Who Participates in Urban Agriculture? An Empirical Analysis*

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Abstract: A few highly publicized food supply chain disruptions early in the COVID-19 pandemic were interpreted by some as evidence of a "broken" food system. One solution often brought in response to that perceived brokenness is urban agriculture. But the literature has sidestepped a key question: Who practices urban agriculture? Using survey data on 882 Montreal residents, we find that those who practice urban agriculture are more educated, and more likely to be homeowners and to report an income in the highest income bracket. This is consistent with urban agriculture being a luxury good.

Keywords: Urban Agriculture, Food Systems, Food Supply Chains

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1. Introduction

Even with all the panic buying and hoarding of toilet paper and hand sanitizer it has caused, the COVID-19 pandemic has been an object lesson in supply chain resilience and flexibility. In the context of food supply chains (FSCs), for instance, even though low-income countries are expected to experience and suffer the consequence of FSC disruptions (Reardon et al., 2020a and 2020b), actors all along FSCs in high-income countries have managed to turn on a dime, so to speak, and repurpose or re-orient their activities practically overnight—from distilleries deciding to produce hand sanitizer to restaurants going from dine-in to take-out.

Yet a few highly publicized FSC disruptions—meat supply chain disruptions in particular—have been interpreted by some as (further) evidence that "the food system is broken." Writing in the *New York Times*, Clapp (2020) writes that

> "Farmers increasingly contract to produce single commodities—crops, meat, dairy—for just a handful of large transnational corporate buyers that process and market it. A food system organized in this way may be "efficient" in terms of delivering lower prices, but it also has costs: to the environment, to social inequality and, as the pandemic has revealed, to flexibility in the face of disruption."

One solution that is often brought up to those perceived environmental and social costs is the practice of urban agriculture, which involves people living in cities growing some of their own food. Urban agriculture has been practiced throughout much of recorded human history (Viljoen and Howe, 2005), but over the last 15 years or so, it has grown into a social movement that sees itself as a community-level response to perceived market failures.[1] And in the context of the COVID-19 pandemic,

[1] We are careful to talk of *perceived* market failures rather than actual market failures. Advocates of urban agriculture often mistakenly apply the expression "market failure" to food-system outcomes they personally dislike. When they do employ the expression accurately, it is more often than not to refer to the market power exerted by various firms along the food value chain, whether those firms are input manufacturers, food processors, or food retailers. In an era (at least pre-COVID-19) where food prices are the cheapest they have been in history, it is not entirely clear that that market power has any economically significant effect on food prices.

victory gardens[2] seems to be making a comeback: Recent articles in the New York Times and in the LA Times were respectively titled "Food Supply Anxiety Brings Back Victory Gardens" and "… How to Get through the COVID-19 Crisis by Planting Your Own Food"

In line with the foregoing, urban agriculture, which the USDA (2014) defines as "backyard, roof-top and balcony gardening, community gardening in vacant lots and parks, roadside urban fringe agriculture and livestock grazing in open space," is often hailed as a solution to the triple burden of malnutrition (i.e., undernutrition, wherein people eat too few calories; nutrient deficiencies, wherein people eat enough but lack specific nutrients; and overnutrition, wherein people eat too many calories), from undernutrition in the developing world to overweight and obesity in American inner cities.[3] For instance, Zezza and Tasciotti (2010) find a positive relationship between the practice of urban agriculture and indicators of dietary adequacy, and in her book *American Grown*, Michelle Obama has all but equated vegetable gardens with improved nutrition and health for children (Obama, 2012).

Yet the literature has sidestepped an important question: Who practices urban agriculture? We answer that question using data from a representative 2013 survey of 882 residents of the city of Montreal. We find that, compared to nonparticipants, respondents who practice urban agriculture are on average more educated, as well as more likely to own their home, to report an income in the highest income bracket, and to live on the historically wealthier side of the island. Participants in urban agriculture also are more likely to stay at home instead of working full-time, to be younger, to have resided in Montreal for over 10 years, and to come from larger households. Thus, while urban agriculture has been identified as having potential to advance community development through grassroots efforts, to address "social justice" issues, and to empower low-income communities, our

[2] Wikipedia (2020) defines victory gardens as "vegetable, fruit, and herb gardens planted at private residences and public parks in the United States, United Kingdom, Canada, Australia and Germany during World War I and World War II."

