Action for sustainability through community gardening:
The role of adult learning

by

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Abstract

As community gardens (CGs) become increasingly popular, it is timely to investigate whether they further sustainability goals. Underpinning my research were questions like why people get involved in CGs, what benefits they derive, what they learn from gardening, and how governance facilitates that learning. Through interviews with gardeners, my data show that key benefits of gardening included building community, environmental protection, improved health, and resisting the industrialization of food. CG membership also facilitated learning in all three domains of Transformative Learning: communicative, instrumental, and transformation. Learning outcomes included gardening skills, improved insight into self and others, and increased prevalence of pro-environmental perspectives. The primary source of learning was interaction with other gardeners. CG involvement may contribute to sustainability by providing an environment which allows people to connect with nature, learn from others (if governance, garden organization, and social capital are strong), and choose more pro-environmental behaviours.

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Abbreviations

AFN: Alternative Food Network

AGM: Annual General Meeting

CG: Community Garden

PEB: Pro-Environmental Behaviour

PG: The People Garden

RGS: Riverview Garden Society

SLE: Significant Life Experience

SSOCC: Sustainable South Osborne Community Cooperative

UA: Urban Agriculture

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Chapter 1: Introduction

Urban residents are increasingly getting involved in community gardens (CGs) as one way of achieving community sustainability goals (Enns, Rose, deVries, & Hayes, 2008). As support for and the numbers of CGs increase, the question of their <u>true role</u> in achieving sustainability goals is becoming more and more pertinent. We have a relatively good understanding of the reasons people choose to garden such as, growing healthy food, an opportunity to be physically active, desire for social connection, or positive memories of gardening as a child. Research to date has also uncovered several reasons to engage in community gardening, including health benefits, environmental protection, engaging in leisure activity (gardening), and seeking food sources unavailable elsewhere (Draper & Freedman, 2010). The organization and governance of community gardens, combined with each gardener's history and the garden's context, combine to produce the gardener's experience. In this experience, gardeners may engage in learning (Moyer, 2012), which may be related to their connection to nature. Both this connection, and learning through gardening, may together or individually contribute to the further development of the gardeners' environmental attitudes and sustainability related behaviours.

Community gardens (CGs) take many forms, but all have in common that they are plots of land used primarily to grow food and are under some form of communal ownership and care (Draper & Freedman, 2010). CGs may be considered a type of urban agriculture, and/or as part of alternative food networks (Turner, Henryks, & Pearson, 2011; Evers & Hodgson, 2011). The first documented use of CGs in North America was in the 1890s, and although their historical development is non-linear, their function since then has remained largely the same: to assist vulnerable groups, to combat financial hardship, and to protect the environment (Draper &

Freedman, 2010). The gardens in this research have as their primary functions the dual purposes of producing food and protecting the environment.

Benefits of gardening cover a broad range of areas. Consumers are concerned about many food issues ranging from biotechnology and pesticides to rising food costs and the disconnection between people and the food system (Turner et al., 2011). Gardeners may express concern about environmental destruction and social collapse, and feel that their community garden was one source of security against these fears (Benedict, 2014). At their best, CGs can address some of these concerns, as they are inherently local (addressing the controversial problem of food travel miles); almost exclusively organic; and often grown with heritage or self-gathered seeds (addressing the fears around genetically modified crops). CGs may also contribute to sustainability by reconnecting people to nature in general and food systems in particular, which may lead gardeners to be more interested in and aware of environmental issues and the actions they can take in their daily lives.

CGs can also build social capital. Kingsley & Townsend (2006) explain that "social networks, cohesion, support and connection facilitated by trust and reciprocity are the basis of social capital between individuals in communities and lead to material and social benefits such as social support and mobility" (p. 526). Building social capital is clearly a desirable goal, and features of CGs such as the diversity of individuals who may find themselves co-operating neighbours facing challenges simultaneously, may facilitate this.

Potential for learning to occur in relation to food and food systems has been shown to be high (e.g. Kerton & Sinclair, 2010; McDonald, Cervero, & Courtenay, 1999). The design of CGs would also seem to provide rich opportunities for learning. Some CGs, especially school or kitchen gardens, are good at delivering formal programming, including academic instruction and

nutrition education programs (e.g. Robinson-O'Brien, Story, & Heim, 2009). CGs aimed at adult participants may also offer workshops (as news articles such as Allen, 2012, report on), or simply from interactions with other gardeners (e.g. Kingsley & Townsend, 2006). Moving gardening from the relative isolation of the backyard into public spaces frequented by a variety of gardeners likely provides opportunities for individual learning and social action through the strengthening of social capital.

1.1 Transformative Learning

One promising approach for considering the learning that may occur through community gardening is Transformative Learning (TL) theory. This learning may lead to the sorts of individual change and social action needed to create more sustainable societies. TL is a comprehensive theory of adult learning that describes the processes of individual adult learning (Kerton & Sinclair, 2010; Moyer, 2012). Transformative learning encapsulates learning in three main domains: instrumental, communicative, and transformative (Mezirow, 1996; Mezirow, 1991). In an idealized scenario of TL, an adult will go through several phases before critically and rationally evaluating their meaning structures (i.e., worldviews and perspectives), improving these meaning structures, and going on to express this transformation in both thought and action through behaviour change (Mezirow, 1996). In the context of CG specific TL experiences may have led to participants choosing to garden, or there may be specific features of CGs that enhance continued TL, and these in turn may lead to changes in other aspects of peoples' lives.

1.2 Connection to nature

Transformative Learning theory stems from the field of education, but the concepts are similar to much of the work on learning done in environmental psychology related to ideas about connection to nature, environmental attitudes, and environmental behaviours. This is a large

body of work, spanning from social psychology to ecotherapy (Gifford, 2007; Koger & Winter, 2010). Most relevant to my research, however, are connection to nature, nature relatedness, and emotional affinity to nature: these are all terms used to discuss how humans interact with the natural world that focus on a subjective/emotional connection (e.g. Nisbet, Zelenski, & Murphy, 2009; Perrin & Benassi, 2009; Kals, Schumacher, & Montada, 1999). It is generally theorized that connections to nature at an emotional level may lead to positive or responsible environmental actions, which is also referred to as ecological citizenship (Chawla, 1999; McKenzie-Mohr, Nemiroff, & Desmarais, 1995; Light, 2003). The theory of significant life experiences suggests that experiences in nature (particularly in childhood) shape people's attachments to, attitudes towards, and behaviours within, nature (e.g., Tanner, 1998a; Chawla, 1999). Put simply, we take care of the things we love, and we can only love that which we have intimate experience with. If this is true, CG may be a winding and non-linear path from experience, through to connection and learning, leading to transformations in environmental attitudes and behaviours.

1.3 Purpose and objectives

The purpose of the current research is to increase understanding about what, how, and why adults learn through their participation in CGs and the implications of such learning for community action on sustainability. I theorized that one framework to explain pro-environmental behaviour may include experience in nature (as a child or adult), connection to nature, and transformative learning. I worked towards an answer to the four primary research questions below, using this framework.

1. What and how do adults learn from their participation in community gardening?

2. Does participating in community gardening facilitate transformative learning, and if so, in what ways and form(s)?

3. Are there elements of garden design and functioning, or in participants' lives, which facilitate or stifle transformative learning?

4. Does participating in a community garden facilitate movement towards ecological citizenship, pro-environmental attitudes and behaviours essential to achieving more sustainable communities?

1.4 Methodology and Methods

I approached this work from a social constructivist perspective. Thus, I was interested in participants' understandings of the meanings of their experiences (Creswell, 2014). I am aware that my own perspectives and history may have influenced which meanings arose from my interactions with participants. My worldview will also have an effect on my interpretations of the data I collected (Creswell, 2003). My research process focused on open-ended interview questions as I sought to involve participants in the interpretation of their own intended meanings. A constructivist approach necessitates a qualitative approach to this study, as I sought to understand people's perceptions of their experiences. Given this I created themes grounded in the data as well as utilizing several constructs from TL theory. Because most existing research in the area of CG and TL is qualitative, I was also able to build on a growing strand of research while continuing to make exploratory probes. Linkages between the fields of environmental psychology and transformative learning are emergent, which means that as yet, cause-effect relationships between experiences, connection to nature, and pro-environmental behaviour.

I used a case study approach, which is characterized by in-depth analysis of one case of a phenomenon (Creswell, 2014). The boundaries of this case are both geographically and activity

based: community gardening (as opposed to other forms of gardening or urban food production), within the context of two CGs in Winnipeg, Manitoba. Community garden studies to date use a wide variety of methods, including ethnography (Flachs, 2010), community-based (Wakefield, Yeudall, Taron, Reynolds, & Skinner, 2007), and case study (Kerton & Sinclair, 2010). Kerton & Sinclair's (2010) case-study research on purchasing local organic food as a pathway to TL is the most similar to my proposed project and it supports the selection of case study as a strong strategy for this research.

Data were collected using semi-structured interviews with people participating in community gardening. Where possible, participants also showed me their garden plot in person. These methods are described in detail in Chapter 3. Dissemination of my research takes the form of this thesis and a published paper in an appropriate academic journal. A summary of results will be sent to all participants who indicated interest, including a research brief sent specifically to the garden managers who participated in the study. Early results were presented at the Canadian Association of Geographers' Annual General Meeting in Vancouver in June of 2015.

1.5 Organization of the Thesis

This thesis is organized into six chapters. Following this introductory chapter, Chapter 2 provides a review of the relevant literature, focusing on three main topics: the benefits and sustainability of CGs; transformative learning; and connection to nature. Chapter 3 describes my approach to the research, including methodology and methods, while Chapters 4 and 5 contain results and discussion. These will examine the motivations to garden and benefits of gardening, including social capital; as well as the governance of the gardens, learning outcomes from garden participation (in the Transformative Learning domains of instrumental, communicative, and transformative). They will also discuss the effect of gardening on connection to nature and pro-

environmental behaviour choices. Finally, the chapters look at whether there is any evidence of childhood experiences in nature or with gardening having an effect on adult environmental behaviours. Chapter 6 concludes the thesis with a review and summary of the research project drawing conclusions in relation to each of the objectives set, as well as recommendations for practice and future research.

Chapter 2: Gardening for the Planet

As sustainability becomes a buzzword, food issues continually ride at the forefront of much of the public's imagination, buoyed by books such as Michael Pollan's *In Defense of Food* (2008) and Jonathan Safran Froer's *Eating Animals* (2009). Academic and public interest in alternative food initiatives such as community gardens (CGs) is on the rise. These alternative initiatives are in many ways a response to how our global food system has evolved, with large cities dependent on food shipped from around the world, depending on fossil fuels for transportation. London, for example, contains 12% of Britain's population but requires the equivalent of 40% of Britain's productive surface area for food production (Deelstra & Girardet, 2000). This food is often imported from far away. In an urbanizing world, providing for food security in cities is a growing challenge: urban agriculture (UA) is one potential answer to this conundrum. Given the amount of unused, vacant, or otherwise simply grass-covered land within cities, there is tremendous (though debated) potential for food production in an urban context, whether on rooftops, in the peri-urban fringe, or in vacant lots in the heart of downtown. One form of urban agriculture is the community garden.

CGs can also be considered part of alternative food networks (AFNs; Evers & Hodgson, 2011). Much research on AFNs focuses on community-supported agriculture (CSA), where community members pay farmers a lump sum at the beginning of a season, and in turn receive a regular box of produce. This system gives farmers necessary stability, capital, and a guaranteed customer base; and provides consumers a steady stream of locally-produced, varied food at usually good prices. However, this perpetuates the existing structure of producers and consumers being separate from each other, while in CGs, the consumers are the producers (Evers & Hodgson, 2011). CGs therefore may provide benefits far beyond what a CSA could provide, by

giving consumers agency over their food production and requiring them to have embodied experiences in nature, which may lead to transformation in sustainability behaviours or other benefits.

2.1 Types of Community Garden

As mentioned above, urban agriculture may be manifested in the form of CGs (Turner, at al., 2011). CGs come in many forms, and may be directed towards a wide variety of purposes. Ferris, Norman, & Sempik (2001) completed a survey of CGs in the San Francisco Bay Area and identified varieties as wide as leisure gardens, urban farms/horticulture, healing and therapy gardens, and neighbourhood pocket parks. School gardens, kitchen gardens, and urban agroforests can be added to their list. Each of these types of garden features different types of governance to achieve their objectives. My research focuses on a type of CG most closely related to urban farms/horticulture and leisure gardens. Due to the wide variety of types of community garden, studies have disagreed on a common definition. There are, however, features in common across definitions: most reference sharing basic resources, growing of food and/or flowers (Larson, 2006; Beilin & Hunter, 2011), and being organised by a group such as a council, school, or group of gardeners (Turner, et al., 2011). Gardens may also include non-food goals such as functioning as a community hub, and allowing for community building and organising (Draper & Freedman, 2010).

A definition by Glover (2003) well captures the type of garden this study will examine: CGs are

> organised initiative(s) whereby sections of land are used to produce food or flowers in an urban environment for the personal or collective benefit of their members who, by virtue of their participation, share certain resources such as space, tools and water (p. 264, as cited in Beilin & Hunter, 2011, p. 523)

There are approximately 65 different garden sites in Winnipeg as of 2011 (Clouston, 2011). CGs in Winnipeg have several forms, including allotment, 'community', schoolyard, and CSA. The majority are either 'allotment' or 'community' in governance form, with most offering individual plots for rent. Allotment gardens, according to the City (City of Winnipeg, 2016a), are administered by the city in that individual gardeners rent their plot directly from the city, and they are bound by the City of Winnipeg Garden Plot Rental Terms of Use 2016 (or relevant year of gardening) (City of Winnipeg, 2016b).

Community gardens are distinguished from allotment gardens by the city, as these are run by a community group who signs a lease with the City of Winnipeg and then "handles all aspects of garden membership, maintenance and programming" (City of Winnipeg, 2016a). Both types of garden are managed by the City of Winnipeg Community Garden Policy (City of Winnipeg, n.d.)

Both the gardens in this study would be considered true "community gardens" by the City of Winnipeg, as one is on community center property (the People Garden) and the other is on city-owned park property (Riverview Garden Society), and both are run by nonprofit organizations (SSOCC and RGS, respectively). RGS is categorized by Clouston (2011) as a "community garden on city owned land"; the PG is not included on the map as it is more recently established.

2.2 History of Community Gardening

Community gardening traces its roots to Industrial Revolution England, as poor families in an increasingly urbanized world needed to produce food to eat (Birky & Strom, 2013; Hanna & Oh, 2000). Eventually this grassroots movement was formalized and supported by the British Parliament starting in 1887 (Hannah & Oh, 2000). In the 1890s and 1900s, Canada sported railway gardens and school gardens, which took off and spread in the form of Victory Gardens in World War 1, a phenomenon throughout North America (Turner et al., 2011; Trelstad, 1997).

Community gardening had a bumpy history throughout the 20th century, with booms during times of crisis such as the Great Depression and the 1970s oil crisis (Turner, et al., 2011). CGs exist elsewhere in the world, but do not share a common origin or history, and are often regulated quite differently (e.g., the German Schreber allotment gardens, which are highly regulated and may even feature small sheds which people sleep in on occasion) (Larson, 2006). One paper theorizes that food gardens become most popular "in times of fear and crisis…this may not simply be about…food production, but may be about…grounding people in place and creating and supporting efforts to find a sense of purpose and belonging…to land and to nature" (Turner, et al., 2011, p. 490). This suggests the importance of CGs, not just for food production, but also in their ability to connect people to each other and the sense of relationship they can foster with nature. A major review of United States CG literature found

> five main purposes and/or concerns related to community gardening: (a) engaging youth, (b) health (e.g. dietary, mental, and physical) benefits, (c) gardener versus land holder conflicts, (d) social capital, and (e) participant motivations and perspectives" (Draper & Freedman, 2010, p. 486)

Point (c) refers to the issue that most CGs are built on land held by third parties, and are often temporary. Legitimate CGs, which this research is interested in, generally defend their gardens with the goal of permanence. One Winnipeg study interviewed a garden coordinator who said that their ideal scenario for land tenure would be a 99-year lease (Mikulec, Diduck, Froese, Unger, & MacKenzie, 2013). However, not all community-driven efforts at gardening have permanence as their goal: the most temporary of community gardening efforts is known as guerilla gardening. Napawan (2016) defines this activity as "the growing of plants on vacant private or public land without permission or lease agreements" (p. 32). Mikadze (2015) elaborates on this, explaining that guerilla gardeners are those who refuse to simply accept the land allotted to them by municipal authorities, and their activity differs from that of community

gardeners in terms of the territoriality that they use. Guerilla gardeners, while some may defend their gardened spaces, are often motivated as much by desire to make political statements and reclaim territory from authorities as they are by the desire to grow and produce food (Mikadze, 2015). Because guerilla gardening is undertaken without official permission, and often illegally, the efforts are often very temporary.

Some of the situations which lead people to guerilla gardening are challenges which also face community gardeners. Pressures such as those for development can result in problems and conflicts for the success of gardening; however, banding together against outside forces can also contribute to community development among gardeners (Draper & Freedman, 2010). Several challenges relating to gardener versus land-holder conflicts have been identified in Winnipeg by Mikulec et al. (2013). Because the majority of CGs, particularly those in the inner city, are on City-owned land, the conflict is between gardeners or nonprofit groups which coordinate gardens, and the City (landowner). Challenges identified by Mikulec et al. (2013) included lack of financial and in-kind support (e.g. most sites are not hooked up to city water supplies); use of license to use land rather than a lease; short notification period for termination of license (as short as 30 days); and lack of administrative will and support.

The historical victory gardens, railway gardens, school gardens, and the like from the late 19th and early 20th centuries were undoubtedly massive sources of food production. A common estimation is that the victory gardens during World War 1 produced up to 40% of America's food supply (Brown & Jameton, 2000). Given that community garden models have evolved since the days of victory gardens, more current-day estimations are required. While this is an emerging area of research, a recent Canadian study conducted in Guelph, Ontario attempted a quantitative estimation of the food-growing potential of that city (CoDyre, Fraser, & Landman, 2014). They

found that while current levels of production from CGs provide the equivalent of produce for 2% of the population of the city, if land use for CGs was increased from less than 1% of residential yard space to 10%, and all gardeners produced at the maximum possible levels, 46% of the city's population could be fed produce (CoDyre et al., 2014). These changes would require much higher rates of buy-in from citizens, as well as large amounts of work and education, but it does seem that produce self-sufficiency (or at least partial self-sufficiency) within urban boundaries could be possible with sufficient will.

2.3 Motivations for and Benefits to Gardening

The reasons for getting involved in CGs are varied, and many studies simply speculate on these reasons, though some are beginning to ask gardeners about this topic. The most obvious might be food production, though surprisingly few studies identify this as a primary benefit or motivation for gardening. This may be because research on gardens in North America often assumes relative food security among households which engage in CGs, or because participants deem this statement too obvious to bother mentioning. However, one study conducted in Paris and Montreal focused on whether food production was a major motivating factor for gardeners, and found that indeed, it was the primary one, contrary to their expectations (Pourias, Aubry, & Duchemin, 2015). In fact, most gardeners in both cities reported more than occasional consumption of garden produce, with many having their growing-season produce needs entirely met through gardening, and some even extending that through the winter (Pourias, et al., 2015). Draper & Freedman (2010), in their review of U.S. CG literature, observed that other motivations for gardening included "access to fresh and better tasting food, time to enjoy nature, health benefits, opportunities to socialize, a chance to beautify and give back to the community, and efforts to support the conservation of green space" (Draper & Freedman, 2010, p. 480), as

well as desire for a leisure activity. Another study examined reasons for CG, including "to grow culturally appropriate food, to save money on their food expenses, to connect with their neighbors, or to exercise" (Baker, 2005, p. 306). An in-depth interview study from Australia suggested that it is important to understand individual, not just collective, motivations for gardening (Turner, 2011). Many of these gardeners wanted to grow food that they could not find elsewhere, but beyond this, some felt that gardening was "an assertion of social values and ideals at an economic level…This was [seen as] a bid for…the freedom to exert power over what you consume" (Turner, 2011, p. 514). Another Australian review found that North American CG literature had five themes that represented the motivations to garden, including improving the aesthetics and safety of a neighbourhood; loving gardening and nature; ethical/moral motives; seeking community bonding; learning about plants; and exercise (Kingsley, Townsend, & Henderson-Wilson, 2009).

Financially, CGs may provide great individual benefit; or they may cost more than they yield. Draper & Freedman (2010) reported on a 2004 study that "estimated that in New York City, an investment of $5 to $10 in plants provides a profit of $500 to $700 worth of fruits and vegetables" (p. 481-2). This was confirmed by a similar study from New Jersey that estimated that an input cost of $25 yielded $500 on average in vegetables for an average of a 700 square foot plot (Alaimo, Packnett, Miles, & Kruger, 2008). If these are accurate estimations, gardening could save individuals hundreds of dollars a year in food costs. However, we must recall that these results are confined to a particular climate, and particular social culture and governance structure around community gardening, since a 2014 Canadian study suggested that Guelph residents spend approximately $7.57 per kilogram of vegetables produced on average from their

community garden plot, and point out that this is higher than the equivalent cost if the same vegetables had been purchased from a grocery store (CoDyre et al., 2014).

Benefits of gardening, although often the same as reasons to garden, are a discrete category, although many conflate the two. Reasons to garden are why people state they wish to garden, which may be philosophical and idealistic or practical, or why people theorize that others may choose to garden. Benefits of gardening may be the same as reasons to garden, but emerge from the experience; they may also be unexpected and therefore not motivating factors instigating gardening. Benefits can become reasons to garden over time, which is why they are so difficult to separate from reasons, although I have attempted some untangling in this thesis.

One of the most frequently studied and cited benefits of CGs is personal health. A phone survey conducted in 2003 found that households with an adult who participated in a CG consumed more fruits and vegetables, more frequently, than those without an adult CG member (Alaimo, et al., 2008). Draper & Freedman (2010) found that this was a consistent result across much U.S. CG literature, with CGs enhancing "positive dietary habits, such as increased fruit and vegetable consumption and preference among participants" (p. 479). They also found that studies cited improved emotional health, as well as increased physical activity, among community gardeners. A qualitative study of an Australian community garden confirmed this health focus, reporting that gardeners found their experience "beneficial to their health and wellbeing", including exercise and nutrition (Kingsley et al., 2009, p. 211).

Further individual benefits may include pride, connection with nature, a defined role in the community, a sense of achievement, spirituality, relaxing, and an opportunity to learn (Kingsley et al., 2009; Poulsen, Hulland, Gulas, Pham, Dalglish, & Wilkinson, 2014). Some of these benefits seem to be provided by the collective nature of the garden, and other benefits are

specifically beneficial to the collective itself, such as increased community safety, cleaner lots, and provision of gathering places (Poulsen et al., 2014).

Social benefits to gardening are discussed more in-depth in section 2.6 below, and include beautification of communities (Hannah & Oh, 2000; Flachs, 2010), socialization (Flachs, 2010), and social capital building (Glover, 2004; Flachs, 2010, Twiss, Dickinson, Duma, Kleinman, Paulsen, & Rilveria, 2003).

2.4 Criticism of Community Gardens

Despite their health, sustainability, and social capital benefits, CGs have been critiqued by some as potentially problematic. One concern is that, by filling service gaps that governments could or should fill, CGs further a neoliberal agenda and absolve the government from responsibility to ensure that our food supply is sufficient, safe, nutritious, affordable, and accessible by all. When the lack of these things is strongly noticeable by citizens, more social pressure is put on the government; however, if grassroots service providers enter and satisfy the felt need, that social pressure may ease. Essentially, those who make this critique believe the government should be providing CG-like services, and CGs legitimize their lack of service provision (McClintock, 2014; DeLind, 2015). However, this critique does not take into account that UA may be necessary for sustainability. It may be that a middle road exists where, without neoliberalization, UA may continue to thrive.

Further, the role of CGs in society, and governments' role in providing or supporting them, is little-examined. CGs only provide necessary government services where they are serving the poor; in this study, it is clear that at least some CGs serve people who are already food-secure and seeking a boost to the taste or freshness of their food, or other benefits such as community connections, exercise, relaxation, and a hobby. Because CGs are so varied in location, size,

organization, and population served, it is difficult to make a blanket statement about how they are related to a neoliberal agenda.

A recent paper exploring Lansing, Michigan's Urbandale farm, a non-contiguous urban farm in a relatively poor yet stable blue-collar neighbourhood, expressed several concerns about how urban agriculture intersects with social issues (DeLind, 2015). Several of the author's concerns relate more specifically to urban farms, rather than CGs, such as the concern about depoliticizing residents and professionalizing production with increasing focus on production paired with decreasing focus on the local context (DeLind, 2015). She suggests that in order to be effective, urban agriculture (including CGs) requires careful consideration of the neighbourhood context, as well as "growing new power" (DeLind, 2015, p. 4) - that is, putting social justice at the forefront.

Another concern about CGs is that they may feed "defensive localism" (Evers & Hodgson, 2011, p. 589), or a mindset that local automatically equals better, whether or not it is actually more sustainable or valuable. This is a cognitive distortion, which may lead to irrational behaviour and choices which are suboptimal for communities and individuals. Media reports include more practical concerns with CGs, such as whether marijuana might be grown in the plots, fights between gardeners, thefts of produce, weedy and overgrown plots abandoned by overzealous gardeners who got overwhelmed by the work, and providing a haven for homeless people and drug sales and use (Hirsch, 2013).

Beyond social concerns with CGs are health concerns. Because CGs are often established on brownfields, or otherwise near roads and high-traffic zones; these areas are likely to contain contaminants such as heavy metals, which plants can take up, and enter the bodies of those who consume it, resulting in health problems (Mok et al., 2014). It is clear that further research into

the ecological benefits to and sustainability of CGs needs to be done, yet initial work indicates many potential positives. Some CG sites are addressing concerns about brownfield contamination by implementing raised beds instead of in-ground planting (e.g. Food Matters Manitoba, 2012); other solutions may be possible but practical considerations must be taken into account (i.e. CGs rarely have the organizational stability or funding to do large-scale or long-term brownfield remediation).

In order to better address these and other concerns, it is necessary to gain a deeper understanding of the experiences of gardeners, and the true impacts of gardens on sustainability behaviours.

2.5 Sustainability and Gardens

CGs may also contribute to the sustainability of the food system. Currently, the food system (i.e., all activities related to food production, processing, distribution, consumption, and waste management) has put many of our metaphorical eggs in a single basket: that of large-scale monoculture agriculture dependent on fossil fuels (Barthel & Isendahl, 2013). Any system without redundancies and diversity is much less resilient to shocks, despite being highly efficient. Since the food system is one of the most polluting activities of everyday life, it is a key component in designing a more sustainable future for humanity (Carlsson-Kanyama, Ekstrom, & Shanahan, 2003). We may require, for the sake of the long-term viability of our food system, a less impactful system which is more diverse, redundant, and thus more likely to provide food security for everybody in the long term. CGs also feed directly into food security at the local level, as they are often created in the midst of 'food deserts' - areas, usually in inner cities, which are far from grocery stores and supermarkets that carry affordable and good-quality produce (e.g. Barthel & Isendahl, 2013; Corrigan, 2011; Ferris, et al., 2001).

