Health and Place 53 (2018) 155–163

Contents lists available at ScienceDirect

Health & Place

journal homepage: www.elsevier.com/locate/healthplace

People and places shaping food procurement among recipients of Supplemental Nutrition Assistance Program (SNAP)

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ARTICLE INFO

Keywords:
Food access
Food environment
Social networks
Supplemental Nutrition Assistance Program
Food retail
Food security

ABSTRACT

A key gap in existing food environment research is a more complex understanding of the interplay between physical and social contexts, including the influence of social networks on food habits. This mixed methods research examined the nature of social connections at food procurement places among a sample of 30 people receiving Supplemental Nutrition Assistance Program (SNAP) benefits in an urban setting. Results highlight the significance of social connections as motivators to use food places, the value of access to information and other resources at food places, and the role of weak ties with actors within food places to facilitate utilization and interaction. Social connections at the varied places individuals procure food may be leveraged to disseminate information and resources to further healthy food access.

1. Introduction

Food and nutrition are understood as embedded within socio-cultural traditions of households and communities (Counihan, 1999; Delormier et al., 2009; Story et al., 2008). While socio-cultural traditions are often invoked in relation to food preparation and consumption, the sociality of food procurement is often overlooked. We use the term food procurement to describe the acquisition of food at both retail and non-retail (e.g., emergency food assistance) locations. There is an emerging body of research aimed at understanding how physical environments shape procurement, however, less attention has been paid to the impact of social environments on food procurement behaviors (Caspi et al., 2012; Walker et al., 2010). Research suggests food procurement is interwoven with social roles, relationships, status, and needs (Munoz-Plaza et al., 2013), yet few studies examine the complexity of these social factors (Nam et al., 2015). To address this gap, we examined social relationships that exist between people at food procurement places among a sample of parents and caregivers receiving Supplemental Nutrition Assistance Program (SNAP) benefits.

Our focus on food procurement aligns with public health strategies aimed at promoting healthy diets. Poor diet quality is a primary risk factor for some chronic diseases (Boeing et al., 2012; Murray et al., 2013; Willett and Stampfer, 2013). Low-income Americans (Wang et al., 2014) and minority populations experience greater inequities related to diet quality and chronic disease and these disparities are particularly high for African American women (Flegal et al., 2010). Our focus on SNAP recipients aligns with emerging research centered on this sub-group of low-income consumers for three reasons: 1) they suffer worse diet quality compared to income eligible non-participants (Leung et al., 2013, 2012), 2) the mode of payment with SNAP benefits influences where SNAP benefits can be utilized (Jones and Bhatia, 2011; Zenk et al., 2011), and 3) the mode of payment also influences interactions within food procurement establishments (Haynes-Maslow et al., 2015). We focused on parents and caregivers because this group represents the largest sub-group of SNAP recipients. In 2015, the year of data collection for the present study, 43% of SNAP recipients were families with children (U.S. Department of Agriculture, 2016). Moreover, shopping habits of families with children have unique constraints influencing procurement ranging from time costs to taste preferences (Skinner et al., 2002). Additionally, food procurement for families with children has an impact on multiple people (i.e., adults and children in the household).

A key community-level strategy to improve diet quality is to increase access to healthy food in neighborhoods through changes to the

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https://doi.org/10.1016/j.healthplace.2018.08.003
Received 16 March 2018; Received in revised form 30 July 2018; Accepted 3 August 2018
Available online 22 August 2018
1353-8292/

physical food environment. The development of supermarkets or farmers' markets in areas where access to healthy foods is limited (i.e., food deserts) are examples of strategies to improve the physical food environment (Centers for Disease Control and Prevention, 2011; U.S. Department of Agriculture, 2013). The assumption is that proximity to healthy food procurement options will contribute to healthier eating. However, research has found conflicting results regarding the impact of these strategies on consumer behavior. For instance, two separate studies found opening a supermarket in food desert neighborhoods resulted in limited changes in food procurement behaviors or diet (Cummins et al., 2005; Dubowitz et al., 2015). However, a few farmers' market intervention studies demonstrate modest dietary improvements (Evans et al., 2012; Freedman et al., 2013a).

There is growing interest in examining social interactions that occur at food procurement places in addition to physical factors such as proximity (Hillier et al., 2011; Travers, 1996). The sociality of food procurement is recognized as a common motivator for consumers' shopping behaviors (Arnold and Reynolds, 2003; Cicatiello et al., 2015; Rintamäki et al., 2006). Research by Cannuscio et al. (2014) on social dynamics of shopping behaviors suggests people choose to shop at stores frequented by people of similar race, ethnicity, income, and education, and where they had positive interactions with personnel and proprietors. Much of this type of research is focused on farmers' markets as spaces that promote meaningful social interaction (Carson et al., 2016; Cicatiello et al., 2015; Sommer et al., 1981) and how the exchange of information can influence food behaviors. Sommer et al. (1981) showed the number of social and informative interactions (those that require an involvement of both parties) were higher at farmers' markets than supermarkets. Cicatiello et al. (2015), when comparing supermarkets, green grocers, and farmers' markets, found that interactions occurring at famers' markets were more likely to foster social exchanges among strangers. Carson et al. (2016) examined types of interactions occurring at farmers' markets between consumers and vendors including purely social and interactions that included information exchange. Interactions that were informational in nature were most influential and, depending on their intensity, were more likely to result in transformative learning (Carson et al., 2016).