[3] For a broader overview of the literature on food systems and food security, see Stephens et al. (2018).

findings are consistent with this practice being a luxury good—a good whose quantity demanded increases as income increases, but at a rate faster than that at which income increases (Mas-Colell et al., 1995).

Several studies have looked at urban agriculture in relation to food security in the developing world (Maxwell, 1995; Mougeot, 2005; De Bon et al., 2010; Zezza and Tasciotti, 2010). Redwood (2012), for instance, suggests that urban agriculture can contribute not only to food security, but also to food self-reliance, providing an opportunity for creating work, especially for the poor and disadvantaged living in cities with low food access. In developed countries, while urban agriculture has been criticized to appeal to locavores—those wanting to eat close to their homes, or young people with a "do-it-yourself" ethos, urban agriculture is sometimes put forth as a solution to community development and justice (Reynolds and Cohen, 2016). To date, however, there has been a dearth of quantitative investigations of urban agriculture in developed countries, with possible exceptions being Rich et al. (2015, 2018), who respectively discuss the use of systems dynamic to study urban agriculture and then apply the approach to the case of organic urban farming in Christchurch, New Zealand. Except for a handful of studies in the developing world (e.g., Maxwell, 1995; Zezza and Tasciotti, 2010), few of the studies in the literature rely on solid empirical (i.e., econometric) evidence.

Our contribution is to provide evidence about who practices urban agriculture on the basis of a household survey data conducted in a large North American city. Thus, because our findings identify the correlates of participation in urban agriculture, they can help inform policies aimed at encouraging people in metropolitan areas of developed countries to grow some of their own food.

The remainder of this paper is organized as follows. In the next section, we provide a background of where urban agriculture situates itself in developed-country food systems. In section 3, we discuss the data and present some descriptive statistics. Section 4 lays out the empirical methods we use to study

the correlates of participation in urban agriculture. In section 5, we present and discuss the empirical results. Section 6 concludes by providing some policy recommendations and directions for future research.

2. Urban Agriculture in Developed Countries

Early urban agriculture was born out of periods of stressful societal and economic conditions, especially in the form of relief during times of recession, war, or conflict (Basset, 1981). During World War II, for example, the Victory Garden movement in the United States encouraged households to grow vegetables to support the war effort and improve domestic food security (Brown and Jameton, 2000).

Up until the COVID-19 pandemic hit, modern-day urban agriculture in developed countries had different objectives. Hynes and Howe (2002) highlight personal and community benefits of urban agriculture. Others have emphasized urban agriculture's potential to reduce food miles, mitigate carbon emissions, improve community relations, conserve habitat for wildlife in urban areas, increase land prices, and manage waste and recycling (Slater 2001, Twiss et al., 2003; Pearson et al., 2010). Bill (1991) conducted an extensive review of urban-agricultural practices in the United States, highlighting how farmland policy dictates trends and incentives for agriculture in urban areas. Another study of six counties in Southeastern Pennsylvania found that farm and land preservation programs were beneficial in encouraging cultivation of traditional crops (Larson et al., 2001).

The broad rhetoric surrounding modern day urban agriculture revolves around its potential to help solve various issues that face the food system: economic development, food security, and conservation. The practice tends to be commonly depicted as unambiguously effective at addressing big urban community challenges. Tornaghi (2014), however, warns against a naïve and utopian approach to representing urban food production.

Overall, there is widespread belief that urban agriculture can provide benefits to its participants. Thus, it is no surprise that various stakeholders are pushing for the promotion and support of urban agriculture through various programs and policies. Still, it remains uncertain whether these benefits are reaching those for whom the impacts would be most consequential–that is, those for whom this practice would have the capacity to improve their food security, access to affordable food, general health, and surrounding community. This paper is an attempt to address this question in a context—the COVID-19 pandemic—where urban agriculture has been suggested as a potential substitute for longer industrial food supply chains.