Sourcing food locally may - or may not - have an impact on the footprint of imported or industrially-produced food. There is a growing popular belief that local food has a smaller ecological footprint than imported food, based on the logic of food-miles; that is, it takes fossil fuels to transport food from farm to plate, and thus a farther distance of transport equates to a higher use of fossil fuels and thus higher overall ecological footprint. However, others argue against the entire concept of local food being more sustainable, suggesting that life-cycle analyses of transportation energy and/or fossil fuel outputs are actually greater for locally grown food rather than industrially-produced food (e.g. Edwards-Jones, et al., 2008). Life-cycle analyses are extremely challenging to perform, including on food, because of the wide variety of relevant foods, different production methods, variation in climate over time and space, and multiple potential levels of processing. A life-cycle analysis, the only comprehensive one to date that could be found, studied the greenhouse gas emissions of the food system in the USA, finding that food miles only contributed 4% of total greenhouse gas emissions (Weber & Matthews, 2008, as cited in Mok et al., 2014). Buying locally may actually *increase*, in some cases, the greenhouse gas emissions of a food product due to higher inputs required for smaller-scale or out-of-season, non-local production.

This critique is typically narrowly focused on the food-miles approach, however, and excludes other aspects of sustainability and resilience, and ignores that locally-produced food is also often produced and processed using different methods than imported food (which is typically part of the industrial food system). Further, the entire discussion about the ecological footprint of local food is focused around what farmers produce, and ignores the issue of gardens. It is unclear what the ecological impact of food consumed by the producer in an urban

community garden is, and this may prove impossible to quantify due to the vast variety in garden types, produce grown, and travel time to and from the gardens.

In terms of physical role in the immediate ecology of their city, CGs and other forms of urban agriculture have potential to contribute to urban biodiversity, although as Beilin & Hunter (2011) point out, we do not yet have a suitable set of indicators with which to measure this, and "most plant species in a CG are introduced ones, and known to urban ecologists as 'exotics'" (p. 524). A study on the richness, abundance, and ecological characteristics of bees in CGs in the core of New York City - the only quantitative natural science study on the ecology of CGs which could be found - found that the species richness of native bees in urban gardens was quite low, compared to larger green spaces and urban forests nearby (Matteson, Ascher, & Langellotto, 2008). However, exotic bee species are abundant in these same gardens. They concluded that CGs have strong ecological value, and that gardens may "serve as reservoirs, and possibly points of establishment, for exotic species" (Matteson et al., 2008, p. 148). This lone study can be supported by more tangential research such as examinations of other types of urban green space. For example, one study examined multiple park spaces in Halifax, from naturalized forests to mowed playing fields, studying their vegetation (LaPaix & Freedman, 2010). While they did not study any garden settings, urban parks share many characteristics with CGs, particularly in terms of their heavy human impact and active management. This study suggests the strong importance of incorporating native vegetation into gardens wherever possible, and being cognizant of managing for potentially invasive species both in and at the edges of community garden spaces.

2.6 Social-Ecological Sustainability: Social Capital and Community Development

CGs contribute not only to ecological sustainability, but also to social sustainability. Some authors theorize that CGs may contribute to resilience in social-ecological systems, in part

through encouraging civic environmentalism through environmental education (Krasny & Tidball, 2009). Frequently CGs are geographically located in underprivileged areas of cities, with primarily poor, minority, disabled, elderly, immigrant, and/or homeless populations. These are areas which are most likely to lack easy access to fresh high-quality produce in food stores, and are most likely to benefit from the establishment of a CG. CGs are seen by gardeners and organizers alike as contributing to the beautification of their community (Hannah & Oh, 2000; Flachs, 2010). CGs can also be locations for both socialization (Flachs, 2010) and building social capital (Glover, 2004; Flachs, 2010; Twiss, et al., 2003).

Social capital may be defined as "the trustworthy and reciprocal connections that exist between individuals in social networks" (Moquin, 2014). It contains two main generally recognized subtypes: bridging (connections between groups) and bonding (connections within groups) (Chitov, 2006). Social capital is considered an important concept by many scholars, community activists, and policy makers because it is believed that "successful cooperation for long-term mutual benefit depends on the cultivation of social capital" (Bridger & Luloff, 2001, p. 464). Bridger and Luloff (2001) question this value, suggesting that at least a clearer definition of what is meant by social capital is required. While a general consensus seems to have formed that social capital is a positive good, it also has a dark side. When bonding social capital becomes too strong, the bonds are so tight that the social network becomes exclusionary, and prevents the development of bridging capital. A balance between bonding (intra-group) and bridging (inter-group) social capital is important in order for its benefits to have maximum benefits on the maximum number of people – maintaining strong linkages without unnecessarily excluding.

CGs can facilitate the building of social capital by being locations where people from "a diverse demographic of race, age, sex, religion, and tradition" can meet and interact (Flachs, 2010, p. 1), which allows for community-building (Glover, 2004; Hanna & Oh, 2000). For example, immigrants may find that through mutual involvement in a CG, that they are able to support each other (Hanna & Oh, 2000). Glover (2004) points out that

> a community garden is a collective venture that entails the formation of a social network, which voluntarily brings together the collective resources of neighbors to address pressing neighborhood issues…The participants' willingness to share resources is only enhanced by the social connections they make during their participation in the shared act of gardening (p. 143)

In CGs, gardeners have an opportunity to organize themselves around gardening and other issues (Twiss et al., 2003). Flachs (2010) suggests that "by linking organizers with socially conscious people garden initiatives provide a social space that fosters networking and activism" (p. 8). However, Glover (2004) points out that there may be both costs and benefits to building social capital in this way, as social dynamics of gardens may create core groups which sometimes exclude outsiders from decision-making. The benefits and costs of CG-based social networks seem to depend somewhat on a persons' position in that social network (Glover, 2004). Many participants and researchers still find CGs to be a powerful source of good and a focal point for community organization and mobilization, two key ingredients towards our sustainable future.

2.7 Learning and Connection to Nature: Paths to Sustainability

CGs have been spoken of as contexts for learning, particularly for youth (Krasny & Tidball, 2009; Klemmer, Waliczek, & Zajicek, 2005; Ozer, 2007; Hardy & Grootenboer, 2013). Learning, according to Mezirow (1994, p. 222-223), is "the social process of construing and appropriating a new or revised interpretation of the meaning of one's experience as a guide to

action". Little research has been done on how and what adults might learn in relation to their garden experiences, although one paper concludes that purchasing organic food may be an occasion for learning (Kerton & Sinclair, 2010). However, because the development of ecological citizenship through gardening is consistent with Mezirow's description of learning (discussed below), we can look to this literature in order to understand some of the relationships between gardening and learning outcomes. I discuss this link more in-depth in section 2.9 below, acknowledging that through enhancing place attachment and social capital, as well as providing an opportunity to gain social-ecological knowledge, gardens have already been found to be sources of learning by some (e.g. Rogers & Bragg, 2012; Firth, Maye, & Pearson, 20104; Larson, 2006; Moquin, 2014). I have chosen to draw on TL theory because it is a current, dynamic framework within which to place gardener's experiences and behaviours and because of its explicitly constructivist underpinnings (Mezirow, 1994).

Although CGs usually have collective groups which govern them, there is ample opportunity for individual learning through interactions with others, and the trial-and-error process of learning to garden effectively. Although CGs have a strong collective element, the extent of this varies heavily depending on many factors, including governance model. Even the least collective CGs have individuals participating in gardening. Further, in most CG models, individuals have agency over what and how to grow in their own plot of land. They generally work independently unless they have a garden model which involves collective work bees, or an alternative model such as communal gardens. TL theory has been applied to sustainability learning by other researchers (e.g. Diduck, Sinclair, Hostetler, & Fitzpatrick, 2012; Moyer, Sinclair, & Spaling, 2012; Keen & Mahanty, 2006), and my use of it here contributes to a growing field. It is almost impossible to draw causal links between learning experiences and behaviour change in

participants, but their own critical reflection on their learning experiences (a central feature in TL) should reveal potential connections and correlations. The choice to garden may itself be a sustainability behaviour resulting from a transformative learning experience; or gardening may be an experience leading to transformative learning and new sustainability behaviours. The interview schedule was designed to capture participants' experiences with gardening and elicit both pre- and post-garden learning and behaviour.

2.8 Transformative Learning Theory

Transformative learning (TL) theory is one of only a small number of adult learning theories, and is one of the most prominent and frequently cited. It is the subject of much discussion, debate, and revision (e.g. Howie & Bagnall, 2013; Newman, 2012). This theory, which Jack Mezirow began to develop in 1978 in a study on adult women in post-secondary education (Mezirow, 1978), outlines the process through which adults learn. In Mezirow's words, TL is "intended to be a comprehensive, idealized, and universal model consisting of the generic structures, elements, and processes of adult learning" (Mezirow, 1994, p. 222), with the ultimate goal of making people "more inclusive, discriminating, open, reflective, and emotionally able to change" (Mezirow, 2003, p. 58). In a 1997 book chapter, Mezirow expanded on his definition, explaining that

> The nature of adult learning implies a set of ideal conditions for its full realization…The position here is that there is an inherent logic, ideal, and purpose in the process of transformative learning. The process involves transforming frames of reference through critical reflection of assumptions, validating contested beliefs through discourse, taking action on one's reflective insight, and critically assessing it (Mezirow, 1997, p. 11).

One key to TL theory is the notion of meaning schemes or structures; that is, the perspectives we hold about the world. Mezirow points out that we resist learning things that do not fit with our meaning structures, yet we still have an intense urge to comprehend the meaning

of our experiences. It is through reflection, he argues, that we can make sense of these experiences; a process which is likely to transform our meaning structures. This reflection is part of a series of eleven stages that Mezirow has distilled from empirical research (Mezirow, 1991, pp. 168-169):

1. A disorienting dilemma
2. Self-examination with feelings of guilt or shame, sometimes turning to religion for support
3. A critical assessment of assumptions
4. Recognition that one's discontent and the process of transformation are shared and others have negotiated a similar change
5. Exploration of options for new roles, relationships, and actions
6. Planning a course of action
7. Acquiring knowledge and skills for implementing one's plans
8. Provisionally trying out new roles
9. Renegotiating relationships and negotiating new relationships
10. Building competence and self-confidence in new roles and relationships
11. A reintegration into one's life on the basis of conditions dictated by one's new perspective.

TL theory establishes two main learning domains: instrumental, and communicative, which may lead to transformations in an individuals' behaviour and individual and/or community action. All domains of learning are oriented towards the transformation of meaning structures, which Mezirow defines as "the structure of psycho-cultural assumptions within which new experience is assimilated and transformed by one's past experience" (Mezirow, 1981, p. 6).

The first domain is instrumental learning, or learning about the world through empirical testing. Instrumental learning is distinct from communicative learning in that "the developmental logic is hypothetical-deductive, and empirical methods are more often appropriate for research" (Mezirow, 2003, p. 59). Instrumental learning usually manifests as increased knowledge about facts and skills.

Communicative learning is the attempt to understand what somebody else means by what they are saying. In contrast with instrumental learning, communicative learning is heavily defined by its context and draws on "ideal and normative concepts" (Mezirow, 1994, p. 225). As Arends (2014) explains, "communicative action is the shared and universal attempt of individuals to understand through the use of language" (p. 362), a statement that supports Mezirow's own definition:

> communicative learning refers to understanding what someone means when they communicate with you. This understanding includes becoming aware of the assumptions, intentions and qualifications of the person communicating…the developmental logic involves analogic-abductive inference. Abductive reasoning is reasoning from concrete instances to an abstract conceptualization (Mezirow, 2003, p. 59).

In part because communicative learning encourages abductive reasoning, it can facilitate learners' questioning received wisdom, which allows them to form their own theories about a problem or situation. This can be empowering as it allows the learner to advance their own assumptions, intentions, and qualifications.

Transformative learning (not to be confused with the name of the theory itself, but rather one of the theory's domains of learning, equivalent to instrumental and communicative learning) is "the evaluation of premises and assumptions that results from questioning the products of instrumental and communicative learning" (Moyer, 2012, p. 63-4); it "transforms problematic frames of reference - sets of fixed assumptions and expectations" (Mezirow, 2003, p. 58). This third domain, also known as perspective transformation, is an "emancipatory process" (Mezirow, 1981, p. 6), which leads the agent to understand the constraints their current psycho-cultural assumptions place on how they see the world, then shift that structure towards one which is more inclusive, and act upon these new understandings. Mezirow identified two primary routes to perspective transformation:

one is a sudden insight into the very structure of cultural and psychological assumptions which have limited or distorted one's understanding of self and one's relationships. The other is movement in the same direction that occurs by a series of transitions which permit one to revise specific assumptions about oneself and others until the very structure of assumptions becomes transformed (Mezirow, 1981, p. 7-8).

The latter route to perspective transformation is the most common. Newman (2012) agrees that a 'watershed' moment is rare, citing another author who found that "'although a single event may catalyze a shift or a particular story might dramatize a transformation, closer examination reveals that change or shift was long in coming and its possibility prepared for in myriad ways'" (Daloz, 2000, pp. 105, as cited in Newman, 2012, p. 43). Disorienting dilemmas tend to be a series of ideas, events, and confrontations which, remembered or not, prepare the ground for learning.

One of the most central components to the learning process is discourse and rational reflection. Discourse, in TL theory, "refers to dialogue involving the assessment of beliefs, feelings, and values" (Mezirow, 2003, p. 59). Mezirow lays out a set of conditions which should be in place for ideal discourse to occur:

> (a) have accurate and complete information, (b) be free from coercion and distorting self-deception, (c) be able to weigh evidence and assess arguments "objectively," (d) be open to alternative points of view and to care about the way others think and feel, (e) be able to become critically reflective of assumptions and their consequences, (f) have equal opportunity to participate in the various roles of discourse, and (g) be willing to accept an informed, objective and rational consensus as a legitimate test of validity (Mezirow, 1994, p. 225).

While ideal conditions for discourse may be almost impossible to achieve, even discourse undertaken in less than ideal conditions may produce learning outcomes.

While TL has traditionally been seen as something that occurs in formal or classroom settings, extensions into non-formal settings such as sustainability issues have recently been explored by many researchers. TL theory is a common theory of individual learning applied to

sustainability and natural resource management research (Moyer, 2012). It has been applied to

topics such as environmental assessment (Sinclair & Diduck, 2001; Walker, 2012) and

participatory resource management (Marschke & Sinclair, 2009; Diduck et al. 2012; Sims &

Sinclair, 2008). Social learning theory is also often used to understand learning in natural

resources management; this area boasts a robust literature (e.g. Cundill & Rodela, 2012; Rodela,

2011). Social learning involves learning by individuals in a group setting, through interactions

with multiple stakeholders and/or through experimentation and reflection (Cundill & Rodela,

2012). While social learning has significant overlap with TL theory, in this research I focus on

TL due to its emphasis on the individual and my interest in individual behaviour choices.

Research has also explored the ways in which programs directed towards environmental

education create transformative learning (Najjar, Spaling, & Sinclair, 2013; D'Amato & Krasny,

2011). Individual choices may lead to transformative learning (Kerton & Sinclair, 2010;

McDonald, et al., 1999), as may participation in environmental activism (Kovan & Dirkx, 2003;

Alexander, Donald, 1999).

Enacting learning, or taking action based on one's learning, can be seen as an integral final

step to complete the TL process (Diduck, et al., 2012). This is the application of "the outcomes

of our reflection and discourse to transform our habits of mind and points of view and then take

action based on this new perspective" (Diduck, et al., 2012, p. 1315). Some caution about the use

of behaviour change alone as evidence of transformation, such as Cranton & Kasl (2012) who

suggest that "mobilization [enacting learning] could lead to transformation, but it is not an

outcome in itself" (p. 397). This concern is shared by Wals, who goes one step further to suggest

that education for sustainable development and environmental education should avoid the

attempt to change behaviours, since learning from the perspective of transformative learning

theory is emancipatory rather than instrumental, seeking to foster autonomous thinking, rather than achieve specific outcomes (Wals, 2011). However, some mention the enactment of transformation as a critical step in the learning process (Diduck, et al., 2012), integral to Mezirow's initial conception of a course of action as part of the 11 stages of transformative learning.

Transformative Learning theory has been critiqued for issues such as its focus on rational discourse to the exclusion of non-rational dimensions (Dirkx, 1997; Moyer, 2012), overlooking the role of power and power structures (McDonald, et al., 1999), as well as for issues of circular causality, disagreement with its modernist and emancipatory perspective, lack of change since the original stages of learning were proposed, and questions of whether the term 'transformative' is meaningful (Howie & Bagnall, 2013). A 2007 review of transformative learning research found that "transformative learning was found to be effective at capturing the meaning making process of adult learners" (Taylor, 2007, p. 174). However, it did agree with other critiques of transformative learning, saying that the theory needed to better incorporate "the role of context, the varying nature of the catalysts of transformative learning, the increased role of other ways of knowing, the importance of relationships and an overall broadening of the definitional outcome of a perspective transformation" (Taylor, 2007, p. 174). However, TL theory is unabashed in its focus on rationality as the heart of learning, although others wish to expand the definition of rationality into "multiple rationalities" (Arends, 2014, p. 361), allowing the incorporation of embodied learning. In light of these critiques, I have incorporated statements by participants which both explicitly demonstrate critical reflection, and imply non-rational reflection.

2.9 Emotional affinity and connection to nature as a path to ecological citizenship

A vast repository of research exists, primarily within the environmental psychology literature, which attempts to parse why some people make more sustainable choices, why some people move from unsustainable choices to sustainable, and why some people persist in making unsustainable choices. One of the challenges facing researchers in determining causes of behaviour change towards sustainability is that people's attitudes, and even the behaviours they *intend*, are only very weakly correlated at best with actual behaviour (Finger, 1994). However, experience in nature does appear to be correlated with environmental action (Finger, 1994; Wells & Leckies, 2006); as does sense of place/place attachment (Rogers & Bragg, 2012). Turner (2011) used the notion of embodiment - that is, "the idea that we know and experience the world through our bodies" (p. 510) - to understand the experience of community gardeners in relation to sustainability. In a series of interviews, Turner discovered that many gardeners in this sample desired a "deeper connection to the food system…[and] to know what goes into their bodies" (2011, p. 517). Gardens help adults to achieve this desire. Other work on connectedness with nature has confirmed that various measures of connection appear to predict both environmental values and pro-environmental behaviour (Sparks, Hinds, Curnock, & Pavey, 2014; Dutcher, Finley, Luloff, & Johnson, 2007).

Connectedness to nature is theorized to stem from significant life experiences (SLEs) in nature, and to potentially lead to pro-environmental behaviours (Tanner, 1998b; James, Bixler, & Vadala, 2010; Dutcher et al., 2007; Frantz & Mayer, 2014). This sense of connectedness, or "emotional affinity" (Kals et al., 1999), is "not only about seeing the environment as part of ourselves but also about seeing ourselves as part of the environment" (Dutcher et al., 2007, p. 490). This 'inclusion of self in nature', or its correlate, 'inclusion of nature in self', has been

shown to correlate with pro-environmental attitudes, though its relationship to behaviour has yet to be established (Schultz, 2001; Davis, Green, & Reed, 2009). Those with a strong sense of oneness with nature are more likely to be concerned about its fate, compared to those who view themselves as separate from nature. Frantz & Mayer (2014) drew on psychological theories of human-human relationships to theorize that in human-nature relationships, "feeling connected to someone or something motivates protective and self-sacrificing behavior" (p. 85). Thus, including nature in one's sense of self may motivate Pro-Environmental Behaviour (PEB).

The field of SLE research, sparked by Tanner's 1980 work (Tanner, 1998), is generally conducted as interviews with environmentally committed and active adults reflecting on their significant childhood experiences in nature (Chawla & Cushing, 2007). The observation that many conservationists attribute their environmentalism to childhood nature experiences spawned a self-referential body of research, which seeks to understand how various childhood and adolescent life experiences lead to pro-environmental attitudes and behaviours (Tanner, 1998a; 1998b). SLE research attempts to "bridge the rational and emotional sides of environmental learning" (Chawla, 1998, p. 360). Findings thus far have strongly suggested that a relationship between exposure to nature in childhood and adult environmental commitment does exist (Wells & Lekies, 2006). "Nature activities in children" have been found to be "'key entry-level variables' that predispose people to take an interest in nature themselves and later work for its protection" (Chawla & Cushing, 2007, p. 4).

This promising field has several gaps which, if filled, would provide a much clearer picture of the sources of pro-environmental behaviour. First, it focusses on environmentalists, rather than recruiting those with a wide range of environmental commitments and actions or lack thereof. This means that we do not yet know whether environmentalists share similar childhood

experiences with non-environmentalists and some other factor has caused the environmentalism, or whether nature experiences were the source of the difference between the groups. Second, the use of memory is often critiqued in SLE research: hindsight bias and gaps in memory may well alter the stories adults tell about their childhood experiences (Chawla, 1998). Third, SLE research has focused on youth experiences affecting adult behaviours, but has not yet studied whether adult experiences in nature may also be significant and formative. We know that learning occurs throughout life, and TL theory demonstrates that powerful paradigm shifts can still occur after a person has matured. Significant life experiences thus seem likely to occur at any age. Lastly, SLE research has often focused on more 'extraordinary' nature experiences in wilderness, overlooking everyday encounters such as gardening, playground play, and farm chores. This study answers some of these gaps by asking adults about proximate experiences in the 'everyday' nature setting of gardens. Recruiting from among gardeners may increase the likelihood of speaking with environmentalists, but environmental action and activism were not criteria for recruitment and thus participants held a range of perspectives on environmental issues (though admittedly not as wide as the general population).

Drawing on affective dimensions of human experience in nature is also one tool to address the critique of TL theory that it focusses too heavily on rational critical thought, leaving aside emotive or unconscious processes. As Kals, et al. (1999) point out, "[n]ature-protective behavior cannot be sufficiently explained using a pure rational/cognitive approach" (p. 178). Further, not everybody has the same capability for rational reflection, but most people can have emotional/embodied experiences of nature. While there is significant evidence that connection to nature promotes sustainability behaviour, we must conduct rigorous research before definitively linking CGs to this change. Turner (2011) reminds us that "gardening can still be bracketed off

from other areas of [gardeners'] lives" (p. 518) and might not lead to behavior change in other areas. The question remains, however, what conditions facilitate the generalization of gardening experience to other areas of gardeners' lives.

The behavioural outcomes that this study is most interested in have variously been dubbed "ecological behavior" (Kaiser, 1998), "pro-environmental behaviour" (Hargreaves, 2011); "sustainability behaviours" (Uzzel, Pol, & Bandenas, 2002); and "ecological citizenship" (Light, 2003). Subtle differences in the emphasis of each term exist, although for most practical purposes they are synonymous. All four terms describe actions which are oriented towards caring for the earth in a sustainable manner. The concept of ecological citizenship bears some further expansion, however, as it incorporates a sense of community, which relates well to the attempt I am making to bring together learning (particularly in this case the communicative and discursive dimensions), connection to nature, and social capital. Ecological citizenship indicates a sense of belonging and ownership, which some theorize that CGs may engender through mechanisms such as place attachment (Rogers & Bragg, 2012) and social capital (Firth, Maye, & Pearson, 2011; Larson, 2006). One thesis found that CGs provided several opportunities to become a better ecological citizen, particularly in terms of gaining social-ecological knowledge (Moquin, 2014). Ecological citizenship is a concept that Light (2003) has expanded upon at length. He uses a citizenship model of "civic obligation" (p 51), specifically in the context of urban environmental issues. Citizenship is traditionally characterized as "a virtue met by active participation at some level of public affairs" (Light, 2003, p. 51). Light argues that we have obligations, not just to our fellow citizens but to the environment as a whole, and fulfilling those obligations is to be an ecological citizen (2003). What distinguishes the concept of ecological citizenship from classical environmentalism is that it balances the requirement to encourage

"bonds of care or empathy with one's fellow urbanites....[with] finding the normative source of bonds of care for nature" (Light, 2003, p. 52). It is especially important to use a concept of environmental behaviour that focuses on the urban, since the vast majority of the Western population lives in urban centers, and sense of place and connection to nature is most easily lost in urban environments (Rogers & Bragg, 2012). These feelings of attachment and connection may be a mediating or an independent factor in adults' learning outcomes and environmental behaviors. Despite the value of this construct, I mainly use the term 'pro-environmental behaviours' (PEBs) throughout this thesis, because ecological citizenship is a sufficiently complex concept that was not within the scope of this thesis to cover in-depth. In addition, PEBs are a crucial piece of ecological citizenship and serve as a sufficient indicator for my purposes.

2.10 Organization and Management of CGs to Promote Sustainability

One further factor that may be relevant to the experience of gardening and learning outcomes is the organization, or governance, of the community garden (CG). Beilin & Hunter (2011) remind us that "the social benefits present at individual CGs are dependent upon the contextual setting of the garden and influenced by complex structural, historical, and cultural factors" (p. 525). Fundamentally there is a difference between individual-plot, and communal-plot, CG organization (Flachs, 2010). Individual plot CGs are sometimes called allotment gardens (as they are in the city of Winnipeg, Manitoba), where gardeners rent a plot of land over which they usually have full control from planting to harvesting, and retain all the produce. Communal plot CGs usually feature a larger single plot, which is maintained by a committee of volunteers, who collectively make management decisions, and may share in or donate the produce. Germany's government-owned and heavily-regulated Schreber allotment gardens, which dictate the percentage of fruits and flowers to grow, are individual-plot gardens (Larson,

2006). School gardens, run by teachers and parent volunteers, are more similar to communal-plot gardens. Some new forms of CG organization are emerging, such as garden sharing, but these are so new that little to no academic literature exists examining them (Sustainable South Osborne, 2014). Some CGs are even organized by non-profit groups as outreach, teaching, or therapy gardens, often for inner-city residents, immigrants, or those with physical or mental health concerns or disabilities. The three primary types of CG organization are grassroots, externally-organized, and active non-profit management (or a combination thereof) (Drake, 2014).

Not every organization scheme for CGs may be equally effective, however. The goals of a particular CG should determine its organizational structure. Emergent themes in academic literature suggest that to be successful, or at the least to self-sustain over a significant period of time, CGs must arise from grassroots initiatives being sparked by the interest of the community; have committed local leadership, staffing, or volunteers; and provide skill-building opportunities for participants (Corrigan 2011; Twiss et al., 2003). Unfortunately, very little research has explored the effectiveness of various CG governance structures in producing self-sustaining gardens or in facilitating sustainability behaviours. This study contributes to filling this gap by contrasting an individual-plot garden with a communal-plot garden and comparing participants' reactions to their garden organization, as well as their learning outcomes.

The Riverview Garden Society (RGS) is an exemplar for individual-plot gardens, which tend to run similarly to RGS but in a much more bare-bones style. These are also some of the most common, and the typical form of community garden that people imagine (Turner et al., 2011). RGS offers opportunities for engagement that are not present in most other CGs, such as committees, a president, annual general meetings, and work bees. By studying a particularly well-organized individual plot garden, it was possible to see which elements of governance and

functioning are key to the success of RGS, and which are of less importance, and which may still be lacking.

The People Garden (PG) is built on an emergent model of community gardening, using permaculture principles to form the communal management style. However, in Chapter 4, I discuss how the importance of hierarchical governance remains a theme despite attempts to continually democratize the PG. The organizational structure of this garden is still rare among CGs both in Winnipeg and nation-wide. Lessons learned from this case can provide a comparison to the dominant allotment gardens, allowing us to understand which outcomes of CGs are due to governance and which are due to the activity engaged in (i.e. gardening).

