

Internet-enabled access to alternative food networks: A comparison of online and offline food shoppers and their differing interpretations of quality

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Abstract Online food retail has the potential to broaden access to systems of food provision which promote social and environmental quality attributes. This possibility is explored using data from a survey of 365 consumers who purchased food either via internet retailers of local and organic food, or via farmers' markets, in Vancouver, Canada and Melbourne, Australia. Survey results are analyzed using principal component and regression techniques and interpreted via the theoretical framework of conventions theory. Key findings show that while online retailers of local organic food are not currently attracting more resource constrained consumers, they do appeal to a similar, although broader, array of quality conventions. This research provides new insights into the challenges and opportunities associated with increasing consumer access to alternative food networks, as well as adding to the small number of quantitative studies in the conventions theory literature.

Keywords Alternative food networks · Internet retail · Conventions theory · Access equity

Introduction

A growing number of consumers in high income countries purchase food from provisioning systems such as farmers' markets or community supported agriculture projects (Adams 2011; U.S. Dept. of Agriculture 2014). These systems of food production, exchange and consumption, frequently referred to as alternative food networks (AFNs), promote an appreciation of food and food system qualities which go beyond price and individual consumer utility to include broader social and environmental quality attributes. While these initiatives frequently garner praise as providers of "good food" (Sage 2003, p. 1), research shows that they offer only limited accessibility for consumers with marked educational, temporal and financial constraints (Sanderson et al. 2005; Rice 2015; Wolf et al. 2005; Zepeda and Nie 2012). Meanwhile, attempts to make AFNs more accessible to a broader market have been met with claims that their unique quality attributes tend to be diluted as they enter the mass market (Allen 2010; Buck et al. 1997).

In this context, internet commerce, as a highly disruptive force in information rich markets, could present opportunities for broadening access to AFNs while retaining the unique quality attributes with which they are associated. Yet, with a few exceptions (Butler et al. 2009; Holloway 2002; Volpentesta and Ammirato 2010), there has been scant scholarly examination of how growing online food retail sales are impacting AFNs. This may be because researchers have considered these domains to be largely unrelated. Certainly, there is a difference between the "virtual" (Holloway 2002, p. 70) and arms-length nature of online food retail and the "personal, immediate and direct exchanges" (Carson et al. 2016, p. 861) available through AFN systems such as farmers' markets. However, a primary purpose of the rich interpersonal communication

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which take place within AFNs such as farmers markets, is the transmission of a “complex mix [of] additional [quality] criteria ...” that [enable consumers] to go beyond purely price based choices (Little et al. 2010, p. 1798). Much of this information can be digitized. Furthermore, as the number of users of social media continues to climb around the world, it would also seem that the interpersonal aspects of AFNs could be, at least partially, replicated online.

In recognition of the continued growth in demand for products sold in the online environment, this article evaluates the potential of internet-enabled commerce to affect both the accessibility and nature of AFNs (Brynjolfsson et al. 2003). In doing so, we aim to raise the profile of online AFNs as an underexplored yet important area of agri-food scholarship. We address these issues by examining the demographic characteristics of consumers shopping for local and organic food via either online vendors or via traditional farmers’ markets.

In order to interpret the role of consumers as both recipients and co-creators of these notions of quality, we use the theoretical framework of conventions theory to illuminate quality as a contestable social construct (Boltanski and Thévenot 2006–1991; Storper and Salais 1997). Conventions theory sets out an evolving schema of six generic realms, or *worlds*, of inter-subjective quality assessment. This theory has been used by other food studies scholars to highlight how the concept of quality is constructed in AFNs broadly and in terms of farmers’ markets specifically (Kirwan 2006; Murdoch and Miele 1999; Ponte 2016; Reynolds 2014; Rosin and Campbell 2009).

Existing research suggests that the conventions of quality which differentiate AFNs such as farmers markets as alternative economic spaces are less accessible for consumers with limited resources (Rice 2015; Wolf et al. 2005; Zepeda and Nie 2012). This is particularly the case for consumers with limited financial resources, but also affects people with limited knowledge resources around food preparation, or who are very time poor. However, the growth of online commerce is lowering transaction costs associated with finding products with unusual or highly specific quality attributes such that demand for niche products is growing more strongly than for non-niche products. (Anderson 2006; Brynjolfsson et al. 2011; Choi and Bell 2011). We investigate whether this changed pattern of demand, enabled by lower online transaction costs, extends to relatively higher demand for AFNs from resource constrained online consumers.

We examine the possibility of increased AFN access online via a comparison of the demographic attributes and food shopping motivations of 365 individuals who purchased food from one of two distinct but comparable systems of food provisioning. One group of respondents was drawn from consumers who purchased local, organic food

from online retailers, while the second group comprised shoppers at offline farmers’ markets who did not also shop online. Data were gathered in Melbourne, Australia and Vancouver, Canada. Principal component analysis of the survey data identified four motivational factors that we considered in relation to conventions theory. Information on these significant consumer motivations was then combined with consumer demographic variables in a logistic regression model to identify significant differences between online and offline consumers, both in terms of their demographic characteristics and their interpretations of quality.

The purpose of this analysis is to determine if the online retailers are attracting more resource constrained consumers, while also maintaining the quality attributes for which AFNs are celebrated. The results of this research show that online consumers are not significantly more resource constrained than farmers’ market consumers. Online and offline consumers also share similar food shopping motivations, although the online consumers surveyed were significantly more motivated by cost minimization and product compliance with standards. This research is significant as it explores how the internet, as a pervasive innovation with the capacity to lower the cost of communication and information transfer, is affecting AFNs.