3. Data and Descriptive Statistics

The data used in this article were obtained from the city of Montreal's Open-Data Portal (http://donnees.ville.montreal.qc.ca/).[4] The data were collected in an effort to study Montrealers' attitudes with respect to and behaviors related to urban agriculture. In total, 882 individuals over the age of 18 living in the boroughs of Montreal were interviewed by phone. The sample, which is stratified by whether respondents practice urban agriculture, was generated by calling individuals on a list of randomly generated Montreal phone numbers, for a response rate of 51.4%. Because of this, the data set includes age- and gender- related sampling weights reflecting the age and gender composition of Montreal residents as per the latest Canadian census (Statistics Canada, 2014). Those sampling weights are used throughout this paper in order to improve the external validity of our findings so that they apply to the population of Montreal residents. More information about how the data were collected is available from the city of Montreal website (Ville de Montréal, 2014).

[4] Montreal's Open-Data Portal is a website run by the city government on which the city shares the data it collects on a myriad of topics (e.g., agriculture and environment, businesses and the economy, education and research, natural resources, government and public finances, infrastructure, public safety, health, tourism, sports and leisure, and transportation).

Table 1 presents descriptive statistics for the full sample. Before discussing these descriptive statistics, it is necessary to discuss how missing data were treated. For each variable where some data is missing (i.e., occupation, education level, place of birth, how long a respondent has lived in the city, whether they are homeowners, the number of individuals in their household, the number of children in their household, and their income category), an additional dummy variable was coded for whether that variable was not missing (i.e., that variable is thus equal to one if a response is included and equal to zero if it is missing). Those dummy variables are not reported anywhere in this paper, but they are accounted for in the estimation results in the following way so as to not introduce missing variables. In each regression estimated for this paper, those dummies are included on their own (though not shown) and interacted with the variable to which they are related. This allows keeping missing observations (they are replaced by a zero) so as to increase statistical power. In addition, for some variables (i.e., individuals in the household, and children in the household), a dummy variable was created for whether a value was reported for those variables, and those dummies were interacted with the actual values reported. So someone who did not tell the interviewer how many people they had in their household would receive a value of zero for the number of individuals in their household.

For starters, almost 42% of Montreal residents practice urban agriculture. While this may seem like a high proportion, note that “urban agriculture” was as “growing fruits, herbs, or vegetables in the city” in the context of the survey. Respondents 18 to 34 years of age constitute almost one third of the sample, and the proportion of respondents in each subsequent categorically decreases monotonically, which reflects a well-known pattern in Canada according to which young people move to the city to

study or for work, but then tend to migrate to the suburbs once they form families and retire. More than half of respondents work full time, and almost half of them are university-educated.[5]

Almost half of respondents were born in Montreal, but foreigners—that is, people born outside of Canada—are the second-most important category, at almost 30% of the sample; this reflects Montreal's multi-ethnic makeup. Most respondents have lived in the city for over 10 years, with only about 20% having lived there for less than 10 years. The average respondent's household is composed of a little over two individuals. Half of respondents own their dwelling, and the income category with the highest proportion of respondents is that for individuals whose household income exceeds C$80,000. Close to half of respondents are male, and about one in seven respondents was English-speaking. Finally, about one quarter of respondents live in each of the eastern and western parts of the island, which are respectively more heavily French- and English-speaking, with half of them living in the center of the island.

Table 2 presents descriptive statistics for the same variables split along whether respondents participate in urban agriculture (columns 2 and 3), along with the results of t-tests assessing whether the difference between those two participation regimes is statistically significant (column 4). Although the t-tests reported in column 4 do not allow making causal statements, the picture that emerges from table 2 indicates that urban agriculture mainly attracts upper-class respondents, i.e., those who are more educated, own their home, and report an income in the highest bracket. Given those descriptive statistics, urban agriculture exhibits the characteristics of what economists refer to as a luxury good, i.e.,

[5] College and university are distinct educational levels in Quebec. Because secondary school only goes up to the eleventh grade and there is no freshman year in university, a two-year pre-university college degree is necessary before one can enroll in a bachelor's degree at a university. Students who are not interested in getting a bachelor's degree can elect to enroll in a three-year technical or vocational college degree.

a good whose quantity demanded increases with income, but at a rate faster than that at which income increases (Mas-Colell et al., 1995).