2.11 CGs in the Winnipeg Context

A few studies since 2000 have examined Community Gardens specifically in Winnipeg. Later in this thesis I discuss the local context as found in relevant policy documents. Three Master's thesis and one published journal article have examined allotment and community gardens in Winnipeg, a distinction in designation consistent with current usage by the City of Winnipeg. Food Matters Manitoba has also conducted a series of community food assessments from 2012 – 2014 in various Winnipeg neighbourhoods and regions, which included an overview of current CG initiatives and major successes or challenges with these.

In 2013, Mikulec, et al. did a scan of the policy situation in the City of Winnipeg to determine what legal and policy barriers there existed to community gardening. This study is referred to in Section 2.2 "History of Community Gardening", as well. Overall, they found that community gardening in Winnipeg has many barriers, including short leases (leading to insecure land tenure), vague responsibility, lack of financial and in-kind support for gardeners and garden

organizers, incentives for infill putting pressure on inner-city gardens, and a lack of integration of CGs into the city's overall policy framework (Mikulec, et al., 2013).

Other research supports some of these challenges, particularly emphasizing that community gardening may not be accessible to lower-income individuals in Winnipeg. Lind (2008) points out that urban and suburban gardens function very separately from each other, and Roy (2001) found that many gardens are poorly located for the poor to access them. This may be in part due to the city's infill incentives mentioned by Mikulec et al. (2013). Overall, Winnipeggers who are engaged in community gardening appear to do so primarily for social reasons or a desire for wellbeing and health, as opposed to income supplementation (Hall, 2000; Lind, 2008).

Given that Food Matters Manitoba in their community food assessments found that interest in community gardening was very strong even in low-income communities, it may be that there is simply an entire group of Winnipeggers who would garden for income and nutrition supplementation if they had more equitable access to CGs. The community food assessments found a wide variety of CG initiatives occurring throughout the city, from small raised-bed projects to massive in-ground allotments (Food Matters Manitoba, 2012a; 2012b; 2013; 2014). Challenges with CGs varied depending on the community studied, but included overwhelming demand in many gardens (although in a few cases, there were vacant plots); concerns about soil contamination; lack of funding; and vandalism. The most successful gardens included the South Winnipeg Garden Club, established in 1931, and thriving due to irrigation, compost bins, and a wide variety of community building activities (Food Matters Manitoba, 2012a). High community interest in CGs emerged across the community food assessments, and this may be one of the strongest assets Winnipeg has in terms of community gardening. Roy's 2001 assessment that Winnipeg's CG scene does not contribute to sustainable development to the extent that CGs do

in other cities may be less applicable today, especially given that a large number of gardens have been established since 2008 (Food Matters Manitoba, 2012b).

2.12 Chapter Summary

CGs, present in the historical record since the Industrial Revolution, are experiencing a current swell in popularity, due in part to perceptions of them being sources of healthy sustainable food, as well as locations for exercise, relaxation, and socialization, among other benefits. While some question whether CGs may contribute to defensive localism or neoliberalization, or simply fail to meet the lofty goals to which they aspire, they remain sites of rich potential to enhance the sustainability of cities and food systems in various ways. One route through which they could contribute to sustainability is examined in this thesis. By experiencing and connecting with nature through community gardening, participants may experience emotional ties. At the same time, they are exposed to learning opportunities through informal interactions with other gardeners, trial-and-error methods, and formal programming as reflected in the literature reviewed above. Through some combination of emotion and rational-reflective learning, gardeners may undergo transformations of their meaning-structures. This may be influenced by the governance structures of the gardens, and may result in increased presence of pro-environmental behaviours among gardeners. In order to study this pathway, and contribute to existing gaps in literature, I have designed a qualitative case study to gather gardeners' interpretations of their experiences in relation to my objectives.

Chapter 3: Approach

Building off upon the strong tradition of emancipatory and constructivist underpinnings in transformative learning theory, I approached this research from a social constructivist perspective. Constructivism is an approach often closely associated with psychology (Burr, 2004). It views "the person as actively engaged in the construction of his or her own subjective world. This is in opposition to views that regard objects and events as having an essential nature and universal meaning" (Burr, 2004, p. 186), and thus leads me as a researcher to focus on participants' multiple meanings and understandings of their experiences (Creswell, 2014). The constructivist perspective also led me to conduct my research using open-ended questions in order to discover the subjective meanings individuals gave to their experiences (Creswell, 2014). Further, I acknowledge that my own background and worldview shaped my interpretation of the stories participants shared with me. While all of who I am and my history likely affected my interpretation of the data, particularly pertinent to this research is that I am a young, white, middle-class Canadian who identifies as an environmentalist and enjoys nature. I have positive memories of gardening as a child but am not currently an active gardener. While I attempted to allow participants' stories to be as true to their interpretation as possible, I am aware that my biases could not be completely removed, nor is this seen to be a desirable goal.

3.1 Strategy of Inquiry

In previous community garden research, a wide variety of strategies of inquiry have been used, with case study as a common choice due to the highly local context of CGs (e.g. Corrigan, 2011; Firth, et al, 2011; Krasny & Tidball, 2009). The case study is a qualitative strategy of inquiry that seeks to "facilitate understanding of a concept or theory by making it more concrete" (Gummerson, 2008). Gummerson (2008) suggests that the case study is particularly useful in

situations where the phenomena are not well understood and may be dynamic or complex. The case study is in opposition to the experiment, acknowledging that, in situations where the case study method is appropriate, the researcher cannot control contexts and variables (Hird, 2003). This is true to the constructivist approach, which seeks to describe rather than manipulate. A case study can examine an individual, multiple individuals, an event, or a phenomenon (Hird, 2003). Some have criticized case studies for their lack of generalizability, but Hird (2003) points out that while they have an insufficient sample size for most statistical tests, they *do* lend themselves to analytical (though not statistical) generalization: "that is, generalisation to theory" (Hird, 2003), which fits well with my research questions.

For this study I selected The People Garden and Riverview Garden Society as the case to be studied. While these are two gardens, and are compared and contrasted, they also share many characteristics including location. After scanning the multiple CGs currently operating in Winnipeg, these two emerged as gardens which would both be amenable to research participation, and provide access to a wide variety of garden experiences. They offer composting, community feasts, a university course, an intergenerational garden project, and workshops, among other engagement opportunities such as the RGS Annual General Meeting. These two gardens also differ in several key characteristics, particularly their governance model, which allows for comparative analysis, triangulation of results, and more comprehensive recommendations. The gardens are in immediate proximity to each other (five minutes' walk, within the same neighbourhood), which limits their differences in terms of participant demographics which is unlikely to be a factor in this study. CGs in general tend to be created to meet a variety of goals and needs, including youth engagement, physical and mental health, and social capital building (Draper & Freedman, 2010). Both RGS and the PG demonstrate aspects of

all three of these elements. A final reason for the selection of these sites was the significant number of gardeners involved (approximately 130 in total).

The People Garden is identified as a permaculture demonstration site, and is run on a commons model. This means that, while still classed as a CG, a group of volunteers all offer time and effort to maintain the plot, and all volunteers benefit from all the produce grown. The PG is run by Sustainable South Osborne Community Co-operative (founded in 2009), and is related to many other sustainability initiatives in the neighbourhood. Related gardening initiatives include the community orchard, with 50 apple and 8 plum trees, tended by a group of volunteers; a weekly gardening club for children ages 5-12; a pickup location for people ordering local food from the Harvest Moon Local Food Initiative; and a garden share, where those with yards who cannot or do not want to garden donate space to gardeners, and the resulting produce is shared 1/3 with the landowner, 1/3 with the gardener, and 1/3 with a social agency who will distribute the food (Sustainable South Osborne, 2014).

Riverview Garden Society, the second garden I recruited from, is a 107-plot allotment garden. It has existed since the 1970s, replacing a piece of the former Riverview Health Centre farm (van Vliet, 2007). Some estimates put productive capacity at 182,000 pounds of produce per year (van Vliet, 2007). The RGS is "without an organized mandate in social networking, education, or urban food supplements" (van Vliet, 2007), and gardeners officially focus on the mechanics of food production. However, some RGS gardeners have been involved in teaching and mentoring others, selling produce at local farmer's markets, and starting campaigns such as "Grow a Row" to support the local food bank. RGS also partners with Sustainable South Osborne to provide an intergenerational garden and space for a community orchard.

By recruiting from these gardens, which are in close physical proximity but differ dramatically in model and purpose, I had the opportunity to examine the differences and possible impacts of governance model on participant outcomes. The large pool of gardeners I recruited from also meant that I had access to participants whose gardening experience ranged from mere months, to decades.

3.2 Methods

A semi-structured interview schedule was administered to eighteen participants, with six primarily associating with the People Garden and twelve with Riverview Garden Society. At eighteen participants, no further volunteers emerged, and strong themes had emerged which – combined with the difficulty in recruiting more participants – indicated I was likely near saturation. In total, seven participants were male and eleven female (only one male participant was identified with the PG). Ages ranged from the early twenties to mid-eighties, with garden experience demonstrating a similar range from three months to 25 years with a CG (some reported forty or more years of gardening experience in total if non-community-garden experiences were included). Recruitment occurred through an email which was sent out, via the garden coordinators, to the email list for both RGS and the PG.

All participants were interviewed using the same semi-structured interview schedule (Appendix A), and was administered through meeting at a place of convenience for the participant (usually the garden or community center, but in several cases a nearby coffee shop or their home). All interviews were recorded using a digital recorder, and transcribed with ExpressScribe and an AltoEdge transcription pedal. Hand-written notes were also taken during interviews. Length of interview averaged approximately 45 minutes. Data were collected between September 2014 and January 2015, reflecting on the 2014 gardening season.

The interview schedule was designed with several thoughts from Foddy (1993) in mind. He points out that there are several main sources of error in verbal data gathering, including: failure of participants to understanding the intended question meaning; unwillingness to admit to certain attitudes or behaviours; memory/comprehension failure during stressful interviewing conditions; and interviewer failures like inconsistent wording of questions. Other limitations with interview research include a weak relationship between what people say they do and what they actually do, instability in attitudes, beliefs, opinions, habits, etc., and the significance of wording and question order (Foddy, 1993). As a result, I carefully crafted question wording to be as clear, neutral, and non-judgmental as possible. I considered the order of questions and began with more general, factual and background type questions, slowly working up to more involved questions on the topics of experience and learning. I did not stick strictly to the question order in the interview schedule, but rather used it as a guide to ensure that all topics were covered and the conversation flowed as naturally as possible.

All questions either directly or indirectly addressed one or more of the research questions. Which of these a question primarily addressed is indicated in the interview schedule in Appendix A. Several questions do not have an objective listed, as they either indirectly contributed to all objectives, or the answer affected which objective they addressed. Fewer questions directly addressed objective 1, because this is an objective that emergent codes and themes will speak to. Question topics covered background information about the garden, how a participant came to garden at this location, reasons for gardening, experiences with gardening, learning outcomes from gardening, perspectives on nature and feelings of connection to nature, sustainability behaviour, and community involvement. Demographic questions were originally included on the interview schedule, but the small sample size, homogeneity in socio-economic status, and lack of

plans to run statistical analyses meant that I mostly did not ask these questions. I inferred gender

and age where it did not come up in conversation and generally demographic information did not

appear to be significant in the analysis.

While I intended to triangulate interviews with participant observation data, very few

opportunities to do this presented themselves. I spent one morning accompanying a permaculture

university course, which is based out of the People Garden every summer, but was unable to

attend the two community feasts at harvest time due to scheduling conflicts.

There were very few other opportunities to join in community events or workshops, and I

was unable to attend those that did exist for scheduling and cost reasons.

I supported my interview research with document review. These documents were:

- Sustainable South Osborne Community Cooperative website

     (http://www.sustainablesouthosborne.com)

- Riverview Garden Society policy document (provided by Rod Kuneman, current

     president)

- City of Winnipeg website on community gardens

     (http://winnipeg.ca/publicworks/parksOpenSpace/CommunityGardens/default.stm)

     o City of Winnipeg Document: Conditions of Use

     o City of Winnipeg Document: Community Gardening Policy

- Food Matters Manitoba Community Food Assessments

     (http://www.foodmattersmanitoba.ca/projects/community-food-assessment/)

I was not able to find any other documents published which directly referenced either the

People Garden, Riverview Garden Society, or the Winnipeg CG policy context.

This research will be disseminated in several forms: this thesis; a published paper in an appropriate academic journal; and as a summary to all participants who indicated interest, including a research brief sent specifically to the garden managers who participated in the study. Early results have already been presented at the Canadian Association of Geographers' Annual General Meeting, in Vancouver in June of 2015.

This was low-risk research for participants, and no incidents or problems occurred as a result of contact with them. All participants were duly informed of their right to withdraw at any time from the research without consequence, and signed consent forms, which they were provided a copy of for their records. Several participants indicated their desire for anonymity; their names have been changed to reflect this request. Others indicated that they wished to not be anonymous and their names have not been changed, although only first names are used to identify all participants. This project was approved by the University of Manitoba Joint Faculty Research Ethics Board.

In order to analyze the data, I transcribed all interviews from digital recording using Microsoft Word, ExpressScribe, and an AltoEdge transcription pedal. I then used NVivo to qualitatively code the data. The coding scheme can be seen below in Table 1, below.

Table 1: Coding scheme

First-Level Code	Second-Level Code	Third-Level Code
Transformative Learning	Barriers to Learning	
	Desired Learning	
	Learning Outcomes	Instrumental Learning
		Communicative Learning
		Transformative Learning
		Pro-Environmental Behaviours
	Sources of Learning	
Connection to Nature	Childhood Experiences in Nature	
	Gardening Experience	
	Closeness to Nature	
	Concepts of Nature	
Reasons for Gardening	Routes to Getting Involved	
Benefits of Gardening	Peaceful/Relaxing	
	Community Involvement	
Gardening Techniques		
Environmentalism		
Governance		

Several of these codes emerged from the data (e.g. "gardening techniques"), and many relate

to other codes (e.g. "governance" is directly related to "sources of learning"; "childhood

experiences in nature" often relates to "routes to getting involved"). A few other codes emerged

from the data but are not listed as they were not found to be significant nor relevant to the

research questions. This coding scheme was designed alongside data analysis to shed light on the

framework being examined – to reiterate: the relationship between experience in nature

(gardening); connection to nature; learning processes; and ultimately pro-environmental

behaviour choices.

Trustworthiness takes a different form in qualitative compared to quantitative research but is

still important. Creswell (2014) lists multiple strategies to ensure validity, several of which I

drew on: triangulation (interviews, some participant observation, and document review); thick

description; clarifying my own bias where possible; and presenting information running counter

to my themes as well as that which supports them. Again following Creswell (2014), I used two

primary strategies to ensure reliability: checking transcripts for any obvious errors; and

completing multiple passes in my coding to correct for coding "drift".

Chapter 4: Benefits and Governance of Community Gardens

The reasons why people participate in community gardens, the benefits they derive from gardening, and how they choose to govern their gardens have been of ongoing interest to researchers (Draper & Freedman, 2010; Pourias, et al., 2015; Kingsley et al., 2009; Drake, 2014). In this chapter I begin by detailing further background information on the two case study gardens, before presenting data related to participant motivations to garden and benefits of gardening; social capital and gardens; and various aspects of the effectiveness of each gardens' governance structures.

4.1 Riverview Garden Society

Figure 1a, 1b: Left, hand-painted sign directing gardeners in compost bin usage; Right, compost bin at RGS site

Riverview Garden Society (RGS) was founded in the 1970s on land that had formerly been farmed by the Riverview Health Center, originally a site for infectious disease treatment and now primarily offering long-term, palliative, and rehabilitative care (Riverview Health Centre, n.d.). In an initial interview with Rod (president of RGS), we discussed the structure and functioning of RGS in detail (our second interview took the same form as the others'). RGS features approximately 107 garden plots measuring 30 feet by 40 feet. Located along the west bank of the

Red River, the site is surrounded by trees and a little-used road, making it one of the most sheltered gardens in the city, relatively isolated from traffic noise and pollution. RGS is run on a classic plot-allotment system, where individual gardeners pay an annual fee to the to the landowner or garden administrator (in this case, the nonprofit organization Riverview Garden Society, which manages the land) to rent a subdivided plot of land. The renters, like those who rent land for residential purposes, are considered the owners for the gardening season and, as long as their choices meet garden society regulations, may do what they like with the plot. The garden society's regulations center around weed control, building of permanent structures, and removal of structures and plants at the end of the season for tilled plots. The garden society meets once a year at an annual general meeting (AGM), has elected governing members (as well as committees to manage tasks like composting), and makes major decisions democratically. Gardeners may all attend this AGM, where they learn about their responsibilities to the society and the society's commitments to them. RGS provides "watering cubes", large storage tanks which are filled by hoses or trucks, which gardeners may use to irrigate their plots (most other allotment gardens in Winnipeg do not provide water). It also provides compost piles (see figures 1a and 1b), and there is an annual composting "bee" where the compost is shredded to speed up decomposition. Gardeners have access to this compost to enhance their soil. Lastly, RGS provides fall tilling to all the plots - except those in "no-till" rows (a new innovation since about 2007 that accommodates gardeners' desiring to practice permaculture).

RGS is well-established, and two-thirds of the participants from this garden had been involved for 10 years or more, with one-third having been involved for between two and seven years. This also meant that most of the gardeners were between middle and older age, ranging from approximately their 50s to 70s. Most of the gardeners at RGS also had prior experience

with gardening, either growing up on farms, in backyard gardens, or in other CGs. One of the

reasons for this prior experience is that plots at RGS are in high demand, and turnover is low,

meaning that the waitlist (at least in the last 20 years) may be as long as five or more years

before a plot becomes available. New gardeners may find themselves at other CGs while they

wait, or assisting current gardeners in exchange for learning how to garden and share the

produce. Most gardeners here grow a significant amount of produce for personal consumption.

4.2 The People Garden

Figure 2: Sign for the People Garden, painted by local elementary students. The PG features several instances of community-created art.

The People Garden (PG), as it has been dubbed by a group of elementary school children

(see figure 2 for hand-painted sign), could not be more different from RGS and remain a

community garden. Where RGS consists of a group of people who rent individual pieces of land,

the PG consists of a group of people who collectively care for a single piece of land. In a sense,

RGS might be called a community garden, and the PG a communal garden (FoodShare Toronto,

n.d.). The PG was founded in 2009 by a small group of people who wanted to build community

and organize people for change in the face of what they saw as formidable environmental and

social challenges, or possibly even impending collapse (Sustainable South Osborne, 2015). It

calls itself a permaculture demonstration site - that is, a small piece of land that uses principles of the gardening and life philosophy known as permaculture, demonstrating how those techniques may be incorporated and used effectively to produce food and maintain a self-sustaining, aesthetically pleasing site. Permaculture was initiated in Australia in the 1970s by Bill Mollison and David Holmgren. The word is a mashup of "permanent", "culture", and "agriculture". These three words exemplify its goals: permanent, sustainable, low-maintenance food production sensitive to the local context (Permanent Culture Now, n.d.). As such, permaculture emphasises the importance of working with the shape of the land and taking the path of least resistance. It can also become a philosophy of life and governance, aiming towards self-sustaining, non-hierarchical governance structures and living simply. Figures 3, 4, and 5 show several permaculture features of the PG. While most participants in my study focused on the application of permaculture to gardening, a few began to see the relationship between permaculture principles and other aspects of their lives (Akhtar, Lodhi, & Khan, 2014).

Because the PG was established so recently, anybody who wishes to be involved has an opportunity to do so, as more volunteers are always desired. Most participants from this garden were completing their first year of involvement, with those who had more long-term involvement completing their third or fourth year. The age of participants ranged more widely in this garden, from the youngest at age 20 to the oldest in her late 80s. Unlike at RGS, participants generally had little gardening experience prior to PG involvement. Less food is produced at this garden, or at least, participants harvest and consume less food from this garden than gardeners at RGS.

Figure 3: The "hoop-house" at the People Garden, which is a passive greenhouse allowing for an extended growing season for sensitive crops like tomatoes.

Figure 4: Herb spiral at the People Garden. This is a typical permaculture technique. The garden features many different permaculture techniques, including raised beds, bushes, and the hoop house (see figure 3).

Figure 5: Flowers (asters) at the People Garden. Community gardens may feature decorative as well as edible plants!

4.3 Reasons for Participation

One of the topics the gardeners were very clear about was their reasons for gardening. Their responses fell into two primary categories: first, motivations to garden; and second, benefits of CG membership. As Guitart, Pickering, & Byrne (2012) point out, there is some overlap between how and why people get involved in community gardening, and the benefits people derive from that gardening practice. They clarify: "a motivation is the desire for achieving something while the benefit is actually achieving it" (Guitart et al., 2012, p. 367). I have made a distinction between these categories, despite some overlap, because this research is focused on learning and change resulting from CG involvement. This means that the mindset and reasons for getting involved in a CG provide a baseline on which learning builds. Benefits derived from gardening are experienced only after the decision to get involved has been made.

4.3.1 Motivations to garden

Participants' motivations for gardening fell into two main categories: personal reasons (seeking out benefits primarily to themselves), and ethical, moral, or philosophical reasons (seeking to live out values and provide benefits for others as well as themselves). They spoke particularly passionately about their philosophies around environmental and social issues. They spoke of fear of impending collapses in food, economic, social, and industrial systems; of hope that change and resilience could either reverse environmental damage, or help society to weather it; and of their frustrations with what they saw as broken and corrupt structures in society. The gardeners at RGS tended to respond with more philosophical reasons for gardening than PG gardeners. This difference may also be due to the fact that most of the RGS gardeners interviewed were long-term gardeners who were deeply involved with and committed to the organization (it should be noted that this may be a self-selection bias and not all RGS gardeners

necessarily share these perspectives). The PG gardeners were newer to the phenomenon of community gardening and identified themselves as at the beginning of a learning journey.

Table 2: Participant motivations for community gardening

Philosophical Motivations	Resilience in the face of impending societal collapse
	Protect the environment
	Opt out of broken food system
	Increase food security
Personal Motivations	Food production
	Increase ability to be self-sufficient
	Access to better-tasting, local, and organic food
	Continue a childhood practice

4.3.1.1 Philosophical Motivations

Philosophical motivations for getting involved in gardening included several themes, as can be seen in Table 1**.** The four motivations are each considered next.

Resilience in the face of impending societal collapses

Rod, the president of RGS, was especially political in his motivations for gardening. His philosophy has had a large impact on participants in both gardens, as he has contributed to shaping not only RGS but mentored Evan, the instigator and leader of the PG, and sees his role as an educator and mentor. He is also involved in several other sustainability and gardening-related projects in the community. A strong majority of participants referred to knowing him, learning from him, seeing him around, taking workshops from him, and seeing his influence in the neighbourhood's school gardens and community orchard.

In speaking of his philosophy, he took a tone of cynical matter-of-factness. He had a sense of inevitability about the current problems in the world and the emergency that we are facing:

> If I told them [the gardeners] what I thought about the economy and what's going on in the world of corporations, that'd be a nasty experience….You know capitalism requires 3% a year growth, it's not possible…it's success and it's triumph and it's collapsing on itself…they just see nature as a resource pool instead of us being a part of a web and all those other things….You know I don't worry about the Earth, I worry about human beings. You know the Earth will take care of itself, don't worry about that. So I mean we've got a ramping up emergency, we don't have a lot of time, we have a totally unskilled population, we have a government that's not paying any attention to this stuff, we have an economy that's totally focused in the opposite direction. We're just running off a cliff. So for me it's really urgent now (Rod, RGS).

Rod poured energy into many gardening projects in Riverview, an effort which seemed motivated by his seeking to bring a ray of hope into an otherwise bleak picture. Gardening can help to tackle the problem of having a "totally unskilled population" (Rod, RGS), increasing our ability to be resilient to the "ramping up emergency" (Rod, RGS). He believes that gardening, by its very nature, is one of Rod's sources of hope about transforming people towards caring and sharing in more sustainable ways:

> There's something about food, because in a climate like this, it all ripens at the same time, so you have too much, so you have to give some away. So it actually induces sharing because there's too much. Even after you've canned your face off you know, and froze it, you still have to give shit away, or else throw it in the garbage, and you know gardeners aren't going to do that. So it by its very nature generates, you know the bounty of nature just makes it possible for you to give it away right (Rod, RGS).

Creating a culture which is more willing to share, and support all its members, means to Rod that in a crisis, we would be able to distribute resources most effectively (e.g. by sharing excess produce) and thus protect more members of our communities from hardships. Rod was not alone in being motivated to garden because he believes it helps people to share and cohere as a community:

here's several levels that a community garden operates on that are practices and values I think this world needs. And you know, just, one of the things that I find interesting about a community garden there's…embedded in it something that feels like a group of people. It's not my garden vs. yours, which I think is important, another important value (Oliver, RGS).

Protect the environment

The desire to protect the environment was a frequent motivating factor for participants. This topic is discussed in more depth in Chapter 5 when discussing perspective changes and self-identification of environmentalism, but is also relevant as a reason for community gardening. A statement one RGS gardener said nicely summarizes the general sentiment participants expressed about the environment: "I think, if we don't protect the environment, if we don't look after the environment, then we're doomed, obviously" (Barbara, RGS). Community gardening appeared to represent at least part of an alternative, less-destructive and more caring, mode of behaviour.

One gardener explained that he is

concerned about the land. And we're part of the land, as are the birds and the deer and the plants and the water….I have kids. I want them to have a better place to live than what I have. Not worse, which seems to be the path we're going down at the moment (Jody, RGS).

Participants mentioned not only global and societal-level impacts that gardening could contribute to, but also smaller, more localized impacts. One older PG gardener explained

The whole business of justice and all of that in the world, I'll leave that to the young, because I'm a little bit cynical…But I don't like to maintain a gloom and doom attitude in my mind, I'm a little closer to home and just think it's a damn good idea to do it now as much as individually I can (Joyce, PG)

Another was concerned about the loss of bees: "you just don't see the bees around anymore. We used to keep bees, I was the beekeeper too…I'm not the only one who's somewhat concerned, but I don't have the scientific knowledge to make a huge issue out of it myself, I just go with the flow as best I can" (John, RGS).

Opt out of broken food system

As part of their concern about the natural environment, several participants expressed that

the food system was problematic, and community gardening offered a less harmful alternative,

allowing them to resist industrialization of food and care for the Earth.

One gardener explained that he believed that

> the food path we're on is destructive. It's destructive of the planet, it's destructive of communities, and the only way to stop it is community kinds of organizing. And community gardens are one of those – there are many ways of resisting that industrial capitalist path and community gardens are just one of them, however small (Oliver, RGS).

Gardening was a political statement for some. Community gardening can be a piece of

opting out of the industrialized food system:

> We do buy from organic producers - from the organic stores but it's really expensive, plus I feel like it's a political statement. That 'no I'm not buying from your chain store'. I'm not buying anything just garbage you put on the shelf for me. So I feel most strongly about the political statement (Linda, RGS).

Increase food security

While food security is frequently cited in academic literature as a major reason why

community gardens should be promoted, it was a surprisingly infrequently-mentioned theme

among participants. Participants were unclear as to whether they understood food security as

being an individual, household, community, municipal, or larger-scale concern; however their

comments seemed to best align with more of a community-level concern. Two participants

mentioned the 'issue' of food security as a motivating factor in their gardening:

> Food security is such a big issue, and I don't wanna go so far as to say anything about being like survivalist or whatever, but it's important, and it's important to know that you know our climate is changing, and the more control we can have the better (Cassandra, RGS).