Very few studies that are focused on the social dimensions of the food environment have been grounded in concepts from social network theory (Alia et al., 2014). This is a gap because social network theory provides a useful framework for understanding the social processes underlying food procurement, allowing researchers to examine patterns of relationships that exist among people in a social space, such as a grocery store or food pantry (Scott, 2017). In these food procurement places, family, friends, and acquaintances (*alters*) can influence the targeted individual's (*ego*) behavior. The intensity of connections, whether weak or strong, between social network members also holds implications for food-related decision making (Fonseca-Becker and Valente, 2006; Wutich and McCarty, 2008). Stronger ties between egos and alters are characterized by intimate, frequent contact, and include reciprocal obligations (Lin, 2001). Ties with people such as friends, partners, and other family members have been found to guide food-related decisions such as infant feeding practices (Wutich and McCarty, 2008) and adult and adolescent eating behaviors (Fletcher et al., 2011; Pachucki et al., 2011). Weaker ties are those found between individuals who are loosely connected and often hold memberships to different social groups such as between a store cashier and a customer. An individual's chances of gaining new information or accessing different resources are enhanced if the ego reaches out to alters with whom weaker ties exist (Granovetter, 1973). Trustworthiness or personal trust between egos and alters is also a relevant social network concept. Trust is seen as mediating the influence of social relations (Buskens, 2002; Cook, 2005). For example, trusting relationships built up through repeated personal contact were prioritized by farmers' market consumers above produce quality factors such as organic certification (Moore, 2006).

Building on social network theory and emerging research illuminating the role of social networks in diet-related decision-making, the goal of this mixed methods research was to explore social interactions within different types of food procurement places and to examine how these interactions influence perceptions of these places. Specific research questions include: 1) What are the main food procurement places, 2) To what extent do participants have social connections within food procurement places, 3) What is the nature of social connections at these places, 4) What are participant's perceptions of social interactions at their main food procurement places?

2. Methods

2.1. Study context

Data collection occurred between November 2015 and March 2016 in Cleveland and East Cleveland, Ohio, adjacent municipalities with roughly 400,000 residents and a high proportion of low-income census tracts. The majority of residents in Cleveland (53.3%) and East Cleveland (93.2%) were African American and more than one third of the households receive SNAP (US Census Bureau, 2015). The majority of census tracts in these cities have low access to full-service supermarkets (U.S. Department of Agriculture, 2016) and higher access to farmers' markets (3.3 markets per 100,000 residents) compared with state and national trends (2.3 and 2.5 per 100,000 residents, respectively) (Centers for Disease Control and Prevention, 2013).

The present research is part of an ongoing mixed methods dissemination and implementation study called FreshLink that aims to improve the reach, adoption, and impact of farmers' markets among recipients of SNAP using a peer-to-peer outreach approach. Two formative studies were conducted to guide the development of the intervention including a cross-sectional survey with findings previously published (Flocke et al., 2017; Freedman et al., 2017) and in-depth social network mapping interviews that are the focus of the present analysis. Interviews were conducted to explore constraints and facilitators influencing food habits to identify factors that may support integration of a farmers' market within overall food shopping routines.

2.2. Sampling and recruitment

We recruited 30 parents/caregivers into the present study from a sample of 224 who participated in a prior survey and consented to be followed-up for future project-related studies. The goal was to reach theoretical saturation of emerging themes and have a sample size including at least 10% of the survey sample. Eligibility criteria included that participants: were 18 years of age or older, had children 18 years of age or younger in their home, had received SNAP during the past 12 months, were responsible for at least some household food procurement, and spoke English or Spanish. Per the sampling frame of the survey study, all participants lived within a mile of a farmer's market and within census tracts where at least 30% of the population received SNAP.

We relied on information from the survey to purposively select participants based on several theoretically meaningful indicators to inform our peer-to-peer outreach approach. Theoretically relevant factors included: social network size, working or student status, and experiences with farmers' market shopping. For social network size, we reviewed responses to the following survey question: Among the people close to you in Cleveland, how many are currently receiving EBT/Ohio directions? We identified three categories of network size: 18+, 5–17, and less than 4. We also selected people based on their work or student status because those working or studying outside of the home may have more opportunities to interact with more people. Given that the end goal of our formative research was to develop a farmers' market specific outreach model, another theoretically relevant dimension for our sampling approach was farmers' market shopping experiences. Based

on survey responses, we identified three categories of farmers' market shopping patterns including: never, not in the past year or 1–2 times, 3+ times in past year. Seventy-two people were invited to take part and 45 of these could be reached by phone or mail for recruitment, 36 expressed interest in the study, and 30 consented to participate. Case Western Reserve University Institutional Review Board approved this study and all participants provided written informed consent.

2.3. Data collection procedures

Data collection consisted of participatory social network mapping and semi-structured interviews, which took place simultaneously. Two trained researchers conducted each interview, which lasted an average of 1.5 h. Per the participant's preference, interviews took place at their home or in a private room at a public space. Participants received a $40 supermarket gift certificate to reimburse their time and effort. All interviews were audio-recorded. A contracted professional transcribed the recordings verbatim, and two research staff evaluated each transcript for accuracy. One interview was conducted in Spanish, the preferred language of the participant. A member of the research team fluent in Spanish conducted, transcribed, and translated this interview.

