members from all sources in the past 12 months?	_____ Canadian Dollars/ year
Alright, that was my last question. Thank you so much for your time. You may remember that when we first met, I promised to reimburse you for your time. I'll be mailing this to you within the week along with a feedback letter about the study. You had given permission for me to re-contact you at ask further questions in a face-to-face interview. I just want to make sure it is still alright with you, if I do so. *If yes* – Great. Is this still a good time and day for me to call, if I need to recontact you? *If no* – That is no problem. Thank you very much for taking the time today, I really appreciate it. Great. Have a wonderful day and thanks again!	

Table E.2: Telephone Script to Schedule Qualitative Interview

Hi, my name is Tanya Christidis and I am a Master's student in the Department of Health Studies and Gerontology at the University of Waterloo. I contacted you a few weeks ago, and asked you questions about physical activity and transit use. If you remember, when you were recruited for this study, I said that you may be contacted after the first survey to take part in a face-to-face interview. I was wondering if you'd be interested in taking part in an interview with me. If yes, proceed to Q1 If no, proceed to Q2
1. Wonderful! Is there a specific day in the next week or two that works best for you? This interview would take about half an hour and we can meet at either the University of Waterloo, or somewhere in your community. Write down date and time If yes to University, consolidate meeting in BMH. Otherwise read list of options : Kitchener or Waterloo Public Library or The Working Centre in downtown Kitchener
2. Alright, well thank you for taking my call. I'd also like to thank you again for taking part in the first survey. I really appreciate your time.

Table E.3: Qualitative Interview Script

Alright, before we start I want you to know that this interview will be tape-recorded for the purpose of data collection. Participation in this study is completely voluntary, and you may decline to answer any questions presented during the study if you so wish. Also, you may decide to withdraw from this study at any time by telling me, and may do so without any penalty. All information you provide is considered completely confidential and your name will not be included or in any other way associated, with the data collected in the study.	
1. How would you describe your general health and well-being? Probes: Are there any behaviours that you partake in that you consider very healthy or very unhealthy, or somewhere in between? Do you consider your health to be very good, very poor or somewhere in between?	
2. Can you tell me about your lifestyle? Probes: Do you consider yourself to have a healthy lifestyle, a not particularly healthy lifestyle or somewhere in between? In what ways do you think of your lifestyle as health or unhealthy?	
3. A) You mentioned exercise already, when you hear people talk about exercise what kinds of things do you think of? Probes: What kinds of activities? What kinds of places or locations? What kinds of clothing?	B) You didn't mention exercise, but do you think of that as a part of a healthy lifestyle? Probes: What kinds of things do you think about when you hear people talk about exercise? What kinds of activities? What kinds of places or locations? What kinds of clothing?
4. By your definition of what exercise is, what types of ways do you get exercise on a daily basis? Probes: Do you walk? Stretch? Garden? Clean your house?	
5. In an ideal world, what would your physical activity level be? Probes: Do you think you are exercising an adequate amount for healthy living?	
6. Is this ideal based on health ideals or do you enjoy this activity in itself regardless of the health effect?	
7. The last time we talked, we discussed public transit use. Could you maybe think of reasons that people take public transit?	
8. You said the last time that we talked, that you use public transit to get around. Could you describe why you take transit? Probes: Do you have a car? Is transit more convenient? Is transit more affordable?	
9. In an ideal world, what means of transportation would you use to get around? Probes: Would you rather be taking a car?	
10. How do you think people, in general, feel about taking public transit? Probes: Are there positive or negative feelings associated with taking public transit? How do you feel about taking public transit?	
11. How do you think they feel about people who take public transit? Probes: What do you think about people who take public transit?	
12. Mindfulness is often described as heightened self-knowledge or self awareness; thinking through the things that you do and why you do them. Have you ever heard of mindset or mindfulness?	
13. Have you ever considered your mindset?	
14. Do you think mindfulness is a positive or a negative thing to have in your life?	

15. What do you think people's mindset is about public transit? Probes: Do you think that people like or dislike taking public transit?
16. What do you think your mindset is while walking to transit? Probes: What do you think about when you are walking in the transit stop?
17. Can you foresee a reason for your mindset about public transit to change? Probes: In what way would your mindset change while taking public transit?
18. Do you expect that a different mindset about transit use would impact the way you feel when you take transit? Probes: Is there a way you can view walking to public transit that would change the way you feel?
19. Do you expect that a different mindset about transit would impact your health and well being?
20. If a mindset shift were to lead to health outcomes, what might those outcomes be? Probes: Would a mindset shift help you to enjoy walking to transit stops?
21. What would you expect to happen if started to consider walking to transit stops as a form of exercise? Probes: Do you think you could be healthier if you shifted your mindset?
Wonderful. That was my last question, thank you so much for your time. You may remember that when we first met, I promised to reimburse you for your time. Because you took the time to be interviewed twice, I will be sending you something else to thank you. Great. Have a wonderful day and thanks again!

Appendix F: Results From Quantitative And Qualitative Survey Questions

Table F.1: Response Distribution of Mixed-Methods Quantitative Questions

Variable	Response	Response count	% frequency
Transit Mindfulness	Strongly Agree (7)	16	30.2
	Agree (6)	6	11.3
	Agree Slightly (5)	4	7.6
	Neither Agree or Disagree (4)	10	18.9
	Disagree Slightly (3)	7	13.2
	Disagree (2)	4	7.6
	Strongly Disagree (1)	6	11.3
Perceptions of transit walking	Strongly Agree (7)	7	13.2
	Agree (6)	2	3.8
	Agree Slightly (5)	3	5.7
	Neither Agree or Disagree (4)	10	18.9
	Disagree Slightly (3)	7	13.2
	Disagree (2)	9	17.0
	Strongly Disagree (1)	15	28.3
Transit Walking Behaviours (km/week)	0 - <2	10	18.9
	2 - <4	10	18.9
	4 - <6	6	11.4
	6 - <8	7	13.3
	8 - <10	0	0.0
	10 - <12	5	9.4
	12 - <14	3	5.7
	14 - <16	1	1.9
	16 - <18	1	1.9
	18 - <20	2	3.8
	20 - <22	0	0.0
	22 - <24	2	3.8
	24 - <26	1	1.9
	26 - <28	1	1.9
	...	--	--
	32 - -<34	1	1.9
	34 - <36	1	1.9
	36 - <38	1	1.9
	…	--	--
	42 - <44	1	1.9
Self-rated health	Excellent (5)	7	13.2
	Very Good (4)	17	32.1
	Good (3)	22	41.5
	Fair (2)	4	7.6
	Poor (1)	3	5.7

City of Residence	Kitchener	38	71.7
	Waterloo	15	28.3
MAAS (score /90)	20 - 24	1	1.9
	25 - 29	0	0.0
	30 - 34	1	1.9
	35 - 39	1	1.9
	40 - 44	6	11.3
	45 - 49	8	15.1
	50 - 54	2	3.8
	55 - 59	5	9.4
	60 - 64	6	11.3
	65 - 69	8	15.1
	70 - 74	8	15.1
	75 - 79	4	7.5
	80 - 84	3	5.7
Gender	Female	33	62.3
	Male	20	37.7
BMI (kg/m2)	17 - <19	2	3.8
	19 - <21	3	5.7
	21 - <23	9	17.0
	23 - <25	10	18.9
	25 - <27	6	11.3
	27 - <29	12	22.6
	29 - <31	4	7.5
	31 - <33	2	3.8
	33 - <35	0	0.0
	35 - <37	1	1.9
	37 - <39	3	5.7
	…		
	45 - <47	1	1.9
Age (years)	18 - 19	1	1.9
	20 - 24	8	15.1
	25 - 29	8	15.1
	30 - 34	6	11.3
	35 - 39	7	13.2
	40 - 44	2	3.8
	45 - 49	1	1.9
	50 - 54	6	11.3
	55 - 59	7	13.2
	60 - 64	3	5.7
	65 - 69	3	5.7
	70 - 74	1	1.9
Education	Less than high school (1)	8	15.1
	High school (2)	8	15.1