> Oh for sure [environmental issues are a reason for my gardening]. Well it is in almost everything I do, so just food security issues, I think there should be more food produced through urban areas (Noah, RGS).

Those who believed that there is an impending societal or food system collapse also saw the skills that community gardening teaches as a source of resilience against future hunger in the city. The personal aspect of this theme is discussed below under "Increase ability to be self-sufficient".

4.3.1.2 Personal motivations

The four main personal motivations to garden reported by participants are each considered below.

Food production

Food production, though indicated by major reviews such as Draper & Freedman (2010) as a major motivation to garden, did not emerge among participants as a major theme. Clearly food production was either a motivation, benefit, or both, particularly for RGS participants (who often produce large quantities of food from sizeable plots), but participants rarely self-identified this as a reason to garden. Two exceptions to this include Joyce, who said that "if I'm lucky enough to produce anything from [the garden]" (Joyce, PG) was one of three main reasons she gardened; and Sara, who spoke about how she liked doing "something as satisfying as being able to grow your own food and see the immediate reward of doing that" (Sara, PG). However, when probed, Sara elaborated that "[food production] is part of [my reason for gardening], but it's not solely that purpose…it's more about community than it is solely about gardening or food" (Sara, PG).

It is possible that the lack of identification of food production as a primary motivation to garden is due to participants perceiving it to be too obvious to state, or even to recognize themselves. Additionally, accessing better-tasting food could be the way in which this theme gets expressed among participants. As far as I could determine without asking explicitly, all participants were food-secure, so gardening was not supplementing a diet scarce in calories, but

may be supplementing a diet scarce in flavour. It must be considered, however, that participants

may have simply found greater motivation from other sources than from food production itself.

Increase ability to be self-sufficient

Desire for self-sufficiency was often linked to fear of institutional collapse; that is, the belief

that society and the food systems are going to collapse feeds a need to be able to produce enough

food to survive if or when that occurs. Rod articulated this connection clearly:

> I mean so far everything seems to be working relatively well but, so you know there's so
> much to learn and there's so much need to know this stuff, we have to get it transmitted to
> the next generation because I think the wheels are going to fall off this, and we're going to
> be, the state and market are going to collapse, to varying degrees and we're going to be left
> on our own and if we don't know how to do anything, we'll starve to death you know. And
> so we need to know how to do that (Rod, RGS).

One young gardener, who was mentored by Rod, felt strongly about the need for self-

sufficiency:

> I guess [gardening] kind of plays also into the philosophy that I've come to develop, like
> learning the essentials of life, like what would happen if something were to just happen on a
> larger scale to the world we live in, like that's always the question that I ask myself, is what
> if….I don't like having to rely on other things or corporations for that matter, something that
> can be so sensitive to the economy or just the way that the system works so it doesn't feel
> right to totally lean on that if it's not always going to be there, there's a chance that it's not
> always going to be there (Sara, PG).

Another gardener associated self-sufficiency with increased simplicity, which he felt

gardening contributed to: "I think people buy too many things, so it's nice to simplify things. Be

a little more self-sufficient" (Nathan, RGS).

Access to better-tasting, local, and organic food

Draper & Freedman had found that "access to fresh and better tasting food" (2010, p. 480)

was one of several reasons people chose to garden. This was also a theme among my

participants, particularly in the form of local and/or organic food:

I don't think there's any question that my keen interest in gardening is also connected to wanting to buy local, wanting to buy pesticide- and hormone-free food and you know looking for fresh (Oliver, RGS).

Participants universally stated or agreed that "Garden veggies taste better than store veggies, it's just a fact" (Neve, PG). Tomatoes were mentioned particularly often as a fruit which many participants grew, in large part due to their ability to grow better-tasting and heritage varieties. Another gardener mentioned this disparity of taste between garden-grown and store-bought vegetables with relation to carrots:

Some of these products I wouldn't bother buying in a store. And other things seem to taste better too. Down below [in the garden plot], before I came up here [for the interview], I picked some carrots, and the carrots taste like carrots. The carrots you buy in the store don't always, you know have that same kind of flavour (John, RGS).

For one gardener, the taste of the food was the primary instigating factor for her CG activity: "I think initially it [my involvement] was strictly because I loved the taste of the food, and I just love to be in the garden" (Barbara, RGS).

Continue a childhood practice

For a few gardeners, they were motivated to join the community garden because they either remembered gardening as a child or had a continuous garden practice and sought out the CG as a way to continue that. For some, this manifested as a strong sense of personal identity:

For me to come back to gardening is coming back to who I always was since I was a little kid you know (Ani, RGS).

For others, this meant simply doing what felt natural:

the most obvious impetus was growing up in a garden… there was always a garden and then you know my mother had a huge garden in our backyard. So I just grew up with it. So that's one of the reasons. It just felt natural, it just felt to me like everybody should have a garden in their backyard (Oliver, RGS).

Many participants expressed that childhood familiarity with gardening was an important piece of their motivation to garden, though usually intertwined with other reasons such as their values.

Summary of themes

Overall, there was a high level of environmental and political awareness among gardeners, even among those who felt that they were 'newbies', 'learners', and 'not scientists' and thus did not know very much. Many explicitly and implicitly tied their gardening activities to the beliefs and values that sprang from their awareness and fear around environmental issues, finding it to be a source of hope, resilience, and resistance. Whether they felt that gardening helped on a small scale, such as increasing their personal self-sufficiency, or on a larger scale, such as resisting problematic political and agricultural structures or bonding the community together in order to face a coming crisis, many were clear that being involved in the community garden was part of a bigger picture. It played into their philosophies and values about the world and how to live well, rather than just being a leisure activity.

4.3.2 Challenges and barriers to involvement

Participants faced several challenges and barriers to involvement and to continuing involvement. The main challenges they identified were physical challenges and time. Physical barriers included the short growing season, "Manitoba gumbo" or the clay heavy soil in the area, and in the case of RGS flooding on the river-side of the garden. Limited time was frequently cited as well. Participants talked about how their jobs were busy or took them away in the summer; that they were aging and would not have enough time in life to either learn as much as they wanted or to pass on as much knowledge as they wanted, and that their energy levels were

not always high enough to garden as much as they desired. Busy lives meant that gardening was

sometimes just one more thing to try to fit in:

> Everybody has really good intentions, there's a lot of energy, but sort of getting people out the door when they're at home and they've just come home from work or school and they have kids, like people are busy. So we need to somehow like connect them with that really good feeling that sometimes we get when we're working outside (Neve, PG).

> I mean obviously just lack of time, so you maybe know that you should try something, like I may realize that I should try some things differently but I don't always have the time to go about, you know to do all the research that I would need to and that kind of thing (Noah, RGS).

Gardening as a source of food is much more time-intensive than shopping at a supermarket, a

fact which also emerged as a barrier:

> It's so easy to go to Safeway, it's right there…after being educated on just the whole food system it's hard, because I don't wanna fully support that, but at the same time, gotta eat (Sara, PG)!

4.3.3 Benefits of community garden membership

As discussed in the introduction to section 4.3, benefits of CG membership are the result of

garden activity, rather than the motivation to begin CG involvement. Overlap may be seen

between benefits and motivations, as motivations often include the desire to achieve expected

benefits. The wide variety of benefits of CG membership as identified by participants, are

summarized in Table 2. Many of these benefits have been previously identified in the literature

(e.g. Draper & Freedman, 2010). Benefits identified by participants were very similar between

RGS and the PG, making comparison of limited value. The reader may note that learning

outcomes are not included in the table of benefits of CG participation. Learning outcomes are a

significant benefit of CG participation; however, they are of a special class of benefit due to the

focus of this thesis, and are thus discussed in their own chapter (Ch. 4). Benefits are discussed

below.

Table 3: Reported benefits of community garden participation

Health Benefits	Peaceful, relaxing
	Mental health benefits, especially anxiety reduction
	Physical exercise
Food and Food Safety Benefits	Access to better-tasting foods
	Avoiding pesticides, herbicide, hormones, and petrochemicals in food and food production
	Cheaper access to organics
	Access to hard-to-find/expensive foods
Political Benefits	Improve society/make a difference in the world
	Makes a political statement about mainstream food system
	Avoid concerns about welfare of farmers and harvesters
Personal & Social Capital Benefits	Self-sufficiency in the case of societal collapse
	Meeting new people
	Career opportunities/reflecting on career path
	Opportunity to garden, not otherwise available
	Bonding activity with partner/spouse
	Source of community involvement/connection
	Saving money

4.3.3.1 Health benefits

Three major themes emerged in relation to the health benefits of gardening: that it is

peaceful or relaxing; that it provides anxiety reduction and other mental health benefits; and that

it provides a source of physical exercise (See Table 2). In contrast with academic literature,

which focusses on improved nutrition as a major health outcome of community gardening (e.g.

Alaimo, et al., 2008; Kingsley et al., 2009), participants rarely mentioned nutrition, focusing

instead on mental health. Gardening for them is calming; relaxes them after a busy day; it is a

space to decompress, and to cushion themselves from the noise and rush of city life. Anxiety

reduction can also occur through providing protective action and learning against fears about the

world:

> There is a kind of imminent danger in every class that I was hearing about, that made me want to do something about it that would make me feel a little bit better, kind of an anxiety reduction strategy (Evan, PG).

> Gardening, for the participants, can be therapy: "I tell people I don't need a psychiatrist because I come and spend an hour a day in the garden. Keeps me sane" (Jody, RGS).

> Secondarily, several participants felt that gardening was a source of physical activity for

them. One participant found that gardening took the same role in her life as a gym membership

does for others, explaining that she diverted money away from a gym membership towards

gardening.

4.3.3.2 Food and safety

There were many benefits related to CGs that directly related to food and food safety

concerns, including having access to better-tasting food, avoiding various contaminants, more

affordable organics, and better access to foods that are otherwise expensive or hard to find (See

Table 2). Several participants mentioned how they felt that vegetables like corn, peas,

cucumbers, and tomatoes tasted much better from their gardens than from the grocery store: "I

think the vegetables taste a lot better when they're freshly picked, especially peas and corn"

(John, RGS). This was a goal they often had when beginning to garden, and clearly most

participants achieved this.

The source of their food was a matter of concern for many participants. One gardener described her process of discovering that gardening could help her source her food more ethically:

> I was just reading a book in my car, called *Where your food comes from and why it matters*. So just learning more about the ethics behind different farming and…it was mostly talking about meat in this book in particular. But I am interested in just making sure I'm getting wholesome food, and making sure I know where it's coming from. And it is very rewarding to eat something that you've planted yourself. And trusting that it's not pumped with chemicals and that animals weren't harmed in the making, you know those kind of things (Laura, PG).

Organic food was not fully accessible to all participants due to cost. Gardening was not necessarily a direct replacement for store-bought organics, but did provide an alternative means of acquiring food without buying into what some saw as problematic food systems:

> I wanna buy organic it's just like the prices are so racked up but I don't wanna not eat organic…why does it have to be a privileged thing, why does it have to be a privilege when there are people who are just surviving off nachos at 7-11 or whatever right? I like supporting the idea of organic, but I don't like the word organic itself just because it has this label attached to it (Sara, PG).

Other foods that are difficult to access in stores are not necessarily expensive organics, but may be heritage varieties (especially of tomatoes), specialized varieties grown in other countries, or specialty foods, which are hard to find and if found, expensive. Growing these items in the CG made it possible for participants to enjoy these foods.

> Then the other things I plant are things that I don't find easily in the store. Swiss chard now they have, right, but not the other things, Argentinian tomatoes, that's what they are, and the other round zucchini that are also Argentinian that I won't find here (Ani, RGS).

> [I could grow] peppers that were just simply too expensive to buy. I mean that's probably my biggest savings right there is just in the peppers…it definitely does [save me money] in the summer (Nathan, RGS).

In terms of the actual amount of food produced, participants at the two gardens experienced significantly different produce benefits. While people at RGS spoke about large proportions of

their summertime meals coming from the garden, and about having root vegetables, preserves, and dried herbs lasting well into the winter, PG participants experienced only minimal produce benefits. This is likely caused by the PG's wide variety of crops and relatively low yield per gardener (particularly in the early stages of the development of the site), and potentially also other factors such as lack of clarity among gardeners on how much produce they can harvest for their own use.

4.3.3.3 Political

As discussed in section 4.2, politics was a strong theme amongst participants. Many were motivated to garden for political reasons. Below, I demonstrate the ways in which participants felt that their garden activities helped them to fulfill their values and meet their political goals.

Several participants expressed sentiments summarized by the statement 'I want to make a difference in the world'. A PG gardener explained

> I want to see change happen, so I've been trying to do it myself. And I started reading a lot about food and agriculture, and realizing that's something I can do. I can't fix everything in the world, but I can choose where I get my food from, and what I feed my family, and I'm learning how to save seeds and things like that (Cathy, PG).

One way to make a difference was to make a political statement. A long-time RGS gardener felt that, particularly in the past, gardening for him had been a strong outlet for his political convictions about resisting structures he saw as problematic.

> By my early 20s I was a lot more political in my thinking, and I mean I can't say that I had these ideas completely worked out at the time, but you know, it was also a political thing for me, to grow your own food, to know what goes into your body, to you know resist the industrialization of food (Oliver, RGS).

A third, less frequently mentioned theme, also emerged. One participant in particular expressed his concern about the health effects of pesticides and herbicides on farmers, agreeing when asked that he saw the way in which food is produced as a justice issue.

I don't like the use of, I guess petroleum products in farming, whether it's sprays or fertilizers. It's bad for the soil, but it's also bad for the people that work the soil. I mean I'm more concerned about the people that are harvesting the bananas that I eat, and whether those banana trees are sprayed repeatedly throughout the season, as are most of the crops that we eat. I don't know whether it has any impact on us or not, whether those trace amounts will affect us, but the people that are actually in the field, harvesting after they've been sprayed (Jody, RGS).

4.3.3.4 Personal

Many benefits of CG membership emerged which can be classified as general benefits to the individual: self-sufficiency if society collapses; meeting new people; considering and being presented with career opportunities; a bonding activity with their partner or spouse; feeling involved with the community; saving money; and simply the opportunity to garden for enjoyment where they were not otherwise able to at home. Several of these benefits are a type of social capital (meeting new people; bonding with partner; involvement with community); social capital is discussed below in section 4.4.

Gardening was not necessarily a source of financial benefit for participants. Hobby gardening, as those at RGS do, may save only negligible amounts of money:

> I mean it depends on you know how you value your time I guess. Like I'm sure that it's cheaper than buying food but you know a lot of time goes into it so if there was something else you could be doing to earn more money, so maybe it's not a huge benefit perhaps financially but it's not really one of those things I consider too much I guess. But I'm sure I save money for sure (Noah, RGS).

> No, I don't think it saves money…this year, putting those raised beds up, was like five or six hundred dollars. And that's only for half of it. So that's going to take a lot of gardening years to make any to even break even…it's the fencing, and all those kinds of things. I would think that garden this year…well it'll last for 10 years, but probably was about nine hundred to a thousand dollars. Well we can buy a lot of produce for that. So if I didn't enjoy it I wouldn't do it. It has much more to do with this is my hobby, and I don't pay fees to a recreation centre to go and exercise on a bicycle, I garden (Sandra, RGS).

However, some serious gardeners at RGS felt that they did save some money:

> It definitely does [save me money] in the summer…Just with the sheer number of vegetables, and I really did not buy any vegetables…because I had the hydroponics growing

> I bought very very minimal vegetables in the springtime, leafy greens and things like that, and then over the summer I was just using everything from the garden and really didn't buy any vegetables until about this month [December] (Nathan, RGS).

The idea of self-sufficiency echoes one of the themes of gardener motivation, which suggests that CG involvement is an effective way to meet the goal of increasing people's feelings of efficacy around providing for their needs in a potential crisis.

> There's kind of a survivalist instinct that starts kicking in too like I don't feel like I'd be totally lost if like, Rod always warns about the industrial machine grinding to a halt, I don't feel like I'd starve if it happened during growing season for instance (Evan, PG).

Two participants were surprised by the benefit of CG involvement to their careers. Evan, founder and leader of the PG, had the opportunity to design and teach a university course based around the PG. This taught him job skills like public speaking, and provided a part-time income. Sara, whose story is explained in more detail in Chapter 5, found that gardening helped her to reflect on her vocational options. She also found temporary part-time work in the gardens, as the intergenerational garden coordinator (a project which shares space with RGS).

Participants often found a variety of social benefits arose from their gardening experience, including a chance to meet new people, solidify existing relationships, and be more involved with the wider community.

> I get a lot of social benefits out of it. I met my last partner in the orchard for instance and we had a lot to share because of that. I had a lot of friends who are involved in it and I bring all my friends to the spaces and everybody gets something out of it, it's just a very pro-social positive learning and interacting environment (Evan, PG).

> I did meet this guy who wanted a garden plot, and I thought since I live in the neighbourhood I would get one for him, I thought I'd have a better chance, so I got a garden plot for him, and he thought it was for us. So we worked on it together, and you know I faked it for a whole summer…I've been [gardening] since 2002 and I married that guy in 2006 (Linda, RGS).

> [I was looking for] just something to get involved in, with the community. And it just so happened that it ended up being in the gardening and that was something that I've been looking for even prior to this. I was living in West Broadway last year and there was tons of

community gardens there so I hadn't heard about anything in this neighbourhood up until that point, so yeah. I wasn't specifically looking for that at the time, but yeah (Sara, PG).

CG involvement, in several cases, provided an opportunity for several participants to simply garden. Some participants wanted to do a specific type or amount of gardening and did not have enough space; others found their yards too shady or too acidic due to pine needles falling. This is not a theme which has emerged strongly in community gardening literature to date.

> I realized our backyard wasn't big enough for the kind of gardening I wanted to do. And then I heard about the community garden (Sandra, RGS).

> I was an avid gardener but couldn't really garden at home because it was too shady, and had heard about this place, and I made inquiries and got in touch (John, RGS).

The primary benefit reported from CG involvement, however, was simple enjoyment of gardening. Participants liked how it feels to get out into the garden, to get their hands dirty, to produce something real. Gardening engages their senses: they hear the quiet and the birdsong; they feel dirt on their hands; they taste sweet tomatoes. One heavily involved gardener, president of RGS, said "I still do it for pleasure. It's a miracle" (Rod, RGS). Another elderly gardener at the PG explained the top three reasons why she gardens:

> One is the pleasure. Two is good exercise. And three if I'm lucky enough to produce anything from it (Joyce, PG).

An idealistic young gardener with the PG even spoke of spiritual benefits:

> I felt like it represented new life. So each time I came it gave me, it was more of a spiritual experience too. It gave me new life, and it was great to watch the progress of the planets right from the beginning till they were growing, and just that representation of growth, and it helped me as I was going through my practicum this summer… Just that representation of it being new life, and growth, and how that relates to myself as well, like how I was growing through the summer and how I felt like I was growing with the garden (Laura, PG).

4.3.3.5 Summary of benefits

Many of the benefits ascribed to CGs here have also been found by other researchers. In the largest review of CG literature to date, benefits included "time to enjoy nature, health benefits,

opportunities to socialize, a chance to beautify and give back to the community" (Draper &

Freedman, 2010, p. 480). All of these except for beautification were relevant to my participants.

The neighbourhood of Riverview is already well-kept and features many mature trees and park

spaces, whereas CGs are classically often established in inner city neighbourhoods severely

lacking in green space. However, benefits indicated by participants covered positive impacts on

physical and mental health, organic food availability, political activism opportunities, and several

other personal benefits such as building community, a stronger sense of self-sufficiency, and

participation in an enjoyable leisure activity.

4.4 Social Capital and Community Gardens

Social capital is another benefit of being involved in community gardens, as mentioned

above. There were many ways in which both RGS and the PG functioned as a facilitator for

building social capital among gardeners. One participant's description of her garden eloquently

depicts CGs as a source of bonding and bridging social capital:

> It's more about the people. It's not a person garden, it's a people garden. It's not one person,
> it's people, it's more than just a garden even, it's a place where people come to meet and get
> to know each other, get connected with the community (Neve, PG).

Some participants explicitly sought out their CG for precisely the reason that they wanted to

get more connected with their community.

> Sometimes you're just looking for something to help get connected and in my opinion
> there's nothing better than being in a garden and spending time with people of all ages, not
> just you know people your own age (Sara, PG).

As well, several felt that gardening did have the effect of helping them to feel connected to

the neighbourhood, even if they did not live there (or no longer lived there):

> I don't live in Riverview, but I definitely feel a lot more rooted there. I feel like I am part of
> that community or part of that neighbourhood (Neve, PG).

One participant, whose wife is a librarian, pointed out how few 'third spaces' remain in our society; how there are almost no public spaces where people can freely assemble and meet each other anymore. Researchers have also noted this role as a non-commercial 'third space', even going so far as to suggest that in some cases, "community gardens are less about gardening than they are about community" (Glover, Parry, & Shinew, 2005, p. 454). Because CGs are one of the few remaining 'third spaces', many who are involved in them value the characteristics which make them third spaces. Simply by providing a place for socialization, gardens can help build social capital (Flachs, 2010; Glover, et al., 2005). This can take the form of both bonding and bridging social capital, though exclusion due to too-tight bonds may also occur (Moquin, 2014).

Supporting this research, my thesis shows that for some, the garden served as a place to meet people in a casual and incidental way. This sometimes (though not always) led to the formation of friendships:

> Yeah you just kind of run into them. I mean at the garden plot every time you see them you say hi and talk for a couple minutes…it's a nice bonus…I did get to know some people in the community. I don't really know that many of them by name but I know their faces (Nathan, RGS).

> It's the best way I've found to meet people. Over the last seven years I now have a dozen or more very good friends that are all involved in the garden or the orchard, trying to improve the neighbourhood (Jody, RGS).

However, not all gardeners experienced that the garden enhanced their social connections, as several were already connected to the community in other ways. For them, the garden did not add to their state of already feeling connected. The CG may have provided for enhanced bonding for them, but did not play a bridging role in their lives.

> I've always been involved with the community. You know when we moved here, my kids were very young, so when we moved here in order to meet people I immediately got involved with the community club and volunteering at the kids' schools. So I've always been - that's never been an issue…I mean I have met a few people here, through gardening, but it hasn't been a huge impact (Barbara, RGS).

One first-year gardener focused more on how her involvement with the garden highlighted her lack of connection with the community. It never bothered her up till this year, but suddenly she realized that "I don't know my neighbours. And I really would like to know my neighbours" (Cathy, PG).

Some authors indicate that CGs can provide beautification for a neighbourhood (Draper & Freedman, 2010; Hanna & Oh, 2000). Neighbourhood beautification is a source of social capital (Flachs, 2010), but was conspicuously not mentioned by any participants, although a few did mention their enjoyment of walking through the gardens. It is likely that beautification is more relevant in inner-city gardens, where CGs may occupy a formerly vacant lot, or otherwise be a space of rare green in the 'concrete jungle'. Riverview is a community made up almost exclusively of single family detached dwellings, surrounded on three sides by a river, and features many parks and mature trees; CGs in this neighbourhood have been created on existing greenspace. Their role in beautification is minimal, and in fact the leaders of both gardens mentioned actions to do with proper maintenance and weed control that suggested concern that the community had the potential to view the gardens as *less* aesthetically pleasing than a more manicured park-like setting.

It seems clear, however, that social capital is built and supported by the gardens. A strong theme or sense of 'we're in this together' was spontaneously mentioned by several participants, who felt that sharing the goal of gardening and caring for that piece of land together, no matter what the differences between the gardeners, was a unifying factor. A "we" emerged often in the data and can be attributed to the shared activity of gardening. It is unclear whether this would be true for any activity, or whether gardening stimulates this particularly well, although peoples' strong philosophical motivations for gardening may indicate that sharing gardening is more

profound than sharing certain other interests, and thus has more potential to bring people together. The following quotes from Oliver explain this phenomenon:

> One of the things that I find interesting about a community garden is there's an individuality because it's your plot, and it's quite well-defined, and some people actually make it VERY well-defined, they put up you know ropes and strings, but yet within that, that's also embedded in something that feels like a group of people. It's not my garden vs. yours, which I think is another important value (Oliver, RGS).

> There's a quicker glued-ness, or something like that, because we all know we have something in common down there. We all know, and we mostly talk about gardening. But that can lead to other conversations, and I…meet them and I look at them and I go there's one thing about this person I know that I like. Right away, I don't have to spend any time, because I can see them, what they're doing (Oliver, RGS).

This reflects other research, which demonstrated that households which were involved in community gardening (and related activities) tended to have perceptions that various aspects of social capital were strong and present in their lives and neighbourhoods (Alaimo, Reischl, & Allen, 2010).

Unfortunately, not everybody experiences this "glued-ness" and strong sense of community. While a majority of participants did feel a sense of community to some degree, or did not care to seek it out, others felt more on the edges socially. Selection bias towards more involved gardeners may have left out even more of those gardeners who felt that they were on the fringe. Some critiques of CGs have suggested that there tend to be inner and outer rings of involvement, and one's position in that social structure has a large impact on how one experiences the community (Glover, 2004) – I consider this further below in looking at governance. Cassandra, a relatively recent RGS gardener, was not one of those who found community in the garden:

> I dunno, we have met some [other gardeners], but it's not…like it's very limited, it's very isolated to 'our corner', it's probably a similar experience for a lot of people (Cassandra, RGS).

However, this can be contrasted with how one of the most passionate gardeners from the PG eloquently explained the sense of community-building purpose she found:

> It's more about the people. It's not a person garden, its' a people garden. It's not one person, it's people, it's more than just a garden even, it's a place where people come to meet and get to know each other. Get connected with the community. If I wanted, like I have my garden at home and like there's always so many issues when it comes into ownership and wanting to say something you own is yours, but it's really not about that and I think that's what makes it a unique place is that it's for the people (Sara, PG).

Glover (2004) studied the social networks formed around CGs and found that while they can support the formation of strong community connections, there may well be those 'on the outside' who feel left out for those very reasons. Cassandra (RGS) found it difficult to break into existing networks of gardeners, supporting this notion, but most other participants felt that their involvement with their garden was a source of strong and positive social connections.

Another way in which CGs may build social capital is by exposing people to others who think differently or may be from different backgrounds than themselves. Exposure to this diversity of background and age has been suggested by Flachs (2010) as a source of bridging social capital. Supporting this, my thesis shows that these widely varying connections can be facilitated by the structure of the CG, as highlighted by the following two quotes:

> I met a lot of people here who have different backgrounds, and there is a common purpose. That's what I like. When you meet people here they're always nice, it seems, or they're friendly, or that, it's because we're all into this same thing. We all have this purpose that is to grow here. And to look after the place (Ani, RGS).

> We have a new family here from Congo, and they've been gardening here three years I think, because they were newcomers, and there was something that the mom wanted to do was to garden. So they garden right next to us, and they have nine children…And so they grow beans. Beans, and they plant them randomly like that, like not in rows like we do so that was interesting. And one time they were looking at the young children are the ones that speak English better, so they were looking at my squash, and then they were asking me, their mom had asked if they could take some of the leaves of this squash, the leaves, so I said well yeah but do you mean the squash? I can give you some squash. No, no the leaves! Well, you can take them all if you like, cause I wasn't going to use them. Apparently they eat them, so their mom took this big bouquet of them (Ani, RGS).