4. Empirical Framework

The descriptive statistics in table 2 and associated t-tests, though informative, fail to hold other relevant factors constants. Witness what happens, for example, when one looks at the relationship between being retired and urban agriculture as well as the relationship between being older than 65 and urban agriculture in table 2. In both cases, respondents are less likely to participate in urban agriculture, but those two variables are highly correlated, so it is possible than one or both of them has no explanatory power when looking at whether people participate in urban agriculture, holding other factors constant.

To do so, this paper relies on linear regressions of the form

$$y_{ih} = \alpha + \beta_i x_i + \beta_h x_h + \epsilon_{ih}, \quad (1)$$

where the subscripts *i* and *h* denote the respondent and her household, respectively, y_{ih} denotes an outcome of interest (e.g., a dummy variable for whether the respondent participate in urban agriculture), x_i is a vector of individual-level characteristics (i.e., age, education, etc.), x_h is a vector of household-level characteristics (i.e., household size, income), and ϵ_{ih} is an error term with mean zero, given that the relationship in equation 1 is stochastic rather than deterministic.

Because all the outcomes studied in this paper (whether a respondent participates in urban agriculture, whether she gave a specific reason if she did not participate in urban agriculture, and whether she adopts specific behaviors if she does participate in urban agriculture) are all binary (i.e., "Yes" or "No" answers), the empirical specification in equation 1 is estimated everywhere throughout by ordinary least squares, which amounts to estimating a series of linear probability models (LPM).

5. Empirical Results

Table 3 looks at the correlates of the decision to participate in urban agriculture. Relative to respondents aged 50-65 (the omitted category), younger respondents are more likely to participate in urban agriculture: respondents aged 18-34 as well as those aged 35-49 are about 12 percentage points more likely to do so. Similarly, relative to respondents who work full time (the omitted category) respondents who stay at home are 17 percentage points more likely to participate in urban agriculture. Recent immigrants (i.e., people who have lived in Montreal for less than 5 years) are almost 13 percentage points less likely to participate in urban agriculture compared to their counterparts who have resided in Montreal for over 10 years.

Respondents whose households have more individuals are more likely to participate in urban agriculture: for every additional person within the average respondent's household, the respondent is 7 percentage points more likely to participate in urban agriculture. Respondents who own their home, for their part, are 22 percentage points more likely to do so. Compared to those who make over C$80,000 (the omitted category), those who earn less than C$20,000 were 10 percentage points less likely to partake in the practice. Finally, men are almost 6 percentage points less likely than women to participate in urban agriculture.

6. Discussion and Concluding Remarks

Because of the increasing importance given to urban agriculture by policy makers in the developing as well as the developed world, this paper has analyzed the results of a survey conducted by the city of Montreal in 2013 on the urban agricultural practices of respondents. Specifically, this paper has looked at who practices urban agriculture.

It appears that the practice of urban agriculture is a luxury good—a good whose consumption increases with income, but at a rate faster than income. Indeed, urban agriculture seems to mainly

attract upper-class respondents, i.e., those who are more educated, are homeowners instead of renters, report an income in the highest bracket, and live on the wealthier side of the island.

For those who advocate urban agriculture as a solution—however partial—to malnutrition in high-income countries, this is a problematic finding. Though some studies have effectively found that low-income participants in urban agriculture tend to improve their access to nutritious and affordable food, perhaps as a result of participating in urban agriculture, studies focusing exclusively on participants have seemingly left out an important part of the issue: If the participants are mostly the well-to-do, the practice is unlikely to reach those who would benefit the most from it.

That said, our analysis does not allow making causal statements. As such, future research on urban agriculture should focus on developing research designs that can allow identifying the potential causal relationship between income and participation in urban agriculture. If indeed urban agriculture can play a role in improving nutrition, policy makers will need to rely on more than mere correlations. To that end, the unexpected disruption to economic life that is the COVID-19 pandemic may prove fruitful as a source of exogenous variation in some people's income, as many have people have lost their livelihood due to the various lockdown policies that have been declared in most high-income countries.

