Sensible Shopping: A Sensory Exploration of the Information Environment of the Grocery Store

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ABSTRACT
Grocery shopping is an everyday activity ideal for exploring how the body impacts information behaviors in the form of sensory-based information sources. Previous information behavior research has largely ignored the body and its relationship to information behaviors. The present work expands two areas of information behavior research, the importance of the body in information behavior, and our understanding of nontextual and verbal information sources. Both expansions work toward creating a more accurate and holistic understanding of information behaviors and the contexts they exist within. Through two empirical studies using qualitative methods, the sensory experience of the grocery store is explored. Findings demonstrate that grocery shoppers rely on their sight, taste, touch, and smell in the act of information seeking, encountering, sharing, and browsing throughout the process of grocery shopping.

INTRODUCTION
Few spaces exist where the sensory experience of information is more obvious than the grocery store—which may be why Lueg (2015) describes grocery shopping throughout his article on embodiment and information behavior research. Grocery stores are designed to appeal to all of a shopper’s senses. Shoppers are typically welcomed into stores with the smell of warm bakery bread and the bright colors of fresh produce (Figueroa 2014). The grocery store provides an ideal space to explore the sensory experience of information and the importance of the body’s impact on information behaviors. Although plenty of documentation and reading occurs in the grocery store, customers also see, smell, touch, and sometimes even taste potential grocery items throughout their shopping trip.

while also being influenced by their previous grocery-buying experiences. The present work addresses the sensory experience of grocery shopping with a focus on sensory-based information sources and their corresponding information behaviors as described and demonstrated by participants in two studies on the information behaviors of grocery shoppers.

The relationship between embodiment and information behavior will be explored throughout this paper in order to demonstrate how both areas of library and information sciences (LIS) can be strengthened through the concepts and theories of each other. Adding a focus on the body to information behavior research will allow for a more realistic understanding of the information individuals interact with throughout their daily life. This paper will provide background on the LIS areas of embodiment and information behavior, as well as a description of the benefits of exploring each in the everyday space of grocery shopping; explain the methods of two empirical studies into the information behaviors of grocery shoppers; and conclude with a discussion of the work’s findings on sensory-based information sources and their use.

Background

**Embodiment**

The role of the corporeality of the body, also known as embodiment, in the LIS field has been understudied (Lloyd 2010). Researchers and practitioners largely approach information behaviors as a cognitive process in which information, typically in written or verbal form, is transmitted to an individual. Rarely does research address the unique experience of how one’s body impacts their understanding of information or how it is used to take in information through sensory inputs. Progress has been made to address embodiment in the field of information literacy (Lloyd 2014), but the related field of information behavior has lagged behind (Lueg 2015). Incorporating embodiment research and its focus on the physical, material, and sensory experience of information to develop a more holistic understanding of how individuals experience information will strengthen both LIS and information behavior research by providing further contextualization into how individuals interact with information in all forms (Lloyd 2010; 2014).

Following Lloyd (2014) and Fox (2008), the present work understands experience as the complex interaction of the body, sensory inputs, and neurological processing. The theoretical framework that grounds this work is based on Merleau-Ponty’s (2014) *Phenomenology of Perception* and its articulation that the body and mind cannot be separated. The body’s senses function as tools of the mind that provide experiential information. In order to understand information, one must understand and consider the specific experience of the body’s senses and its integral role in information behavior.
The experience of grocery shopping highlights the role of senses in information behavior and the importance of considering the body when researching information behaviors. Previous information behavior research has largely ignored embodied information as a source used in the process of information behaviors. “Bodies are central to the information experience, but are not often accounted for as a source of information” (Lloyd 2014, 85); rather, the focus is most often on information transmitted through words (Case and Given 2016). There are a few studies that have addressed embodiment in the workplace (Lloyd 2009, 2014; Olsson 2016; Veinot 2007), information seeking of online pornography (Keilty and Leazer 2014), and information literacy in a sadomasochist community (Harviainen 2015). Embodiment research in LIS can gain great insights by further expanding away from information domains focused on physically demanding work (Lloyd 2009, 2014; Olsson 2016; Veinot 2007) or sexually motivated information pursuits (Harviainen 2015; Keilty and Leazar 2014) into banal information behaviors where the body may not be foremost but still is an important source of information. No studies have directly addressed embodied information in the form of sensory-based information sources and their relationship to information behavior in an everyday-life context. Sensory-based information sources are defined as sources of information delineated by their transmission through the five sense of taste, touch, smell, sight, and sound. Although words are can be transmitted to several senses, the present work focuses on nonword forms of information to highlight their presence and importance.