	Trade certificate (3)	14	26.4
	College diploma (4)	1	1.9
	University Degree (5)	14	26.4
	Above university degree (6)	8	15.1
Confidence	Very confident (5)	7	13.2
	More confident (4)	23	43.4
	Neutral (3)	16	30.2
	Less confident (2)	4	7.6
	Not confident at all (1)	3	5.7
Household Income ($/year)	Less than 10 000	4	3.8
	10 000 - 19 999	6	11.3
	20 000 - 29 999	7	13.2
	30 000 - 39 999	5	9.4
	40 000 - 49 999	4	7.6
	50 000 - 59 999	3	5.7
	60 000 - 79 999	8	15.1
	80 000 and over	6	11.3
	Did not disclose income	10	18.9
Self-esteem	Strongly Agree (7)	13	24.5
	Agree (6)	13	24.5
	Agree Slightly (5)	7	13.2
	Neither Agree or Disagree (4)	13	24.5
	Disagree Slightly (3)	4	7.6
	Disagree (2)	3	5.7
	Strongly Disagree (1)	0	0.0
Spirituality	Not spiritual	14	26.4
	Spiritual	39	73.6
Smoking (cigarettes/week)	0 cigarettes	44	83.0
	1-5 cigarettes	2	3.8
	6-10 cigarettes	4	7.6
	11-15 cigarettes	1	1.9
	16-20 cigarettes	1	1.9
	21+ cigarettes	1	1.9

Response Distribution of Mixed-Methods Qualitative Questions

Table F.2: Response Distribution of Exercise Definition

When you think of exercise or people exercising, what do you consider exercise to be?	
Response	**Frequency of Response**
Walking	22
Any physical movement or activity	22
Going to the Gym	13
Running	9
Cardiovascular or Vigorous Activity	9

Strength training, muscle building or toning	9
Increased heart rate	7
Swimming	6
Biking	5
Household work or chores	4
Health	4
A specific frequency of exercise	4
A specific duration of exercise	4
Taking the stairs	3
Stretching, yoga or pilates	3
Burning Calories	2
Playing sports	2
Exercise must be more effort than walking	2
Being Outdoors	2

Frequencies displayed were responses that had been stated by at least two participants.

Table F.3: Response Distribution of Exercise Imagery

When you hear people talk about exercise, what kinds of things do you think of?	
Response	**Frequency of Response**
Walking	23
Going to the Gym	22
Running	22
Swimming	10
Biking	10
Playing sports	10
Strength training, muscle building or toning	5
Any physical movement or activity	5
Stretching, yoga or pilates	5
Health	4
Cardiovascular or Vigorous Activity	4
Household work or chores	2
Being Outdoors	2

Frequencies displayed are responses that had been stated by at least two participants.

Table F.4: Response Distribution of Personal Exercise Behaviours

Can you tell me about ways that you get exercise on a daily basis?	
Response	**Frequency of Response**
Walking	42
Biking	9
Stretching, yoga or pilates	8
Walking to the bus	6
Running	6
Swimming	5
Going to the Gym	3
Dancing	3
Gardening	2
Strength training, muscle building or toning	2
Playing sports	2
Carrying groceries	2
Playing with kids	2
Taking the stairs	2

Frequencies displayed are responses that had been stated by at least two participants.

Table F.5: Response Distribution of Ideal Physical Activity Level

In an ideal world, what would your physical activity level be?	
Response	**Frequency of Response**
More active/more than now	26
A specific frequency of exercise	10
I want to be exercising	7
My current level is ideal	6
More fit (physical appearance)	5
I want to go to the gym	4
More Walking	4
A specific duration of exercise	4
Something to make me healthier	3
Swimming	3
Sports	3
Be more knowledgeable/able to instruct	2
More variety of exercises	2
I want to have more time to exercise	2

Frequencies displayed are responses that had been stated by at least two participants.

Table F.6: Response Distribution of Exercise Purpose

Is this ideal based on health ideals, or do you enjoy physical activity in itself, regardless of the health effect?	
Response	**Frequency of Response**
I exercise for health	23
Both health and enjoyment	14
I just enjoy being physically active	12
I don't like the gym. I exercise for health.	2
I don't have any time. I exercise for health.	2

Frequencies displayed are responses that had been stated by at least two participants.

Table F.7: Response Distribution of Qualitative Perceptions of Walking

Is walking a form of exercise?	
Response	**Frequency of Response**
Yes	50
It's not ideal	3
Maybe	3

Frequencies displayed are responses that had been stated by at least two participants.

Table F.8: Response Distribution of Qualitative Transit Mindfulness

Is walking to transit a form of exercise?	
Response	**Frequency of Response**
Yes	31
It depends on the distance	13
No	9

Frequencies displayed are responses that had been stated by at least two participants.

Appendix G: Correlation Analyses

Table G.1: Correlation of Conceptual Model Variables and Covariates

	Self-Rated Health	Transit Walking Behaviours	Perceptions of Transit Walking	QLTM	QNTM	MAAS
Self-Rated Health	1					
	-					
Transit Walking Behaviours	0.01	1				
	0.97	-				
Perceptions of Transit Walking	-0.03	**0.42**	1			
	0.85	**<0.01**	-			
QLTM	-0.20	-0.02	0.06	1		
	0.15	0.88	0.68	-		
QNTM	0.07	0.18	**0.42**	**0.27**	1	
	0.59	0.20	**<0.01**	**0.05**	-	
MAAS	0.21	**-0.24**	-0.14	-0.15	0.09	1
	0.13	**0.09**	0.32	0.29	0.52	-
BMI	-0.19	0.02	-0.09	-0.03	**0.31**	-0.18
	0.17	0.91	0.53	0.82	**0.03**	0.19
Self-esteem	**0.23**	0.14	**0.39**	0.01	**0.29**	0.05
	0.10	0.33	**<0.01**	0.96	**0.04**	0.71
Smoking	-0.18	-0.15	**0.28**	**0.29**	-0.01	0.04
	0.19	0.29	**0.04**	**0.03**	0.95	0.76
Confidence	0.17	0.22	0.09	<-0.01	**0.24**	0.06
	0.22	0.11	0.53	0.98	**0.09**	0.66
Spirituality	0.07	0.02	**0.30**	0.17	0.18	**0.26**
	0.64	0.90	**0.03**	0.23	0.19	**0.06**
Age	-0.19	-0.14	-0.15	0.15	**0.25**	0.08
	0.17	0.30	0.28	0.29	**0.07**	0.56
Education	0.20	**0.27**	<0.01	**-0.44**	-0.16	0.16
	0.15	**0.05**	0.98	**<0.01**	0.24	0.26
Income	**0.33**	0.22	0.11	**-0.26**	0.11	0.09
	0.03	0.48	0.15	**0.09**	0.50	0.58
Location	0.19	0.07	0.18	-0.09	0.16	0.06
	0.18	0.64	0.20	0.50	0.25	0.67
Gender	-0.03	-0.11	-0.06	-0.01	0.19	0.17
	0.83	0.43	0.67	0.94	0.17	0.20

Bolded values have reached significance at p = 0.10.