2.3.1. Participatory social network mapping

The participatory social network mapping data are quantitative and involved the recording of social networks related to personal food habits. A personal network is a social network perceived from the perspective of the participant (ego) and encompasses social ties to people (alters) or other types of non-human actors (e.g., stores, organizations) (Borgatti et al., 2013). Participants were guided through a structured interview process to identify people, places, and their relationships related to three aspects of a food habit: food procurement ("where you get your food"), food preparation ("who you make food with and for"), and food consumption ("who you eat food with"). This paper only includes data surrounding food procurement, which first asked participants to list all places where they typically get food. Then, participants listed the people (alters) involved with food procurement including people they get food for, people who get food for them, and people they know who work at places frequented (Table 1). For each alter listed, participants reported attribute data including demographics, relationship to alter, and whether egos and alters shared information about food. In this paper we focus on data regarding alters who worked at places frequented.

2.3.2. Semi-structured interviews

Semi-structured interviews examined participants' typical food procurement patterns. Questions focused on where participants chose to shop (or opted not to shop), their experiences in those places, and why they made their decisions regarding food procurement. Participants were asked about their relationships with staff, what type of information they received, and whether this information influenced their food procurement choices (Table 1).

2.4. Data analysis

2.4.1. Participatory social network mapping

Social network data were analyzed by calculating frequencies for the number of alters, alter characteristics including relationship type (acquaintance, friend, or family) and nature of relationship (purely social, information exchange, or material exchange defined below), and frequency of procurement at places. Two-mode social network analysis (Everett and Borgatti, 2012) was used for visualization of the ties between places and participants. This affiliation network is composed of two sets of nodes: 1) the egos who participated in the interview, and 2) the food procurement places they frequent. Food procurement places were categorized into 10 types including: 1) food pantry, 2) convenience store, 3) dollar store, 4) specialty store, 5) farmers' market, 6) small grocer, 7) discount store, 8) supermarket, 9) supercenter, and 10) warehouse store. A tie between a participant and a procurement place means the participant reported going there in the past 12 months (Fig. 1). The number of alters that egos described at each food procurement place were examined as an attribute of this affiliation network. Alters are either individuals or groups (e.g., "workers at store"). We derived a two-mode network centrality measure to identify the central food procurement store types in the network. Degree centrality is defined as the number of egos that attend a food procurement place and it is expressed from 0 to 1 with a higher number indicating greater centrality. Social network analysis and visualization were conducted using UCINET version 6.587 (Borgatti et al., 2002) and NetDraw version 2.155 (Borgatti, 2002).

Table 1
Interview questions relating to food procurement.

Please list all the places where you normally go to get food for your household? Which location (cross streets, neighborhood)?
a. How often do you go to [insert place name]?
b. How do you go to and from [insert place name]?
c. Why do you go to [insert place name]? What do you get there?
d. Are there people at [insert place name] that you know, such as the cashier, the owner, a volunteer, a vendor? [IF YES, ASK THE FOLLOWING]
i. How are you connected to [insert person name/role]? Do you see them outside of [insert place name]?
ii. Is [insert person name/role] a family member or friend or someone you consider an acquaintance?
Which of these is your favorite place to get food for your household?
a. Can you tell me about why you like [insert place name]?
b. In general, what do you think makes somewhere a good place to get food?
What is your least favorite place to get food for your household? This place does not have to be one of the places you go to get food.
a. Can you tell me about why you don't like this place?
b. In general, what makes somewhere a bad place to get food?
Tell me about a time when you had a bad experience getting food. What happened?
Are there any other places that are not on your map where you go to get food? This would include places that you go only at certain times of the year?
When in season, do you ever get food from a farmer's market or a farm stand? Why or why not? Are there reasons why you don't? What seasons do you normally go?
a. Has anyone ever invited you to go to a farmers' market? If so, who?
b. Have you ever invited anyone to go to a farmers' market? If so, who?
Looking at the places on your map, which of these places are the main ones you go to for food in a typical month?

2.4.2. Semi-structured interviews

We employed a grounded theory approach (Strauss and Corbin, 1997) to analyze interview data, including inductive and deductive analyses (Charmaz, 2001). We used three deductively derived themes adapted from Sommer et al. (1981) to analyze social interactions with staff at food procurement places. *Purely social* refers to social interactions not related to food procurement; *Information exchange* refers to information exchanged related to food procurement, which may include information about current bargains or food preparation. *Material exchange* refers to material benefits received through a relationship with staff, such as setting aside sale items or price reductions for repeat customers. Inductive analysis focused on perceptions of social interactions at food procurement places. Two researchers read interview transcripts line-by-line to record and inductively derive in-vivo codes for each relevant section of text in the transcript. During analysis, emergent themes were discussed and refined by four members of the research team. Deductive coding linked in-vivo codes to the a priori themes described above. Inductive coding linked in-vivo codes to emergent concepts. Coders discussed any discrepancies in assignment of in-vivo codes to themes and sub-themes until reaching agreement. ATLAS.ti (2013 version 7.1) software was used to manage and organize coding.