*Information Behavior*

Information behavior is a field that studies how individuals and groups interact with and even avoid information (Case and Given 2016). The field began with a limited focus on scientists and engineers using structured information systems. Information behavior has expanded throughout its history into new domains, such as leisure (Hartel 2010a, 2010b, 2011) and everyday life (Julien and Michels 2004), and addressing new types of information, such as interpersonal communication and entertainment (Savolainen 1995). Although few information behavior studies have addressed the corporeality of the body or embodied information (Harviainen 2015; Keilty and Leazar 2014; Veinot 2007), it is an area that can strengthen and further the field in its pursuit to gain a holistic understanding how individuals interact with information in their everyday life (Lueg 2015). This gap is important because many individuals interact with nontextual and verbal-based information created through sensory inputs in the less structured and traditionally information-rich portions of their life. The written word may be the primary channel for information seeking in the library, but it may be one of many channels in the grocery store.

Applying the focus of embodiment research in LIS to information behavior can be especially useful in expanding the conceptualization of how
Information sources, an integral aspect of information behavior research, are understood. Sources are defined as “an individual or institution that originates the information,” and the channels of information sources, for example documents, are generally combined in the research literature (Case and Given 2016, 375). The vast majority of information sources that information behavior scholars address in their work are word based. The concept of information sources is often described in terms of source types, with the common distinction between formal (books and journals) and informal (friends and popular culture) sources that all share a focus on word-based information. Today, there are many more distinctions, although none directly address embodied information or how non-word-based information is received through human senses (Savolainen 2008).

One possible link to embodied information as a source in the information behavior literature is Krikelas’s (1983) model of information-seeking behavior. The model includes a description of both external and internal information sources. Although not directly described in embodiment terms, Krikelas describes an internal source as a “seeker-generated source” that “can include those stimuli that are stored (memory or personal files) and are the direct result of information-gathering activities, or the seeker may conduct direct observations” (14). Krikelas goes on to describe direct observations as coming in two forms—structured or casual. Structured refers to systematic organized observation, similar to rigorous scientific observation, and casual is described in terms of experience. Krikelas’s casual direct observations and the rest of the model of information-seeking behavior create a framework for considering sensory-based information sources and their interaction with various information behaviors.

In addition to Krikelas’s (1983) casual direct observations, other well-researched concepts in information behavior can help researchers to understand sensory-based information sources and the ways they are used. Sensory-based information sources likely function in the same way as other traditional information sources. In grocery shopping, specifically, several information behaviors are common; these include information seeking, encountering, browsing, and sharing (Ocepek 2016a). By addressing these well-established information behaviors in the grocery store, the present work is able to both demonstrate the information richness of grocery shopping and explore the similarities between sensory-based information sources and previously studied sources of information (Savolainen 2008).

Everyday Spaces: Grocery Shopping

Previous work on embodiment in LIS has addressed work (Lloyd 2009, 2014; Olsson 2010, 2016) and hobby/lifestyle (Harviainen 2015; Keilty and Leazar 2014) sectors of life. The present study expands this work into the everyday space of the grocery store. Historically, information behavior scholars have focused on studying information behavior in structured
information spaces such as the workplace and library (Case and Given 2016). Hartel (2003) was one of the first scholars to advocate for information behavior studies to directly address the leisure and food domains, building on previous expansion developed by everyday-life-information-seeking scholars (Savolainen 1995). In recent years, scholars have continued to move further away from the workplace and address information behaviors more holistically by studying individuals in their everyday-life spaces outside of work and serious leisure pursuits (Julien and Michels 2004; Ocepek 2016a, 2016b).