Literature review

While the dominant mode by which food is grown, processed and sold in high income countries is perhaps the most efficient in history in terms of price per calorie (United States Bureau of Labor Statistics 1999), it also attracts criticism as the cause of significant environmental and social damage. Negative interpretations of the dominant food system model have in turn led to a diverse range of attempts to construct a different or alternative food system. The review by Venn et al. (2006) of the relevant literature found that AFNs vary across a range of production, transaction, and consumption activities to include organic production methods and local food supply chains, as well as efforts to increase consumer agency, such as consumer food co-operatives. A common attribute associated with AFNs within the food studies literature relates to the level of physical and/or cognitive proximity between food producers and consumers. For example, Hendrickson and Hefernan (2002, p. 363) state that AFNs are more “embedded in a particular locale, in a particular set of cultural, economic, political and social relationships than conventional food supply chains, and [are] therefore more transparent and trustworthy”. For some, this means that AFNs are necessarily associated with short food-supply chains, in which consumers and producers have a high degree of physical connectedness. For other food studies scholars, however,

the physical proximity between consumers and growers/producers is not the critical factor. Rather, the provision of abundant information is more important (Fonte 2006; Renting et al. 2003). Regardless of whether the emphasis is on direct and physically proximate relations in the supply chain, or the provision of value-laden information, the transfer of information between producers and consumers is at the heart of AFNs.

However, AFNs do not have a monopoly on the ability to provide products that convey detailed product information. Globally-integrated food systems that supply large supermarket chains are also 'embedded' in the societies and environments in which they operate (Penker 2006; Winter 2003). As such, products which have been produced using large scale, highly mechanized processes, transported long distances and sold through supermarkets can be furnished with information which helps consumers understand the significance of their place of production and the sustainability of the production methods used to produce them (Fonte 2006). The permeability of the notions of quality that exist between alternative and conventional systems of food provision serve to make dichotomous definitions problematic, as they tend to reify what are complex, evolving processes in a manner which results in conceptual "slippage" (Guthman 2003, p. 47). In recognition of the difficulties associated with conceptualizing AFNs in neat dichotomous terms, we follow other agri-food scholars interested in AFNs (Murdoch et al. 2000; Murdoch and Miele 1999; Ponte 2016; Reynolds 2014; Rosin and Campbell 2009; Stræte 2004) by employing a theoretical framework based upon conventions theory (Boltanski and Thévenot 2006–1991).

Developed by a group of French economists in the late 1980s (Dupuy et al. 1989), with a central contribution from Boltanski and Thévenot (2006–1991), conventions theory seeks to explain how social and economic exchange is coordinated. The unique perspective afforded by conventions theory is its conceptualization of rationality as dependent on inter-subjective assessment, or as Stark (2000, p. 4) states, "[rationality is] only possible insofar as it takes place within the boundaries and through the social technologies of particular orders of worth". Therefore, while conventions theory seeks to explain the behavior of actors, including individuals, the explanatory unit is not the atomistic individual but rather a broad range of social actors, from individuals to firms, regions and nation states, all of which coalesce around durable inter-subjective agreements about what constitutes high worth. These agreements, when they become stable, are termed conventions and are used by actors to coordinate their interactions with others in a more predictable and therefore efficient manner.

In the often dichotomous debate between sociological individualism and structuralism, the view of coordination

put forward by conventions theory was criticized, according to Wagner (1999), as affording individuals an unrealistic level of agency. However, Boltanski and Thévenot (2006–1991, p. 23) refute this interpretation, instead claiming that the theory charts a middle ground between structuralism and individualism. To do this they identify six overarching and relatively stable "worlds of justification" which are based upon different, but commonly recognized, interpretations of what constitutes the "common good" as described within "canonical" works of political economy. These different worlds are: the *Market* world in which prices, profits and personal utility are valorized; the *Industrial* world, in which efficiency, precision and replicability are promoted; the *Domestic* world in which personal relations built on trust and long standing connections to physical place are valued, the *Civic* world which sees value placed on people and things that provide benefits beyond the individual, the world of *Inspiration* which applauds the visionary behavior of religious or artistic fervor and, lastly, the world of *Fame* which valorizes public recognition as the hallmark of quality. Significantly however, actors, including individuals, are able to use these different interpretations of high worth to affirm or challenge the way social and economic interactions are undertaken.

The ability to conceptualize the contested and malleable nature of worth has made conventions theory appealing to agri-food scholars interested in understanding the similarities and contrasts inherent in different food systems. Within these studies, AFNs have been most frequently observed to "synthesise ... domestic conventions of personal trust and place attachment ... and civic conventions based on social and ecological welfare commitments" (Reynolds 2014, p. 501). For example, the conventions of quality employed by shoppers and vendors at farmers' markets in the UK have been explored by Kirwan (2006), who found that farmers' markets are critical enabling spaces within short food-supply chains because they allow high levels of interpersonal connection between producers and consumers, thus creating worth as it is understood within the domestic world of justification which places significant value on strong social and geographic ties. In relation to the development and ongoing promotion of organic agriculture in New Zealand, Rosin and Campbell (2009, p. 42) found that "from the perspective of the civic ... world ... the quality associated with an organic product lies ... in the reduction of environmental impact and human health risks".

We follow previous authors such as Rosin and Campbell (2009) in only making use of worlds of justification that are particularly relevant to AFNs. Nonetheless, conventions theory is a powerful tool for highlighting both the similarities and differences between alternative and conventional food systems in a manner which is able to accommodate both change and multiple perspectives on worth. However,

when discussing how consumers ascribe value to food, we favor the term ‘quality’ instead of the term ‘worth’ because the concept of ‘quality’ is commonly employed within the agri-food literature.

A significant change in AFNs is recent growth in the number of farmers’ markets in high income countries such as Australia (Adams 2011). However, while popular enthusiasm for farmers’ markets is growing, so too have concerns that alternative systems of provision may not be the benign and emancipatory economic spaces described by some proponents (Doherty 2006; DuPuis and Goodman 2005; Goodman et al. 2010a,b; Hinrichs 2000). Instead, Doherty (2006, p. 2) suggests that these alternatives risk a distinctly different hue as “a socially and economically exclusive movement for white, middle class participants”. In discussing the potential for such exclusivity, both Goodman (2004) and Hinrichs (2003) point out that the promotion of the local spatial scale within popular and academic discourse around AFNs tends not to allow for its socially-constructed and often socially-contested aspects. These include competing discourses in terms of what constitutes quality or good food. As such, the ability to access food that is celebrated as good does not rely solely on having material means, but also the ability to recognize and value the socio-cultural meanings that attach to food and underpin their perceived benefits.