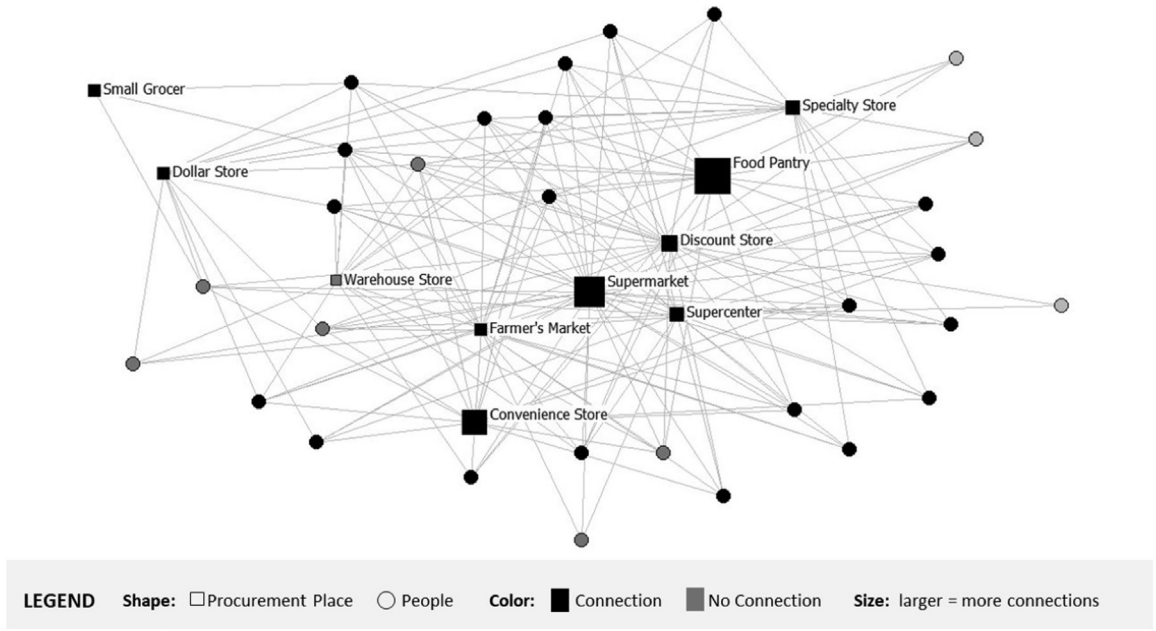

Fig. 1. Food Procurement affiliation network map. This map shows ego's connection to food procurement place types. Boxes represent food procurement place types (N = 10) and circles represent egos (N = 30). The size of the box nodes indicates the number of alters known by egos at each food procurement place type. More alters were named at food pantry, indicated by a bigger box. Convenience stores and supermarkets are also places where more alters were named by participants. The color black represents at least one connection with a staff member at a food procurement place. The color grey represents no connection is held at a food procurement place. Participants held no social connections at a warehouse store. Nine participants held no social connections at any of the stores they frequented.

3. Results

3.1. Description of study sample

The majority of the 30 interview participants were African American (77%); the remaining were Caucasian (n = 4; 13%) and Latina (n = 3; 10%). All but one participant were women and 73% were not currently employed for wages. Half reported an annual income of less than $10,000/year and 30% had not completed high school. The average age was 36 (ranging from 25 to 59 years old). On average, participants had three children living in their household (range 1–8) (Table 2).

Table 2
Characteristics of Supplemental Nutrition Assistance Program participants in Cleveland and East Cleveland (N = 30).

Continuous variables	**Median**	**(min, max)**
Age (y)	36	25–59
Number of children in the home	3	1–8
Categorical variables	**N**	**%**
SNAP social network size		
Small (0–4)	10	33.3
Medium (5–17)	10	33.3
Large (18+)	10	33.3
Farmers' market shopping		
Never	9	30.0
Not in the past year OR 1–2 times/past year	9	30.0
3+ times/past year	12	40.0
Gender		
Female	29	96.7
Male	1	3.3
Race/Ethnicity		
Black	23	76.7
White	4	13.3
Latina	3	10.0
Education level		
≤ Some high school	9	30.0
High school graduate	12	40.0
College or more	9	30.0
Employment status		
Employed/Student	8	26.7
Not employed	22	73.3
Income		
Less than $10,000 per year	15	50.0
More than $10,000 per year	15	50.0

3.2. Food procurement patterns, type and nature of social interactions

3.2.1. Type and frequency of food procurement places

Findings indicate that participants shopped at a variety of food procurement places (Table 3). On average, participants reported shopping at 6.3 distinct procurement place types (range 5–9) over the past 12 months. The most common places included discount stores (n = 29; 97% of the sample), supermarkets (n = 27; 90%), farmers' markets (n = 20; 67%), supercenters (n = 20; 67%), and food pantries (n = 18, 60%). Less common places included specialty stores like meat markets (n = 16; 53%), warehouse stores (n = 15; 50%), convenience stores (n = 14; 47%), and small grocers (n = 3; 10%). Most procurement places were frequented at least once a month with the exception of farmers' markets and small grocers, which were frequented on average every two months. While less than half of the participants went to convenience stores, those (47%) shopping here went frequently (about once every three days). Supermarkets were the next most frequently visited procurement place (about twice a month).