Table G.2: Correlation of Covariates

	BMI	Self-esteem	Smoking	Confidence	Spirituality	Age	Education	Income	Location	Gender
BMI	1	-0.03	-0.18	**0.24**	-0.07	**0.47**	-0.04	**-0.26**	-0.10	-0.08
	-	0.86	0.20	**0.09**	0.60	**<0.01**	0.77	**0.09**	0.48	0.55
Self-esteem		1	<0.01	**0.40**	0.18	**-0.26**	0.12	0.10	0.16	< - 0.01
		-	0.99	**<0.01**	0.21	**0.06**	0.41	0.52	0.26	0.99
Smoking			1	**-0.28**	-0.07	-0.10	**-0.49**	-0.15	-0.07	**-0.25**
			-	**0.04**	0.62	0.47	**<0.01**	0.34	0.60	**0.07**
Confidence				1	0.09	0.05	**0.41**	0.18	0.22	0.20
				-	0.53	0.72	**<0.01**	0.25	0.11	0.15
Spirituality					1	0.21	-0.16	-0.13	< - 0.01	**0.24**
					-	0.13	0.26	0.42	0.98	**0.08**
Age						1	-0.03	**-0.29**	-0.03	0.12
						-	0.81	**0.06**	0.82	0.39
Education							1	**0.41**	0.18	0.21
							-	**<0.01**	0.21	0.12
Income								1	0.13	0.17
								-	0.39	0.29
Location										1
										-

Bolded values have reached significance at p = 0.10.

Appendix H: Chi –Square Tests Of Conceptual Model Variables And Covariates

	Self-Rated Health	Transit Walking Behaviours	Perceptions of Transit Walking	QLTM	QNTM	MAAS
Self-Rated Health	1					
	-					
Transit Walking Behaviours	1.89	1				
	0.17	-				
Perceptions of Transit Walking	0.56*	**10.74**	1			
	0.46	**<0.01**	-			
QLTM	1.43+	<0.01	1.06	1		
	0.23	0.99	0.30	-		
QNTM	0.12*	0.21	**3.20**	**5.04**	1	
	0.72	0.65	**0.07**	**0.02**	-	
MAAS	0.91*	**1.22***	<0.01*	0.08	0.02*	1
	0.34	**0.08**	0.98	0.77	0.90	-
BMI	0.02*	0.001	0.29	0.08*	**4.34**	3.01
	0.89	0.97	0.59	0.77	**0.04**	0.08
Self-esteem	**3.90***	0.72	1.75	0.60*	2.54	1.37
	0.05	0.40	0.19	0.44	0.11	0.24
Smoking	**3.83+**	0.09	**5.87**	1.93+	0.09	0.46
	0.05	0.76	**0.02**	0.17	0.76	0.50
Confidence	2.58*	0.92	0.09	0.17*	**3.31**	0.05
	0.11	0.34	0.76	0.68	**0.07**	0.82
Spirituality	0.61+	0.21	**3.16**	0.60+	1.36	4.38
	0.43	0.64	**0.08**	0.44	0.24	0.04
Age	1.29*	**4.30**	0.56	<0.01*	**5.64**	<0.01
	0.26	**0.04**	0.45	0.99	**0.02**	0.97
Education	**6.18***	1.76	0.09	1.40*	1.60	2.07
	0.01	0.18	0.76	0.24	0.21	0.15
Income	**7.36***	1.65	0.14	0.38+	0.95	0.09
	0.01	0.20	0.71	0.54	0.33	0.76
Location	**3.18+**	0.71	1.20	0.05+	1.00	0.02
	0.07	0.40	0.27	0.82	0.32	0.90
Gender	0.09*	2.06	0.16	0.60*	2.54	1.37
	0.76	0.15	0.69	0.44	0.11	0.24

Bolded values have reached significance at p = 0.10 , * 50% of cells had an expected count less than 5, + 25% of cells had an expected count less than 5

Appendix I: Logistic Regression Analysis

Table I.1: The Association between QLTM and Perceptions of Transit Walking

Variable	Response		OR adjusted for							
			Crude OR	Gender	Age	Education	Self-esteem	Gender, Age, Education, Self-esteem	BMI	Income	Confidence
Transit Mindfulness QLTM	Perceived as Inadequate	OR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-	-	-	-
	Perceived as Adequate	OR	2.40	2.52	2.42	2.36	2.21	2.22	2.37	2.34	2.38
		95% CI	0.44 – 13.20	0.45 – 14.08	0.44 – 13.44	0.42 – 13.20	0.39 – 12.47	0.37 – 13.21	0.43 – 13.09	0.40 – 13.67	0.43 – 13.10

Table I.2: The Association between QNTM and Perceptions of Transit Walking

Variable	Response		OR adjusted for							
			Crude OR	Gender	Age	Education	Self-esteem	Gender, Age, Education, Self-esteem	BMI	Income	Confidence
Transit Mindfulness QNTM	Perceived as Inadequate	OR	2.77	3.15	**3.93**	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	0.90 – 8.85	0.96 – 10.32	**1.10 – 14.07**	-	-	-	-	-	-
	Perceived as Adequate	OR	2.77	3.15	**3.93**	2.77	2.48	3.76	2.76	2.80	2.83
		95% CI	0.90 – 8.85	0.96 – 10.32	**1.10 – 14.07**	0.88 – 8.73	0.78 – 7.88	0.92 – 15.33	0.85 – 8.96	0.85 – 9.20	0.88 – 9.14

Table I.3: The Association between MAAS and Perceptions of Transit Walking

Variable	Response		OR adjusted for							
			Crude OR	Gender	Age	Education	Self-esteem	Gender, Age, Education, Self-esteem	BMI	Income	Confidence
Transit Mindfulness MAAS	Perceived as Inadequate	OR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-	-	-	-
	Perceived as Adequate	OR	0.99	1.02	0.99	1.05	0.88	0.99	1.06	0.94	0.97
		95% CI	0.33 – 2.96	0.34 – 3.11	0.33 – 2.98	0.33 – 3.39	0.28 – 2.72	0.31 – 3.16	0.34 – 3.27	0.31 – 2.87	0.32 – 2.93

Table I.4: The Association between QLTM and Transit Walking Behaviours

Variable	Response			OR adjusted for							
			Crude OR	Gender	Age	Education	Self-esteem	Gender, Age, Education, Self-esteem	BMI	Income	Confidence
Transit Mindfulness QLTM	Does Not Meet Transit Walking Criteria	OR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-	-	-	-
	Meets Transit Walking Criteria	OR	1.01	1.15	1.02	1.21	1.09	1.59	1.01	1.10	0.97
		95% CI	0.21 – 4.78	0.23 – 5.67	0.20 – 5.14	0.24 – 6.01	0.23 – 5.26	0.29 – 8.63	0.21 – 4.78	0.23 – 5.34	0.20 – 4.66

Table I.5: The Association between QNTM and Transit Walking Behaviours

Variable	Response			OR adjusted for							
			Crude OR	Gender	Age	Education	Self-esteem	Gender, Age, Education, Self-esteem	BMI	Income	Confidence
Transit Mindfulness QNTM	Does Not Meet Transit Walking Criteria	OR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-	-	-	-
	Meets Transit Walking Criteria	OR	0.77	0.91	1.16	0.87	0.85	2.89	0.75	0.83	0.65
		95% CI	0.25 – 2.35	0.29 - 2.92	0.34 – 3.96	0.28 - 2.74	0.27 – 2.67	0.62 – 13.55	0.23 – 2.40	0.26 – 2.62	0.20 - 2.90

Table I.6: The Association p between MAAS and Transit Walking Behaviours

Variable	Response			OR adjusted for							
			Crude OR	Gender	Age	Education	Self-esteem	Gender, Age, Education, Self-esteem	BMI	Income	Confidence
Transit Mindfulness MAAS	Does Not Meet Transit Walking Criteria	OR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-	-	-	-
	Meets Transit Walking Criteria	OR	0.53	0.59	0.51	0.33	0.56	0.26	0.52	0.55	0.48
		95% CI	0.17 – 1.64	0.19 – 1.85	0.16 – 1.64	0.09 – 1.23	0.18 – 1.76	0.06 – 1.06	0.16 – 1.64	0.18 – 1.70	0.15 – 1.53