The benefits of information behavior addressing the everyday allow for a more complete understanding of how individuals interact with information in all aspects of their daily life. Schütz (Schütz and Luckman 1973, 3), one of the theoretical founders of the theory of the everyday, argued that “the world of the everyday life is consequently man’s fundamental and paramount reality.” Before we have scientific thought, before we enter the classroom or library, we are steeped in the everyday world and learn how to interact with and understand information there. Additionally, Lefebvre (2008), another early everyday scholar, emphasizes that the everyday is the totality of an individual’s experience, the nexus of their work, leisure, family life, and the banal activities required for daily maintenance. In order to gain a more holistic understanding of information behaviors and the how the body impacts those behaviors, information behavior scholars should focus on developing research, concepts, and theories that address the aspects of the totality previously unexplored. The present work addresses this gap through its focus on an individual’s information behaviors in the act of grocery shopping, an act of daily maintenance that has been largely overlooked by information behavior scholars.

In addition to its focus on the everyday, the present work also expands on previously fruitful work that addresses the information richness of food culture (Aspray, Royer, and Ocepek 2013; Hartel 2010a, 2010b, 2011; Ocepek 2016a, 2016b). The grocery store is a site where most Americans purchase and interact with food on a weekly basis (Hartman Group 2016). The grocery store is a physical space filled with shelves where shoppers browse items and make purchase decisions. It is also a space where many of us learned to first make decisions as young children grocery shopping with our parents or guardians (Haselhoff, Faupel, and Holzmüller 2014). Grocery shopping is an amalgam of information behaviors that use a great array of information sources (Ocepek 2016b) and create an ideal space to explore the body’s impact on information behaviors.

**Methods**

To study the information environment of the grocery store and the act of grocery shopping, I conducted two empirical studies to explore two perspectives of grocery shoppers. The first perspective, the creative shop-
per, was explored through interviews and shopping observations addressing the relationship between grocery shopping and creativity. The second perspective, the nurturing shopper, was explored through semistructured interviews addressing the role of food provider and the cultural norms surrounding the practice of feeding one’s family. Both studies were influenced by existing consumer-behavior research using interpretative analysis to focus on the lived experience of individuals (Carrigan and Szmigin 2006; Smith 1987; Thompson 1996). The observations for the creative-shopper study also included the think-aloud technique (O’Brien et al. 2014). All participants were recruited with flyers placed at selected recruitment sites or through interactions with the researcher. Potential participants qualified for the study by answering four questions ensuring they were over eighteen, served as their home’s primary grocery shopper, self-identified as middle-class, and fit the specific focus of each study.

To protect confidentiality, all participants’ names and identifying information have been removed from the following quotations. The participants were assigned pseudonyms using a random name generator based on U.S. census data delineated by gender. Table 1 presents all of the pseudonyms for participants in both studies.

Creative-Shopper Study
The creative-shopper study consisted of individuals recruited for their love of food, cooking, or grocery shopping and the creative enjoyment some shoppers experience in their relationship with food. All eighteen creative-shopper participants participated in the interview portion of the study, and seventeen participated in the shopping observation. Glen did not participate in the observation portion after failing to respond to scheduling requests. His interview data is still included in this work. As compensation for their time, all participants received a $10 grocery-store gift card at the beginning of their interview and observation.

The creative-shopper study occurred in a rural and suburban area of the U.S. Midwest near a large research university. The creative-shopper sample comprised of fourteen women and four men. Two pairs of participants knew each other in the sample. Joseph and Robin are father and daughter, and Tonya and Arturo were dating during the time of the study. These relationships pose a minimal effect on the study as each individual lived separately and largely grocery shopped alone or with members of their household.

Nurturer-Shopper Study
The nurturer-shopper study addresses how the role of food provider impacts the self-identity and moral obligation shoppers experience in selecting food for their families. To explore the role of food provider, the nurturer-shopper study sought a sample of grocery shoppers who had re-
cently (in the last twelve months) been through a change in household. All of the participants had recently been married, had their first child, or had someone recently move out of their home. The sample consisted of eighteen grocery shoppers, ten women and eight men. The participants each received a $20 grocery-store gift card as compensation for their time at the start of their interviews. The nurturer-shopper study took place in a large city in the U.S. Southwest with a great variety of grocery stores and specialty food stores.