3.2.2. Type and nature of social connections

Findings highlight the social nature of food procurement (Table 3). Twenty-one participants (70%) indicated knowing at least one person at one or more food procurement place types. Social connections with alters were highest at food pantries (n = 10) and supermarkets (n = 10). We found the participants were most connected with alters at convenience stores (64% of egos knew an alter) and food pantries (56%) and least connected at discount stores (10%), farmers' markets (10%), and dollar stores (8%) (Table 3).

Findings suggest considerable variation with respect to the type (e.g., family) and nature (e.g. purely social) of relationships with alters

Table 3
Number of food procurement places types, average frequency of attending per participant (N = 30), and number and percentage of alters known at each food procurement place type.

	Participants who use food procurement type, n	Degree centrality[a]	Frequency of shopping per 30 days (mean)	Participants who know an alter, n (%),
Overall, for all types	30		2.0 (Mean 1.2)	21 (70)
By Type				
Discount Store	29	0.9	1.4	3 (10)
Supermarket	27	0.9	2.0	10 (37)
Supercenter	20	0.7	1.4	3 (15)
Farmer's Market	20	0.7	0.5	2 (10)
Food Pantry	18	0.6	1	10 (56)
Specialty Store	16	0.5	1	3 (19)
Warehouse Store	15	0.5	1	–
Convenience Store	14	0.5	10	9 (64)
Dollar Store	12	0.4	1.4	1 (8)
Small Grocer	3	0.1	0.5	1 (33)

[a] Degree centrality is a social network measure indicating the number of egos that attend a food procurement place and it is expressed from 0 to 1 with a higher number indicating greater centrality.

(see Table 4). The majority (70%; n = 43) of alters named were identified by participants as acquaintances. Few were identified by egos as friends (16%) or family (13%). The most common relationship experience with alters was purely social accounting for 54% of the relationships, while 31% were focused on information exchange, and 15% on material exchange. Participants reported that 85% of alters shared their race/ethnicity.

3.3. Nature of social connections and perceptions of interactions at main food procurement places

Our next analysis is focused on six of food procurement places used by the majority (> 60%) of the participants and also included places where > 60% of the participants reported a connection to an alter. These criteria allowed us to examine the most frequented places in addition to the places where participants held more social connections. These six main food procurement places included supermarket, discount store, farmers' market, supercenter, food pantry, and convenience store. The following describes three themes related to the nature of social connections at these six places, and themes that emerged relating to participants' perceptions of social interactions at each. Pseudonyms are used for egos (participants) and named alters.

3.3.1. Nature of social connections

3.3.1.1. Purely social connections. We found evidence of purely social relationships, those not related to food, at all six main food procurement places. Some were linked to how often the ego went to the place: *"well I know them now because I've been going there for two years… You just know them because you go there every day*." (Ego: Kate 38-year old white woman, Alter: workers at convenience store). Other purely social relationships included participants' friends or family who worked at the food procurement place. For example, a participant described an alter as "*…just somebody I went to school with. I just happened to see her [at the discount store], and like 'oh you work here'."* (Ego: Thea 31-year old black woman, Alter: friend who works at discount store). Emma described purely social relationships at a supercenter as follows: "*like people I'll just say hi to because I went to school with them or just know them from the neighborhood*." (25-year old black woman).

3.3.1.2. Information exchange connections. Information exchange relationships with alters occurred at all six main food procurement places. As exemplified below, these information exchanges focused on deals, new food items and food preparation instructions:

> "well, because we talk all the time, they shared information with me. …[like] you should come here 'cause we got a sale on this and we got a sale on that, and you can come get a case of chicken wings from here because it's cheaper over here than over there', you know this, that, and the other, but, I mean normal stuff, prices." (Ego: Thea 31-year old black woman, Alter: cousin who works at supermarket)

> "…[a friend] usually tells people or tells me, you know, like if they're getting different stuff in the store, like if they're getting like a new product of the, like different foods or something then she lets us know that she's getting something that comes in." (Ego: Cindy 36-year old white woman, Alter: friend who works at convenience store)

> "Oh yeah, they try to get you to eat squash at the [food pantry] … They tell you how to cook it and how to eat it." (Ego: Ronda 36-year old black woman, Alter: volunteers at food pantry)

Some participants also shared negative experiences with information sharing. For example, Ron felt the staff at a particular supermarket were "*…snotty. I tried to ask them twice for a certain thing and I had to just stand there waiting for them to get back and it takes them 20 min to just get*

Table 4
Characteristics and nature of relationships with alters at food procurement place.