However, among those agri-food studies scholars who are conscious of the potential for AFNs to become exclusionary and even elitist, there is debate as to whether AFNs can be made more accessible while retaining their positive quality attributes (Allen 2010; Brunori 2007; Guthman 2004). Agri-food scholars such as Guthman (2004) and Allen (2010) (who write from a political economy perspective), see moves to expand AFNs into mass markets as problematic because it makes AFNs susceptible to neo-liberalizing forces, via a process that Guthman terms conventionalization (Buck et al. 1997; Guthman 2004). According to Lockie and Halpin (2005, p. 284), the conventionalization thesis describes “a process through which organic agriculture [and AFNs more broadly] comes increasingly, as it grows, to resemble in structure and ideology the mainstream food sector it was established in opposition to”. An example of the conventionalization process is provided by Buck, Gets and Guthman (1997) who observe that within California the growing demand for organic food from supermarkets prompted large, highly-specialized production units to start producing organic crops. The prediction made by Buck et al. in (1997) and later reaffirmed by Guthman (2004), is that conventionalization results in a fall in the price of some popular organic varieties, thereby increasing their accessibility for resource constrained consumers, while also causing a decline in the economic viability of smaller production units. This prediction has

been borne out by the change in organic farming over time. The majority (60%) of organic farms in the United States recently qualified as large farms with more than 500 acres in production, while the number of small farms continues to fall (Freyer and Bingen 2015; Granatstein 2013).

The conventionalization thesis has also been criticized as holding up an unrealistic and inflexible “ideal” (Connell et al. 2008, p. 172) of organic agriculture specifically and AFNs more broadly. Indeed, the attraction of conventions theory for many agri-food scholars is precisely the way it recognizes the permeable and contestable nature of quality, both for producers and consumers. Scale economies can, for example, be viewed negatively as a movement away from an idealized small-scale local agriculture, or positively as an important means of supplanting the predominance of environmentally-damaging chemical agriculture.

The permeability of notions of worth in relation to scale notwithstanding, many of the AFN businesses examined in the empirical literature operate on a small scale. Rather than relying on high levels of mechanization and scale efficiencies, AFN businesses are more likely to market to customers who value quality attributes that are difficult to maintain under conditions of large-scale production, such as having a personal connection with the person who produced the food.

The diversity of AFN consumer motivations is emphasized by Little et al. (2010, p. 1798) who state:

A complex mix of motivations ... have worked together to fuel the growth of AFNs. Crucially, the attachment of additional criteria is fundamental to the creation of purposive acts of consumption that go beyond the purely price based choices.

The difficulty associated with delivering both diverse ‘additional’ quality attributes and low product prices has implications in terms of access for resource constrained consumers. According to Noe and Alroe (2010, p. 13), “different forms of qualities put different demands on the food network in terms of handling and mediat[ion]”, which in turn implies different cost structures and levels of affordability and access. Where mass market penetration, if not explicitly access and affordability, is prioritized it is possible that a “diluting and disempowering [of] the counter-narratives and imaginaries of ‘local’, ‘organic’ and ‘quality’ foods” (Goodman 2009, p. 19) could take place. That is, as AFNs become successful, larger firms are able to use their greater material resources to replicate certain quality conventions and appropriate the value associated with them, while discarding other quality conventions which are less amenable to mediation and handling through industrial and market processes. The conventionalization thesis therefore raises considerable doubts as to the ability of AFNs to ever appeal to a significantly larger consumer

base, including consumers with limited financial or temporal resources, without at the same time undermining many of their defining quality attributes. However, widespread although by no means universal access to internet-enabled commerce is having profound effects on many markets, including, according to some information systems scholars (Anderson 2006; Brynjolfsson et al. 2011; Choi and Bell 2011), a general increase in relative demand for niche products in the online environment. Increased demand for niche products online may in turn flow through to increased supply and lower prices, thereby potentially enabling increased access for resource-constrained consumers (Brynjolfsson and Smith 2000; Porter 2001).

The assertion that niche products are more popular in the online environment is supported by empirical research by Brynjolfsson et al. (2011). They attributed this increased demand to lower product search costs online which mean customers can more easily find products with very specific characteristics, as well as to more easily access impartial product reviews and recommendations, which reduces the need to rely on known brands as markers of quality. Combined, these factors lead Brynjolfsson et al. (2011, pp. 1373–1374) to conclude that “underlying trends in technology portend an ongoing shift in the distribution of product sales ... boost[ing] the share of sales generated [by] niche products.” Given that firms within AFNs tend to offer products with a relatively unique set of quality attributes, including associations with very specific physical environments and social customs, this shift in demand toward niche products could mean that AFNs will become relatively more popular in the online environment than they are in the offline environment. This is because internet-enabled commerce makes it easier for consumers to locate and compare AFN products than in the offline environment, where customers often have to travel to one or more specialist retailers such as farmers’ markets. Another obstacle is that farmers’ markets often have very limited opening hours.

Furthermore, the internet and social media have had profound effects on the way in which we engage with interpersonal connections and understand ‘community’. For example, in 2006 when Kirwan published research showing how farmers’ markets promote notions of quality from the domestic world of justification, there were only 6 million users of the social networking site Facebook (Sedghi 2014). By 2013, there were 1.2 billion Facebook users, suggesting that the internet could significantly change the way people build and understand a sense of interpersonal community. The continued growth in internet access and social media use therefore raises questions about how quality conventions associated with AFNs and described in the agri-food studies literature of the last 20 years are being affected by the online environment. For example, does the internet enable consumers to build a sense of community

and environmental connection with more distant and possibly more convenience-focused and price-competitive food providers? If this is the case, online AFN could enjoy increased demand from resource constrained consumers.

To investigate these issues, we explore two linked research questions. Firstly, do online AFN consumers exhibit relatively more resource constraints than offline consumers? Secondly, do online consumers prioritize different quality attributes, including those from the market world of justification such as price and convenience? In answering these questions, we shed light on how the growth in online connectivity is affecting the accessibility of AFNs, as well as the quality conventions associated with them.

Methods

In order to explore how internet-enabled transactions could change AFN quality conventions and consumer access to them, we surveyed 215 consumers who purchased food from online retailers of local and organic food and 150 consumers who did not use online retailers but purchased food from offline farmers’ markets. All respondents were drawn from Melbourne, Australia and Vancouver, Canada in 2011. We selected these locations because they both host numerous established farmers’ markets and at least one established online retailer with significant AFN attributes. In addition, consumers in both locations are broadly comparable. While the majority of residents enjoy high levels of economic development (Economist Intelligence Unit 2011), a segment of society continues to experience resource constraints, including to the point of being food insecure (Foodbank Australia 2013; Tarasuk et al. 2014).