Table I.7: The Association between QLTM and Perceived Health

Variable	Response			OR adjusted for								
			Crude OR	Gender	Age	Education	Self-esteem	Gender, Age, Education, Self-esteem	BMI	Income	Confidence
Transit Mindfulness QLTM	Perceived to be Poor	OR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-	-	-	-
	Perceived to be Good	OR	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
		95% CI	<0.01 – >999.99	<0.01 – >999.99	<0.01 – >999.99	<0.01 – >999.99	<0.01 – >999.99	<0.01 – >999.99	<0.01 – >999.99	<0.01 – >999.99	<0.01 – >999.99

Table I.8: The Association between QNTM and Perceived Health

Variable	Response			OR adjusted for								
			Crude OR	Gender	Age	Education	Self-esteem	Gender, Age, Education, Self-esteem	BMI	Income	Confidence
Transit Mindfulness QNTM	Perceived to be Poor	OR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-	-	-	-
	Perceived to be Good	OR	1.33	1.28	2.00	2.07	0.93	2.26	1.42	2.00	0.96
		95% CI	0.27 – 6.64	0.25 – 6.63	0.35 – 11.61	0.37 – 11.53	0.17 – 5.12	0.21 – 24.14	0.27 – 7.55	0.33 – 12.22	0.18 – 5.20

Table I.9: The Association between MAAS and Perceived Health

Variable	Response			OR adjusted for								
			Crude OR	Gender	Age	Education	Self-esteem	Gender, Age, Education, Self-esteem	BMI	Income	Confidence
Transit Mindfulness MAAS	Perceived to be Poor	OR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-	-	-	-
	Perceived to be Good	OR	2.29	2.25	2.33	1.61	1.85	1.34	2.34	2.32	2.28
		95% CI	0.40 – 13.04	0.39 – 13.04	0.40 – 13.51	0.26 – 10.13	0.31 – 11.23	0.19 – 9.23	0.39 – 13.92	0.36 – 14.96	0.39 – 13.49

Table I.10: The Association between Perceptions of Transit Walking and Perceived Health

Variable	Response			OR adjusted for							
			Crude OR	Gender	Age	Education	Self-esteem	Gender, Age, Education, Self-esteem	BMI	Income	Confidence
Perceptions of transit walking	Perceived to be Poor	OR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-	-	-	-
	Perceived to be Good	OR	1.92	1.96	1.78	2.92	1.47	1.36	1.95	1.78	1.87
		95% CI	0.34 – 10.96	0.34 – 11.21	0.31 – 10.34	0.37 – 14.32	0.24 – 9.04	0.17 – 11.01	0.34 – 11.16	0.26 – 12.21	0.32 – 11.07

Table I.11: The Association between Transit Walking Behaviours and Perceived Health

Variable	Response			OR adjusted for							
			Crude OR	Gender	Age	Education	Self-esteem	Gender, Age, Education, Self-esteem	BMI	Income	Confidence
Adequacy of transit walking (km/wk)	Perceived to be Poor	OR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		95% CI	-	-	-	-	-	-	-	-	-
	Perceived to be Good	OR	4.22	4.73	3.52	3.20	5.96	3.54	4.23	3.14	3.73
		95% CI	0.47 – 37.99	0.50 – 44.32	0.37 – 33.46	0.33 – 31.42	0.61 – 58.71	0.28 – 44.14	0.47 – 38.04	0.32 – 31.09	0.40 – 34.60

Appendix J: Charts Comparing Covariates To Conceptual Model Variables

Table J.1 Covariates by QL Transit Mindfulness

	Not Mindful (n=8)	Mindful (n=45)
Perceived health		
Perceived to be good (n=46)	8	38
Perceived to be poor (n=7)	0	7
Transit Walking Behaviours		
Meets transit walking criteria (n=20)	3	17
Does not meet transit walking criteria (n=33)	5	28
Transit Walking Perceptions		
Perceived as adequate (n=22)	2	20
Perceived as inadequate (n=31)	6	25
Transit Mindfulness		
High transit mindfulness (n=26)	1	25
Low transit mindfulness (n=27)	7	20
MAAS		
High Mindfulness (n=24)	4	20
Low Mindfulness (n=29)	4	25
Location		
Waterloo (n=15)	2	13
Kitchener (n=38)	6	32
Gender		
Female (n=33)	4	29
Male (n=20)	4	16
BMI		
Normal BMI (n=24)	4	20
Overweight (n=29)	4	25
Age		
Young (n=33)	5	28
Old (n=20)	3	17
Education		
Low Education (n=30)	3	27
High Education (n=23)	5	18
Confidence		
Low Confidence (n=23)	4	19
High Confidence (n=30)	4	26
Income		
Low Income (n=10)	1	9
Moderate Income (n=33)	6	27
Self-esteem		
Low Self-esteem (n=20)	4	16
High Self-esteem (n=33)	4	29
Spirituality		
Not Spiritual (n=14)	3	11
Spiritual (n=39)	5	34
Smoking		
Smoker (n=9)	0	9
Non Smoker (n=44)	8	36

Table J.2 Covariates by QN Transit Mindfulness

	Not Mindful (n=27)	Mindful (n=26)
Perceived health		
Perceived to be good (n=46)	23	23
Perceived to be poor (n=7)	4	3
Transit Walking Behaviours		
Meets transit walking criteria (n=20)	11	9
Does not meet transit walking criteria (n=33)	16	17
Transit Walking Perceptions		
Perceived as adequate (n=22)	8	14
Perceived as inadequate (n=31)	19	12
MAAS		
High Mindfulness (n=24)	12	12
Low Mindfulness (n=29)	15	14
Qualitative Mindfulness		
High Qualitative Mindfulness (n=45)	20	25
Low Qualitative Mindfulness (n=8)	7	1
Location		
Waterloo (n=15)	6	9
Kitchener (n=38)	21	17
Gender		
Female (n=33)	14	19
Male (n=20)	13	7
BMI		
Normal BMI (n=24)	16	8
Overweight (n=29)	11	18
Age		
Young (n=33)	21	12
Old (n=20)	6	14
Education		
Low Education (n=30)	13	17
High Education (n=23)	14	9
Confidence		
Low Confidence (n=23)	15	8
High Confidence (n=30)	12	18
Income		
Low Income (n=10)	4	6
Moderate Income (n=33)	19	14
Self-esteem		
Low Self-esteem (n=20)	13	7
High Self-esteem (n=33)	14	19
Spirituality		
Not Spiritual (n=14)	9	5
Spiritual (n=39)	18	21
Smoking		
Smoker (n=9)	5	4
Non Smoker (n=44)	22	22

Table J.3 Conceptual Model Variables and Covariates by Mindful Attention Awareness Scale

	High MAAS Mindfulness (n=24)	Low MAAS Mindfulness (n=29)
Perceived health		
Perceived to be good (n=46)	22	24
Perceived to be poor (n=7)	2	5
Transit Walking Behaviours		
Meets transit walking criteria (n=20)	6	14
Does not meet transit walking criteria (n=33)	18	15
Transit Walking Perceptions		
Perceived as adequate (n=22)	10	12
Perceived as inadequate (n=31)	14	17
Transit Mindfulness		
High transit mindfulness (n=26)	12	14
Low transit mindfulness (n=27)	12	15
Qualitative Mindfulness		
High Qualitative Mindfulness (n=45)	20	25
Low Qualitative Mindfulness (n=8)	4	4
Location		
Waterloo (n=15)	7	8
Kitchener (n=38)	17	21
Gender		
Female (n=33)	17	16
Male (n=20)	7	13
BMI		
Normal BMI (n=24)	14	10
Overweight (n=29)	10	19
Age		
Young (n=33)	15	18
Old (n=20)	9	11
Education		
Low Education (n=30)	11	19
High Education (n=23)	13	10
Confidence		
Low Confidence (n=23)	10	13
High Confidence (n=30)	14	16
Income		
Low Income (n=10)	4	6
Moderate Income (n=33)	15	18
Self-esteem		
Low Self-esteem (n=20)	7	13
High Self-esteem (n=33)	17	16
Spirituality		
Not Spiritual (n=14)	3	11
Spiritual (n=39)	21	18
Smoking		
Smoker (n=9)	5	4
Non Smoker (n=44)	19	25