	Total number of alters named by egos	Ego's relationship with alter[a]			Nature of ego's relationship with alter[b]		
		Acquaintance	Friend	Family	Purely social	Information exchange	Material exchange
Total, for all types	61	43 (70)	10 (16)	8 (13)	33 (54)	19 (31)	9 (15)
Food Pantry	20	17 (85)	2 (10)	1 (5)	10 (50)	6 (30)	4 (20)
Supermarket	16	9 (56)	–	7 (44)	9 (56)	5 (31)	2 (13)
Convenience Store	11	9 (82)	2 (18)	–	7 (64)	3 (27)	1 (9)
Discount Store	4	2 (50)	2 (50)	–	3 (75)	1 (25)	–
Supercenter	3	2 (67)	1 (33)	–	1 (33)	2 (67)	–
Specialty Store	3	3 (100)	–	–	1 (33)	2 (67)	–
Farmers' Market	2	1 (50)	1 (50)	–	1 (50)	–	1 (50)
Dollar Store	1	1 (100)	–	–	1 (100)	–	–
Small Grocer	1	–	1 (100)	–	–	–	1 (100)
Warehouse Store	–	–	–	–	–	–	–

[a] Ego's relationship with alter was defined as whether participants self-identified alters as family, friends, or acquaintances.
[b] The nature of ego's relationship with alter include: 1) *purely social* defined as social interactions not related to food procurement 2) *information exchange* defined as information exchanged related to food procurement and 3) *material exchange* defined as ties with alters that were related to material benefits.

back to me… 'oh I'm sorry we don't have it.'" (Ego: Ron, 34-year old white man)

Kayla also discussed a negative experience with a cashier who lacked knowledge regarding the use of SNAP benefits at a store as follows:

> "I was out with my friend… we would go out places like far out [indicating suburbs]. …and of course I have an EBT [electronic benefits transfer] card, so the lady at the register…, she was like, 'Oh, what is that?' and I was like, 'Oh, you know, it's EBT. Do you accept it?' She was like, 'Oh, I think maybe so,' and she just yelled it all across the room to the manager, 'Do we accept, um, food stamps? …" (Ego: Kayla 37-year old black woman)

Kayla went on to state that this negative experience with information regarding EBT use stayed with her and influences where she chooses (or opts not) to get food because, as she said, "*…it made me feel out of place.*" (Ego: Kayla 37-year old black woman).

3.3.1.3. Material exchange connections. Material exchange relationships occurred with alters at all main food procurement places except discount stores. Examples of material exchange relationships included gifting food items and giving extra food at food pantries for large families or for redistribution to neighbors in need. The following quotes exemplify these relationships:

> "…I don't have to pay for them, no, he [farm owner] just gives like if he slaughters a cow um he'll give me [cuts of meat]…. He didn't think I had a turkey for Thanksgiving and decided to give me a turkey." (Ego: Ramona 37-year old black woman, Alter: friend who owns a farm).

> "…they know I'll share [food received at food pantry] with the older lady that's across the street so she [food pantry volunteer] give me like a crate of each vegetable or whatever that they have [to share with others]." (Ego: Olivia 32-year old Latina woman, Alter: volunteers at food pantry).

3.3.2. Perceptions of social interactions at food procurement places

3.3.2.1. Sociality of food spaces. Several participants contrasted positive and negative interactions with alters at food procurement places. For example, participants recognized that not all convenience stores offered the same opportunities for social connection. One participant discussed that even though there are three different gas stations near her house she prefers one in particular because:

> "I love the people there…. They're so friendly and lovable and down to earth. I can joke, I can mess with people. I've even had them singing [and] taking a selfie singing with me…" (Ego: Ramona 37-year old black woman, Alter: workers at a convenience store).

Participants generally described the social space at food pantries in a positive light. However, a few participants identified both positive and negative interactions with staff or volunteers at food pantries through statements such as the pantry staff are "*smiling*" and saying things like "*have a good day*" while other staff were described as being "*old biddies*" who were "*grouchy and mean*" and "*just don't want to be bothered.*"

One participant discussed her perception that there's a lack of emphasis on customer service at discount stores as follows:

> "…they got a bunch of people working there that don't want to be there [discount store]. A lot of the times the … employees don't have no knowledge of the store. You know, you ask them where something is and they say 'I don't know. That isn't my department'." (Ego: Ramona, 37-year old black woman, Alter: no alter named).

While only two alters were actually named by participants who shopped at farmers' markets, several participants described them as spaces that offered a positive atmosphere and as spaces for social interactions. Jayla described her relationship to vendors at farmers' markets as follows: "*I mean they're [vendors] all pretty friendly. I mean I don't know anyone like, to talk to a person, but they probably know us…"* (Ego: Jayla 31-year old black woman, Alter: no alter named). Responding to the question of why she chose to go to a farmers' market, Gloria stated: *"[I go] mainly [because of] the people. I just love people that come to farmers' markets. Everybody's smiling and talking…"* (Ego: Gloria 40-year old black woman, Alter: no alter named).

3.3.2.2. Trustworthy relationships. Participants expressed varying levels of trustworthiness of alters related to food procurement. Food pantry staff were generally considered trustworthy and represented people with whom deeper personal information such as social service needs was revealed. In comparison to other food procurement places, relationships at food pantries often included exchanges that went beyond food procurement to include provision of information about community events and services such as "*clothes giveaways*" or places to go "*…if you need help with mental health*" or "*help to get a job*" (Ego: Ava 58-year old black woman, Alters: Pastor and volunteers at food pantry). Participants such as Kate discussed feeling that food pantry staff were trustworthy resources for providing assistance in times of need such as holidays:

> "…[T]hey know, they try to help people out as much as possible. So they share everything they find out and they help out with a lot of stuff. Like during the holidays they'll give you a free turkey or ham or help with Christmas dinner and all that." (Ego: Kate 38-year old white woman, Alter: staff/volunteers at food pantry).