Online respondents were drawn from customers of two online retailers in Vancouver and one online retailer in Melbourne. The Melbourne retailer operated as a for-profit subsidiary of a non-profit environmental charity, while the Vancouver based retailers included a non-profit, consumer-owned cooperative and a privately-owned for-profit company. Despite the mix of ownership structures and profit motives, all three online entities were internally comparable, as well as being comparable to offline farmers’ markets, in that they all made available a range of food produced from local farmers and producers, as well as providing detailed information about who produced or grew the products for sale, where they were grown and what methods were used to grow them (i.e. organic or not).

In order to gather data for online food shoppers, we deployed a structured survey instrument via the internet. To recruit respondents, we arranged for an article to be placed in the online newsletter and social media page of each participating firm. The article invited respondents to visit the

survey website and included sufficient information about the project so that participation was based on informed consent. This method of survey recruitment makes the calculation of an accurate response rate difficult, as the total number of consumers who actually viewed the advertisement is unknown. The total number of online consumers who completed the survey ($n=215$) is equal to 10.6% of the combined customer populations of the case study firms at the time of survey completion.

In order to gather information from farmers' market customers, we obtained permission from the organizing committees of farmers' markets in both Vancouver and Melbourne to set up a table at specific markets and to engage with consumers. Informed consent was obtained by providing potential respondents with verbal and written information on the research project. Surveys were completed in person by shoppers at Trout Lake ($n=22$), Kitsilano ($n=22$), the West End ($n=15$) and Oak Street ($n=16$) farmers' markets in urban Vancouver in August 2011 and in Flemington ($n=17$), Collingwood ($n=20$), Gas Works ($n=18$) and St Kilda ($n=20$) farmers' markets in Melbourne in November 2011. Three of the eight markets are held on a weekly basis, while the remainder are held monthly. Under-representation by farmers' market attendees with children was identified as a possible issue due to the need for these respondents to continue monitoring children while completing the survey. We therefore conducted a follow-up count at two markets to look for significant variation between the proportion of attendees with children and the proportion of survey responses from this group. No evidence of underrepresentation was found.

The survey instrument used for both online customers and farmers' market customers is adapted from one developed by Connell et al. (2008) for their investigation of shopping motivations amongst shoppers at farmers' markets in British Columbia, Canada. The question includes 16 Likert-scale questions with four response options (not important, somewhat important, important and very important). The 16 motivations are listed in Table 1. While the use of four response options is less common than five or seven point scales, 4-point scales are within the "optimum" range (Lozano et al. 2008, p. 73).

In addition to the motivation questions, the survey instrument contained questions to capture demographic data on age, sex, household income, highest level of educational attainment, and the number of adults and children in the respondent's household.

While a significant number of the online shoppers who responded to the survey also attended farmers' markets, only a small number of the respondent shoppers at the farmers' markets ($n=12$) also shopped for local organic food online. These consumers were removed from the data set, leaving 150 responses from individuals who used

Table 1 Survey questions on motivations for food shopping

Factors considered when buying food
Nutritional content
Brand name
Low price
Ease of preparation
Sold in season
Appearance (of product)
Packaging (how it looks; aesthetics)
Convenient to buy
Grown or produced locally (within 100 km)
Grown or produced in state/province
Grown or produced by someone you know
Organic (certified)
Natural, but not certified (e.g., not sprayed)
Fair trade (made by someone who gets fair wages)
Food safety
Animal welfare

Source: Adapted from Connell et al. (2008)

AFNs but did not shop online. The resulting dataset therefore consists of two independent samples, with one group using online AFN retailers while the other group (offline) did not. We assume that the two independent samples are drawn from the same population, in the sense that all respondents are AFN participants because they purchase local and/or organic food from sources that give them some level of direct access to the producer and which have varying levels of commitment to social purpose objectives.

The survey data are analyzed via a two-step process. First, we use categorical principal component analysis (CATPCA in SPSS) to reduce the 16 motivation questions (see Table 1) to a manageable number. Unlike classical principal component analysis which requires interval or scale data, CATPCA is designed specifically for use with nominal or ordinal data such as that produced from the Likert scale questions (Manisera et al. 2010) used in our survey instrument.

The adequacy of the sample size is measured by the Kaiser–Meyer–Olkin (MSA) score, with figures over 0.600 considered acceptable (Anglim 2007). With an MSA of 0.790, the data gathered for this study is in the middle range of acceptability. In addition, no evidence of multicollinearity problems are observed, with all between-factor correlations below 0.32. The analysis uses Varimax rotation to improve the interpretability of the results, resulting in a four-factor solution with Eigenvalues greater than 1.

Secondly, the four factors identified via CATPCA are included with consumer demographic data in a logistic regression model on the use of online AFNs. This analysis is capable of determining which demographic and

motivational factors are significantly associated with being an online shopper, allowing for the potential confounding influence of all other variables in the model. As such, this test is an appropriate method for determining if online AFNs attract a higher share of resource-constrained shoppers while continuing to appeal to the same quality attributes.

The logistic regression results are given in Table 2 and provide the odds ratios $\text{Exp}(B)$ for each independent variable for online shopping. The odds ratio is the probability that the outcome occurs in the presence of the independent variable compared to the probability that the outcome occurs in the absence of the independent variable. In Table 2 an odds ratio greater than one indicates that the

independent variable increases the probability of online shopping, while an odds ratio below 1 decreases the probability of online shopping. The logit regression results are good, with a highly significant model X^2 ($p < .000$), a correct classification rate of 70.7%, very good results for the Hosmer and Lemeshow test for the goodness of fit and an acceptable pseudo R^2 value of 0.29.

Results

Identification of main shopping motivations

Table 3 gives the CATPCA results. The total variance explained by the four-factor model is 52.4%, meaning just over half of the variation in respondents' answers to the 15 shopping motivations can be explained by the four identified factors.