Evidence of reciprocity and trust can also be seen in the above quote, defined by Glover et al. as "conventional forms of social capital" (2005, p. 454).

4.5 Governance

Governance is a rarely studied aspect of CGs, and yet has the potential to have a large impact on the experience and learning of gardeners. For example, a CG with a coordinator but no organizing committee and no programming might have less bonding social capital; whereas a CG with formal workshops, community gatherings, and committees to manage projects and improvements might lead to more positive feelings about the garden, stronger social capital, and more opportunities for learning. Participant responses indicated that it was important to consider the relationship between how the garden was designed and run, and their experience gardening. This section will examine the difference in governance model between RGS and the PG; the ways in which these structures facilitate or hinder initial involvement; the role that a key person can play in governance; and various challenges and successes in governance reported by participants.

4.5.1 Governance model: PG vs. RGS

As has been previously discussed, RGS runs on an allotment model, where gardeners rent a piece of the garden and are considered its tenants for the gardening season. The garden is run by an elected president and committee, including sub-committees for certain tasks and events, and offers an AGM open to attendance for all. The current president of RGS has a personal philosophy emphasizing the importance of collective decision-making and of ensuring that everybody has a chance to have their say.

Several other participants had commentary on how important or positive the democratic process was in the way their garden was run, though from a less 'academic' standpoint. In one

case, PG involvement was an instigator for reflecting on issues around private property. Others felt that having their say, even in small ways, and maintaining a 'flat' institutional structure, was important. AGMs provided a "chance for everybody to have a say in things that they would like to see changed around the garden" (Noah, RGS). However, while participants valued a garden organization that was "very inclusive and cooperative", some recognized that "on the outside it might look undemocratic because there's you know, the more active people in the organization, but that's just the way things work" (Oliver, RGS). Oliver felt that while the democratic process was a positive value, he emphasized that he didn't think it was problematic when "some people just do what needs to be done" (Oliver, RGS), even if that did not spring from democracy – a perspective shared by some others. Although many participants reflected on the importance of democratic process in their gardens, the majority focused on how garden organization directly affected them and their own ability to garden, be involved, and make connections.

In contrast with RGS, which retains a degree of private property, the PG is run on a commons model. This is an experimental model of governance drawing on principles derived from Garrett Hardin's paper "The Tragedy of the Commons" (1968). The commons is an economic idea, and describes a type of good which is both non-excludable and rival. Traditionally, this idea has been applied as a problem to be solved: how do we manage resources effectively when we cannot prevent people from using them, and when one person's use reduces the ability of others to use it? Commons have, historically, been a point of concern around selfish resource over-use. However, the gardeners at the PG have embraced the notion of the commons as a way to counter what they see as the problems with private property. By managing their garden collectively, and benefitting collectively, they see themselves as building community and

resisting problematic institutional structures. Evan, the founder of the PG, elaborated on how the

PG attempts to be a demonstration of effective commons management:

> [The commons] is an institutional framework whereby the communities of resource users
> can govern the resource themselves….So I've become very interested in this whole model
> where the community of land users can govern the land themselves…I'm looking at how do
> we come up with structures at a local level that have a whole bunch of benefits to them but
> are also managed by the people that participate in it and encourage…real participation
> (Evan, PG).

One PG participant felt that while there were benefits to the commons model, there were

also challenges with the ideal of openness that the model exemplifies, pointing out that "I think

people really need and appreciate guidelines…it almost needs like sort of a formalized program"

(Neve, PG).

Although RGS maintains a more traditional model of private property leases of garden plots,

it seemed that a sense of the collective bordering on the commons may be emerging:

> And you know, one of the things that I find interesting about a community garden there's an
> individuality because it's your plot, and it's quite well-defined, and some people actually
> make it *very* well-defined, they put up you know ropes and strings, but yet within that,
> there's also embedded in something that feels like a group of people. It's not my garden vs.
> yours, which I think is important, another important value (Oliver, RGS).

The data were unclear as to what exactly the direct effects of the commons-based

governance versus more traditional private-property-based governance had on gardener

experience and learning outcomes. Emergent themes suggest that future research should

investigate whether the commons model of governing gardens is one which draws less-

experienced gardeners and serves best as a learning opportunity, or whether it can function well

for long-term gardeners desiring to produce more significant amounts of food.

4.5.2 Structure leading to initial gardener involvement

There are structures both within, and external to, CGs which may facilitate a gardener's

initial involvement with a particular CG. It is important to understand what these structures are,

in a political climate which is increasingly positive towards CGs. In 2015, the newly-elected City

of Winnipeg mayor promised to open up 1,000 new garden plots within the first year of his term

in office (VanRaes, 2015) – a move which reflects a growing swell of support for CG plots.

Understanding why people are drawn to participate in CGs will help predict need for new plots

(both number and location) and will help create strategies for attracting gardeners to newly-

created plots.

About half of participants in this study stated that they learned about and started being

involved in the CGs through word of mouth, or appreciating their visual presence in the

communities. For example, one woman has friends who were involved in the CGs in the

community, and had Rod (president of RGS) recommended to her as a community leader whose

portrait she should sketch. She said,

> I admired the community gardens immensely and often would walk with my husband
> down, we'd take some coffee and sit in a little area there and admire the
> gardens…through Rod I learned about the sustainable south Osborne community co-op,
> which I thought was tremendous (Joyce, PG).

The relatively prominent placement of RGS and the PG, as well as signage explaining what

they are, and benches to invite passers-by to sit and enjoy the garden, seem to have worked be

effective recruitment tools. Another route to involvement involved individuals reaching out to

formal structures such as online searches and city services, seeking information on community

gardening. This suggests that a strong online presence, and connections with existing urban

governance, may also facilitate involvement.

> I recently moved into the neighbourhood and I heard about sustainable south Osborne
> just through word of mouth and whatnot and I sent an email about how to get involved
> and I heard back from Evan almost instantly telling me about the People Garden (Sara,
> PG).

> I had started to learn about permaculture through podcasts and I was reading books and
> stuff so then I looked it up online: "Permaculture Winnipeg" and it came up with

Sustainable South Osborne. And then they had a thing on their website which said if you're interested in learning more about what's going on [click here], and so I said yes and the next thing I know they said 'great, we're so glad to have you on board!' so I started helping out there (Cathy, PG).

Several gardeners reported getting involved because of their history of gardening or farming as children or young adults:

The most obvious impetus was growing up in a garden…It just felt natural, it just felt to me like everything should have a garden in their backyard (Oliver, RGS).

My mother always gardened growing up. So I always kind of just liked being outside and getting to do something active outside (Noah, RGS).

The importance of word-of-mouth transmission indicates the importance of providing a positive gardener experience, and of integrating the garden with the community.

4.5.3 Role of a key person in governance

There is a tension at play in both RGS and PG with regards to the role of a single significant person in holding the structure of the garden together. While the leaders of both gardens attempt to minimize their own importance in the gardens' structure and functioning, both emerged as having unique and key roles. Rod and Evan both emphasized the importance of grassroots and democratic processes in their respective gardens, as well as their hope that the gardens can function well even when their influence is not present.

Several participants independently mentioned, without prompting, their perception of the importance of a strong individual in leading and running their community garden. This was true both at RGS and at the PG. At the PG, one participant mentioned how important Evan was to making participation a positive and enriching experience:

I would give Evan a lot of credit for being around when people are coming here to volunteer, especially at the beginning. I felt like he was able to facilitate ok what needs to get done, give some direction, but also then give these little tidbits of information and he was always willing to educate and inform people about what's being done in the garden and what

brought out the plan, and what his vision is, so I would give him lots of credit for that (Laura, PG).

Another participant at the PG mentioned the importance of having a person in a coordinator-type role, although she acknowledged the tension between having top-down coordinators, and the governance ideal of a commons-model permaculture garden like the PG that emphasises collective and democratic decision-making:

> I think somebody does need to be in charge, and that kind of goes against in a way the common sort of ideal, but I think it's important to have a coordinator or someone who can, I don't know, people can ask, and if not like allow, but just be there to answer questions or be available by phone or by email…I think there needs to be someone there, there needs to be a leader or a mentor, and I know that that's impossible to manage, the teaching and the learning and the getting the gardening done, like, in a perfect world we could do all these things at one time (Neve, PG).

Evan himself seemed to struggle with the tension of how important his leadership role is in the PG. On one hand, he mentioned

> There's a couple key points in the year when I had to leave, you kind of feel the structure faulting a little bit. You feel the glue or the solidarity of the group is very clearly not what it needs to be (Evan, PG).

He also felt that the garden was at the stage where it could use another leader,

> sort of another one of me or Rod around, just because I don't have the background to be able to give people instruction for them to be able to pass it on kind of thing. I'm not as solid as I need to be occupying that role (Evan, PG).

In this, we can see his recognition of both the importance and the influence of key individuals within the organization of the garden. At the same time, however, Evan was pleasantly surprised with how well the garden continued without his presence: "I thought that when I was going to leave this thing it might just crumble because it was just me and Rod for a good chunk of the whole organization's history. So that's been very…pleasantly surprising I guess…now, yeah I don't think I have much to do with keeping it around, that's for sure" (Evan, PG). This statement, which seems to contradict his above comments, indicates to me that the PG

is in a state of organizational transition. Evan still holds a place of importance in the PG, but it has gained sufficient momentum and buy-in that he is no longer so essential that a brief absence means the organization falls apart – simply that it suffers a little, and may not yet have the integrity to continue for long without Evan or somebody in Evan's motivating and organizational position. The PG appears to still require some degree of top-down vision and organization before it fully transitions to a point where there are sufficient, established, and committed volunteers, and sufficient organizational knowledge and social capital to maintain it long-term from within.

Data from RGS suggests that regardless of the integrity and potential for longevity within the social structure of the garden, whoever is in a leadership position will still have a strong impact on the functioning and organizational culture of the community garden. One participant noted that there was a contrast between the culture at RGS under the previous president, and the current president, attributing the differences directly to the approach of the leadership. She felt that Rod's leadership style – one she characterized has having a strong vision for the future – had contributed to changes in garden functioning such as fewer weedy plots better-organized composting.

Another gardener spoke about how the way Rod approaches his leadership, as a mentor and activist, is providing her with an education: "his big thing is community development, and that's what he's teaching doing. So I'm getting a whole free education from him" (Linda, RGS).

Beyond the influence of a single person, in the larger organization at RGS there was a generally acknowledged understanding that there is a smaller sub-group of gardeners who will 'get things done'; that is, a dedicated set of core members who may make and implement decisions without going through the full democratic process. This was acknowledged by several

gardeners without rancour, and often with some appreciation that they could trust the necessary

tasks would happen.

> Of necessity lots of the things that need to be done to run a volunteer community organization like the RGS happen kind of, I don't wanna say this wrong, but some people just do what needs to be done… On the outside it might look undemocratic because there's, you know, the more active people in the organization, but that's just the way things work (Oliver, RGS).

> I think we've done a good job this season of getting volunteers and there has been a little bit more interest, but it's sort of the thing that plagues community gardens, people are interested at the beginning and then it sort of drops off, and it really drops off when it's time to clean up, and certain people end up doing most of the work (Neve, PG).

However, although gardeners did not mention this explicitly, there is the possibility that this

sort of structure excludes certain gardeners, leaving them outside of the social structure; as well

as that it leads to lack of ownership among those gardeners not part of the inner circle.

4.5.4 Successes and challenges in garden governance

In order that community gardens may achieve at least a few of the lofty goals set for them by

policy-makers and community organizers, it is important to gain a thorough understanding of the

successes and challenges involved in governing the gardens. I have here conceived of successful

garden governance as governance which is perceived positively by participants, and is related to

stability in the gardens and increased connection to nature or environmental commitment in

gardeners.

4.5.4.1 People Garden successes and challenges

Overall, the PG was evaluated by members as functioning quite well, with a couple of

challenges identified as opportunities for change in the future. Successes included use of the

internet as an organizational tool; beginning with a small project and expanding; and having

access to Evan as an "expert" source of gardening knowledge and advice.

Two participants mentioned how helpful they found the PG website, finding that it enhanced their experience, one explaining:

> Well, it's beautifully organized. You can do it online, select when you want to go, you don't necessarily know who else is going to turn up, but you can meet your neighbours there, and not realize, you know, that they're going, and while you're just weeding and chatting and enjoying the fresh air, it's such a pleasure to see things grow, so it's a very enriching experience (Joyce, PG).

As the founder of the PG, Evan had a unique perspective, pointing out that starting the PG as a small demonstration project has been a successful strategy. This has provided him and his volunteers a chance to prove that this garden can work:

> It's been really great, and the people are enjoying it, so that's all I can ask for. As long as the place doesn't look terrible and we're getting complaints, I think we're in good shape. So that's sort of where we're at. I think it is working though (Evan, PG).

Another gardener felt that the governance style of the PG in general was successful in terms of what she learned from it: "[the organization of the PG] definitely makes me feel less selfish, like I'm not going there for myself, I'm going there to be a part of something" (Neve, PG).

A final success which participants mentioned multiple times was Evan's presence at the garden providing advice and guidance, particularly at the beginning of the season. The availability of a 'resource person' seems to be highly desirable for participants.

> I give Evan a lot of credit for being around when people are coming here to volunteer, especially at the beginning. I felt like he was able to facilitate what needs to get done, give some direction, but also then give these little tidbits of information and he was always willing to educate and inform people about what's being done in the garden and what kind of brought out the plan, and what his vision is, so I would give him lots of credit for that (Laura, PG).

However, there remain some challenges with the garden as well. Two primary issues of governance emerged: volunteer power and clarity of expectations. Although the PG started small, it grew quickly in its early years, resulting in a problem of limited human resources capital

Rod and I have a very bad management style and that is to expand beyond our capacity and then try and recover, that's kind of been the pattern… So that's been a problem up until the last year, where it's been like no more expansions, let's just deal with what we're dealing with, and that's been a little bit better, but seems like the growth in volunteer involvement hasn't kept pace with the expansion of our projects. So it's been growing pains the whole way (Evan, PG).

Finding a good balance between growth and sufficient volunteer hours has been a learning experience for Evan in particular.

The second main issue with regards to PG governance was clarity of expectations. Two gardeners mentioned they were often uncertain about how to handle the honour system of the garden. Because it is a single plot of land managed by many volunteers, governed on a commons model, gardeners must make judgment calls on what to pick, at what time of year, and how much:

I would go and I would weed and sometimes I would be the only one there, and be like how much is too much, and how do I know if I'm taking all of like, should I take all of this lettuce, or should I take some of it, you never know if somebody's going to be coming after you, or if anybody ever knows that you were there. It's just like this strange honour system which I love, but is kind of uncomfortable at the same time because you don't know if what you're doing is fair or not (Neve, PG).

Like I said it was very helpful to have Evan here at the beginning, but I think when I come alone, or when there aren't people here, that is a barrier, because I'm not as accessible to the information [sic], but nor do I expect him to be here all the time because he's so busy….I wasn't sure what was ok to pick, or what was ok to take, so that part wasn't as clear as I think would've been helpful, so I ended up not taking very much, because I wasn't sure kind of the boundary with that (Laura, PG).

One of the uncertain gardeners had experience with another garden's honour system, and while that experience increased her confidence in her ability to make good choices, she still felt that this was a challenge. Interestingly however, she felt the benefits of the system still outweighed any concerns.

In the second quote above from Laura, we can also see a challenging side of one of the PG's successes: the resource person. When an experienced gardener is sporadically present, but not

constantly present and not on a regular schedule, participants who feel less certain or more dependent on the knowledge of a more experienced gardener may find themselves gardening alone without direction, which can be frustrating.

Lastly, a minor theme which was a governance challenge was that the organizing tool of choice, the PG website, did not always function properly. Fortunately, PG gardeners managed to work around these website challenges, but it was still a source of challenge: "I know he's had a bit of trouble, like you're supposed to post on [the website] every time you come what's happening and what needs to be harvested, but that's not working right now" (Cathy, PG).

4.5.4.2 Riverview Garden Society successes and challenges

RGS had several indicators of success, particularly positive evaluation on the part of participants, as well as strong social capital.

RGS gardeners had generally very little if any comment on how the society was run. Participants spoke in generalities, like "It's always been a positive experience" (Veronica, RGS); and "It seems to run fairly well" (John, RGS). Most gardeners seemed to agree with the statement of one participant who indicated that "I don't know a whole lot about it, I mean the system that they had in place seems to work really well…overall I'd say I have a positive view of it. I'm not too involved with it so I don't know a whole lot about it" (Nathan, RGS). A long-time gardener had very positive feelings about the efficacy of its administration:

> It's great that we rent a plot and that they, I love that they till it in the fall, it's part of what we pay for, and because we found that we don't need to do anything else in the spring, it's very easy that way…We could choose not to get it tilled but for it's good because I don't wanna have to be digging and that kind of stuff it is not needed. So yeah, for all these years we've just been very happy. The other thing is too the association or the society is watching that people keep removing the weeds, cause we used to have sometimes abandoned gardens next to ours, and then you get all the weed seeds (Ani, RGS).

It seems that there has been a positive culture shift in the garden governance in recent years, towards a culture of more involved members:

> Before it was hard to get anybody to come out. This year we had one [work bee] on Sunday, last Sunday, and we had more people than we needed…it's more and more people getting involved, like unbelievable (Linda, RGS).

Gardeners also felt positive about the existence of structures and guidelines, which kept people in check and ensured that certain rules and social norms were adhered to, yet with enough flexibility to allow for members who may have innovating ideas. One gardener's experience demonstrates this phenomenon well:

> You always need somebody to make sure that you're staying within the boundaries. I tend to push them. The first president that I dealt with was like 'Jody you're six inches over the line, come on man, you can't…' Alright alright, it's true, I try to take it right to the edge. I wanted to use as much space as I could on the plot. And eventually I actually took over much more land than most gardeners have, because we have a perimeter around, a 4' barrier around a tilled plot, a tilled section. And that's where most of the weeds grow, because they get tilled up and create more. So I asked to take it over, after I demonstrated what I'd done with the rest of my plot. So, yeah, they're there to keep me in line, I have to be told to step back. But all very good people (Jody, RGS).

RGS has also built significant social capital over the many years of its existence. This was reflected by participants in their perception that RGS has something special. The years-long waiting list also attests to that. One gardener has significant experience in non-RGS community gardens, as he resorted to them while waiting for a plot at RGS, and he expressed his strong feeling that there is a difference in how RGS is run compared to typical plot-allotment CGs in the city:

> I think [RGS is] well organized and it probably somewhere between doesn't affect and helps [me to do what I'd like to do]…Just having seen a few other gardens, I know that Riverview is better organized than those others…In those other [gardens]…they didn't organize, they don't meet as frequently, other than just seeing people out in the garden, so they didn't plan as many activities. Or meet to discuss strategies, or anything like that. Whereas this…I think in that case it was more just like renting a piece of land, whereas it didn't really have that community feel to it…[in the other gardens] there was pretty much just somebody that would collect a payment and just let you know when you were able to plant and when you

needed to have your stuff off by and that's about it, they didn't really organize anything, there was no committees and I think, there are more subcommittees (Noah, RGS).

Challenges that RGS faces include how to manage thefts of garden produce, getting gardeners involved in governance structures, a perception of lack of formal resources for learning gardening techniques, and some minor concern about the communication of weed notices.

Thefts of produce discouraged some gardeners:

I would also say that people just don't really care enough, generally. And I think a huge problem is theft still (Evan, PG).

The only serious disappointments I guess have been on a couple of occasions there have been thefts from the gardens. This year hasn't been bad, but last year a lot of gardeners lost a lot of produce, it was kind of organized I think, that seemed unconscionable on the part of those taking the vegetables, we put the effort and a bit of the money into it, so it was theft as far as I'm concerned (John, RGS).

Coping with thefts does not appear to have been addressed particularly on an organizational scale, beyond the placement of signs explaining that the garden produce belongs to those who grew it (in an attempt to counter a mistaken idea that "community garden" also means "community produce"). Some gardeners took individual steps to reduce thefts, even to the extent of building locking fences around their property, though more usually in the form of planting less desirable produce along the borders of their gardens, and intercropping more heavily to reduce the convenience of mass clear-outs. While there may be a governance solution to cope with thefts, one has not yet been established in RGS.

Some gardeners found the lack of formal programming a challenge at RGS, limiting their ability to connect with other gardeners socially and to build gardening skill:

We have met some [other gardeners], but it's very limited, it's very isolated to 'our corner', it's probably a similar experience for a lot of people….I feel like I would like to see…maybe one or two more proposed workshops or something or meet and greets. I know that there's the big fall supper but…there's the annual general meetings and things like that but

something - yeah. Maybe more informal, to just help people meet each other (Cassandra, RGS)?

I think that they have done some [more formal workshops], I've heard from other gardeners, but I haven't participated myself...I think they periodically do that kind of thing and more would be better for sure, it would help everybody (Noah, RGS).

Lastly, one gardener struggled with the method RGS has in place for dealing with gardeners who do not manage their plots well. She had inherited an extremely weedy plot and it took her a significant period of time to get it cleaned up, and the weed notices simultaneously discouraged and motivated her to get the unwanted plants under control:

That first year, I'll be very honest with you, and even part of the second year, we got lots of very unhappy notices, saying you know, your plot is weedy, and it's affecting others, and if you don't do something by this date, then...So you know, that was discouraging, but it was also...I'm very highly motivated by fear of loss than fear of embarrassment and things like that, so it was a good reason to get going (Cassandra, RGS).

4.6 Discussion

This chapter examined gardener-reported motivations for and benefits of participation, and it described and evaluated governance for each garden. Participants got involved with their gardens for a variety of reasons, which fell into the categories of personal and philosophical. The 'philosophical' category is grounded in previous research which found that environmental sustainability – dubbed 'ethical reasons' – was a motivation for gardening (Kingsley, et al., 2009). This thesis shows that while protecting the environment was part of the 'ethical' motivations, several other issues such as food security and resilience in the face of perceived impending socio-economic collapse were also important to participants. Research by Turner et al. (2011) also supported that community gardeners may see gardening as a way to assert their economic and social values and ideals. While previous literature has generally identified this ethical motivational factor, this research was able to uncover some specific manifestations of this ethic. Further research is needed to confirm the generalizability of the categories of increasing

community food security, resisting/opting out of a broken food system, protecting the environment, and increasing personal and community resilience in the face of impending societal collapse.

The category of 'personal' reasons found several motivations to garden supported by previous literature. Food production and access is commonly found to be a primary motivation for gardening (e.g. Draper & Freedman, 2010; Pourias et al. 2015). Improved access to local, organic, or hard to find food, and control over what is added to food, is a theme supported by the most comprehensive review of American CG literature currently available (Draper & Freedman, 2010). Interestingly, although previous researchers (Draper & Freedman, 2010; Kingsley, et al. 2009, Baker, 2005) have suggested that saving money, connection to neighbours, contributing positively to community aesthetics and safety, exercise, and learning were all primary motivations, the data from this study suggest that these are primarily perceived as benefits by participants, rather than forming a major part of their reason for getting involved. Birky & Strom (2013) did, however, identify urban sustainability, access to healthy local food, and fitness as motivational factors for CG participation.

These motivations for initial involvement were reflected in the benefits they reported, which could be categorized as health benefits, benefits relating to food and food safety, political activism opportunities, and general personal benefits. Motivations and benefits are often not clearly differentiated in literature, with many of the above-cited motivations also being presented as benefits of gardening by other authors. However, the benefits of gardening reported by participants are strongly consistent with benefits previously uncovered, particularly in large review studies such as Draper & Freedman's work (2010). Significantly, in this thesis community beautification or refuge from urban decay were not important motivations for

gardening, as others frequently discuss (e.g. Poulsen et al., 2014). The placement of RGS and the PG are likely to be the cause of this since they are located in relatively naturalized areas within an already mature, heavily-treed neighbourhood.

Although existing literature speaks about the money-saving benefits of gardening, and how important it can be for immigrants and people with lower incomes to garden in order to get access to fresh fruits and vegetables they would otherwise be excluded from due to cost, few participants in this study felt that cost was a factor for them (e.g. Wakefield et al., 2007; Flachs, 2010). This is not to deny the importance of gardens for marginalized groups, but this study was conducted in a middle- to upper-class neighbourhood and affordability was generally not a concern for residents. If they do not garden, and organic or locally-grown food is important to them, most indicated that they are able to access the more expensive farmer's markets or local food stores. These are food-secure households and individuals. These findings are consistent with the literature. While two studies (Draper & Freedman, 2010; Alaimo et al., 2008) found a financial benefit to gardening, a more recent Canadian study found a moderate financial cost to gardening as compared to purchasing the same produce in a grocery store (CoDyre et al., 2015). These contradictory findings are supported by the variety of comments among participants ranging from feeling that there is a financial benefit to them for gardening, to several who felt that gardening cost them money. Gardening has the potential to save gardeners money on their food costs, but only under specific circumstances and usually with heavy labour input.

Participants also reported that their involvement in the gardens was a significant source of social capital, and gardens seemed to contribute to the social capital of the neighbourhood. Many previous studies have found that CGs contribute to social capital (e.g. Birky & Strom, 2013). This has been framed in a variety of ways, such as making neighbourhood connections (Poulsen

et al., 2014) and increased social cohesion, support, and connection (Kingsley & Townsend, 2006). Draper & Freedman's review of the CG literature from the USA found consistent positive impacts on social capital across studies (2010). However, there are ways in which CGs may not always be maximally effective at supporting social capital growth. The experiences of one participant in this study, who felt isolated at times, suggest that while most gardeners experience positive social connections through their CG involvement, some may be left 'on the outside'. Glover (2004), while concluding that CGs have positive social capital impacts, also found that in-groups and out-groups can form, meaning that the social capital is built in a smaller subgroup within a community. Others have supported this idea that social capital impacts may be isolated to within the setting of the garden (Kingsley & Townsend, 2006). This study did not examine whether non-CG participants within the Riverview neighbourhood experienced positive social capital impacts; however, participants frequently mentioned increasing their involvement with and connection to non-participants within their communities, or other related or unrelated community groups. The relationship of both the PG and RGS to Sustainable South Osborne Community Co-operative, which works with many community organizations in the neighbourhood and surrounding areas, may be part of the reason why there are signs of the impact of these gardens extending beyond their boundaries where this is not always true for CGs.

The history of CGs, stemming back to late 1700s England, is of allotment gardens instituted by governments in times of crisis, which were gardened by the working poor as a necessary source of nutrition, and faded once the crisis was over (Birky & Strom, 2013). Since then, the purposes and goals of CGs have evolved significantly, along with their governance. However the allotment model still remains the 'classic' model of organizing a CG and is a common organizational structure. Ferris et al. (2001), as mentioned earlier, identified a wide range of

types of community garden, including such broad forms as entrepreneurial garden and school garden as well as the 'leisure garden' that this study focusses on. The PG and RGS run on very different models, with the PG focusing on collective management and communal ownership, and RGS maintaining private property and democratic but committee-based management. Some degree of democratic control is generally considered to be a key feature of a CG (Ferris et al., 2001), although Drake (2014) acknowledges that CGs may also be set up and managed externally with very little consideration for the actual needs of the users. In this study, both the PG and RGS have leaders who are quite sensitive to the neighbourhood, possibly in part because they are residents in the community.