Table J.4 Covariates by Transit Walking Behaviours

	Does Not Meet Transit Walking Criteria (n=33)	Meets Transit Walking Criteria (n=20)
Perceived health		
Perceived to be good (n=46)	27	19
Perceived to be poor (n=7)	6	1
Transit Walking Perceptions		
Perceived as adequate (n=22)	8	14
Perceived as inadequate (n=31)	25	6
Transit Mindfulness		
High transit mindfulness (n=26)	17	9
Low transit mindfulness (n=27)	16	11
MAAS Mindfulness		
High MAAS Mindfulness (n=24)	18	6
Low MAAS Mindfulness (n=29)	15	14
Qualitative Mindfulness		
High Qualitative Mindfulness (n=45)	28	17
Low Qualitative Mindfulness (n=8)	5	3
Location		
Waterloo (n=15)	8	7
Kitchener (n=38)	25	13
Gender		
Female (n=33)	23	10
Male (n=20)	10	10
BMI		
Normal BMI (n=24)	15	9
Overweight (n=29)	18	11
Age		
Young (n=33)	17	16
Old (n=20)	16	4
Education		
Low Education (n=30)	21	9
High Education (n=23)	12	11
Confidence		
Low Confidence (n=23)	16	7
High Confidence (n=30)	17	13
Income		
Low Income (n=10)	8	2
Moderate Income (n=33)	19	14
Self-esteem		
Low Self-esteem (n=20)	11	9
High Self-esteem (n=33)	22	11
Spirituality		
Not Spiritual (n=14)	8	6
Spiritual (n=39)	25	14
Smoking		
Smoker (n=9)	6	3
Non Smoker (n=44)	27	17

Table J.5 Covariates by Perceptions of Transit Walking

	Perceived as Inadequate (n=31)	Perceived as Adequate (n=22)
Perceived health		
Perceived to be good (n=46)	26	20
Perceived to be poor (n=7)	5	2
Transit Walking Behaviours		
Meets transit walking criteria (n=20)	6	14
Does not meet transit walking criteria (n=33)	25	8
Transit Mindfulness		
High transit mindfulness (n=26)	12	14
Low transit mindfulness (n=27)	19	8
MAAS Mindfulness		
High MAAS Mindfulness (n=24)	14	10
Low MAAS Mindfulness (n=29)	17	12
Qualitative Mindfulness		
High Qualitative Mindfulness (n=45)	25	20
Low Qualitative Mindfulness (n=8)	6	2
Location		
Waterloo (n=15)	7	8
Kitchener (n=38)	24	14
Gender		
Female (n=33)	20	13
Male (n=20)	11	9
BMI		
Normal BMI (n=24)	15	9
Overweight (n=29)	16	13
Age		
Young (n=33)	18	15
Old (n=20)	13	7
Education		
Low Education (n=30)	17	13
High Education (n=23)	14	9
Confidence		
Low Confidence (n=23)	14	9
High Confidence (n=30)	17	13
Income		
Low Income (n=10)	7	3
Moderate Income (n=33)	21	12
Self-esteem		
Low Self-esteem (n=20)	14	6
High Self-esteem (n=33)	17	16
Spirituality		
Not Spiritual (n=14)	11	3
Spiritual (n=39)	20	19
Smoking		
Smoker (n=9)	2	7
Non Smoker (n=44)	29	15

Table J.6 Covariates by Perceived health

	Perceived To Be Poor (n=7)	Perceived To Be Good (n=46)
Transit Walking Behaviours		
Meets transit walking criteria (n=20)	1	19
Does not meet transit walking criteria (n=33)	6	27
Transit Walking Perceptions		
Perceived as adequate (n=22)	2	20
Perceived as inadequate (n=31)	5	26
Transit Mindfulness		
High transit mindfulness (n=26)	3	23
Low transit mindfulness (n=27)	4	23
MAAS Mindfulness		
High MAAS Mindfulness (n=24)	2	22
Low MAAS Mindfulness (n=29)	5	24
Qualitative Mindfulness		
High Qualitative Mindfulness (n=45)	7	38
Low Qualitative Mindfulness (n=8)	0	8
Location		
Waterloo (n=15)	0	15
Kitchener (n=38)	7	31
Gender		
Female (n=33)	4	29
Male (n=20)	3	17
BMI		
Normal BMI (n=24)	3	21
Overweight (n=29)	4	25
Age		
Young (n=33)	3	30
Old (n=20)	4	16
Education		
Low Education (n=30)	7	23
High Education (n=23)	0	23
Confidence		
Low Confidence (n=23)	5	18
High Confidence (n=30)	2	28
Income		
Low Income (n=10)	4	6
Moderate Income (n=33)	2	31
Self-esteem		
Low Self-esteem (n=20)	5	15
High Self-esteem (n=33)	2	31
Spirituality		
Not Spiritual (n=14)	1	13
Spiritual (n=39)	6	33
Smoking		
Smoker (n=9)	3	6
Non Smoker (n=44)	4	40

Table J.7 Conceptual Model Variables and Covariates by Gender

	Female (n=33)	Male (n=20)
Perceived health		
Perceived to be good (n=46)	29	17
Perceived to be poor (n=7)	4	3
Transit Walking Behaviours		
Meets transit walking criteria (n=20)	10	10
Does not meet transit walking criteria (n=33)	23	10
Transit Walking Perceptions		
Perceived as adequate (n=22)	13	9
Perceived as inadequate (n=31)	20	11
Transit Mindfulness		
High transit mindfulness (n=26)	19	7
Low transit mindfulness (n=27)	14	13
MAAS Mindfulness		
High MAAS Mindfulness (n=24)	17	7
Low MAAS Mindfulness (n=29)	16	13
Qualitative Mindfulness		
High Qualitative Mindfulness (n=45)	29	16
Low Qualitative Mindfulness (n=8)	4	4
Location		
Waterloo (n=15)	11	4
Kitchener (n=38)	22	16
BMI		
Normal BMI (n=24)	15	9
Overweight (n=29)	18	11
Age		
Young (n=33)	18	15
Old (n=20)	15	5
Education		
Low Education (n=30)	17	13
High Education (n=23)	16	7
Confidence		
Low Confidence (n=23)	13	10
High Confidence (n=30)	20	10
Income		
Low Income (n=10)	5	5
Moderate Income (n=33)	20	13
Self-esteem		
Low Self-esteem (n=20)	11	9
High Self-esteem (n=33)	22	11
Spirituality		
Not Spiritual (n=14)	6	8
Spiritual (n=39)	27	12
Smoking		
Smoker (n=9)	3	6
Non Smoker (n=44)	30	14

Appendix K: Full Transcripts From Qualitative Interviews

Interview #1

How would you describe your general health and well-being?

If I were to use an adjective I would say it's excellent.

Are there any behaviours that you partake in that you consider very healthy or very unhealthy, or somewhere in between?

Yes, very healthy. Exercise on a regular basis.

Can you tell me about your lifestyle?

I lead a pretty Spartan I exercise on a regular basis. I don't eat sugary foods, I never eat fast food. I quit smoking. I don't do anything that's really unhealthy, per se. And I don't drink as much as I used to. I drink too much on the weekends but I don't really do that anymore. It's more of a past behaviour.

You mentioned exercise already, when you hear people talk about exercise what kinds of things do you think of?

You mean what kind of regimens do I think of? You mean, I personally associate exercise with you know, either resistance training with weight or cardiovascular exercise or a combination of the above. That is what I would categorize as exercise. As opposed to a sport which has exercise like qualities but isn't truly speaking an exercise. Exercise can occur anywhere.

By your definition of what exercise is, what types of ways do you get exercise on a daily basis?

I do my kettle bell routine. I walk a lot since I scrapped my car last month.