Trustworthiness with vendors at farmers' markets was centered around perceptions that vendors were valuable sources for actionable information about fruits and vegetables. This was noted even though participants never once mentioned the name of a specific vendor as an alter during the social network mapping exercise. Weak ties at farmers' markets, such as the relationship between Marnie and vendors, were trusted channels of communications for insights about produce:

> "They [vendors] have about the best knowledge of the fruits and vegetables, like different varieties, things like that…like I've asked if there was a fruit or something that I wasn't familiar with, I've asked them, even though I didn't purchase it, but it was kind of like, oh okay. Just to know what kind of fruit it was….it was good to know. Learn something new… like avocados." (Ego: Marnie 30-year old black woman, Alter: farmers' market vendor)

Similarly, Nancy discussed how information received from a vendor at a farmers' market led to incorporating a new food item into her family's eating habits:

> "…I've gotten a lot of good resources and information just by talking to vendors at the farmers' markets. That's been really cool especially about preparation and I mean we've had some… Do you know what a ground cherry is? They've got like a, like a soft sheath over them and they're a berry and you peel…anyway there's a vendor there, my husband brought home this basket and I'm like 'what is this?' He's like 'these are ground cherries.' What?! They became like the rage at the house because they're super sweet and yummy, you know?" (Ego: Nancy 37-year old white woman, Alter: farmers' market vendor).

Trustworthiness of alters was also observed at supermarkets. Participants mentioned confidence that staff at supermarkets would provide privileged information to help participants overcome price obstacles. Olivia discussed shopping around the work schedules of trusted alters:

> "I have my person I go to at the meat and deli sections, they take care of me. … I know their schedules, and only go on the days they

work. … If that steak is on sale … if it's three dollars cheaper a pound than that one, I'm going for what she said is on sale." (Ego: Olivia 32-year old Latina woman, Alter: deli and meat counter workers at supermarket).

4. Discussion

This study offers novel insights into the nature of social connections at main food procurement places among a sample of SNAP recipients. Findings from this study show that a variety of interactions unfold during food procurement and that these social connections, or lack thereof, should be considered when thinking about ways to improve social access to healthy foods. Three key findings include: 1) purely social connections motivate people to use food procurement spaces, 2) people value opportunities to receive information and access other resources in connection to food procurement, and 3) people view farmers' markets as a social space and place for gaining information regarding new food items, even though few social connections were identified in this space.

4.1. Importance of purely social connections

Among this sample, the majority of ties were identified as purely social connections (54% of 61 alters named) that developed as result of frequent store attendance or connections with friends and family who work or volunteer at a food procurement place. Findings show people may choose to procure food at specific places where they can experience positive social interactions. For example, given a variety of similar options, Ramona chooses to go to a store where people are "*friendly*," "*lovable*," and "*down to earth*," and with whom she shares jokes and sings. Others indicated they stayed away from places where they felt people are "*grouchy and mean*." Prior research illuminated the sociality of food shopping experiences as a motivator for consumers' shopping behaviors, emphasizing the need to look more closely at the hedonic aspects of shopping (Cicatiello et al., 2015; Larchet, 2014). Social connection is increasingly recognized as a driver of shoppers' satisfaction (Arnold and Reynolds, 2003; Rintamäki et al., 2006).

4.2. Information exchange is important

Our findings suggest information exchange at food procurement places impacts this sample of SNAP recipients in several ways. Firstly, receiving information builds social connections between shoppers and staff. Receiving information about sales, how to prepare food, or where to get other resources creates an environment that motivates a return visit. Thea mentioned talking to employees at the grocery store "all the time" and receiving information from them, demonstrating frequent use of a grocery store wherein social relationships are present. These connections can be classified as *routine support* and create a sense of *belongingness*, both of which are considered positive social supports (Lin et al., 1999). Secondly, negative experiences when trying to get information will deter people from shopping at that place in the future. Similar to previous research (Cannuscio et al., 2014), we found participants minimized shopping at places where they had negative social interactions. Participants who reported bad social experiences such as stigmatization or poor customer service did not want to return to these stores. The findings of this study extend prior research on the sociality of food shopping (Cannuscio et al., 2014; Munoz-Plaza et al., 2013; Zenk et al., 2011) by offering new insights into the ways in which information exchange, in particular, builds social ties within food procurement spaces. In addition, this study shows that people value opportunities to receive information in connection to food procurement.

4.3. Leveraging social connections within specific food spaces

Findings highlight the range of food stores used by people receiving SNAP falsifying myths or stereotypes that someone who gets food from a food pantry or convenience store would not also shop at a farmers' market. Our findings point to the importance of both purely social connections and information exchange in relationship to people's satisfaction with the experience of obtaining food. Of the food procurement places frequented by participants – convenience stores, food pantries, and supermarkets – stand out as places where people identified more social connections. Farmers' markets, on the other hand, were described as informative spaces where people are "*friendly*" and "*smiling*" and are knowledgeable about "*fruits and vegetables*," "*varieties*," and "*[food] preparation*."