The most significant of the four factors, in terms of its ability to explain variation in the data (24.3%), is labeled Provenance, as it groups together a range of consumer motivations related to where and when a food product has been produced, by whom and under what conditions. The second factor accounts for 12.7% of the variation in the data and is labeled Compliance as it groups concerns about the attainment of set standards such as organic and fair trade certification, with regulatory compliance issues such as food safety and animal welfare. The fourth factor explains 8.1% of the variation in the data and is termed Image as it encompasses concerns about product brands and appearance. The final motivational factor explains 7.3% of the variation in the data and is labeled Cost Minimization as it captures consumer interest in low product prices and time saving.

Combined logistic regression of consumer demographics and motivational factors

The regression results control for the effect of country (Australia versus Canada), gender (male versus female) household size and age. Neither country nor gender are statistically significant, but older individuals are significantly less likely to shop online than younger individuals and single-person households are less likely to shop online than households with multiple adults and no children. The key independent variables of interest consist of the two measures of resources, income and educational levels, and the four motivational variables. Income has no effect on the probability of shopping online, while formal educational qualifications has a strong effect, with the probability of shopping online increasing with the level of educational qualifications. For example, the odds ratio for a bachelor's

Table 2 Results of a logistic regression with online shopping as the dependent variable

Variables in the equation	Exp(B)	S.E.	Sig.
Country ^a	1.183	0.255	0.511
Gender ^b	0.719	0.328	0.314
Age ^c			0.000
<36 years	4.722	0.352	0.000
36–50 years	2.664	0.344	0.004
Income ^d			0.919
<\$39,999	1.083	0.393	0.840
\$40,000–\$59,999	1.305	0.406	0.512
\$60,000–\$79,999	1.263	0.370	0.528
\$80,000–\$99,000	0.927	0.376	0.840
Household ^e			0.021
Multiple adults no children	2.353	0.349	0.014
Adult(s) plus children	2.417	0.342	0.010
Education			0.015
Bachelor's degree	2.063	0.351	0.039
Post graduate degree	2.763	0.351	0.004
Provenance	1.183	0.250	0.501
Product Integrity	2.070	0.261	0.005
Image	0.825	0.233	0.410
Cost minimization	3.384	0.240	0.000
Constant	0.001	1.242	0.000
Model (d.f.=16)	$X^2=92.47$, Sig=0.000		
Nagelkerke R^2	0.29		
Hosmer and Lemeshow test	0.751		
Classification accuracy	70.7		

Items in bold are significant at the 0.05 level

N = 365

^aReference category = Canada

^bReference category = Female

^cReference category = > 50 years

^dReference category = > \$99,000

^eReference category = Single Adult

^fReference category = Certificate/Diploma

Table 3 Principal component analysis of shopping motivations of both online and offline AFNs consumers

	Provenance	Compliance	Image	Cost minimization
Nutritional content	0.060	0.664	-0.033	0.101
Brand	0.090	-0.117	0.662	0.008
Low price	0.085	-0.056	-0.114	0.762
Ease of preparation	-0.148	0.103	0.252	0.616
In season	0.561	0.120	-0.131	0.055
Appearance (of product)	-0.131	0.215	0.709	0.103
Appearance (of package)	-0.039	-0.020	0.743	0.122
Convenience	-0.053	-0.009	0.143	0.743
Grown or produced locally (within 100 km)	0.828	0.156	0.062	-0.037
Grown in state/province	0.818	0.139	0.086	-0.072
Grown or produced by someone you know	0.627	0.034	0.067	-0.048
Organic (certified)	0.431	0.433	-0.093	-0.035
'Natural,' but not certified (e.g. not sprayed)	0.582	0.336	-0.171	-0.001
Fair trade (Made by someone who gets fair wage)	0.497	0.493	-0.121	-0.131
Food safety (e.g. BSE)	0.142	0.718	0.211	0.007
Animal Welfare	0.277	0.678	-0.011	-0.047

Items in bold load onto the same factor. N = 365

degree compared to only a certificate or diploma is 2.06, while the odds ratio for a post-graduate degree is 2.76.

Two motivational factors are positive and statistically significant: Cost Minimization and Compliance. A person who is highly motivated by cost minimization is 3.38 times more likely to be an online shopper compared to a person who is not motivated by cost minimization, while a person who is motivated by Compliance is twice as likely to be an online shopper as a person who is not motivated by compliance factors. In total the logistic regression model tells us that online consumers are more likely than offline consumers to be less than 50 years old, to be highly educated, to live with other adults (with or without children), and to be motivated by concerns around cost minimization and compliance.

Discussion

Consumer motivation

Conventions theory has proven useful for agri-food scholars interested in AFN because it provides a single framework for encapsulating both the dominant food system model, which is focused on markets and industrial processes, and AFNs which promote non-economic concerns for social and environmental processes. For example, Kirwan (2006) and Rosin and Campbell (2009) highlight how domestic and civic conventions are promoted within farmers' markets and organic food sales while still acknowledging that they are operating within a profit-orientated market context. Similarly, the results of this study show that both

online and offline consumers ascribe to a range of motivational factors, some of which are shared across the two groups while others are not, pointing to differences in consumer demand. These differences are important as they not only speak to the different motivations of consumers, but also foreshadow current or potential future differences in how these two food systems operate.

One of the most important areas of similarity identified in this study is consumer enthusiasm for Provenance, which is strongly associated with issues of geographic proximity and *place*, understood as "a 'where' dimension formed by people's relationship with physical settings" (Najafi and Bin Mohd Shariff 2011, p. 187). Using conventions theory, this factor can be related to the domestic world of justification. According to Murdoch, Marsden and Banks (2000, p. 114), this "involve[s] goods which can draw upon attachments to place." This latter point is interesting in that seasonality is included within this factor along with attributes more clearly associated with geographic proximity, such as distance to the place of production. This suggests that both online and offline AFN consumers obtain a connection to place via purchasing produce which is in season in their area. Furthermore, the AFN consumers surveyed also conflated the issue of knowing the grower with other factors associated with geographic Provenance. The fact that there is no difference in the logistic regression between online and offline consumers for Provenance as a motivation is perhaps surprising, given the physical distance between the grower and consumer in online commerce. However, all of the online businesses in this study provided opportunities for consumers to personally meet one another, the vendor and occasionally farmers. This facility may partly explain

online consumer engagement with the factors captured by Provenance.