Participants from both gardens mentioned the importance and influence of a primary leader/president/instigator in the garden culture, a perspective which is somewhat in tension with both leaders' desires for communal leadership and emphasis on the importance of democratic process. One study which examined governance in CGs suggested that the "organizational form – grassroots, externally-organized, or active nonprofit management – does not predictably lead to participation [in the garden]. How garden leaders bring their own expectations as they encounter others, however, perhaps makes more of a difference" (Drake, 2014, p. 193).

Although a few gardeners in my study mentioned a desire for increased opportunities to learn and socialize in structured contexts, the governance of both gardens was evaluated by participants as helping them meet their goals more than hindering those goals. In order for a garden to have buy-in from a community, it must be designed to meet their felt needs, and offer some degree of grassroots management (Drake, 2014). Either gardeners who did not feel that the PG or RGS met their needs did not participate in either garden or this study, or these gardens were sufficiently grassroots-oriented to be responsive to gardener needs and desires.

Chapter 4 has focused on why people garden and the benefits they receive from gardening, and where RGS and the PG succeed and struggle in their governance structures. This particularly focusses on the third objective of this research: are there elements of garden design and functioning, or in participants' lives, which facilitate or stifle transformative learning? Chapter 5 will build on this foundational knowledge and examine transformative learning outcomes, including pro-environmental behaviours, as well as the role of experience in nature and connection to nature in producing these outcomes (objectives 1, 2, and 4, as laid out in section 1.3). This will bring us to the heart of the purpose of this research; that is, how experience in nature, connection to nature, and transformative learning may work together to result in pro-environmental behaviours.

Chapter 5: Learning Outcomes and Connections to Nature

As part of the proposed pathway from experience in nature through to pro-environmental

behaviours (PEBs), Transformative Learning theory (TL) helped to explain some of the changes

that participants experienced in relation to their gardening as revealed in the results presented in

this chapter. The results reveal that learning outcomes for participants reflected instrumental,

communicative, and transformative learning. These TL outcomes are discussed in the section

below, followed by an exploration of the sources of these types of learning.

5.1 Learning Outcomes

As discussed in Chapter 2, TL theory springs from Jack Mezirow's (and others') work on

understanding the processes of adult learning. I have categorized learning experiences into the

three domains of instrumental, communicative, and transformative which are typically

considered to constitute TL theory. As others have indicated previously, all transformative

learning is grounded in communicative and instrumental learning (Moyer, 2012); however, I

have still separated transformative outcomes from the other domains in order to emphasize the

way that these learning outcomes are qualitatively different and more profound and pervasive

than instrumental or communicative outcomes.

5.1.1 Communicative outcomes

Communicative learning, one of the major domains of Transformative Learning, consists of

clearer understanding of "the meaning of an interpretation or the justification for a belief…[it]

involves understanding purposes, values, beliefs, and feelings and is less amenable to empirical

tests" (Mezirow, 1997, p. 6). When we try to understand what somebody else is trying to

communicate with us, using language, we are engaging in communicative learning (Mezirow,

2003; Arends, 2014). While Mezirow focuses on how communicative learning may directly lead

to perspective transformations, learning of many sorts may occur through dialogue. There is a particular link, in this research, between learned skills (instrumental learning), and dialogic communication between gardeners. The main communicative learning outcomes found in this study can be found in Table 4 below. Communicative learning can be a self-supporting cycle, where discourse teaches, which encourages further learning:

> I think what I really appreciate about coming here is that it forces me to ask more questions, or puts me in a position where I start to know what questions to ask, because before it was just so foreign. And now even at home I can ask my mom things, and I'm more attuned to that knowledge when people are talking about it, I'm more interested in learning (Laura, PG).

Table 4: Transformative Learning outcomes by domain

Learning Domains:	Outcome Themes:	Outcome Sub-Themes:
Communicative Learning	Outreach beyond garden	
	Knowledge preservation	
	Effective communication	
	Involvement in gardening	
	Insight into others	
Instrumental Learning	Gardening techniques	Preserving
		Organic
		No-till gardening
		Harvest
		Pest management
	Public speaking	
	Community organization	
	Nutrition	
Transformative Learning	Gardening and food production	
	Nature concepts	
	Self-understanding	Career path
		Lifestyle priorities
		How self is connected to nature

  Some participants found themselves engaging in *outreach beyond the garden (see table 4).*
They used the knowledge, social capital, and skills they gained in their garden and applied it to
interactions with others, passing on that knowledge through the connections they already had, or
forming new relationships around the topic of gardening. One gardener spoke of how because of
her gardening experience, she now "evangelizes" about the PG, sharing about it with anybody
who will listen: "I'm so enthusiastic if I can pull anyone else in, I will" (Joyce, PG). She is
taking her learning and extending it beyond the garden through communication, being herself a
catalyst for the learning of others. The founder of the PG mentioned that he learned how much he
loved talking about gardening and sustainability, and an RGS member was excited that her
gardening experience meant that she had valuable conversational topics to offer her vegan
community (as well as heirloom garlic). A nurse involved in RGS took the knowledge she gained
from gardening and found a protégée at work, another nurse and a mother herself, and is
mentoring her and providing her with starter plants so she can garden in her own yard producing
food.

> Now I'm working with a nurse that I work with quite often, you know we work shifts, and
> she is trying to do these things for her children. So yeah, she's going to be my little protégée,
> and she's going to take off and I'm giving her some of my rhubarb to start…She wants to
> grow food for her kids. And so she finds something that she's looked up or heard and then
> we look at it together, so she's putting in the raised beds and everything this week, and then
> we're going to start with the garlic when it freezes…So that'll be exciting. I mean there's
> lots of people you tell different things to but she wants like, right from scratch (Linda, RGS).

  One other example of how the reach of communicative learning can extend beyond the
garden can be found in Laura's experience of how CG involvement sparked personal reflection
and learning:

> There was one experience where a girl who is my age and myself were weeding together,
> and we were talking about our dreams and how it related to nutrition, and it seemed very
> fitting to be in the garden talking about that, and we seemed to really spark each other to go

home and pursue further towards what we want to do. So there were certainly moments of inspiration here (Laura, PG).

Other gardeners demonstrated actions that build social capital by helping in the *knowledge preservation process (See table 4)*. Knowledge preservation occurs through dialogue and teaching, deeply communicative processes. Sharing knowledge and philosophy, as well as preserving and passing down what gardeners saw as dying and essential skills, were important for many participants.

> And then you turn around and you say to people, oh you know this is what's happening and they go wow, you know? And then you tell them how they can use that knowledge to increase their yield or whatever. So that's really exciting to me…I'm teaching my son in law how to do some of that gardening. None of my own kids seem to be terribly interested in it so for me it's passing on that knowledge just to the family but I also did it to pass on the knowledge to the larger community (Rod, RGS).

> [I'm also gardening] to keep the knowledge alive, you know? And I want people to see me doing it that are walking by. I want my kids to know how to do it, because that scares me that if we don't know how to grow our own food or save our seeds we're just sitting ducks really, that's kind of ridiculous…I've got composting going on with [the kids in my class], I did a lot with that, with them last year and talked about soil and I'm hoping that we'll be able to do some gardening and growing and seeding (Cathy, PG).

Gardening also built social capital through facilitating *effective communication (See table 4)* among participants. Social capital, that is, increased reciprocity and trust, can be seen as a form of communicative learning.

In several cases communicative learning was the precursor to *involvement in gardening (See table 4)*. One participant became involved in the CG because a friend suggested she get involved in an organic farming volunteering organization, which instigated significant transformation in her life. Another participant shared a similar story, of how communicative learning led to garden involvement:

> I did spend a lot of time as a kid outside, so I really do refresh in nature. And my parents are environmentally friendly people, but I think I took it on more in my adulthood than they have. And I think that was the social circles that I sought out, and then encouraged that. So I

would say, one friend in particular who I really respected that about her and wanted to learn more, and so, I think we helped nourish that in each other… My friend, who is a part of Sustainable South Osborne, she told me about this opportunity [to volunteer in the PG], and she'd been a part of the implementation of this garden last year, and like kind of the startup of it, and I was really interested in gardening, and wanted to know more, but wasn't in a place where I could start my own garden yet, so I thought this would be a great place to get involved and meet community members and learn more about it from Evan, and yeah, so that's how I got involved, through her (Laura, PG).

In Laura's story, we can see that the discourse and culture of the social circles she was involved in were key to her learning about and taking ownership of sustainability-related activities in adulthood. Here, social capital and communicative learning come together to produce the learning outcome of her garden involvement.

Insight into the minds and experiences of others *(insight into others, See table 4)* is another type of communicative learning. Through their CG-facilitated interactions, participants reported several instances of gaining a better understanding of others. One gardener spoke about her insight about other's meaning structures and scope of knowledge (or lack thereof); another expressed that gardening helped her to learn about community and a diversity of cultures.

I TA'd [was a teaching assistant for] a class in Clearwater, which is more on like rural livelihoods but it's sort of the same sort of thing [as the Building a Commons course at the PG], like we at the beginning of the ten days we go out to a local market garden and we pick all of our vegetables for that week and like, there are students that actually say 'I didn't know potatoes grew in the ground' and like you see things that happen and it's like oh, yeah, that isn't basic knowledge that everybody has (Neve, PG).

I learned about community from gardening you know. I met a lot of people here who have different backgrounds, and there is a common purpose. That's what I like…so I've learned about other cultures (Ani, RGS).

Insight into others also took the form of increased understanding and empathy for farmers:

I definitely have more respect for those that try to supplement their own food and try to buy less and grow more…I think it makes you appreciate certain foods more, having fresh tomatoes is a wonderful thing… Over years of gardening, I've come to appreciate, learned to appreciate where food comes from more, and where good food comes from. Rather than just buying the…cheapest thing in the grocery store and it's going to taste like the cheapest thing in the grocery store. But buying a good quality food, it costs more, but also if you grow it, it

also takes more work. And so I think it's definitely brought an appreciation for where food comes from and using and not wasting (Nathan, RGS).

5.1.2 Instrumental outcomes

Instrumental learning, a second main domain of Transformative Learning, is centered around learning information and skills, particularly through logical-deductive means. Mezirow defines it as "learning to manipulate or control the environment or other people to enhance efficacy in improving performance…the truth of an assertion may be established through empirical testing" (1997, p. 6).

Gardening techniques (See Table 4) was the main area where instrumental learning outcomes could be seen, with skills falling into a number of areas, particularly *preserving*, growing *organically*, *no-till techniques*, *effective harvesting*, and *weed and pest management.*

Weed and pest management are major issues at RGS, with gardeners constantly interacting to suggest that their neighbours adopt their favoured management techniques. Potato bugs are a particularly pernicious pest, especially given the requirement to garden organically. Through discussion with others, reading online, and trial and error, gardeners have come up with several management techniques, including manually knocking them off plants into a bucket, spraying a soap mixture on the plants, or removing potato bugs before mashing them and spraying a solution of squished bugs back on the plants to discourage new invasions. Other issues may arise as well, such as fungus, which one gardener discovered how to deal with through reading and experimenting with a new technique:

> We had a crop of garlic over there and a couple of years we had bad crops because of this fungus in the soil. So I read that if you chop up cabbage leaves where you're going to plant the garlic, that that prevents the fungus from growing. And we had a wonderful crop this year (Ani, RGS).

Managing soil is another challenge facing gardeners. Several have adopted various uses of compost, whether drawing from the communal compost bin or dedicating part of their plot to producing soil-remediating compost. Others are adopting a gardening technique known as no-till, where the soil is only minimally disturbed between growing seasons rather than dug up every year. They are learning with and from each other:

> More and more [of my neighbours] are going to no-till operations so they can keep perennials and the like, I'm a little tempted in that way and if my neighbours down below went the same route I might join them, but that's a developing story (John, RGS).

One area in which nearly every gardener reported learning was experimentation with and forays into new crops and varieties. Sometimes this meant learning that a variety was unsuccessful:

> I always wanna try something that I haven't. It might be just a new thing like this year I grew these things called french fingerling potatoes, I've never done that before. I'm not going to do it again, they didn't work out all that well (Oliver, RGS).

However, other times attempts at growing new varieties could be extremely successful:

> I never grew some of the crops that we grow now, because when I was growing up in Thunder Bay, we didn't grow broccoli. My neighbour Gord, he sells bedding plants…so he introduced me, he says I've got broccoli here, you wanna try it?…And that sort of started me experimenting with other things, like I'd never grown cabbage before…and I got into growing my own herbs, just from going out to the garden centers and seeing them all and I started trying them (Veronica, RGS).

> We grew garlic for the first time, and we grew this beautiful heirloom garlic, hundreds of cloves right, hundreds of bulbs of it, and did it successfully after reading researching how to do it. But all based on one conversation with someone who happened to be strolling by (Cassandra, RGS).

While most instrumental learning outcomes that could be classified as a gardening technique occurred in the physical garden space itself, a few participants reported learning about what to do with the fruits of their labours as well.

[Gardening has] forced me to learn how to preserve more food, and to research and learn more about that, either through other people or other sources too like books or internet sources (Noah, RGS).

Not everybody reported learning outcomes which overlapped with others. Two examples of unique experiences included Laura's learning process on how much water to give her potted tomato plants, and Ani's experience of adapting to a new growing climate and soil composition:

I tried having some tomatoes at my house this year, at my apartment, and they totally died out and there was that fur texture to them, so I guess maybe they got over-watered. So that's what my friend thought happens when they get over-watered (Laura, PG).

I am from Argentina so the climate there is very different. The soil is very different. So for me to learn to garden here took quite a few years (Ani, RGS).

Gardening techniques were the most emphasized by participants, but three other primary types of instrumental learning outcomes were reported: *public speaking*, *community organization*, and *nutrition*.

I've learned just through observing community organization and things like that. You know there's little committees for various tasks like filling the water containers or doing the composting or cleanups and stuff like that, so just learning more about these organizational things and good ways of going about them (Noah, RGS).

I might actually be a much more comfortable public speaker because of [my garden involvement], because I've had to do so many presentations about gardening and presentations to gardeners in the gardening context…it's been a learning experience that I've really enjoyed that's somehow related to the garden too (Evan, PG).

A few participants mentioned how gardening enhanced their personal *nutrition* and awareness of eating habits. While they did not specifically mention gaining knowledge in this area, they directly attributed a new habit of greater mindfulness around eating to their garden experience.

I do feel like I'm not absent-mindedly eating, and there's a bit more mindfulness involved (Laura, PG).

Just, being in the garden, thinking about the food that's being grown, and thinking about the physical activity that you're doing, makes me remember about eating well, and makes me remember about activity. So definitely it's awareness raising (Cassandra, RGS).

5.1.3 Transformative outcomes

As mentioned earlier, there is a third domain of transformative learning, which may itself be described as "transformative", in that it indicates a transformation of meaning perspectives. As discussed in chapter 2, true transformation is rare, because it involves the transformation of frames of reference. The new meaning structures, in order to be considered evidence of the transformative changes described in TL theory, need to be more inclusive, discriminating, open, and reflective than before. Below, I discuss outcomes which indicate elements of transformation, though due to lack of evidence of a stricter definition of transformation I have applied a looser approximation of the term.

One gardener described a typical learning process from disorienting dilemma (a series of experiences which overwhelmed her), to action (seeking out more positive news sources), to transformation of meaning perspective (I can't fix everything but I can make a difference in my small corner):

> I guess for me it was watching the news and stuff like that just made me completely overwhelmedly depressed and feeling totally hopeless, I guess. And so I just stopped watching the news completely, and started reading books about people who were actually making a difference in the world. And that made me feel really hopeful, and really - you know I think about 'be the change you wish to see in the world' so that's what I like to see, I want to see change happen, so I've been trying to do it myself. And I started reading a lot about food and agriculture, and realizing that's something I can do, I can't fix everything in the world, but I can choose where I get my food from, and what I feed my family, and I'm learning how to save seeds and things like that (Cathy, PG).

Another participant reflected on how his involvement with the garden showed him an alternative lifestyle, and he changed his perspective on how interesting and useful certain topics

were, that he had been previously uninterested in. His description of having been pulled into an

"alternative lifestyle" demonstrates transformation.

> I've been drawn into the whole kind of culture of this sort of alternative lifestyle world that's drawn me in where I'm now more interested in stuff like passive heating and alternative building materials and stuff like that…I started off just being interested in how do I move water from one spot to another with using no energy to being like how do I do this sort of thing in my house eventually, which is sort of interesting when that's kind of the gateway into that, because it gets to much more complicated….Now that I've gotten more into that I'm interested in all these wacky things like rocket heater stoves and like, things that I never really thought that I'd be interested in like from an engineering perspective I'm all of a sudden curious about building stuff, so that I think has been kind of an interesting things, a spark in my mind…I can tell that over the course of my lifetime I'm going to be interested in this and I'll eventually get good at it. So like that wouldn't have happened had I not spent time in the garden and been interested in this (Evan, PG).

He was not alone in finding that garden involvement exposed him to a new way of thinking

about how to live his life; Sara also talked about how she learned that permaculture was a whole-

life philosophy:

> I mean there's always somebody who's going to be, have like a different approach to something, but I guess I learnt a lot more about even just the word permaculture, as broad as that is, because that can mean many different things, but that whole approach to not even just gardening but a way of living life (Sara, PG).

One participant experienced a particularly dramatic transformation. While I believe her story

represents Transformative Learning, that learning appears to have primarily stemmed from

experiences that occurred prior to her involvement in the PG. At the time of the interview, Sara

was working in an Urban Green Team position running the intergenerational garden connected

with RGS. She lives car-free and does not own a computer; spends large portions of her leisure

time cooking, gardening, and connecting with her community; she dumpster dives and tries to eat

organic whenever she can afford it. What is remarkable about her, however, is not that she takes

these actions, it is the journey she took to get there. Sara, originally connected to gardening

through the PG, experienced one of the most dramatic transformations in perspective and actions

of any of the participants.

Sara characterized her background in contrast to how she lives now:

> I spent a lot of my youth in front of the TV and even eating meals in front of the TV and not really, I don't know, with my family we never really talked on a nightly basis about our days or anything or even feelings and whatnot, emotions, and what was going through our minds, and we drove everywhere (Sara, PG).

Right out of high school, she explained, she lived a very different lifestyle than the one she

has now: "having a car and going to university, even something as simple as, or not simple but

like spending my free time or weekends and money on alcohol and towards partying, something

like that" (Sara, PG). Her change of mindset did not happen overnight. A friend suggested she

try WorldWide Opportunities on Organic Farms (WWOOF), a worldwide network of organic

farms that recruit volunteers to be temporary farmhands in exchange for room, board, and a bit of

free time to experience the area they've just travelled to. Sara attributes much of her change to

her WWOOFing experience: "being a part of the WWOOFing community…kinda opened my

eyes up to that whole world and without it I wouldn't be who I am today. It definitely shaped a

path for me" (Sara, PG). This path "was a slow process and a lot like from travelling and every

time I left and came back it felt like things had changed" (Sara, PG).

Sara found that the WWOOFing experiences (several excursions totaling about 18 months

over 2 years) were disorienting:

> coming back [each time it felt] almost like starting from ground zero again because you go back to the life that you were once living and spend time with the people that you were once spending time with and it just doesn't feel right anymore, so it's like starting fresh again where I would go out and not really necessarily have a group of friends or family or that community that I felt like I connected to. So it was a slow buildup from there and like for a while when I came back it just felt like limbo in one sense and I just eventually met some people that I felt connected to and developed more meaningful relationships.

She described the changes that she sees in her life now:

I guess I just, I wanna conduct my life now as something that has meaning to it, in every sense. Like relationships, the people I surround myself with, my roommates, and having dinner every night with them, or at least like an attempt to have dinner in a more meaningful way. We don't have TVs or I don't even own a computer which is pretty rare nowadays for people my age…I get around by walking or biking, I don't drive, I don't own a car. For leisure, I spend my time, well in the summer it was gardening of course, spent a lot of time outside and I do spend a lot of time outside period, like biking by the river and spending time in nature and put a lot of time towards music and arts and cooking good food and sharing it with people…I used to own a car, so there's definitely been a big shift in my own life, in how I've conducted day to day things, like simple things like that.

From Sara's perspective, one of the biggest changes was her career path. She rejected the 9-5 office desk job that her parents had modelled, and instead chose to embrace a career path which she felt would be more 'real' and concrete, where she could have a relationship with her employer and her work would have tangible outcomes. Sara's self-understanding of the changes in her life pointed strongly to the WWOOFing and gardening experiences as formative and causal.

Not everybody experienced such dramatic transformations, however. Those who experienced smaller-scale perspective shifts that may be a signal of future transformation can be grouped around a few major themes: gardening and food production; nature; and insight into self.

5.1.3.1 Gardening and food production

Several gardeners spoke about how they do not do the growing; they just facilitate the growing and the food grows by itself. They shifted their view of themselves as gardeners through learning how much of the process of growing food occurs without their intervention or control. They learned that they have to give up control, and that instead of humans controlling nature, nature may be unpredictable and put humans at the mercy of its shifts.

I can't really call it gardening anymore….We're not just growers, we're not producers, we're not gardeners, it's more than that….We work too hard at growing food…you plant the

plants that you want, or get the animals that you'd like, but you just let them go and they grow themselves and reproduce. We put so much energy into the food system, treating it like a factor, and it's not, it doesn't have to be (Jody, RGS).

I'm more ok with things being a little bit messy and imperfect, like I remember liking the idea of a really nicely neat weeded garden and now I see that's not always even the best for the plants or for the garden or for our own sanity (Neve, PG).

A really big lesson that I learned here was gardening is all about mistakes. Like it's ok to make them. And I was too afraid before to start, because I thought I don't know what I'm doing, and the plants might die, and you talk to any gardener and they've had many failures and they just keep trying the next year. So that was a good lesson (Laura, PG).

One gardener, through her experience, shifted her agricultural paradigm, learning through

experience how precarious monocultures can be, and how difficult it is to be an organic farmer.

She increased her empathy for farmers, and came to a new understanding of risk:

I think I have a much greater appreciation of how risky it is, in a way. Because you're sort of at the mercy of nature - weather, and I have a much greater appreciation for farmers that are trying to grow organically and how it's a huge risk. But I've also, I think maybe I've learned also that if you have a really bad tomato [year], you have maybe a great squash year. It's much better to have a diversified farm rather than, you know. I understand how risky monocultures are, because if you have something that comes in and eats it, it's all gonna go. All of it is gonna go. So it's kind of madness (Cathy, PG).

Another gardener experienced a gradual transformation towards belief in and practice of an

organic life. Sandra ate a lot of organic food already, and gardened at RGS with her partner

starting a decade or more ago, but through a network of factors she became self-motivated to

seek out organic, pesticide-free foods and methods of gardening. Important factors were her

partner, seeking knowledge on pest control through organic-promoting media, and changing

culture in the RGS gardens.

We had already ate as much as we could get organically here. But in terms of the bigger picture of eating locally produced things, we could, my partner Chris is very aware of the tastes of food, and as soon as we would get tomatoes that would be shipped from somewhere she would say there's no flavour. And she notices those things more. So partly it was my living with her that I became more aware of these things and also people started being more articulate about wanting to go pesticide-free, about how to manage weed control, so then all this information, it came kind of in droplet form to me, and I didn't do a ton of reading, but I

did read a lot of gardening books and magazines from an organic publishing house in the States. I used to subscribe to the magazine so I started to learn - like I was more interested then in pest control and stuff so that'd I'd get more produce. So it was kind of more subtle, like I wasn't going looking for the big philosophy but I started to develop it over time (Sandra, RGS).

Not only was she convinced of the value of eating organically, she developed a "big philosophy" that extended beyond pesticide use, particularly into considering the location her food was grown.

Local, the movement to eat food that's grown or produced within a 100 km [radius], I don't think that I necessarily had that philosophy in mind at the time but as I participated more in the garden society and went to meetings and things I learned a lot about people having a bigger picture about gardening. For me initially it was just a place to have more opportunity for gardening than what I had here (Sandra, RGS).

5.1.3.2 Nature

This category of response was difficult to separate from data reflecting on connection to nature, and has significant overlap with that theme. However, one participant's experience showed most clearly the potential for critical reflection on understandings of nature changing a meaning perspective:

I don't know if I would've gotten there [to my new understanding of nature] on my own without being forced to really critically examine the term [nature] in the context of a master's level course, but I have thought about that question, like what is going out of town, what does getting out of the city really mean. Does it mean like going to Bird's Hill [Provincial Park] or does it mean driving 2 hours to your cottage or 2 hours to a small town, which is really just a micro urban environment. Or I had sort of thought about those things but I'm not sure if I would've really went for resolving that. I was exposed to sort of the philosophical ideas of nature and the Earth and I think it helps think about those big picture ideas, helps us to understand different environmental conflicts (Neve, PG).

While Neve's understanding of nature did not stem from her gardening experience, her involvement in the course that sparked that reflection, and the outcomes of her reflection, do tie her transformative learning in this area to the action of gardening. She felt that she connected to

nature through gardening, but that gardening was not the only source of that connection. Rather, connection to nature was a necessary prerequisite for other forms of learning:

> I think I kind of don't really see gardening, you know it is connecting to the Earth, in kind of an instrumental way, but that sort of learning had to take place in order for me to get to sort of the wild edibles and the medicinal plants kind of stuff (Neve, PG).

Another gardener also experienced a new understanding of how she was connected to nature, although in her case this experience occurred years ago as a teenager. She shared this epiphany in the context of factors that contributed to her choosing to garden.

> I remember my [epiphany or eye-opener] when I was an art student, and we had to go to the museum of natural history, and I went through cargoes and cargoes of these skeletal structures of bones and animals, and I just thought "Good God, we're all the same". Just seeing it you know, is believing. I mean it's common knowledge, but for me personally as a young person, I think I was 16-17 - that was really something. That was really something…you can sort of think, oh that's a fact, that's an extraneous fact, but in actual fact, we really are connected, back and laterally (Joyce, PG).

5.1.3.3 Self

Insight into the self was a more minor theme, but covered a wide variety of topics. A small thread emerged among younger gardeners in the PG around vocational discernment:

> [Has gardening affected what you want to do with your life in general?] Totally. And have I figured it out yet? No. But I feel like I'm onto something when it comes to this, especially with all the projects going on in this neighbourhood, I'm really happy to be a part of it because there's so much opportunity (Sara, PG).

Evan described his initial vocational intention upon entering school:

> I started off school thinking I was going to be like either a doctor or a lawyer or something along those lines (Evan, PG).

As a result of becoming involved in founding and running SSOCC and the PG, he became drawn towards a career which would be much more hands-on; he now no longer has any interest in becoming a doctor or lawyer.

Another young PG gardener felt that volunteering in the garden helped her to form some of her priorities and that those new priorities shaped where in the city she wanted to live.

> I think it did lead me to, I think it has influenced me more than I would have considered until this moment. Because now I'm more interested in living in [the neighbourhood of] Wolseley, because it is more of a community environment and because people do garden and value that there. So, I think as a direct result of being a part of this, I was led to where I would like to live, which is a pretty big decision (Laura, PG).

5.2 Learning as it Relates to Behaviour Change and Pro-Environmental Behaviours

One of the final steps in Mezirow's transformative learning theory is enacting the learning, or acting on a changed meaning perspective. These actions extended beyond the context of the garden, and were often attributed by participants to their gardening experience.