Data Collection and Analysis

The interviews and observations occurred at locations of the participants choosing. The shopping observations occurred at a variety of grocery stores, including large grocery chains, small food cooperatives, farmer’s markets, and farm stands. Six of the shopping observations involved shopping at more than one location. Each interview began with a brief description of the research and obtaining informed consent from the participants. The interviews concluded with a debriefing, at which time participants were encouraged to ask questions and provide additional information about their grocery shopping.

Each interview and observation were audio recorded and then transcribed. Notes taken by the researcher were added to the transcriptions to record actions and provide additional context. In total, both studies produced 2,173 minutes of recorded audio, with 1,554 minutes of interview and observation data from the creative-shopper study and 619 minutes of interview data from the nurturer-shopper study.

The data from both studies was analyzed using iterative coding. Codes were developed using both the research literature on grocery shopping and information behavior and through an emergent coding process based on trends present in the data. Codes were grouped into higher-level concepts for analysis, and memos were created to develop and clarify emerging codes and trends (Corbin and Strauss 2008). Triangulation was used to find meaning using multiple perspectives around the grocery-shopping activity through comparisons between themes and studies. Analysis was performed using Atlas.ti qualitative research software.

For the present work, coding focused on the sensory experience of

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
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<tbody>
<tr>
<td>Creative Shoppers</td>
<td>Alberta, Arturo, Carole, Gina, Glen, Henrietta, Jenna, Joseph, Julius, Katie,</td>
</tr>
<tr>
<td></td>
<td>Leah, Lorraine, Mabel, Michelle, Patsy, Robin, Tonya, and Wilma</td>
</tr>
<tr>
<td>Nurturer Shoppers</td>
<td>Angelica, Deborah, Dora, Emanuel, Faye, Felix, Gladys, Grace, Jerome, Jerry,</td>
</tr>
<tr>
<td></td>
<td>Kendra, May, Marcella, Paul, Ramona, Rudy, Santiago, and Tim</td>
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grocery shopping, including experiences outside of the grocery store. No interview questions directly asked about the sensory experience of the grocery store. During the shopping observations of the creative-shopper study, participants were asked to describe what they were doing and how they were making their decisions. Participants were not specifically prompted to described their senses. Despite the lack of specific prompting, most participants described their sensory experience in their interviews and observations. Sound was not described by any of the participants throughout their grocery shopping.

The sensory experience included descriptions of the shoppers’ experience as well as their perception of the sensory experience of others. For example, Ramona shared how her family reacted to seeing the more health-conscious packaging of items she started buying at the grocery store. The visual information of the grocery items is received by Ramona directly through her experience and indirectly through her perception of her family’s visual interpretation of the healthier items. Additionally, participants described the sensory experience of grocery items making them both more and less likely to buy something. For example, while several participants described how well-designed packaging made them more likely to purchase an item or try something new, Santiago had the opposite reaction to packaging.

SANTIAGO. I believe a lot of packaging is created to place a certain message to the consumer of, “I am bigger. I am better.” Quite often it’s bogus, and it ends up costing more while you can get the same thing in a smaller package, or with less colors, et cetera, and it’s the exact same product that costs $3.00 less.

Santiago’s description of the visual experience of packaging was coded in the same way as participants who were drawn to visually appealing packaging. The codes also were not mutually exclusive. Participants described making a purchase decision using multiple senses. Finally, if a participant mentioned the same sensory experience multiple times, only one occurrence was recorded. This does not include relying on the same sense for making different decisions. Every new context surrounding a description of sensory-based information was recorded.

RESULTS AND DISCUSSION

The sensory experience of grocery shopping takes on many forms, both in terms of the senses used to gain information and the information behaviors that interact with the information. In the creative- and nurturer-shopper studies, I was able to identify shoppers using their senses throughout the grocery-shopping experience. Between both studies, I identified 169 sensory-based information sources and 129 occurrences of participants
exhibiting an information behavior while relying on their senses. Tables 2 and 3 show the breakdown of the information sources and information behaviors.