The regression results also show no significant difference in the level of motivation that online and offline shoppers report for Image, which covers factors relating to branding as well as product and package appearance. This factor can be related to the worlds of *Fame* which holds public renown as the primary marker of worth.

While the above results point to similarities between the online and offline AFN shoppers, two significant motivational difference were observed. Firstly, while online consumers did not exhibit lower financial resources than offline shoppers, our results suggest that the more importance a consumer places on Cost Minimization, the more likely they are to be an online AFN shopper. The Cost Minimization factor is made up of motivations related to low food prices as well as concerns about the ease with which a food item can be procured and then prepared for final consumption. According to Boltanski and Thévenot (2006–1991, p. 43), coordination within the market world “relies on two supports: a common identification of market goods, ... and a common evaluation of these objects in terms of prices”. The identifiable market goods in this study are convenience and a savings in time and effort. Online consumers can save time and effort by doing their food shopping when it is most convenient for them and save time by having their purchases delivered to their home or neighborhood. Thus, while there is no difference in the income of offline and online consumers, online consumers are nonetheless more motivated by time and costs savings than offline consumers.

Yet, while convenience has value in the market world as a tangible product attribute, in the case of online food provision it also comes at a price because the consumer forgoes the ability to inspect items via direct sensory experience prior to purchase. It is understandable therefore that the online respondents are also significantly more motivated than the offline respondents by concerns about Compliance, which has value in the industrial world as it relates to a desire for products which are “functional, reliable [and] operational” (Boltanski and Thévenot 2006–1991, p. 205). For example, while organic farming may not immediately seem relevant to the industrial world of justification, consumers were asked to evaluate the importance of a product being certified organic rather than organic farming methods *per se*. This is significant as the certification process relates to the codification of organic production processes, such that certified organic food becomes a more “reliable” (Boltanski and Thévenot 2006–1991, p. 205) bearer of product attributes. Similarly, Fair Trade products are certified by an external body. While previous research (Ponte and Gibbon 2005) has associated third party certification with efforts at product differentiation and the Market world of justification, the fact that online consumers purchase food without

first inspecting its quality means they must focus on attributes such as reliability and conformity which have value in the industrial world.

In relation to the demographic characteristics of online consumers, the regression results demonstrate that resource-constrained consumers are not more likely to shop online compared with co-located farmers’ markets. No significant differences were found between the two groups in the levels of reported household incomes. However, online consumers have significantly higher levels of educational attainment, meaning their food knowledge and future earning potential could be higher than those of the offline consumers. As such, on the basis of demographic characteristics alone, it would appear that access to online AFNs, like offline AFNs, still requires “significant economic and cultural capital” (Goodman 2009, p. 14).

Conclusions

Using the lens of conventions theory, growth in consumer demand for AFNs can be understood as a purposive attempt to create forms of food provisioning underpinned by notions of quality that go beyond common concerns for price and convenience to include a greater respect for culture, agricultural workers and the environment. However, this turn, or “flight to quality” (Goodman 2009, p. 15), where quality is based on a wider range of interpersonal and environmentally focused concerns, has resulted in higher product prices and less convenient access, such that AFNs have been criticized for lacking accessibility for resource-constrained consumers. The internet, as a highly disruptive force in fields of commerce that depend on the transmission of rich product quality information, has increased demand for niche products by lowering the cost of searching for unique quality attributes. Despite the relevance of this development to AFNs, the potential of internet-enabled commerce to increase consumer access to AFNs has remained an underexplored area of food studies scholarship.

We have addressed this issue by surveying and comparing 365 consumers who either participated in AFNs online, or exclusively offline. We then analyzed data from these two groups of AFN consumers via multivariate statistical techniques and produced results showing that the online AFNs did not attract significantly more AFN consumers with either financial or educational resource constraints. Conversely, online AFNs were found to attract consumers with significantly higher levels of educational attainment, although there was no difference by income. However, we did find that online consumers place higher levels of importance on cost minimization and product compliance as quality attributes. Viewed from the perspective of

conventions theory, these motivational factors have worth in both the market and industrial worlds of justification and have previously been associated with the conventional food system. Nonetheless online consumers, like the offline consumers surveyed, are motivated by quality attributes associated with the Domestic and Civic worlds of justification. Specifically, both sets of consumers value knowing where a food product has come from, who it was produced by and under what conditions it was produced. These results are significant as they suggest that the act of buying food through an online AFN accommodates more utility maximizing quality concepts such as a focus on low product prices and high levels of convenience while maintaining consumer engagement with those broader environmental and social issues associated with AFNs.

These findings have significant implications for managers of AFN retailers who are interested in adopting online practices, either as an extension of an existing business model or to compete with the increasing role of online platforms in food retail. In particular, managers of AFN businesses who venture into the online space must do so with the realization that customers in this environment are likely to place a premium on quality signaling devices such as organic certification. These devices, along with broader attempts to ensure product consistency, are valued by online consumers who must buy products without personal inspection, as they would at a farmers' market or in a bricks and mortar supermarket. However, the prioritization of product consistency and convenience could be more challenging for small farmers and food businesses without the resources to implement costly logistics control systems. Policymakers and regional development professionals therefore have an opportunity to assist these smaller players to take advantage of opportunities for online commerce, for example through educational programs to promote best practice in online food logistics.

Our findings are based solely on survey data and therefore suffer from a number of limitations, both in terms of a lack of qualitative insights and limitations associated with the specific survey methods. The lack of qualitative data limits the depth at which we can understand the lived experience of individual consumers. As such there are opportunities for qualitative research to dig deeper into the different ways that consumers understand food quality, depending on whether it is purchased online or through a face-to-face to exchange.