In several cases, participants attributed the main influence on their change in attitude to gardening. in such a way that they changed old behaviours or added new actions. This manifested itself in a wide range of changes:

Table 5: Behaviour changes as reported by participants

Type of Change	Example Quote from Participant
Food choices	I shop at the farmer's market as much as I can, I order from the Harvest Moon Local Food Initiative, overall I just pay a lot more attention to food (Neve, PG).
Desire to pursue sustainability in the future	I want to now pursue [sustainability] either at a community level or independently in the future (Laura, PG).
Reduction in food waste	I think I'm more conscious of resources I use. And I never throw out food now because I think oh I grew that, it's cultivated, I weeded it, I watered it, I'm not throwing this out, it's gotta be used (Linda, RGS).
Methods of gardening	The fact of the choice of plants I make now is a very obvious [change] (Joyce, PG).
Acquiring food through dumpster diving	A large quantity of the food that I get I dumpster dive to get, and I'm totally accepting of that because there's just a lot of really great food that I find goes to waste (Sara, PG)
Content of leisure time	For leisure, I spend my time, well in the summer it was gardening of course…I put a lot of time towards music and arts and cooking good food and sharing it with people. I spent a lot of my youth in front of the TV (Sara, PG).

Type of Change	Example Quote from Participant
Increased amount of time spent outdoors	I do spend a lot of time outside period like biking by the river and spending time in nature (Sara, PG).
Emotional awareness and communication	I eventually met some people that I felt connected to and developed more meaningful relationships [with]…the people I surround myself with, my roommates, having dinner every night with them, or at least like an attempt to have dinner in a more meaningful way (Sara, PG).
Reduction in alcohol consumption	[I don't spend] my free time or weekends and money on alcohol and towards partying [anymore] (Sara, PG).
Increased enjoyment and consumption of fruits and vegetables	I really wanted to increase the amount of just straight-up green stuff that I got into my diet this year (Cassandra, RGS). I eat more vegetables and fruits and things like that now than I used to (Nathan, RGS).
Increased consumption of locally produced food products	The movement to eat with food that's grown or produced within a 100 km radius, I don't think I necessarily had that philosophy in mind at the time but as I participated more in the garden society and went to meetings and things I learned a lot about people having a bigger picture about gardening (Sandra, RGS).
Increased use of organic/decreased use of pesticides at home	Partly it was my living with [my partner] that I became more aware of these things and also people started being more articulate about wanting to go pesticide free…I wasn't going looking for the big philosophy but I started to develop it over time (Sandra, RGS).
Decreased purchasing of food containing pesticides and hormones	My keen interest in gardening is also connected to wanting to buy local, wanting to buy pesticide and hormone free food (Oliver, RGS).
Reduced driving (while retaining car ownership)	I'll drive in [to work] sometimes especially if I have a meeting somewhere a long ways from here, I'll ride my bike as much as I can during the warm months, take public transit in the winter (Oliver, RGS).
Reduced driving (eliminating car ownership)	I get around by walking or biking, I don't drive, I don't even own a car (Sara, PG)

Most participants experienced at least some of these changes, although a few changes on this list relate to reported by only one respondent.

The attribution of change to gardening is complex; one gardener pointing out that "I think my food choices have been pretty affected by not just that [gardening], but by all the things that

have led to me being involved in that" (Evan, PG). These changes are all part of a larger

philosophy, a broader shift. For others, their sustainability related actions were simply a

reinforcement of existing beliefs and behaviours: "I've always tended in that direction, but more

so…I'm just focusing more, I'm just getting a better sense of what it is that I should be doing"

(Joyce, PG). Despite struggling with the problems of drawing causal connections, and the

discomfort that some participants felt with causal language, there was a general consensus that

> I personally can't imagine somebody who would have a backyard garden and a
> community garden who wasn't conscious and tried to practice these other [sustainability]
> things. To me it just wouldn't make sense at all (Oliver, RGS).

Generally, gardeners reported a wide range of sustainability-oriented actions, despite often

identifying themselves as beginning learners, not very good at sustainability, and not very

knowledgeable about environmental problems. These pro-environmental behaviours (PEBs) are

not necessarily caused by or even related to gardening, although several participants felt that

their PEBs were inextricable from the commitments and experiences that were part of their

gardening. They also reported actions that were not explicitly linked by participants to their

gardening experience:

Table 6: Pro-Environmental Behaviours reported by participants

Behaviour	Example Quote from Participant
Installation of CFL lightbulbs at home	[my wife] was complaining the other day about my replacing the incandescent bulbs with those chloroflourocarbons (Rod, RGS).
Composting/vermicom posting	I've also started worm composting pretty much as a result of the (Cassandra, RGS). I've composted since I was a young girl (Veronica, RGS).
Recycling	I've always done…composting and recycling (Barbara, RGS).
Purchasing carbon offsets for travel	We are trying to offset our carbon footsteps when we travel (Barbara, RGS).
Teaching children about gardening and sustainability	I've always done the basic things …and trying to teach our kids, my own kids, the importance of it (Barbara, RGS).
Meat-free/reduced-meat diet	I don't eat chicken much anymore, because I think unless they can get outside and have a really nice time [it isn't ethical] (Joyce, PG). I don't eat meat (Cathy, PG).
Accessing local foods through farmer's markets and online ordering systems	We get the Fresh Option delivery (Cathy, PG).
Limited dryer use	We don't use a dryer for clothes, not even in the winter (Linda, RGS).
Limited showering frequency	We don't shower every day (Linda, RGS).
Limited toilet flushing frequency	We don't flush the toilet every time (Linda, RGS).
Computer-free life	We don't have TVs [in my house] and I don't even own a computer which is pretty rare nowadays for people my age (Sara, PG).
Ownership of hybrid automobile	This was my compromise with my partner, a Prius as opposed to a veggie-oil truck (Cassandra, RGS).
Recreationally avoid powerboats	Even in vacationing we are paddlers, we're not powerboaters (Veronica, RGS).
Install bird feeder	My daughter gave me that [bird] feeder, and honestly they consider that a feast (Joyce, PG).
Sourcing food from local and organic vendors	My daughters with their children have maintained the tradition of food closest to the source as possible and as organic as possible. For us, we always go to Vic's which gets as local and as best quality that you can try to get, we've always done that (Joyce, PG).
Use of non-toxic cleaning products	In the last 20 years I wouldn't say I've used anything that's considered toxic to the food chain (Sandra, RGS).
Cycling to replace many car trips	I don't have a car for personal use, I can drive and I do drive for work but only because I work out of town in a lot of remote areas…for personal use I bike or take the bus (Noah, RGS).

It seems likely that this self-identification as not very knowledgeable actually reflects a higher level of awareness than many citizens, since awareness of ignorance requires awareness of the size and complexity of the issues. One gardener identified "90%" as an environmentalist, but had the caveat that "I think I'm environmentally conscious, but I'm not scientifically trained to know exactly what's happening" (John, RGS). This feeling led many gardeners to be uncomfortable being identified as environmentalists, even if they acknowledged that they would probably be defined by others as one:

> that word is tricky to me. I mean yeah I'm committed to environmental problems. I mean like the typical idea of an environmentalist is what, somebody that cares about the environment? Or somebody that's an activist around the environment? And I would qualify under both of those things. I just think that the term itself applies to a lot of stuff that I'm not as well (Evan, PG).

Most gardeners' actions indicated some degree of commitment to environmentalism, regardless of whether they were comfortable with that identification or not. One participant, who was more committed to pro-environmental actions and more politically active than some, described how he makes his choices:

> I'm not an anti-automobile person, because there's lots of important uses of automobiles. But you know, it's certainly connected to the fact that I take - like coming to work, over the cycle of a whole year, I'll drive in sometimes especially if I have a meeting somewhere a long ways from here. I'll ride my bike as much as I can during the warm months, take public transit in the winter…It's part of a constellation of attitudes and behaviour and practices. One doesn't come before the other one, they're just all part of a package. At least the way I would look at it (Oliver, RGS).

As listed above, participants reported engaging in a wide variety of large and small pro-environmental actions, and while they may not all approach them quite as comprehensively or articulately as Oliver does, the way they spoke of those actions was typically linked, as Oliver's were, to a larger 'package'.

One final way that pro-environmental behaviour change manifested itself in the lives of participants was in their involvement in their various communities, whether that took the form of ideological communities or their physical neighbourhoods. Participants were involved in the following ways, which they attributed to their gardening involvement:

Table 7: Participation in community organizations related to garden involvement

Community Involvement	Example Quote from Participant
General community involvement increased	Yeah, [this gardening] has totally increased my community participation (Evan, PG). There's been some events, like the harvest supper or [volunteering to build the orchard] (Noah, RGS).
No additional involvement	*Has your involvement in RGS led for you to get involved in any other activities because of this?* Not really – they have an annual harvest dinner as you call it. I have not participated in that as yet. Mainly because I have a harvest dinner of my own with some friends (John, RGS). No because I've always been involved with the community (Barbara, RGS).
Harvest Moon Local Food Initiative (volunteer and employment)	I'm going to the Harvest Moon festival this weekend and I know they have an acorn eating workshop so I'm hoping to go to that (Cathy, PG).
FruitShare Picking	I'm also involved with FruitShare (Veronica, RGS).
Master Composter program	[I took the Master Composter program] in the mid-2000s, because of the garden (Linda, RGS).
Sustainable South Osborne Community Co-operative	[Without the garden and] South Osborne Community Co-op, I wouldn't know anyone hardly (Linda, RGS).
Urban Green Team Member (employment)	So I was the urban green team's person for the intergenerational gardens, there's one at RGS and then one over at Lord Roberts community center and even at the courtyard at Lord Roberts. That was coordinating the gardens there (Sara, PG).

Two gardeners were very active in multiple communities already, from the Socialist Education Centre to a francophone investment community, and said that the garden did not affect

their community involvement much because they were already too busy and committed. Several other gardeners also said that they had already been active in the Riverview neighbourhood prior to joining the garden, often because they had children and were involved through their children's activities. Becoming involved in the garden did not relate to increased community involvement for these participants, either. However, for many participants, community gardening increased their community involvement in general, and led several to specific other work, volunteer, and awareness activities beyond the garden.

5.3 Sources of Learning

How did gardeners come to learn all these things? Participants reported a wide range of sources for the learning and information they gained about gardening, permaculture, and sustainability. Some of these are sources which participants actively sought; others were more incidental and unexpected, such as in Cathy's experience. She said that "Things keep falling into my [lap] - books to read, or videos on permaculture to watch" (Cathy, PG). Three categories of sources of information emerged: trial and error, independent research using books and internet sources, and various forms of interpersonal communication.

5.3.1 Trial and error

Many gardeners learned skills through trial and error, an empirical approach to learning characteristic of instrumental learning. Often trial and error was how gardeners learned about pest management, how to grow new varieties of crop, and other gardening techniques.

Do you use any particular methods in your gardening? Well, I guess trial and error methods? …I mean, I just try to grow as wide a variety of things as I can that I can make use of, really…There's certainly things that I've done differently since belonging to the community garden…I tried growing taro [one year]. Things like that, trial and error, mostly error with those things because a lot of [the things I tried] didn't really work here (Noah, RGS).

…I kinda tinker and I try different things. I try to see how I can get as many plants as possible into as small a space as possible, like to maximize output (Nathan, RGS).

5.3.2 Independent research

Independent research emphasized the importance of the internet. One elderly gardener used an iPad to watch videos about permaculture news. Others noted the importance of search engines to solve any technical gardening problem they might come across:

The internet is so incredible because [when I had] a question…I just typed it up in Google and there it was (Cathy, PG).

If there's something I want to know, I look it up. Occasionally I find people that I can talk to and ask questions to, but those seem to be few and far between (Nathan, RGS).

Of course we're lucky enough to have Google now so you go and use doctor Google and half an hour later you have a basic understanding of whatever it is (Jody, RGS).

One man had inherited his mother's gardening books and read them extensively; another more reluctantly organic gardener had been encouraged in the transition from conventional gardening through a magazine subscription she received. Library books, podcasts, and many internet resources provided a vast knowledge base, which many middle aged and older gardeners emphasized as exciting and helpful. For example, one woman credited podcasts and an online search with her initial involvement in the PG:

I had started to learn about permaculture through podcasts and I was reading books and stuff so then I looked it up online "Permaculture Winnipeg" and it came up with Sustainable South Osborne. And then they had a thing on their website which said if you're interested in learning more about what's going on, and so I said yes and the next thing I know they said 'great, we're so glad to have you on board!' So I started helping out here (Cathy, PG).

5.3.3 Interpersonal sources

While independent research using books and internet resources was important to participants it was mentioned much less frequently than learning through interpersonal sources. One gardener spoke for many when she pointed out the value of learning from a person rather than a book:

I felt like I could pay a lot of money to take a permaculture class or I could read and read and read but to actually come somewhere [where] there's people who can show you what to do is great (Cathy, PG)

These interpersonal sources ranged widely, from attending meetings, asking aunts/mothers/grandmothers questions, interacting with other gardeners, people walking by and asking questions, attending classes, teaching classes, attending workshops, attending a festival, and receiving mentorship.

I've learned so many things that I want to be able to do that Rod does, by hanging out with him in the garden (Evan, PG).

Being in a community garden, the emphasis is on community, so we learn things from people that we wouldn't have even known to research, about techniques and things (Cassandra, RGS).

Also just being with other gardeners here, there's some who are more experienced, and I'm not afraid to admit that I don't know a lot, so they just have jumped right in and said 'oh this is what I do at home and this is what you could try', and just giving some tips about weeding - because that's mostly what I've done here (Laura, PG).

A less commonly-mentioned source of learning from others was the fall celebrations and potlucks held by the gardens and various local food groups (RGS, PG, Harvest Moon Local Food Initiative).

We have a fall dinner with the association, and that is really interesting, because it's a potluck. And that's where you find out oh, this is really god, ok what'd you do, and then you pick up new recipes (Veronica, RGS).

Interpersonal learning was valued and emphasized by nearly every single participant. It is important to remember that sources of learning combine, sometimes in unexpected ways, and that most participants drew on multiple sources either simultaneously or at different times for different purposes.

It was kind of a slow process of my own education and it still is but I would research on my own and lately I've been attending more workshops and meetings on related subjects (Sara, PG).

Where I've moved to this no-till row, a couple of gardeners are particularly communicative and welcoming and this guy next to me is like going on Google, any question you can ask about gardening it's like, push a button and he'll tell you…So I've learned a lot from him, and feel like I'm more part of the community (Sandra, RGS).

5.4 Connection to Nature and Pro-Environmental Behaviour

Connection to nature has to do with feeling affection for nature, or a particular place (Mayer & Frantz, 2004). In this analysis, participants' responses to questions about their sense of connection to nature, and their concepts of what the word "nature" means to them, overlapped with both the academic concept of connection to nature and integration of nature and self, so I have followed their lead and interwoven the two concepts, treating them as nearly synonymous. It is important to note, however, that they remain separate constructs in current literature and are typically measured using different scales. Because this is a qualitative study, rather than a quantitative one, parsing the two constructs is essentially impossible.

5.4.1 Connection to nature

Many participants spoke of experiencing a connection to nature, and that gardening was one way that they experienced and strengthened that connection:

I would say connecting with the Earth and Mother Nature is very important to me. And I've found it in more activities in the past, like hiking and canoeing, but this is another great way to do it in the city, and be a part of something greater, in the city (Laura, PG).

I guess I have an attachment to the space and I feel different when I'm in it, I guess those are probably signs of emotional response, I get upset when something goes wrong in it. Somebody steals the apples from the orchard for instance, which happened, that's very upsetting to me, so I guess that's an emotional attachment to it, if I'm emotionally attached to the people that I spend the time with in the space (Evan, PG).

I grew up pretty close to nature, so I don't probably appreciate it as much as others would. But, well, it is a connection. Growing things is a nature thing, and I enjoy that part of it (John, RGS).

For some, the garden did have a direct impact on their sense of connectedness, and they believed it would have an impact on others' connectedness:

Spending the time outside made me appreciate plants more, and made me interested in studying biology and ecology just to understand how those things work more, so I'm sure that'll play in somehow (Noah, RGS).

The language of connecting to nature did not resonate with participants in the same way that talking about their own concepts of nature did. It is important to understand *what* is being connected to, not simply how that connection occurs. The definition of the word 'nature' is complex and debated; a debate which it is not within the scope of this research to address. However, individuals still have concepts and instincts about what the term means, which is what I asked about in interviews. One study suggested that a large majority of people do consider themselves to be part of nature (Vining, Merrick, & Price, 2006). However, there is a tension between this finding, and a parallel finding that most people describe nature as areas untouched by human hands. Once we started discussing definitions of nature, participants would pause and consider, trying to wrap their heads around the complexity of defining "nature", and then they would frequently include in their response that nature was all-encompassing; that is was "all that is"; that they felt they were an integral part of it. A surprising number of participants felt deeply connected, and a strong sense of oneness with nature.

> [Nature is] extraordinarily beautiful, I feel I'm part of it. I feel everything is part of it, that all living things on Earth at this moment are connected by being alive at the same time and that each individual lifeform is connected all the way back to the beginning. It's really a very sacred thing, to be alive. It's the connection, just that we're part of it (Joyce, PG).

> I would say [nature is] anything that is sort of part of an ecosystem. Or the Earth. So even to me rocks and certainly soil…Even things that we've made, I know I'm aware that everything that we've made, even cars and houses, came from the Earth (Cathy, PG).

> I feel that all of us are kind of like the tiny components of something bigger (Cassandra, RGS).

> Human beings are just a part of [the web of nature]. We're an apex species, but it's not us against nature, it's not us in nature, we are nature. We're part of it just like everything else is a part of it (Rod, RGS).

Many participants did have a sense of a sort of 'gradient' of nature, however, with an intellectual understanding that parking lots contained nature also but an emotional reaction that the more human impact there was on a piece of land, the less 'natural' it was.

> To me [nature] is when it's more like clean outdoor, breathing in fresh oxygen, being more outdoors. And generally it relates to be out of the city, but more recently I've learned to notice the beauty of nature in the city also (Laura, PG).

> I think there's certain different, like on a gradient, there's different levels of natural environment….And probably that is dependent on sort of how much human impact there is…obviously humans have a place in it. But it seems like areas where there's less human interference seem to have higher quality nature (Noah, RGS).

This tension between understanding humans as nature ourselves, or as part of nature, and understanding humans as external to nature and having negative impacts on it, was present for a surprising number of participants. They sometimes held simultaneous, seemingly contradictory stances, and some were even aware of this.

> I think humans *can* be part of nature… I think in certain environments people are very separate from nature and want to be separate from it, they don't want nature to touch them… so I think some people are more part of nature than others in a way, it's whether or not you want yourself to be (Nathan, RGS).

> I mean sure we are a part of nature but we're not living with nature, we're not harmonious with nature, and we're not, we don't sync anymore. And it feels like nature's just fighting back (Sara, PG).

> I would define [nature] as that part of this planet that we live on that I guess exists and would exist without human intervention and modification. So that when looking at it that way, it would seem to me that includes us… my feeling is that too often it's set up as something that's outside of human beings, and that to me is a real problem, because as soon as you believe that then some problematic implications start to develop, if we're not, if we don't see ourselves and act like we're part of nature, then there's the potential, not the inevitability, but the potential for us to try and control it as opposed to just live in it and with it. And then you get industrial farming… and fear of the wild (Oliver, RGS).

A few participants felt that nature was quite separate from humans, or that even if they did not perceive their relationship with nature in those terms, they felt that citizens in general did. This was not necessarily tied to a personal belief that natural processes should be disrupted; in

fact, one participant explicitly commented that because nature is what we would have without people, people have a responsibility to leave as much of it that way as possible. There was some sense, however, that if others did not see themselves as part of nature, they might not take care of it.

> Well they [people in general] just see nature as a resource pool instead of us being a part of a web and all those other things (Rod, RGS).

> Nature to me is the natural form, which would exist if mankind hadn't changed it. Doesn't mean I'm opposed to the natural causes, or totally in favour of them (John, RGS).

> I think that's what gives me the sense of peace, is the connection to nature…so many people, so many kids who don't get out into nature and that's, I think a big problem because then you're not even going to be inclined to find out where your food comes from, you're completely disconnected (Cathy, PG).

When asked about whether they felt that spending time in the garden affected how connected they felt to nature, participants felt that gardening was neutral to positive. Most gardeners felt that the impact was small:

> I'm hooked up with plants all the time. So being in the garden is just what I can do in the summer (Rod, RGS).

> I wouldn't call [my experience of nature while gardening] quite a replacement for going out into, going for a hike in the bush or in the Whiteshell or something like that, or going on a canoe trip or something, but it is a nice little kind of urban escape…It's kind of…being connected to nature but you're still in an urban environment (Nathan, RGS).

However, several participants spoke quite eloquently about the deeper connection with nature that gardening facilitated for them:

> I feel more connected [to nature] when I do garden. Because it's a bit more direct. And there's more direct results from it. And yeah, the yield that you get from it feels almost like a gift, that's being given back from nature (Laura, PG).

> It connects you to the seasons very closely, and noticing changes in the climate, in community, just even in your little plot you can see things change over time (Jody, RGS).

> I'm always amazed at - you know, you take a pot of earth and you put a seed in there and you never know what you're going to get. It's just…it's hard to explain. It sounds almost, I

don't know, it sounds phony saying it, there's just something magical about watching something grow (Barbara, RGS).

5.4.2 Childhood experiences in nature

Academic literature in the field of psychology has uncovered a potential relationship between childhood experiences in nature and adult environmentalism, a phenomenon and field of study known as significant life experiences. When participants were asked about how they got into gardening, a large number of them spoke (mostly) unprompted about their memories of growing up on farms or assisting in the garden.

> I as a child helped my parents, who probably had, probably close to 3/4 of an acre of land just at the edge of the city of Waterloo in Ontario…I spent my whole childhood from the time I was four till I left home around 15 to go to school in another city, but in all those years in between I helped my mother and my dad run the garden...food self-reliance was a big part of my own childhood experience (Rod, RGS).

> I always hated gardening, my parents used to make us work in the garden as punishment if we did something bad, so I felt like I was being punished (Linda, RGS).

> I got started at it at a young age, I was raised on the farm, and became the garden helper at quite an early age. And so I've always had an interest in it…As I indicated, I grew up pretty close to nature, so I probably don't appreciate [the garden's nature] as much as others would (John, RGS).

> My mom had always been a gardener, and I always helped my Mom in the garden (Barbara, RGS).

A small number of participants had little or no childhood experience with gardening, although some spoke of other nature-related childhood experiences instead.

> I would say I had no previous [gardening] knowledge…I did spend a lot of time as a kid outside, so I really do refresh in nature. And my parents are environmentally friendly people, but I think I took it on a lot more in my adulthood than they have (Laura, PG).

> I grew up with always camping, and getting out to nature. My Dad had a garden, although I don't feel like I ever learned how to garden from him. But it was always important in our house (Cathy, PG).

> I grew up being outside a lot, my parents didn't really garden, but my grandmother did. Pretty much the only one who did any gardening in the family (Nathan, RGS).

Several explicitly tied that experience to their adult choice to garden:

> The most obvious impetus [for getting me into gardening at 24] was growing up in a garden. I grew up on a farm till I was in primary school and even then our family had a - we moved into town, but still had the farmyard and a huge garden there and I hated all the years of picking weeds and picking peas as a kid of course. But there was always a garden and then you know my mother had a huge garden in our backyard. So I just grew up with it. So that's one of the reasons. It just felt natural, it just felt to me like everybody should have a garden in their backyard… Now my brothers and sisters don't [garden] but…I always had a garden, needed to have a garden (Oliver, RGS).

> Probably a lot of things [got me into gardening], like probably first of all that my mother always gardened growing up. So I always kind of just liked being outside and getting to do something active outside in the fresh air. So I'd try to help her a bit, and of course she didn't like it too much, didn't like too much of my help when I was a kid. Still I got to appreciate how good things tasted when they were fresh out of the garden. As soon as I had my own opportunities to grow potted plants, I started (Noah, RGS).

> I come from a family of gardeners, of farmers I guess, my grandparents were farmers, and my mom was just a very accomplished one as well….For me to come back to gardening is coming back to who I always was since I was a little kid. So for me it's a natural thing…It's not a new discovery, it's something that was with me always (Ani, RGS).

The main question these statements raise is to what extent adult learning is built on childhood experience, and whether adult learning, rather than being a new transformation of meaning perspectives, could also include deepening and reaffirmation of values laid down in childhood.

5.5 Discussion

The data gathered in this study showed a wide variety of learning outcomes, in all three domains of TL theory: communicative, instrumental, and transformative (though primarily in communicative and instrumental). Participants reported that they learned a wide variety of gardening techniques, as well as other instrumental outcomes such as public speaking and community organization. Many participants also spoke about changes in their lives and worldviews which represented transformation in small ways and large. This learning came from

several sources, most notably through interaction with other gardeners and mentors, as well as through personal research using books or the internet.

Most research on CG outcomes focusses on participant-reported benefits as well as potential ecological sustainability implications. Walter (2013) observed that there is a paucity of literature examining learning outcomes among community gardeners. He found that, in CG literature, learning is primarily informal and experiential. One study specifically examined learning outcomes, uncovering many similar outcomes to this research (Bendt, Barthel, & Colding, 2013). They examined environmental learning in public-access community gardens in Berlin, found that participants learned about many topics, including gardening knowledge and "self-organization". Pro-environmental behaviour can also be seen as a learning outcome, and is discussed further below. My research also found that skills and knowledge related to gardening was a major theme of learning outcome, as was learning about community organization. Bendt et al. (2013) found that self-organization learning included social cohesion, division of labour, and learning about decision structures. This is mostly mirrored in my research through the building of social capital and participation in the democratic running of the gardens. One participant in the Bendt et al. (2013) study even expressed what could be classified as a transformative learning experience, in that they underwent a change in how they perceived urban space. It is tempting to conceive of transformative learning as stemming from a disorienting dilemma as a single, watershed moment; a pivot point around which a change in meaning structure hinges. However, the evidence presented in this chapter reflects the much more common, and nuanced, notion that a slow accumulation of small moments may also function as a disorienting dilemma. This is consistent with Newman's (2012) conceptualization of disorienting dilemma.

There is some emerging evidence supporting the presence of transformative outcomes through garden participation. One pair of papers (Mayer-Smith, Bartosh, & Peterat, 2007; 2010) focusing on a farm-learning program implemented with several elementary school classrooms over a number of years found that "over time the childrens' views of the environment assumed a more eco-centric character" (Mayer-Smith et al., 2007, p. 82). However, it is unclear how applicable these results will be to the CG context, since although they share the character of an urban food production environment, they differ in that Mayer-Smith et al.'s work focuses on a formal education program with children, whereas most CGs afford primarily informal learning among adults. Despite these differences, the food-producing context may in time prove to be a fruitful environment for all forms of learning.

Some sources argue that the enactment of learning is a key hallmark of truly transformative learning (Taylor, 2007; Wals, 2011). However, this must come with the caution that enactment is not in itself sufficient evidence that transformation has occurred (Cranton & Kasl, 2012). Most participants who indicated evidence of transformative learning appeared to be at a point along an incremental journey, of the sort Mezirow indicated was more common than a radical shift. Pieces and fragments of their meaning perspectives were shifting or had shifted. For one or two gardeners, however, this shift of meaning perspective was more dramatic: either a larger movement from perspective a to perspective b; or a more comprehensive, whole-life shift. Enactment – or pro-environmental behaviours and community involvements – is one part of determining whether transformation has occurred but I did not rely on that exclusively. It is the easiest outcome of learning to measure and observe, particularly since participants did not necessarily undergo full-blown transformative learning and were not always aware of the learning process they had undergone.