In an ideal world, what would your physical activity level be?

I would like to do the weight regimen I am doing now and would like to be able to walk to work as opposed to taking the bus but it's not realistic because it's too far. So that would be ideal for me.

Do you associate the bus with an unhealthy behaviour?

No I don't think it's unhealthy.

Is this ideal based on health ideals or do you enjoy this activity in itself regardless of the health effect?

I engage in physical activity primarily so that I don't fall apart physically. So then I guess it's to be healthier

The last time we talked, we discussed public transit use. Could you maybe think of reasons that people take public transit?

They no longer have cars, like in my case; they get a car repair bill that is too big so they scrap the car. So lack of a car. I would say that most of the people in this town are taking the bus because they don't have a car. And the reason I say this is because I think public transportation in this city and Canadian cities in general is quite overpriced and inefficient by global standards certainly compared to most Asian or European cities Canadian public transit is very decrepit and overpriced. So I would say that most people, myself included are taking it because they either lost their automobiles or can't afford one. Which is really too bad.

So you don't think people take public transit by choice?

No. Public transit. Absolutely not. No.

You said the last time that we talked, that you use public transit to get around. Could you describe why you take transit?

I guess you said that you scrapped your car, so I guess that is why. You've also mentioned that you think the system is lacking.

I find it inconvenient. It's affordable but it's overpriced. I mean I can afford it but by international standards it's grossly…outrageously overpriced. Especially considering how poor the service really is, you know?

In an ideal world, what means of transportation would you use to get around?

In an ideal world I would never own a car again. And I would use only public transit. I would like to use the subway and a bus you know and streetcars. What I dislike is how poorly it's done here.

How do you think people, in general, feel about taking public transit?

I think in my experience most of them loathe it. Especially the single mothers with their kids. The buses are overcrowded because they never have enough of them running. They run infrequently. For me it just a minor irritation but I think for a lot of people it's really a real drag.

Are there positive associations with taking public transit?

Yes I do. I find it's less stressful than driving, so I don't have to worry about you know, accidents. In that sense it's less stressful.

How do you think people, transit users, feel about taking public transit?

I think that people can't wait to get off the bus in most cases. Is my guess. From what I see.

What do you think about people who take public transit?

What is my overall impression? Umm it seems to me that a lot of the people on, well I'm stating the obvious, these are people with really low income for the most part. And there are exceptions. But in general they are very low income. I often see really, I mean low income, and then I see people that are really destitute or handicapped. So I think a lot of people taking the bus are there for a sheer lack of alternatives - which I think I have already alluded to. Or students who I guess aren't destitute per se, but are low income.

Mindfulness is often described as heightened self-knowledge or self awareness; thinking through the things that you do and why you do them. Have you ever heard of mindset or mindfulness?

Yeah, it's a Zen Buddhism thing. Yes I am familiar with it.

Have you ever considered your mindset?

Yes I have.

Do you think mindfulness is a positive or a negative thing to have in your life?

I think it can be great. But the bus is about the last place in the world I engage in introspection of any kind. But yeah, it's positive.

What do you think people's mindset is about public transit?

Generally speaking, people I know who are in the same situation as myself – who have lost their automobiles for various reasons, people who use the GRT can't stand it. I don't know too many people who have anything good to say about the GRT. The service is infrequent the buses are typically off schedule. The operators are surly at best, okay? Um it's not, it's NOT a well run transit system. Actually even by Canadian standards its poor, and by global standards it's abysmal. I think most people that are using the GRT really dislike it.

Do you think that is true about the low income people you were talking about, who don't have a better option?

Well yes and I think that they're on the bus everyday probably reminds them of their limited options so yeah, I'm sure you know, I would consider myself fairly low income because of the contractual nature of my work, so a lot of things went wrong for me so I lost a substantial amount of income and it wasn't pleasant. And I don't find public transit disagreeable at all I find using the GRT highly disagreeable. It's poorly run.

What do you think your mindset is while walking to transit?

It's not the walk that bothers me. I like the walk. It's the bus ride that I can take or leave. I usually just listen to music or tune out. Because I just don't like the whole experience.

When we first talked, you ranked the exercise that one gets while walking to transit as fairly low as a way of getting exercise.

Depending on the speed at which you walk and the distance that you have to you go. So those are variables

Do you consider your walking to transit as exercise?

A light form of exercise, yeah. Cause its only ten minutes at the most. In and of itself it would not constitute an exercise regime.

Can you foresee a reason for your mindset about public transit to change?

I think that the service is just poor. I think that if and when the levels of government are forced to invest more money into public transit and bring it up to European or Asian standards then my mentality would change completely, if the service were punctual, if the operators were civil, if it were a properly run affordable transit system. But as it stands its impunctual, the buses are frequently filthy; the operators are certainly not civil. It is certainly not punctual. It is poorly done.

Do you expect that a different mindset about transit use would impact the way you feel when you take transit?

I mean, I can try. Not necessarily, no. I can try it all I want and it's not going to be on time. It's kind of hard to spin that. The bus is late. How do you make that positive? Or there are no seats. For example, the express bus to UW by rights the hours of 8am and probably 10am they should probably have two buses. Not one bus that is so packed that it is frankly, unsafe. Impossible for people to get off...it's just ridiculous. And that goes back to underfunding. I feel sorry for people that have disabilities or strollers because for them it must be absolutely atrocious. For me it's just minor annoyances right...I don't really think that it increases my stress I think that it goes down because I'm not driving which can be really stressful and downright dangerous.

Do you think that walking to the bus stop decreases your stress or improves your health?

It probably has some salutatory effect on my health. Maybe stress. I don't know. I don't have much stress in my day to day life because my job is really low stress. These GRT things are aggravating at times but they're not really stressful like sitting in rush hour traffic.

Do you think you see your walk to transit in the morning or afternoon as a benefit to your health?

Yeah, I mean I don't see how it could be bad for me. So yeah it probably beneficial but it's too short to really constitute an exercise regimen per se.

Do you think that a shift in your transit mindset could make you enjoy your experience more?

I mean my attitude could not be, I am very much in favour of public transit. I think that the automobile centred way of life in North America has been a colossal waste of resources. It's almost criminal really. It's not transit I have a problem with, it's the GRT. It's abysmal. Even for a medium sized town like this, it's really poorly done. The dearth of leadership and management is just astounding. Some of the lesser used routes which don't have that many riders during certain hours. Why not just send a van instead of a full sized bus? And that way you could run transportation more frequently and service those areas instead of busses every half hour or one hour and sending a full sized bus - it's just phenomenal stupidity on their part. So it's not public transit I have a problem with, my mindset towards public transit is actually quite positive it's just that specifically the GRT stinks

Do you think your health has improved now that you've started taking public transit? On account of the fact that you are walking to the bus stop?

Maybe a little bit yeah, some fresh air. I might not – the walk is really too short – ten minutes. I'm not an expert on exercise or a kinesiologist but I don't think ten minutes makes a difference.

Well let's say that you're walking ten minutes to the bus in the morning and then ten minutes at the end of the day. It's generally suggested that you walk thirty minutes a day, so with incidental walking you probably reach that.

I don't know. I honestly don't know if it had a big effect on my health or not. I feel basically the same. It might be a nice supplement to what I'm already doing.

Interview #2

How would you describe your general health and well-being?

Good

Are there any behaviours that you partake in that you consider very healthy or very unhealthy, or somewhere in between?

Stress, but I am a parent. I am trying to be more patient. Through my own life I don't like to wait for things to happen, I do things instead of contemplating.

What about exercise or your eating?

Oh, I am ok. I am good. I eat ok, from all of the groups. I am exercising steadily and every day I try to walk and go pick up my son and kids and put them in exercise classes like swimming, running.

Do you consider yourself someone with a healthy lifestyle then?

Yes - more than average.

You mentioned exercise already, when you hear people talk about exercise what kinds of things do you think of?