Given the positive outlook on the social space of farmers' markets, we expected more participants to name vendors or alters they knew. However, very few participants were able to name alters connected to farmers' markets. Literature examining the social space of farmers' markets is mixed. Alia et al. (2014) found farmers' markets are spaces that can facilitate the development of social ties providing opportunities for capitalizing on the strength of weak ties among actors in a social network, a concept supported by other research (Morales, 2011; Walker et al., 2007). Others found social barriers to farmers' market use (Larchet, 2014; Slocum, 2008; Tach and Amorim, 2015). In a systematic review of literature relating to farmers' market use, Freedman et al. (2016) found differences in the social benefits of farmers' markets by economic status of customers. In contrast to studies that included low-income populations, those including higher-income populations reported greater levels of social benefits from farmers' market use such as camaraderie, social interaction with farmers and customers, and a sense that the farmers' markets served as an alternative social space for engagement (Freedman et al., 2016). Our findings confer with others that suggest while farmers' markets are social spaces, the ability to build connections in this social space might be tempered by a lack of sociocultural diversity (Alkon and McCullen, 2011).

In contrast to farmers' markets, convenience stores stood out as spaces where the participants identified most connections as acquaintances and where these connections were described as purely social. This finding is consistent with literature that presents convenience stores as sites of community interaction in low-income neighborhoods that are otherwise lacking in public gathering spaces (Larchet, 2014). Interventions to increase access to and use of healthy food retailers such as farmers' markets could focus on finding ways to re-create social connections and ties such as those that are indigenous at convenience stores to further capitalize on the social space of farmers' markets. Such connections could facilitate the acquisition of resources among populations with limited access to healthy foods (Alia et al., 2014; Walker et al., 2007). Likewise, initiatives aimed at increasing the availability of nutritious food at convenience stores could leverage these social connections to promote the purchase and consumption of healthier food options (Romano et al., 2017).

Our findings are in line with research that highlights the importance of trust in consumer vendor relationships (Moore, 2006; Rheinländer et al., 2008). For example, in Ghana consumers navigated mistrust of the hygienic safety of street food by establishing trusted relationships with known vendors (Rheinländer et al., 2008). Our findings include several examples of trusting interactions. Participants' trust in the "*best*" knowledge of farmers' markets vendors seems to be based on a notion of trust in their reputation relating to the fruits and vegetables they produce. Other examples of trusting relationships such as Olivia's trust in shared information relating to "*deals*" seems to be based on past experiences and contact. Interventions to increase access to and use of healthy food retailers such as farmers' markets could focus on capitalizing on the positive reputation of farmers' market vendors and also consider the importance of positive experiences and contact in building trusting relationships

4.4. Limitations

As data are self-reported, social desirability and recall bias are a concern. Findings may not fully represent the reality of food procurement habits and relationships. However, studies show that an individual's perception of their social network composition may play a more important role than the network members' actual behaviors (Montgomery et al., 2003; Valente et al., 1997). Although the ultimate goal of this research is to inform initiatives to improve diet quality, the present analysis does not encompass the content of foods procured. Therefore, we cannot speak to the impact on diet quality of the relationships described. Additionally, study findings may not be generalizable to families not receiving SNAP benefits or those living outside of high-poverty, urban areas. Financial resources limited our sample to 30 participants. Although we achieved theoretical saturation of our themes it is possible that a larger sample may have yielded new concepts.

4.5. Implications

Findings illuminate the importance of integrating social factors into food environment research, policy, and practice aimed at improving community health. Consistent with other health research (Losch et al., 1995; Pronyk et al., 2008), this study provides insights for leveraging social connections to improve healthy food access. A key element of social network theory is the recognition that social relationships are a driving force behind behavior change (Bailey et al., 2007; Latkin et al., 2009; Shaw et al., 2007). Consistent with previous research on social networks, our findings suggest relationships among loosely connected acquaintances within food stores and pantries shape and reinforce food procurement routines (Burt, 2004; Wutich and McCarty, 2008). These relationships may create a social glue to support interaction within a food procurement place and also provide a trusted channel to disseminate information and material resources.

Results also have implications for food access interventions that seek to leverage social connectedness in food procurement places to foster the exchange of information and material resources needed to promote a healthy diet among people receiving SNAP. Findings offer guidance about 1) where social connections are particularly high (i.e., food pantries and convenience stores) and therefore may be more easily tapped into for dissemination of information and resources, 2) the value of having purely social exchange that may be more normative in food procurement spaces rather than focusing exclusively on targeted public health messages (i.e., healthy eating only), and 3) the importance of identifying actors perceived to be trustworthy and who might be an effective disseminator of information (i.e., food pantry staff, convenience store cashiers, farmers' market vendors) given the value of weak social network ties informing food procurement habits.

5. Conclusion

Food is one of the most social aspects of human behavior, yet strategies to improve healthy food access have largely focused on the physical aspects of access without complementary efforts to improve social access (Freedman et al., 2013b; Stern et al., 2016). Results of this study highlight food procurement is a social experience for this sample of parents and caregivers receiving SNAP benefits. These social connections, which are naturally occurring within different food procurement places, may be leveraged to disseminate information and resources to further healthy food access.

Acknowledgements

This research is the product of the Prevention Research Center for Healthy Neighborhoods (PRCHN) at Case Western Reserve University, supported by Cooperative Agreement no. 1U48DP005030 awarded by the Centers for Disease Control and Prevention (CDC).

Results and information presented are the views of the authors and do not necessarily represent the official position of the CDC.

Declaration of conflict of interests

None.

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