The tables also show the differences between the two studies. The creative-shopper study included a shopping observation in which several participants described their sensory experience with grocery items while directly interacting with them. Additionally, the nurturer-shopper study included interview questions about the relationship between self-identity and grocery shopping that encouraged participants to describe their perception of what their grocery purchases say about them and their families. This topic provided most of the sensory-based information sharing identified for this work. All of the participants in the creative-shopper study and fourteen out of eighteen nurturer shoppers—all except Angelica, Jerome, May, and Tim—described at least one sensory experience during their participation in the study. Participants likely participated in many more, but only ones that they described in their own words were recorded.

Most of the information sources were directly linked to an information behavior, and many information behaviors involved multiple sensory experiences. For example, Felix described all of the information he considers when making purchasing decisions in the grocery store.

Felix. I guess I mainly just judge based on the way the food looks and how it feels, I guess tactile in my hand, has a good texture, good color. Maybe I’ll smell it, depending on what it is. I don’t know how much I would research about it. I would just read what information is there. If there was more information presented, then I might read it a little bit more.
Throughout Felix’s interview he described looking at a lot of textual information throughout the grocery store and on grocery items, such as ingredient lists and nutritional information, but when he is describing his general approach to information while grocery shopping, he begins with the sensory experience of the grocery items he is considering purchasing.

Some participants also described sensory-based information sources outside of the context of information behaviors. Between both studies, I identified ten sight-, two smell-, and one taste-based information source without a clear relationship to an information behavior. Nine of the sight sources related to information about how shoppers perceived the physical space or displays of grocery stores, two were descriptions of memories of smell, one pertained to taste memory, and the last sight source was a participant noticing a coloring error on a tomato sauce can that did not affect her purchase decision. These sources as well as several related to information behaviors are described in the following section.

Information Sources

Drawing on their sense of sight, taste, touch, and smell, grocery shoppers interact with a variety of nontextual forms of information throughout their grocery shopping. These information sources help shoppers make purchase decisions, discover new things, and impact their experience in the grocery store. Below are several examples of how each sense was described by participants and how they interpreted sensory-based information.

Sight. The visual presentation of the grocery store, product displays, packaging, and appearance of fresh produce were all described as sources of information by participants in the creative- and nurturer-shopper studies. Most of this information assisted participants in making purchase decisions throughout the process of grocery shopping. Participants used strong visual language to describe how they selected items. For example, Alberta and Patsy described selecting “beautiful” produce, and Ramona explained that she tries to avoid “ugly cuts of meat” when she shops.

The look of products was described by several participants as a driver to purchase or pass on a variety of items in the grocery store. As described above, Santiago purposefully avoided “bigger” and “better” packaging because he associated it with a greater cost for the same quality. Arturo provided a very different view of packaging while selecting a bag of chips at the grocery store.

Arturo. I will say that I’m a total sucker for brown packaging. I wish I wasn’t.

Interviewer. What is it about the brown packaging?

Arturo. It feels old-fashioned and it feels natural, and I have to actively convince myself that no, they just used different packaging.
Interviewer. Even that, they made it look brown. But nothing about it is brown.

Arturo. It’s like a burlap pattern. It doesn’t actually mean anything at all. Interviewer. They are selling a lifestyle?

Arturo. Right.

Arturo articulates the messaging the brown burlap packaging (the packaging is not made of burlap, it is printed to look like burlap) evokes in him, even though he is well aware that this is marketing ploy, he also knows that it is working on him. The burlap is presenting a vision that the bag of chips represents that is not even clearly related directly to chips but represents the farm-to-table movement.

Henrietta was especially driven by the visual appeal of grocery items and described their impact on her general approach to shopping.

Interviewer. Do you have any strategies or techniques when you go grocery shopping?

Henrietta. …Fresh, I think I like kind of a European approach to what looks good, I’ll center the dinner around. I’m not good at being … I cannot plan a week ahead to save money like some people can. That just drives me crazy.

The “European” approach Henrietta described is immensely sensory based. As I was able to observe during her shopping observation, Henrietta is drawn to certain grocery items based on how fresh they look and then plans meals around them. During her shopping observation, she was especially drawn to some radishes and was audibly excited by their visual appeal.

Henrietta. The radishes, like this— [The participant picks up a bunch of raw radishes in the produce section.]

Interviewer. So, why do they jump out?