I would list walking every day, running.

Does exercise have to occur in a certain location?

No no no. It should be part of every little second of your life. Even if you just go shopping, you are going to exercise. That is daily exercise. You shouldn't have to go specifically to burn all your calories at the gym or specific environment. You should do that before you even get there. Like, even if you go to the gym you should walk or run there, not take your car.

In an ideal world, what would your physical activity level be?

More. More active. I f I had the time and money. I could probably do more.

Is this ideal based on health ideals or do you enjoy this activity in itself regardless of the health effect?

I like the way you feel after you are physically active. After swimming lesson or lane run, oh it's so nice. The sensation that you can sleep better, clear your mind better and see through the things that are heavy in your head. You can be much more relaxed and see through things much better.

The last time we talked, we discussed public transit use. Could you maybe think of reasons that people take public transit?

They have to. I have to for my job and for travel in the winter time. But in the summer time I bike if I have to travel between the cities. Other than that, I walk or bike regularly instead of taking the bus. I have to take the bus. That is the reason. I would love to be sharing a car. ..I think other people feel pretty good about taking public transit. They have to do it. But I see teenagers, they are kind of resentful. Because the other kids are under pressure saying 'Oh my Mom can drive me there' so it's like a privilege for them and then the other kids say 'oh, I shouldn't take the bus, you can drive me there? Why should I take it?' So I try to say the bus is much cheaper sometimes and plus especially when you have a storm, it's much safer. Plus you are consuming so much gas to get over a snow bank. I try to tell my kids that it's much better to have bus transit.

Are there positive or negative associations with taking public transit?

Oh, I took it from the time I was born. My parents grew me up with mass transit from back home. So I have respect for the people that are driving the bus, they have such a huge responsibility. On top of that, especially here in Kitchener they are coming on the clock, plus back home I had to wait for two or three buses until I could get on the bus because they were so full. Here it is much more convenient and easier. Like when I first came to Canada I saw they have the travel thing for the strollers and I was amazed. I was like 'Wow, what kind of world is it here?' Back home you had to carry your own kid; you couldn't take a stroller into a bus. No way. So for me, it's such a plus. It's so convenient.

How do you think people, transit users, feel about taking public transit?

It's convenient. I can't walk more than 3 or 4 kilometers. It's transportation. It's the best way I can go somewhere far.

Mindfulness is often described as heightened self-knowledge or self awareness; thinking through the things that you do and why you do them. Have you ever heard of mindset or mindfulness?

Yes. If you are aware of what you are trying to do in that right moment when you are trying to focus. For example when you are trying to pass an exam you have to be mindful that if you never study to pass that exam then you better not show up and then you'll lose your money the fee. And it's better to try to prepare in a way that you can go.

You mean being aware of the consequences of your actions?

Yes, exactly.

Have you ever considered your mindset?

I have to train to be like that. No. I wasn't. Like my parents or through education tried to reach me to a point where I might set it. Otherwise I was much too childish. Little by little I can get to it.

Do you think mindfulness is a positive or a negative thing to have in your life?

Oh positive, yes. It is a benefit.

What do you think people's mindset is about public transit?

Depends now. Like I said, in my opinion it is a good thing and you have this choice, to take this regularly.

What do you think your mindset is while walking to transit?

Um, not to miss the bus most of the time but I am aware that it's coming soon. Am I set up to be frustrated or not? No, I am kind of glad that I can a bus to go where I have to go. It's something I am thankful for.

Do you consider your walking to transit as exercise?

Sometimes. It depends. If I have to take a further bus it is exercise for sure, it is more than 2km to get to that bus station. But it's good – I don't mind. Even in winter time I know I just have to leave earlier. It's a good way. It is exercise. Any movement, even when you walk is exercise. Walking to your desk, going to the washroom – is it exercise? Probably not but still you are walking. You burn some calories when you do that. So it is an exercise. Depends on how the human being categorizes that. I know people that cannot do that, so they are probably not exercising a lot. It depends. It is physical activity for sure, you have to get up you have to move your feet, and you have to walk, so it is exercise.

Is what you're saying that there is a difference between people that do acknowledge it as exercise and those who don't?

For sure. And in my opinion it is an exercise no matter what others try to twist my mind. It is an exercise in my mind because you have to put some effort to get there.

Interview #3

How would you describe your general health and well-being?

Right now it's poor.

Are there any behaviours that you partake in that you consider very healthy or very unhealthy, or somewhere in between?

The behaviour I would consider to be unhealthy would be drinking and healthy would be volunteering and being nice to people. As well for poor health would be poor diet and lack of proper nutrition. I'm taking vitamins now, but you know.

Can you tell me about your lifestyle?

Right now it's an unhealthy lifestyle. I'm trying to improve it. But it takes time. I try to eat better when I have the means to. Smoke less. Drink less. I will be joining the Delta Hotel health club. I've got to start exercising again cause I think that will help me with my depression. Like, depression is one of my biggest health drawbacks. You will sleep better. Last night I couldn't sleep so at 4 am I got out of bed and was walking around aimlessly.

You mentioned exercise already, when you hear people talk about exercise what kinds of things do you think of?

Physical exertion. Runners, people who cycle, people who walk. I do a lot of walking and I cycle when I have a bike. But I need to actually do weight training and do proper exercise.

By your definition of what exercise is, what types of ways do you get exercise on a daily basis?

Walking and talking.

In an ideal world, what would your physical activity level be?

Weight training and swimming and sauna to detox. Treadmills and stuff. Get back up to my optimum weight and be in good shape. Get my blood count back to where it's supposed to be for nutrients.

Is this ideal based on health ideals or do you enjoy this activity in itself regardless of the health effect?

I have to exercise for health, there's no doubt about it. I don't mind physical activity

The last time we talked, we discussed public transit use. Could you maybe think of reasons that people take public transit?

Economics. Weather. Convenience.

Could you describe why you take transit?

Because of the distances I have to go sometimes for food. If I walk all day I can't walk to Waterloo. I need to take the bus. It's fairly convenient and affordable.

In an ideal world, what means of transportation would you use to get around?

I'd have a vehicle. I'd have a little pickup truck. I miss having a vehicle. I would still take the bus but I would use the pickup trucks for little jobs.

How do you think people, in general, feel about taking public transit?

I think they don't mind it. I don't hear too much negative.

Do you have positive or negative associations with taking public transit?

No. It's positive.

How do you think people, transit users, feel about taking public transit?

I don't know. There are people that can't get away from their cars. They just need a set of wheels.

What do you think about people who take public transit?

They're smart if it works for them. A lot of people probably think that they're mostly students or seniors.

Mindfulness is often described as heightened self-knowledge or self awareness; thinking through the things that you do and why you do them. Have you ever heard of mindset or mindfulness?

I am extremely aware of my surroundings. It's beyond extreme. Yeah. I am one of the few people that look up, down and sideways wherever I go. When I was in my mid-20s I got into some pretty deep reading and writing. I am mindful of other people...I'm always opening doors or just being kind, just say good morning. The little things, you know?

Have you ever considered your mindset?

I think I am very mindful.

Do you think mindfulness is a positive or a negative thing to have in your life?

Very positive. People aren't mindful.

What do you think people's mindset is about public transit?

Some are mindful some aren't. They'll let somebody sit down, you know? Sometimes it's negative.

What do you think your mindset is while walking to transit?

Where the hell is the bus? Or whatever my mind happens to be thinking about at the time. I don't really think about the bus when I'm going to the bus stop. I know I'm going to the bus stop. But I don't really have to think about it because my feet are taking me there and I just have to wait for the bus,

Do you consider your walking to transit as exercise?

No the bus stop is 35ft away from my house. Sometimes I walk instead of taking the bus. It's depending on the scheduling.

Do you consider that walking as exercise?

Oh, any walking is exercise. Whatever amount you do.

Do you think that being mindful while walking every day improves your health?