References

Alaimo, K., Packnett, E., Miles, R. A., & Kruger, D. J. (2008). Fruit and vegetable intake among urban community gardeners. *Journal of nutrition education and behavior, 40*(2), 94-101.

Angrist, Joshua D., and Jörn-Steffen Pischke (2009), *Mostly Harmless Econometrics*, Princeton, NJ: Princeton University Press.

Brown, K. H., & Jameton, A. L. (2000). Public health implications of urban agriculture. *Journal of public health policy, 21*(1), 20-39.

Clapp, Jennifer (2020), "Spoiled Milk, Rotten Vegetables and a Very Broken Food System," New York Times, May 8, 2020, https://www.nytimes.com/2020/05/08/opinion/coronavirus-global-food-supply.html last accessed May 15, 2020.

De Bon, H., Parrot, L., & Moustier, P. (2010). Sustainable urban agriculture in developing countries. A review. *Agronomy for Sustainable Development*, *30*(1), 21-32.

Hynes, H. P., & Howe, G. (2002, September). Urban horticulture in the contemporary United States: personal and community benefits. *In International Conference on Urban Horticulture 643* (pp. 171-181).

Larson, J. M., Findeis, J. L., & Smith, S. M. (2001). Agricultural adaptation to urbanization in southeastern Pennsylvania. *Agricultural and Resource Economics Review, 30*(1), 32-43.

Mas-Colell, Andreu, Michael D. Whinston, and Jerry R. Green (1995), *Microeconomic Theory*, Oxford: Oxford University Press.

Maxwell, Daniel G. (1995), "Alternative Food Security Strategy: A Household Analysis of Urban Agriculture in Kampala," *World Development* 23(10): 1669-1681.

Mougeot, Luc A. (2005), *Agropolis: The Social, Political and Environmental Dimensions of Urban Agriculture*, London: Routledge.

Obama, Michelle (2012), *American Grown*, New York: Crown.

Reardon. T.A., Bellemare, M.F. & Zilberman, D. (2020a), "How COVID-19 May Disrupt Food Supply Chains in Developing Countries," IFPRI Blog, https://www.ifpri.org/blog/how-covid-19-may-disrupt-food-supply-chains-developing-countries last accessed May 15, 2020.

Reardon, T.A., Mishra, A.K., Nuthalapathi, C.S.R., Bellemare, M.F., & Zilberman, D. (2020b), "COVID-19's Disruption of India's Transformed Food Supply Chains," *Economic & Political Weekly 55*(18): 18-22.

Redwood, M. (Ed.). (2012). *Agriculture in urban planning: generating livelihoods and food security*. Routledge.

Reynolds, K., & Cohen, N. (2016). Beyond the kale: *Urban agriculture and social justice activism in New York City* (Vol. 28). University of Georgia Press.

Rich, K.M., Rich, M., & Hamza, K. (2015). From response to resilience: the role of system dynamics approaches in analyzing and developing value chains from urban and peri-urban agriculture. Working Paper, Food and Agriculture Organization.

Rich, K.M., Rich, M. & Dizyee, K. (2018). Participatory systems approaches for urban and peri-urban agriculture planning: The role of system dynamics and spatial group model building. *Agricultural Systems*, *160*, 110-123.

Statistics Canada (2014), "2011 Census of Canada," http://www12.statcan.gc.ca/census-recensement/index-eng.cfm last accessed March 7, 2014.

Stephens, E.C., Jones, A.D., & Parsons, D. (2018). Agricultural systems research and global food security in the 21st century: An overview and roadmap for future opportunities. *Agricultural Systems*, 163: 1-6.

Tornaghi, C. (2014). Critical geography of urban agriculture. *Progress in Human Geography, 38*(4), 551-567.

USDA (2014). "Urban Agriculture," http://afsic.nal.usda.gov/farms-and-community/urban-agriculture last accessed March 6, 2014.

Viljoen, Andre, and Joe Howe (2005), *Continuous Productive Urban Landscapes*, London: Routledge.

Wikipedia (2020). "Victory garden," https://en.wikipedia.org/wiki/Victory_garden last accessed May 19, 2020.