Sources of learning outcomes are mentioned with slightly more frequency in the literature. One study of college student gardeners found that there was a lack of peer mentorship to help them to learn how to garden (Mecham & Joiner, 2012). The gardeners felt that seeking out the knowledge on their own was possible but arduous and time-consuming, and wished that there were more opportunities to learn from peers. High levels of garden abandonment may have been related in part to this lack of support. The desire to learn from interactions with others is echoed in this research, although at RGS and the PG participants experienced significant peer mentorship, unlike at the college gardens.

Barthel, Folke, & Colding (2010) also found that the majority CG participants found interactions with other gardeners to be the main way they learned garden management techniques, and also listed it as the most important way to transmit garden knowledge and practice. However, participants in their study also reported learning through other vehicles, just as did participants in this thesis project, including garden books, the internet, teaching others, trial and error, copying neighbours, and childhood experience with gardening. This focus on learning from others supports Mezirow's emphasis on the importance of discourse as part of the learning process. It may be that by learning in dialogue with others, participants were able to test out the validity of some of their ideas and be aided in critically examining their perspectives. Interestingly, Barthel et al. (2010) also found that the rules around how gardening may be implemented were a source for learning – for example, eliminating pesticide use and other organic management techniques. The study took place in the Stockholm area of Sweden however, an area where gardens have many more established rules than those examined in this study, and this higher level of regulation may have affected the importance of 'rules' in the learning process.

This chapter also examined participants' reports of their childhood experiences in nature. In many cases, these experiences laid the groundwork for personal meaning structures that included gardening being a norm and spending time in the outdoors as a dearly held value. Several participants reported that time gardening or in nature as children was directly linked to their choice to garden as an adult. This is consistent with Mezirow's (1981) discussion of the development of meaning structures, and how they are rooted in childhood. A significant body of literature has examined the relationship between childhood experiences in nature and adult pro-environmental attitudes and behaviours, although almost none of it included gardening (e.g. Chawla, 1999; Chawla & Cushing, 2007; Wells & Leckies, 2006; Schultz, 2000; Stevenson et al., 2014; Thompson, Aspinall, & Montarzino, 2008; Vadala, Bixler, & James, 2007; Palmer, Suggate, Robottom, & Hart, 1999). One study which did examine garden-related nature experiences specifically found that this interaction with 'domesticated nature' was positively related to pro-environmental attitudes as an adult, and was marginally related to adult PEBs (Wells & Leckies, 2006). The data presented in this thesis also support previous research on significant life experiences, which suggests that significant nature-related experience in childhood leads to adult environmentalism (Chawla, 1999). Being involved in a CG is one form of environmental action, and the number of participants who associated childhood nature experience with their choice to garden can be seen as an outcome supporting these findings. However, several participants did not spend time in nature or gardening as children, and still identified meaning structures consistent with environmentalism. SLE research has found that, although the majority of adult environmentalists speak about significant nature-related childhood experiences, a significant minority (20-50%) either did not have such experiences or did not view them as significant (Chawla & Cushing, 2007). This, along with research suggesting that

quality of primary education may be a more significant factor than experiences in nature, suggests that while SLEs may be an important piece of forming adult pro-environmental attitudes and behaviours, they are insufficient unto themselves (Stevenson, et al., 2014).

Connection to nature theory also provides some insight into the pathways towards adult PEBs. Connection to nature refers to the affection we have for nature or a particular place; as well as the combined emotional and intellectual understanding of being part of a vast, interconnected web of life on Earth (Mayer & Frantz, 2004; Perrin & Benassi, 2009). A concept related to connection to nature in ecopsychological literature is integration of nature and self; that is, how much does a person feel that they themselves are separate from the rest of nature, or how much do they feel that they are integrated with nature and interdependent with it (Schultz, 2001). Most people seem to distinguish between 'wild nature' and 'domesticated nature', often feeling more oneness with nature in the wilder spaces (Vining, et al., 2006). This is consistent across the majority of my participants as well as with previous studies. In several cases, connectedness to nature has been found to be an important predictor of PEBs, such as one study which found a relationship between electricity conservation and connection to nature (Frantz & Mayer, 2014). There is also a probable link between the identification of one's self and nature, as Schultz explained "concern for environmental problems is fundamentally linked to the degree to which people view themselves as part of the natural environment" (2000, p. 391). While theories about connection to nature do not explain these gardeners' initial CG involvement, they do suggest that gardening is a self-reinforcing activity, and may help us to understand why so many gardeners either identified as environmentalists or expressed views consistent with environmentalism. Further, an emotional connection with nature through gardening may help explain why participants exhibited a wide range of PEBs.

This chapter has examined the learning outcomes, including pro-environmental behaviours (some of which are learning outcomes and some of which appear to be only tangentially related to gardening); as well as how connection to nature (including childhood experiences in nature) may contribute to choices to engaged in PEBs. This data, combined with chapter 4's analysis of why people garden, the benefits they derive from gardening, and their governance structures, will help us to begin to answer the original purpose of this research. Chapter 6 will summarize the implications of these data, and put forward suggestions as to how CGs can help to facilitate positive learning outcomes among their participants.

Chapter 6: Conclusions and Recommendations

The purpose of this research was to increase understanding about what, how, and why adults learn through their participation in Community Gardens (CGs), and the implications of this learning for community sustainability. In order to consider this, I recruited eighteen community gardeners from the Riverview neighbourhood in Winnipeg, Manitoba. Twelve of these gardeners were from Riverview Garden Society (RGS), a plot-allotment garden in a bow of the Red River run by an independent non-profit. Six gardeners were primarily identified with the People Garden (PG), a small communal permaculture demonstration plot two blocks away from RGS, run by Sustainable South Osborne Community Co-operative (SSOCC). I interviewed each of the participants as they were available over a period of four months throughout fall and early winter 2014-15, recording and transcribing each interview. I analyzed the data using a combination of *a priori* and *in situ* codes and have presented the results in Chapters 4 and 5. What follows are the conclusions I have drawn in relation to each objective.

6.1 Motivations for Gardening and Benefits Derived

A significant amount of data were generated on motivations for participating in the CGs and the benefits participants derived from this participation. The themes generated on these topics are grounded in the data, rather than *a priori*. Most of the reasons given for gardening were consistent with previous research into the same question (e.g. Draper & Freedman, 2010). However, the importance of food production as mentioned in the interviews was notably less than in other studies. Two possible explanations for this are: first, that 'growing food' felt like too obvious a reason to be gardening for participants to bother mentioning it; second, that due to their socio-economic status, gardening was undertaken primarily for recreational, social, and political reasons and food production truly was a secondary motivation. Given that food

production has been found by other researchers to be the most important motivation for gardeners (Pourias, et al., 2015), it seems likely that a combination of both explanations is true for these participants. Two motivations emerged which have not commonly been found in literature to date: desire to increase self-sufficiency skills in case of impending socio-economic collapse; and desire to resist what was perceived as a broken industrial agricultural and food distribution system. This mindset of resistance is reminiscent of guerilla gardening motivations and goals, despite the fact that it is manifested in legitimate and sanctioned garden spaces. If people are getting involved in CGs for these reasons as well as more traditional reasons of food production and community building, CGs which offer opportunities to build self-sufficiency skills may be more popular than those simply offering a convenient space to garden. There is clearly much more happening at CGs than simply food production.

6.2 Learning Outcomes and Sources

My first objective was to examine what and how adults learn from community gardening. Community gardening provided learning opportunities, leading to learning outcomes in all three domains of TL – communicative, instrumental, and transformative. In this section, conclusions around communicative and instrumental outcomes will be discussed, with transformative outcomes addressed in section 6.3 below.

Instrumental learning was the most common learning outcome for participants, and in this study it was most frequently represented through the learning of gardening techniques (e.g. organic gardening methods and weed/pest management). The dominant presence of instrumental learning is well-documented in other studies of learning related to various forms of natural resources management (Moyer, Sinclair, & Diduck, 2014; Diduck, Pratap, Sinclair, & Deane, 2013; Sinclair, Collins, & Spaling, 2011; Tarnoczi, 2011, Kerton & Sinclair, 2010). These

studies have suggested that the reason for the prevalence of instrumental learning is the nature of the activity being studied as a source of learning. These activities tend to focus on teaching skills and knowledge. One other possible explanation for the prevalence of instrumental learning is that in an interview-based study, learning outcomes can also be tied to participant *perception* of what they learned. My participants were aware this was a study of what they learned from gardening, and although in the interviews I prompted for many types of learning outcomes, they may not have consciously associated non-instrumental learning as closely with their CG involvement, even if it would not have occurred without the garden. Although transformative learning is by and large a conscious, reflective process, people may not have a clear idea as to how they have come to learn something, or adopt a particular behaviour, particularly when a series of smaller disorienting dilemmas (as is most common) is the instigating factor.

Communicative learning, as others have found, was a strong theme though secondary to instrumental learning (e.g. Sinclair et al., 2011; Tarnoczi, 2011). Casual interactions among gardeners who would bump into each other at their plots or join in on the same work bee were key to communicative learning. Communicative learning was also the domain that participants most clearly indicated as extending beyond the physical and community context of the garden, through means such as mentoring other beginner gardens at home, teaching their children, or using their CG experience and produce as a social tool in other communities. They learned the importance of these actions, got better at skills involved in them such as public speaking, and learned through being taught by others. This knowledge extension counters Tarnoczi's (2011) finding that farmers' communicative learning was almost entirely limited to farmer-farmer interactions. However, Kerton & Sinclair (2010) also found that sharing knowledge was a communicative learning outcome.

The data show that participants came to these learning outcomes through three main paths: trial and error (or empirical testing); personal research (using internet and books primarily); and interpersonal interaction (casual interactions or more formal workshops etc.). While all three sources of learning were important in different ways, interpersonal interaction emerged as the primary source. Gardeners expressed that they learned a great deal through interacting with other gardeners, who often have more experience, or different experience, and are usually generous with their expertise. As rational, reflective discourse is critical to the transformative learning process, a point emphasized by Diduck et al. (2012), gardeners' self-report that learning from others is particularly effective confirms the theory. Forming relationships with others has previously also been found to be critical to transformation (Taylor, 2007).

One of the challenges with this objective is that instrumental and communicative learning are difficult to distinguish from each other. For example, improved communication can take the form of a learned skill such as public speaking, and learned skills are often acquired in dialogue and interactions with others. Moyer & Sinclair (2015) in their recent paper discuss this challenge in-depth, pointing out that "many learning experiences contain elements of both instrumental and communicative learning, making it difficult to parse them into categories" (p. 3). In Moyer et al. (2014) "community work" as a learning outcome shows up in both the instrumental and the communicative domains; Marschke & Sinclair (2009) uncovered a similar overlap with data that showed that "learning was rarely exclusively instrumental or communicative" (p. 213-4). This does not mean that the categories of instrumental and communicative are meaningless; rather, in understanding the data it is simply important to recall the complexity of learning processes. There is likely to be more than one aspect to any given learning outcome.

6.3 Transformative Outcomes

My second objective was to examine specifically any transformative learning outcomes among participants. As Moyer et al. (2012) point out, transformative learning is an emergent property of instrumental and communicative learning; all transformation is grounded in one or both of these domains. I have separated transformative outcomes for the purpose of my conclusions in order to highlight the learning outcomes that represented shifts in meaning structure among participants.

It is apparent that community gardening was a key part of meaning structure transformation in several participants. For some, CG membership was the outcome of a transformative process that had already begun; for others, it helped to facilitate an ongoing process; for a very few, it was part of their disorienting dilemma. However, this latter condition was rare, and I therefore conclude that while CGs have great value for TL, they are unlikely to be sufficient unto themselves, to produce significant shifts in meaning schemes. This is underscored by the many other environmentally-related experiences participants reported, including childhood nature exposure, and involvement in activist and community organizations. People do not seem participate in CGs in isolation from all other environmentally-related activities and communities.

Previous work on TL suggests that transformations are difficult to achieve, particularly when one recalls that to qualify as true transformation, change must be enduring (Taylor, 2007). In this study, the main enduring change supported by the data is the activity of gardening itself, as a large majority of gardeners had participated in farming, gardening, or CGs for many years at the time of interview. However, the endurance of gardening is not necessarily indicative of enduring shift in meaning structure, and this study did not examine that relationship in depth.

6.4 Facilitating Learning

The third objective of this research asked what facilitated learning among participants, particularly in regards to garden governance. Governance emerged as a moderately important factor to encouraging or discouraging individual learning, although most participants did not explicitly express this. However, I can conclude that the way the gardens were organized affected who participants interacted with, both in formal and informal contexts, and how frequently they were able to interact with gardening 'experts' and receive mentoring. Governance that involved participants provided further opportunities for learning and engagement, both through their observations of community organizing processes and through exposure to other gardeners and garden activities.

Although RGS and the PG differ significantly in governance, with the former being a more traditional, primarily committee-governed organization that rented private property; and the latter experimenting with communal ownership and direct democracy, very little difference in learning outcomes for participants was found between the two. The more traditional form of CG is the allotment style of RGS, and is more commonly found throughout the world where CGs are established (Turner, et al., 2011). Mode of management of these gardens varies significantly.

Gardeners associated with RGS appeared to be slightly more "political" in their perspectives and reasons for gardening, but there are many explanations for this, particularly that RGS gardeners tended to have 7-10 or more years of tenure in the garden while PG gardeners averaged one year of experience. Increased amounts of experience also equates to longer periods of time to have undergone transformative learning, and to have interacted with others who may influence their perspectives and behaviours. Long tenure of gardening may facilitate or encourage reflection on political beliefs and formation of a pro-environmental meaning structure. However, it may also be that those who have gardened longest have done so because of a pre-

existing environmental worldview. The nearly un-noticeable differences between learning outcomes based on garden structure may also be due to study design. A small qualitative study does not detect the subtle differences that a larger quantitative study might. Both gardens also had significant overlap in participation (several RGS gardeners also occasionally helped out with the PG and related projects; the PG leader was mentored by the RGS leader; etc.).

It is also important to note that although the RGS features a more traditional form of governance among CGs, it appears to be much more active than most CGs. As one participant shared, his experience with other gardens was that the services offered started and ended with fee collection and fall tillage. That RGS has an annual general meeting, committees, watering cubes, a compost pile accessible to all gardeners, a central noticeboard, and occasional workshops, demonstrates how it stands out from other gardens. The differences between the two models in governance and learning facilitation may be minimized as a result of the unusually high number of involvement activities available at RGS. I would suggest that both gardens are taking many steps that facilitate the learning process among their members, and that it is likely that these steps, rather than specific governance model, may be important for learning.

6.5 Action on Ecological Stewardship

The final objective of this research was to examine any relationship that might exist between community gardening and participants' pro-environmental behaviours (PEBs). Previous research has suggested that there is some basis for a link between experiences in nature, connection to nature, and PEBs. The data in this study suggest that childhood experience in nature may be one factor leading to CG involvement and/or PEBs in adulthood, and that CGs are one factor among many others in encouraging PEBs.

Childhood experience in nature (in many cases specifically gardening-related nature experience) was in several cases a factor in participants' decision to participate in their CG. In

these cases, gardening itself can be seen as an enactment of learning that occurred in years prior. These childhood experiences appear to have significance for both the current choice to garden and PEBs. However, because everybody in this study engaged in some form of PEB, and all were gardeners, it is unclear whether these childhood experiences may have been shared with others who did not choose to garden or engage in PEBs. There may be other crucial factors which causes this childhood experience to actually turn into adult environmental actions and beliefs; however, it does seem that whether this factor is present or not, childhood experience plays a significant role.

The fact that childhood experience in nature seems significant has potential implications for transformative learning theory, as well. Meizrow acknowledges that childhood experiences shape adult meaning structures, and I would propose these childhood experiences could be seen as part of the 'disorienting dilemma' of TL. Participants in this study sometimes experienced their gardening, and even transformative experiences, as a returning to childhood roots, values, beliefs, and actions. It is important to acknowledge the importance of childhood and socio-cultural/linguistic context in TL theory, as it is often critiqued for its heavy focus on rationality and tendency to depend on a positivist worldview. This relationship between childhood experience and adult learning is a rich field for future studies.

Gardening was one factor for some, but not all, participants' PEBs. Although many participants did not feel that the garden had any impact on their behaviours, even those who felt this way tended to demonstrate many actions indicative of PEBs, such as recycling and use of non-toxic cleaning products. Of these, some could be traced to gardening, some pre-dated the gardening, and some were linked to activities and interactions surrounding gardening.

The fact that many did not feel that the garden had any impact on their behaviours suggests that either participants had low self-reflection on their learning processes, or that their PEBs were mostly related to non-garden or pre-garden sources. One other potential explanation is that the source of PEBs is incredibly complex, and to pinpoint gardening as the sole source is inappropriate, but that gardening is part of a network of factors that influence behaviour. It seems likely that there are feedback loops between nature experience, meaning structure, and behaviour choices over time.

There is a significant body of literature supporting my claim that the source of PEBs is complex. For example, relationships between pro-environmental attitudes and pro-environmental behaviours are weak (e.g. Rodriguez-Barreiro et al., 2013). Previous research has found that barriers to PEBs include contingency traps, social pressures, and lack of knowledge, among others (Koger & Winter, 2010). These were reflected in barriers mentioned by participants such as bussing being less convenient than driving, food from grocery stores being cheaper than from farmer's markets, and feeling overwhelmed with the amount of work and knowledge gardening requires. However, several factors have been found to be linked to PEBs, including environmental education (Zsoka, et al., 2013; Rodriguez-Barreiro, et al., 2013), and place attachment (Halpenny, 2010). CGs provide a potential source for nature exposure which could lead to place attachment, and as has been demonstrated above, are also a location where environmental education occurs. This suggests that CGs, through these mechanisms and others, may contribute to PEB choices. However, CGs must also be surrounded by social support for environmentalism, strong communities, social systems which ease the path into PEBs, and so on. Initiatives to encourage CG involvement would need to be sensitive to the needs and barriers

faced by the individuals and groups trying to be reached: newcomers to Canada will need very different encouragement to live sustainably than do lifelong Winnipeg farmers, for example.

6.6 Future Research

I need to acknowledge the socio-cultural context of my participants and these gardens. As has been discussed in previous chapters, Riverview is a predominantly White Anglophone community (City of Winnipeg, 2006), with only 5% of the population identifying as any sort of visible minority, and 11% indicating immigrant status as of 2006. Levels of education achieved are high (85% of the population indicated having earned a certificate, diploma, or degree; and 60% had earned more than a high school diploma). The population involved in the gardens and participating in this study reflected these demographics, although several participants mentioned visible minorities and new Canadians being involved in RGS as their neighbours. Unfortunately none of these volunteered to participate in this study. The participants in this study were able to choose to garden, rather than turning to gardening out of financial necessity. This is not the case for all gardeners, and many CGs are established in poor areas of cities, or in food deserts, and gardeners may need the produce in order to supplement their food budget or access otherwise-inaccessible fresh fruits and vegetables. Thus, the findings of this study are primarily relevant for relatively affluent people living in more economically developed countries. CGs as subsistence and income supplementation should be considered as a separate category. My findings are intended to reflect the experience of this particular group of gardeners; any overlooking of people with lower incomes is unintentional and incidental to that focus. However, the experience of nature, connections to nature, and reasons beyond sustenance for gardening *may* apply to those with lower incomes as well. Follow-up studies would confirm or deny this.

6.7 Concluding Comments

In order to organize to the best effect in terms of facilitating learning outcomes, a garden group needs to first determine what its primary goal is. Some groups will determine that maximum food production is their goal. Others, like the PG, might find that their primary role is as a demonstration and learning site and food production is secondary. If garden organizers realize that people join and garden for a wide range of reasons, including food production, learning opportunities, social connections, exercise, time outdoors, community building, and health benefits, they may be better able to support the creation of a garden environment that meets participant goals more effectively. Keeping these uses and motivations in mind can help to create a space more conducive to meeting more of these needs. For example, one participant mentioned that RGS used to be (in paraphrase), a 'bunch of old guys sitting around smoking who just wanted an excuse to get out of the house'. While this participant was pleased that the garden had moved away from this, providing space for 'a bunch of old guys' to get out of the house and have a pleasant place to sit could be a beneficial goal for a garden site. Recognizing also that most gardeners appreciate the quiet of the site, and enjoy the 'buffering' from the city sounds, surrounding a garden site with bushes and shrubs even if it is near a busy road could be a way to maximize the enjoyment and mental health of those who participate.

Given that a major benefit of CGs, in the minds of gardeners, is the *community* portion of them, governing with that goal in mind is important. To make a community garden more than simply a collection of rented plots of land can mean several things. First, it means prioritizing membership from the immediate physical community over those from other areas in the city. People from farther away are less able to participate in the community and tend to their garden with sufficient frequency. However, this should not come at the *exclusion* of those from farther

afield; in fact, several participants either no longer, or never have, lived in Riverview, and yet their connection to the gardens helped them to feel and stay connected with the community at large. Second, it means providing opportunities for communal gathering, such as annual meetings, committee work, organized work bees, workshops, and community feasts. It may also mean initiatives other and beyond these, appropriate to the local context and needs. Different levels of involvement will be appropriate for different individuals, who may vary in their expertise, interest, and time.

Participants in this study pointed towards the importance of having opportunities to learn how to become a better gardener. This is a key point where CGs can organize themselves to facilitate transformative learning to more readily occur. Several participants were new to gardening themselves, or remembered what it took to get them to a point of confidence in independent gardening, and shared several things that helped them to learn. The main two sources of learning were informal interactions with other gardeners, and personal research using book and internet resources. A few even teamed up with existing gardeners and helped them out for a while before being able to get their own plot. Gardens could harness and facilitate these phenomena, providing suggestions on most helpful resources and creating a space where experienced and inexperienced gardeners could team up and share work and knowledge. Secondary to informal interactions and personal research were more formal learning opportunities: formally-designated "resource people" around to ask questions of, and workshops. Many gardeners expressed interest in more workshops being offered, and participants from the PG especially mentioned how having a resource person around during certain hours was critical to their confidence and learning. Other gardens could implement these by offering, either alone or in conjunction with other gardens in the city, seasonally-appropriate workshops, such as

companion planting in the spring, integrated pest management mid-summer, and seed-saving, harvesting, and preserving workshops in the fall. A rotation of more experienced gardeners could volunteer to be available in the garden for certain hours, or an online forum or email list-serve moderated by an experienced gardener could be provided as a resource to assist gardeners with questions.

Many gardeners mentioned the importance of the internet for research and mobilization in their garden. Other similar gardens should take note of this, since even older members seemed confident and excited with internet use. Maintaining a relevant and up-to-date website, as well as active email communication, can facilitate decision-making and increase gardener engagement with the garden.

Several gardeners from the communally-run PG requested clearer guidelines. They wanted to know when to harvest produce, how much to take, how to make sure they got their fair share but left some behind for others, when to clear the land, and more. This is an issue unique to communally-run CGs, but these are becoming increasingly common and many plot-allotment gardens may feature a communal area. As the PG's governance emerges and matures, systems for self-regulation of harvest will need to emerge with more clarity. Weekly group harvests, where volunteers who show up share the produce equally, could be a solution to the harvest conundrum; otherwise, clear a clear record sheet left in a sheltered location in the garden indicating what was harvested and how much might provide a baseline for gardeners to compare their behaviour to the others' and self-regulate harvest amounts.

Overall, this study has examined whether, what, and how adults learn from their community gardening experience. Through a series of interviews, using two gardens with different governance models, I brought together the disparate research areas of significant life experience,

transformative learning theory, and connection to nature, to understand what impact the nature experience of gardening had on peoples' lives. In this context, I found that gardening may play a role in shaping pro-environmental attitudes and behaviours, both directly, and indirectly through creating connection to nature. Many learning experiences are tied to the community gardening experience, including gardening skills, personal self-regulation, expansion of concepts of nature, and interpersonal learning. CGs also contribute to building social capital in their neighbourhoods and among their participants. What gardens do *not* do, in most cases, is provide for self-sufficiency or anything close to it for participants. A small percentage of gardeners grow enough to feed themselves through the summer and supplement through the winter, but this requires more hours of preserving time than most in this context had to spare. It seems that the role these CGs play in the lives of their community is as a healthy hobby and a gathering place; a way to calm down after a busy day; a way to relieve anxiety about the fate of the world through taking action; and a facilitator to refine ideas about nature and environmental issues. There is rich potential in CGs for many learning experiences, and through their governance and organization, garden organizations may continue to better facilitate and enhance these opportunities, potentially even transforming the worldviews of a few of their members.

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Appendix A: Interview Schedule

(Bracketed comments are optional prompts)
Date:
Location:
Participant:

1. In the garden, if possible: Can you tell me a bit about your garden/plot? What are you growing? Why are you growing these things? Is it different than before? What do you like or dislike about your garden? Do you use particular methods to garden, such as permaculture or organic? How is your community garden organized?

2. How long have you been gardening?
What led you to start gardening? Is this your first garden, or do you have previous experience? (If previous experience: why did you move to this garden?) (Objective 3)

3. Why are you gardening? (prompt: Are there any reasons related to the environment that lead you to garden?) (Objective 3)

4. Some people say that they garden because they want more control over various aspects of their food. Is this true for you? (if yes: Do you think you have learned anything by taking control of your food? Do you feel differently because of this control?)

5. Do you feel that you have learned anything from your gardening experience? What do you do differently now when you garden than you did in the past? (Why did you make these changes?) Do you feel that being part of a CG has offered opportunities for you to learn new things? (potential prompts: gardening, environment, food, sustainability, community, governance, personal character, your neighbours, justice, race/immigration/language, etc.) (Objectives 1,2 and 3)

6. Has anything unexpected occurred because of or during your gardening here? What was the result of that? (Objectives 1 and 2)

7. Some people have written about community gardeners saying that they have an environmentalist ethic. Do you think this applies to people in your garden? To you? (Objective 4)

8. How would you define the word "nature"? What is "nature" to you? (Objective 4)

9. Some people say that they simply enjoy gardening for the sake of gardening, and others say that they find gardening gives them a sense of connection to nature. What do you think of these statements? How do they, or do they not, apply to you? (Objective 4)

10. Do you feel differently about nature because of your gardening experience? (Objective 4)

11. In the time since you've started gardening, do you think you've changed any of the ways you do things at home, work, etc? (Potential prompts - exercise, recycling, composting, transportation mode, social activities, food choices) (Objective 2 and 4)

12. Some people write about how gardening might help people make some of their choices, like where they buy their food or even whether they drive or take alternative transportation. What do you think about that statement? Do you think it's true for you, or others in your garden? (Objective 4)

13. What are you interested in learning about gardening, food, or nature? Is there anything that makes it difficult to learn these things? (Objective 3)

14. Have you gotten involved in any other activities because of the garden or SSOCC/RGS? Do you think your gardening has changed how involved or connected you are in your community?

15. Do you have any questions you want to ask, or comments about CG that we did not get to and you'd like to add?

Demographic Questions
Age:
Gender:
Occupation:
Length of residence in Canada:
SES:
(Objective 3)