Furthermore, the results are subject to a number of limitations which inhibit generalization beyond those consumers surveyed and the contexts in which the survey was conducted. Firstly, as response rates could not be accurately calculated, there is a risk that the results are subject to response bias. While the authors did not detect response bias associated with whether or not the respondent had

children, the possibility of other forms of response bias cannot be excluded. Secondly, while there was no difference between respondents from Vancouver, Canada and Melbourne, Australia, observed responses could differ in other locations, particularly in non-urban and less developed contexts. In addition, this study only gathers data from consumers who shop at one particular type of online retail format, despite the fact that the internet now presents a wide and rapidly evolving range of food shopping options, including for local and organic food items. The choice to focus on consumers who shopped via online specialty retailers was made because this model of online provisioning was well established and consumers could purchase equivalent products available via farmers' markets. Investigating the relative accessibility of other forms of online food retailing is an option for future research. Future research could also consider the accessibility of different types of online AFNs relative to conventional food retail formats such as large supermarkets.

References

- Adams, J. 2011. National food plan submission: creating appetites for farmers' markets in Australia. Australian Farmers' market Association. http://www.daff.gov.au/__data/assets/pdf_file/0004/2006869/Australian_Farmers_Markets_Association.pdf. Accessed 15 Nov 2015.
- Allen, P. 2010. Realizing justice in local food systems. *Cambridge Journal of Regions, Economy and Society* 3 (2): 295–308.
- Anderson, C. 2006. *The long tail: Why the future of business is selling less to more*. New York NY: Hyperion.
- Anglim, J. 2007. Cluster analysis and factor analysis. University of Melbourne. <http://web.psych.unimelb.edu.au/jkanglim/03clusterandfactoranalysis.pdf>. Accessed 02 March 2012.
- Biggart, N., and Beamish, T. 2003. The economic sociology of conventions: Habit, custom, practice and routine in market order. *Annual Review of Sociology* 29: 443–464.
- Boltanski, L., and L. Thévenot, 2006–1991. *On justification: Economies of worth*. Princeton MA: Princeton University Press.
- Brunori, G. 2007. Local food and alternative food networks: A communication perspective. *Anthropology of Food* 2: 1–20.
- Brynjolfsson, E., and Smith, M. 2000. Frictionless commerce? A comparison of internet and conventional retailers. *Management Science* 46 (4): 563–584.
- Brynjolfsson, E., Smith, M., and Hu, Y. 2003. Consumer surplus in the digital economy: Estimating the value of increased product variety at online book sellers. *Management Science* 49 (11): 1580–1596.
- Brynjolfsson, E., Hu, Y., and Simester, D. 2011. Goodbye Pareto principle, hello long tail: The effect of search cost on the concentration of sales. *Management Science* 57 (8): 1373–1386.
- Buck, D., Gets, C., and Guthman, J. 1997. From farm to table: The organic vegetable commodity chain in Northern California. *Sociologia Ruralis* 37 (1): 3–20.
- Butler, B., P. Jacqueline, and R. Catherine. 2009. Growing local food systems: Information technology use and impacts in geographically-embedded markets. Proceedings of the 30th international conference on information systems. Paper 92.