Zezza, Alberto, and Luca Tasciotti (2010), "Urban Agriculture, Poverty, and Food Security: Empirical Evidence from a Sample of Developing Countries," *Food Policy* 35(4): 265-273.

Table 1. Descriptive Statistics for the Full Sample (n=882)

Variable	Mean
Practices Urban Agriculture (Dummy)	0.418***
	(0.019)
Age	
Age 18-34 (Dummy)	0.321***
	(0.021)
Age 35-49 (Dummy)	0.262***
	(0.015)
Age 50-64 (Dummy)	0.227***
	(0.014)
Age 65 and Over (Dummy)	0.185***
	(0.012)
Employment	
Works Full Time (Dummy)	0.516***
	(0.019)
Works Part Time (Dummy)	0.064***
	(0.009)
Student (Dummy)	0.089***
	(0.014)
Retired (Dummy)	0.215***
	(0.013)
Jobless (Dummy)	0.055***
	(0.009)
Stays at Home (Dummy)	0.057***
	(0.009)
Education	
Primary Education (Dummy)	0.072***
	(0.008)
Secondary Education (Dummy)	0.247***
	(0.016)
College Education (Dummy)	0.220***
	(0.016)
University Education (Dummy)	0.453***
	(0.019)
Nationality	
Born in Montreal (Dummy)	0.451***
	(0.019)
Born in Quebec Outside of Montreal (Dummy)	0.230***
	(0.016)
Born in Canada Outside of Quebec (Dummy)	0.028***

	(0.006)
Born Outside of Canada (Dummy)	0.289***
	(0.017)
Length of Residence	
Resident for Less than 5 Years (Dummy)	0.103***
	(0.013)
Resident for 6 to 10 Years (Dummy)	0.109***
	(0.014)
Resident for Over 10 Years	0.786***
	(0.017)
Household Size (Individuals)	2.116***
	(0.045)
Homeowner (Dummy)	0.507***
	(0.019)
Income	
Income Less than C$20,000	0.116***
	(0.012)
Income C$20,000-35,000	0.138***
	(0.013)
Income C$35,000-50,000	0.139***
	(0.013)
Income C$50,000-65,000	0.092***
	(0.011)
Income C$65,000-80,000	0.078***
	(0.010)
Income More than C$80,000	0.201***
	(0.016)
Male (Dummy)	0.480***
	(0.019)
English-Speaking (Dummy)	0.144***
	(0.012)
Region	
East (Dummy)	0.257***
	(0.016)
Center (Dummy)	0.510***
	(0.019)
West (Dummy)	0.233***
	(0.016)

Standard errors in parentheses. The “Mean” column also reports results of tests of statistical significance of each reported mean.
*** p<0.01, ** p<0.05, * p<0.1

Table 2. Descriptive Statistics by Whether a Respondent Practices Urban Agriculture (n=882)

	Practices Urban Agriculture?		
	No	Yes	
Variable	**Mean**	**Mean**	**Difference**
Age			
Age 18-34 (Dummy)	0.310***	0.337***	
	(0.027)	(0.033)	
Age 35-49 (Dummy)	0.246***	0.285***	
	(0.019)	(0.025)	
Age 50-64 (Dummy)	0.233***	0.219***	
	(0.018)	(0.021)	
Age 65 and Over (Dummy)	0.203***	0.159***	*
	(0.016)	(0.017)	
Employment			
Works Full Time (Dummy)	0.478***	0.569***	**
	(0.025)	(0.029)	
Works Part Time (Dummy)	0.062***	0.067***	
	(0.013)	(0.014)	
Student (Dummy)	0.097***	0.077***	
	(0.018)	(0.020)	
Retired (Dummy)	0.231***	0.193***	
	(0.017)	(0.019)	
Jobless (Dummy)	0.074***	0.028***	***
	(0.015)	(0.009)	
Stays at Home (Dummy)	0.051***	0.066***	
	(0.012)	(0.014)	
Education			
Primary Education (Dummy)	0.084***	0.056***	*
	(0.012)	(0.012)	
Secondary Education (Dummy)	0.268***	0.218***	
	(0.021)	(0.024)	
College Education (Dummy)	0.227***	0.210***	
	(0.022)	(0.024)	
University Education (Dummy)	0.408***	0.516***	***
	(0.024)	(0.030)	
Nationality			
Born in Montreal (Dummy)	0.431***	0.478***	
	(0.025)	(0.030)	
Born in Quebec Outside of Montreal (Dummy)	0.215***	0.249***	
	(0.020)	(0.026)	
Born in Canada Outside of Quebec (Dummy)	0.025***	0.031***	