Yes, if you try to be positive, that would be positive mindfulness. I think it does help. The air helps. It's also what you're thinking – if you're in a state of depression and you're walking you're still getting exercise but your mind is probably taking away the benefits.

Have you ever been of that mindset?

Oh yeah - lots of times. I try and remain positive and surround myself with positive aspects.

What do you think it takes to change someone with a negative mindset, the way that you describe, to be more mindful?

I guess they would have to be around you more and get to know you and then if they do see that you're mindful – people rub off on each other – if I am hanging around with a guy who's negative and depressed, then I get all negative and depressed. But if I hang out with people that are more positive and upbeat, it definitely lifts my moods and spirits and it's healthier for you.

Interview #4

How would you describe your general health and well-being?

Average health – getting old – not as in shape as I could be

Are there any behaviours that you partake in that you consider very healthy or very unhealthy, or somewhere in between?

I smoke and I drink an exceptional amount of coffee and had to cut back due to medical reasons. I used to drink 3-4 pots of coffee a day, unfortunately that lead to a bleeding ulcer, so for medical reasons I am now down to a pot of coffee a day. Which, both smoking and coffee are fairly unhealthy.

Is there anything that you do that you consider healthy?

I walk. Or at least I try to walk. I am planning on walking this summer at least. Other than that I walk to and from work and that's about the healthiest I get.

Can you tell me about your lifestyle?

Very sedimentary (sic: sedentary) lifestyle, I generally, just recently – I just stay at home and don't go out, don't do anything, just recently. It's just becoming a habit because of stress from work. Where it's just, I don't want to go out and do things.

When you hear people talk about exercise what kinds of things do you think of?

I generally think of 'at the gym' with weights, treadmill, the exercise balls. Things like that.

Do you exercise?

No.

Besides walking can you think of any ways that you get exercise on a daily basis?

No. Just walking.

In an ideal world, what would your physical activity level be?

Lying on the couch playing video games.

Wii fit?

Possibly wii fit.

Would you be more active if you had access to facilities?

Possibly. Mostly in the summer, yes. In the winter, because I am from the States I am not used to how cold it is and I've been here for ten years. From Florida. In the summer and that I wouldn't mind it, where I would prefer to go out more.

Do you enjoy physical activity, or do you think you ought to exercise only for your health?

I feel that am supposed to exercise more because I am skinny and am male, so I should be exercising more to get in peak health and stuff like that.

The last time we talked, we discussed public transit use. Could you maybe think of reasons that people take public transit?

In this day and age people take transit only because it's much cheaper than having a car. Especially with gas prices and that. The city itself is way too big to support walking. And there's a lot of places where the sidewalks are horrible and you just can't walk. Like on some of the side streets, there is no sidewalk. So to get anywhere people take the bus for cost reasons and stuff like that.

Could you describe why you take transit?

Again, cost reasons. I simply can't afford a car. I can't afford rent, food and a car and stuff like that so I'd prefer to have a house and food to eat.

Do you find transit convenient?

Not as convenient as it could be. Especially in outlying regions like my area the bus comes on Sundays but it stops at 6. So I can't have anyone over on the weekends really, unless they leave early. After 6 o'clock it only comes once every hour and on Saturdays it's only once every hour.

In an ideal world, what means of transportation would you use to get around?

Jet pack. A car if I could afford it. If it was a lot cheaper and wasn't 20,000 for a car plus an arm and a leg for insurance and that. And gas.

How do you think people, in general, feel about taking public transit?

Embarrassed, actually. Because it's sort of a status symbol of generally people that can't afford a car and stuff like that and have to rely on somebody else. So it's like I know a lot of people that have cars and they would rather not go out than take the bus. Like if we're going out drinking they would make sure they have enough money for a taxi, because they just simply will not get on the bus. They nickname it 'The Loser Cruiser'

Do you have positive or negative associations with taking public transit?

I personally don't care. It gets me from point A to point B, whether it's a car or a bus. I don't care.

Do you have any positive feelings about transit?

It's a lot better than Toronto. Except for the convenience in Toronto of the subway system, the buses out there generally don't make sense and it's like someone threw darts at a map. Here for the most part, let's take the #12 for example. No matter what bus you're trying to get, the #12 will connect you. So it looks like they're trying to organize it, but just bus times themselves don't mesh too well. They just need to have more people and more buses.

What do you think about people who take public transit?

Car people are embarrassed about it. Walkers and bikers I don't think really have an opinion.

So you're saying that drivers feel bad for transit users?

No, they look down on people. Because it's like 'Ha-ha I have a car and you don't' type thing. Just like if you notice the way that car users look down on pedestrians.

Mindfulness is often described as heightened self-knowledge or self awareness; thinking through the things that you do and why you do them. Have you ever heard of mindset or mindfulness?

That definitely does not describe me.

Have you ever considered your mindset?

Not really, I just generally try to take life as it comes. Because I used to stress out about things like that, especially when I was younger, and then it just got to a point where I was just stressing over everything and it just got where 'okay, stuff happens, plans change, nothing is certain, so might as well just go with the flow and accept life as it comes'

So you don't think of yourself as someone who is present in the moment?

The way you described it is being aware of yourself, and generally half the time I don't know what I'm going to be doing with that, because I generally tend to react to things instead of actually doing things.

Do you think mindfulness is a positive or a negative thing to have in your life?

I think it might be a positive thing, especially as I am getting older.

What do you think people's mindset is about public transit?

I just think that people are doing it, basically spending time on the bus, looking around when I am sitting on the bus, people aren't paying too much attention to anything at all, except 'is this my stop or no?'

What do you think your mindset is while walking to transit?

Everyone is thinking 'I hope I didn't miss my bus'. I am worried 'I hope I didn't miss my bus' or 'I hope it isn't late'. Generally, that's about it.

So it's stressful?

Yeah.

Do you think you could think of walking to transit as an opportunity to exercise or a chance to walk to the bus stop as opposed to a stressful walk?

Other than increasing the times, like the bus route times, so that I don't have to worry about missing the bus and that, I am pretty sure that if it was a lot more relaxed that way, I could be. Such as 'my bus is going come at 7:15 then 8:15 so it's a complete one hour wait at the bus terminal'

So you're saying you don't think you could be more mindful of the walking or the exercise because of the stress of catching the bus is too great?

Yes. Yes.

Do you think that being mindful and less stressed while walking to the bus, you could be healthier or less stressed?

Yes I think I could

Do you think you could enjoy walking to transit if that were the case?

Well I enjoy walking when I do walk, so I'd have to say yes.

What do you think would happen, in terms of your personal health, if you could leisurely walk to the bus stop and not be stressed about schedules. To appreciate the exercise?

I am pretty sure I would be more relaxed, and a lot more relaxed and mindful of what's going on

Could that only happen if the buses came more often or could you change your mindset on your own?

No, you would need a schedule change for that. Because it's just – I am generally stressed out by the fact that I don't want to go out, especially in the winter, I don't want to go out waiting 10 or 20 minutes in the freezing cold and that. In the summer it generally is a lot more relaxing cause I can leave 5 or ten minutes early and if I do leave that early it's not so stressful. It's like 'Oh, it's a nice day. Relax. Walk' instead in the winter it's like you try and get up at the last moment because it's just too cold and then I stress out cause I don't know if I missed the bus or not

Appendix L: Power Calculation

Based on Crum and Langer's (2007) one-tailed test: n = 84 α = 0.05

$$\Delta = \frac{0.45 - 0.15}{(0.4 + 0.5)/2} = 0.67$$

This is a large effect size and power is 0.9 for a mindfulness intervention. A reasonable goal for future research is a medium effect size (0.3) with the same power (0.9), to ensure that findings were not a statistical anomaly which gives a sample size of 191. Future interventions with that are interventions with two groups would therefore need a total sample size of 382 individuals and assuming attrition in future research with transit users will be similar to this study, 660 participants will need to be recruited to retain 382.