- Carson, R. A., Hamel, Z., Giarrocco, K., Baylor, R., and Mathews, L. G. 2016. Buying in: The influence of interactions at farmers' markets. *Agriculture and Human Values* 33 (4): 861–874.
- Choi, J., and Bell, D. 2011. Preference minorities and the internet. *Journal of Marketing Research* 48 (4): 670–682.
- Connell, D. J., Smithers, J., and Joseph, A. 2008. Farmers' markets and the "good food" value chain: A preliminary study. *Local Environment* 13 (3): 169–185.
- Doherty, K. 2006. Mediating critiques of the alternative food movement: Growing power in Milwaukee. Masters thesis. Department of Geography: University of Wisconsin.
- DuPuis, M., and Goodman, D. 2005. Should we go "home" to eat? Towards a reflexive politics of localism. *Journal of Rural Studies* 21 (3): 359–371.
- Dupuy, J.P., Eymard-Duverney, F., Favereau, O., Salais, R., and Thévenot, L. 1989. [Special Edition] Économie des conventions'. *Revue économique* 40 (2): 141–400.
- Economist Intelligence Unit 2011. Global livability rankings. The economist magazine. http://www.eiu.com/site_info.asp?info_names=the_global_liveability_report. Accessed 03 Jan 2015.
- Fonte, M. 2006. Slow food presidia: What do small producers do with big retailers? In *Between the local and the global: Confronting complexity in the contemporary agri-food sector*, eds T. Marsden and J. Murdoch, 203–237. Oxford UK: Elsevier.
- Foodbank Australia. 2013. End hunger report 2013. Foodbank Australia. <http://www.foodbank.org.au/wp-content/uploads/2013/10/Foodbank-End-Hunger-Report-2013.pdf>. Accessed 20 Feb 2016.
- Freyer, B., and Bingen, J. 2015. *Re-thinking organic food and farming in a changing world*. Dordrecht: Springer.
- Goodman, D. 2004. Rural Europe redux? Reflections on alternative agro-food networks and regime change. *Sociologia Ruralis* 4 (1): 3–16.
- Goodman, D. 2009. Place and space in alternative food networks: Connecting production and consumption. Department of Geography, London UK: Kings College. <http://www.kcl.ac.uk/schools/sspp/geography/research/epd/working.html>. Accessed 15 Feb 2014.
- Goodman, M.K., D. Goodman, and M. Redclift. 2010a. Introduction: Situating consumption, space and place. In *Consuming space: Placing consumption in perspective* eds. M.K. Goodman, D. Goodman, and M. Redclift: 3–40. Farnham, Burlington: Ashgate.
- Goodman, M., Maye, D., and Holloway, L. 2010b. Guest editorial: Ethical foodscapes: Premises, promises, and possibilities. *Environment and Planning A* 42 (8): 1782–1796.
- Granatstein, D. 2013. Expanding organic on the landscape: Does farm size matter? Centre for Sustaining Agriculture and Nutritional Resources. <http://csanr.wsu.edu/expanding-organic/>. Accessed 08 August 2016.
- Guthman, J. 2003. Fast food/organic food: Reflexive tastes and the creation of 'yuppie chow. *Social and Cultural Geography* 4 (1): 45–58.
- Guthman, J. 2004. The trouble with organic light: A rejoinder to the conventionalization debate. *Sociologia Ruralis* 44 (3): 301–316.
- Hendrickson, M.K., and Heffernan, W.D. 2002. Opening spaces through relocalization: Locating potential resistance in the weaknesses of the global food system. *Sociologia Ruralis* 42 (4): 347–369.
- Hinrichs, C. 2000. Embeddedness and the local food system: Notes on two types of direct agricultural market. *Journal of Rural Studies* 16 (3): 295–303.
- Hinrichs, C. 2003. The practice and politics of food system localization. *Journal of Rural Studies* 19 (1): 33–45.
- Holloway, L. 2002. Virtual vegetables and adopted sheep: Ethical relations, authenticity and internet-mediated food production technologies. *Area* 34 (1): 70–81.
- Kirwan, J. 2006. The interpersonal world of direct marketing: Examining conventions of quality at UK farmers' markets. *Journal of Rural Studies* 22 (3): 301–312.
- Little, R., Maye, D., and Ilbery, B. 2010. Collective purchase: Moving local and organic foods beyond the niche market. *Environment and Planning A* 42 (8): 1797–1813.
- Lockie, S., and Halpin, D. 2005. The 'conventionalisation' thesis reconsidered: Structural and ideological transformation of Australian organic agriculture. *Sociologia Ruralis* 45 (4): 284–307.
- Manisera, M., van der Kooij, A. J., and Dusseldorp, E. 2010. Identifying the component structure of satisfaction scales by nonlinear principal components analysis. *Quality Technology & Quantitative Management* 7 (2): 97–115.
- Murdoch, J., and Miele, M. 1999. Back to Nature: Changing worlds of production in the food sector. *Sociologia Ruralis* 39 (4): 465–483.
- Murdoch, J., Marsden, T., and Banks, J. 2000. Quality, nature, and embeddedness: Some theoretical considerations in the context of the food sector'. *Economic Geography* 76 (2): 107–125.
- Najafi, M., and Bin Mohd Shariff, M. K. 2011. The concept of place and sense of place in architectural studies. *International Journal of Human and Social Sciences* 6 (3): 187–193.
- Noe, E., and Alroe, H. 2010. Quality, coherence and co-operation: A framework for studying the mediation of qualities in food networks and collective marketing strategies. *International Journal of Sociology of Agriculture, & Food* 18 (1): 12–27.
- Penker, M. 2006. Mapping and measuring the ecological embeddedness of food supply chains. *Geoforum* 37 (3): 368–379.
- Ponte, S. 2016. CT in the Anglophone agro-food literature: Past, present and future. *Journal of Rural Studies* 44: 12–23.
- Ponte, S., and Gibbon, P. 2005. Quality standards, conventions and the governance of global value chains. *Economy and Society* 34 (1): 1–31.
- Porter, M. 2001. Strategy and the internet. *Harvard Business Review* 79 (3): 63–78.
- Raynolds, L.T. 2014. Fairtrade, certification, and labor: Global and local tensions in improving conditions for agricultural workers. *Agriculture and Human Values* 31 (3): 499–511.
- Renting, H., Marsden, T., and Banks, J. 2003. Understanding alternative food networks: Exploring the role of short food supply chains in rural development. *Environment and Planning A* 35 (3): 393–411.
- Rice, J.S. 2015. Privilege and exclusion at the farmers market: Findings from a survey of shoppers. *Agriculture and Human Values* 32 (1): 21–29.
- Rosin, C., and Campbell, H. 2009. Beyond bifurcation: Examining the conventions of organic agriculture in New Zealand. *Journal of Rural Studies* 25 (1): 35–47.
- Sage, C. 2003. Social embeddedness and relations of regard: Alternative "good food" networks in south-west Ireland. *Journal of Rural Studies* 19 (1): 47–60.
- Sanderson, K., M. Gertler, D. Martz, and R. Mahibir. 2005. Farmers' markets in America: A background document. Community-University Institute for Social Research, Saskatoon, CA, http://www.usask.ca/cuisr/docs/pub_doc/economic/FarmersMarket.pdf. Accessed 03 Feb 2014.
- Sedghi, A. 2014. Facebook: 10 years of social networking in numbers. The Guardian, 04 Feb 2014, 4.
- Stark, D. 2000. For a sociology of worth, Columbia University, http://www.coi.columbia.edu/pdf/stark_fsw.pdf. Accessed 4 Oct 2014.
- Storper, M., and Salais, R. 1997. *Worlds of production: The action framework for the economy*. Cambridge, MA: Harvard University Press.
- Stræte, E. 2004. Innovation and changing "worlds of production": Case studies of Norwegian dairies. *European Urban and Regional Studies* 11 (3): 227–241.

- Tarasuk, V., Dachner, N., and Loopstra, R. 2014. Food banks, welfare, and food insecurity in Canada. *British Food Journal* 116 (9): 1405–1417.
- U.S. Dept. of Agriculture. 2014. National count of farmers' market directory listing graph: 1994–2014, USDA Agricultural Marketing Service. <http://www.ams.usda.gov/sites/default/files/media/FarmersMarketDirectoryListing.jpg>. Accessed 18 Nov 2015.
- United States Bureau of Labor Statistics 1999. Food, clothing and shelter see different historical spending patterns, US Bureau of Labor Statistics, US Bureau of Labor Statistics, <http://www.bls.gov/opub/ted/1999/Sept/wk1/art02.htm>. Accessed 19 Feb 2014.
- Venn, L., Kneafsey, M., Holloway, L., Cox, R., Dowler, E., and Tuomainen, H. 2006. Researching European “alternative” food networks: Some methodological considerations. *Area* 38 (3): 248–258.
- Volpentesta, A., and Ammirato, S. 2010. A collaborative network model for agrifood transactions on regional base. *Communication in computer and information science* 112: 319–325.
- Wagner, P. 1999. After justification repertoires of evaluation and the sociology of modernity. *European Journal of Social Theory* 2 (3): 341–357.
- Winter, M. 2003. Embeddedness, the new food economy and defensive localism. *Journal of Rural Studies* 19 (1): 23–32.
- Wolf, M., Spittler, A., and Ahern, J. 2005. A profile of farmers' market consumers and perceived advantages of food sold at farmers' markets. *Journal of Food Distribution Research* 36 (1): 192–201.
- Zepeda, L., and Nie, C. 2012. What are the odds of being an organic or local food shopper? Multivariate analysis of US food shopper lifestyle segments. *Agriculture and Human Values* 29 (4): 467–480.

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