	(0.007)	(0.009)	
Born Outside of Canada (Dummy)	0.324***	0.242***	**
	(0.023)	(0.025)	
Length of Residence			
Resident for Less than 5 Years (Dummy)	0.125***	0.073***	**
	(0.018)	(0.018)	
Resident for 6 to 10 Years (Dummy)	0.114***	0.101***	
	(0.018)	(0.020)	
Resident for Over 10 Years	0.757***	0.826***	**
	(0.023)	(0.025)	
Household Size (Individuals)	1.941***	2.359***	***
	(0.052)	(0.079)	
Homeowner (Dummy)	0.396***	0.662***	***
	(0.024)	(0.029)	
Income			
Income Less than C$20,000	0.158***	0.058***	***
	(0.018)	(0.013)	
Income C$20,000-35,000	0.158***	0.110***	*
	(0.018)	(0.018)	
Income C$35,000-50,000	0.129***	0.151***	
	(0.016)	(0.022)	
Income C$50,000-65,000	0.093***	0.090***	
	(0.015)	(0.017)	
Income C$65,000-80,000	0.070***	0.089***	
	(0.013)	(0.017)	
Income More than C$80,000	0.150***	0.273***	***
	(0.018)	(0.027)	
Male (Dummy)	0.511***	0.436***	**
	(0.025)	(0.029)	
English-Speaking (Dummy)	0.137***	0.154***	
	(0.016)	(0.019)	
Region			
East (Dummy)	0.284***	0.219***	**
	(0.022)	(0.024)	
Center (Dummy)	0.500***	0.525***	
	(0.025)	(0.029)	
West (Dummy)	0.216***	0.256***	
	(0.020)	(0.025)	
Observations	522	360	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3. OLS Estimation Results for Participation in Urban Agriculture

Variable	(1)
Dependent Variable: = 1 if Participates in Urban Agriculture; = 0 Otherwise.	
Age (Base: Age 50 - 64)	
Age 18-34	0.116**
	(0.050)
Age 35-49	0.119***
	(0.039)
Age 65 and Over	-0.033
	(0.067)
Employment (Base: Works Full Time)	
Works Part Time	0.109
	(0.077)
Student	-0.004
	(0.057)
Retired	0.067
	(0.066)
Jobless	-0.072
	(0.079)
Stays at Home	0.168**
	(0.076)
Education (Base: University Education)	
Primary Education	-0.005
	(0.070)
Secondary Education	-0.047
	(0.039)
College Education	0.013
	(0.050)
Nationality (Base: Born in Montreal)	
Born in Quebec	0.035
	(0.031)
Born in Canada	-0.015
	(0.127)
Born Outside Canada	-0.032
	(0.045)
Length of Residence (Base: Over 10 years)	
Resident for Less than 5 Years (Dummy)	-0.132**
	(0.057)
Resident for 6 to 10 Years	-0.039
	(0.059)

Household Size	0.062***
	(0.016)
Homeowner	0.219***
	(0.037)
Income (Base: More than C$80,000)	
Income Less than C$20,000	-0.104*
	(0.060)
Income C$20,000-35,000	-0.050
	(0.068)
Income C$35,000-50,000	0.010
	(0.060)
Income C$50,000-65,000	-0.059
	(0.069)
Income C$65,000-80,000	0.005
	(0.078)
Male	-0.055*
	(0.028)
English-Speaking	0.041
	(0.057)
Region (Base: Center)	
East	-0.059
	(0.046)
West	-0.043
	(0.063)
Constant	0.372**
	(0.156)
Observations	882
R-squared	0.148

Robust standard errors in parentheses, clustered at the borough level

*** p<0.01, ** p<0.05, * p<0.1