Henrietta. They jump out, one, because they’re just unusually big, and they just look really fresh. It’s nice and tactically, like they’re a little wet, and so it looks like they’ve just been refreshed or just put up.

Although the visual information provided by grocery items encourages shoppers to buy one product over another, the store also presents a lot of information in its visual design. As part of the creative-shopper study, I explored how grocery shoppers feel about the space of the grocery store and if it inspired leisure and creativity. In describing their thoughts on the grocery store, many participants described the visual markers that made the store more or less creative and enjoyable. Nine participants mentioned either positive or negative visual aspects of the store. There were several reasons why participants did not like the design of some grocery stores.
Patsy described how she did not like the bigger box stores in her town because the space is not well cared for and “the pictures of the people are always wearing 90s high waisted jeans.” Tonya explained that she does not like being in the grocery store because “it’s too shiny and bright.” On the positive end, Lorraine described the local food co-op as “a gorgeous store,” and Henrietta described her favorite farm stand as “very creative” because it is “organically evolving.”

Interestingly, two participants had very different interpretations of the visual presentation of the large high-end grocery chain Whole Foods. Both interpretations demonstrate the amount of information presented in the visual appearance of a grocery store. Jenna enjoyed the visual appeal of Whole Foods.

**Interviewer.** You said you lived in different places, have you ever found a grocery store you thought of as a creative space?

**Jenna.** Maybe, Whole Foods could be close to that. Again, it’s built very pretty, it has all these colors, it’s very bright, the lighting is very nice. It doesn’t remind me of a hospital in regards to the lighting. Everything has a reason, I think, in an infrastructure, so, yeah, I think Whole Foods would probably be the closest to that.

Whereas Arturo viewed the visual presentation quite differently.

**Arturo.** A place like Whole Foods, it’s a very complicated feeling. I feel like this is where I’m supposed to belong but I hate how bougie it is. I feel like I’m participating in class warfare when I go into Whole Foods. It feels right and wrong at the same time. . . . Those kind of specialty, upper-end kind of stores are strange to me in some ways. It’s one of those things where so much time is being spent on presentation in those places. It’s like, I want to buy it and not have everyone spending so much time and money on making it look really nice, which doesn’t add anything to the actual flavor of the food. Presentation is important. I work with farmers and farmer’s markets and presentation is huge, but there’s a limit to that. I think it’s crossed a lot.

Jenna and Arturo both are aware that Whole Foods places a lot of time and thought into its visual presentation. While Jenna enjoys it, and likes that “everything has a reason,” Arturo feels conflicted about how nice it looks. His comment about “class warfare” demonstrates that he equates the additional effort put into the visual presentation of Whole Foods in terms of upper-class culture. Arturo is conflicted because he is a person that loves food and should embrace the time and attention Whole Foods puts into making it look the best, but the additional culture messaging of class makes it uncomfortable for him.
Taste. While the visual presentation of a store can make shoppers feel more welcome and comfortable, few aspects of grocery shopping are more enjoyable than free samples. Many grocery stores offer samples to encourage shoppers to taste new items without the need to purchase them. During Jenna’s shopping observation, she enjoyed a free sample of a new food item.

STORE EMPLOYEE. Would you like a sample of black bean guacamole?
JENNA. Black bean guacamole. What does it have in it, besides?
STORE EMPLOYEE. It’s corn and black bean salsa. I actually mixed in some black beans, cilantro, and avocado.
JENNA. Thank you.
STORE EMPLOYEE. You’re welcome.
JENNA. . . . It is something I would buy for the house. It’s cool that they had it there.

Jenna both enjoyed the black bean guacamole and the experience of getting to taste a new item while shopping. She was both introduced to a product she had never tried and enjoyed her time shopping more so because of the free sample.

Tasting in a grocery store is unusual; whereas looking at, touching, and smelling grocery items are easy to do, tasting typically requires purchasing, which then impacts future trips. For the participants in my study, tasting was also important in making many of their purchase decisions. Taste was an important factor in how several participants approached their general philosophy to food and grocery shopping. When I asked Emanuel if he buys any grocery items to save time, he described his feelings on what makes food taste good.

EMANUEL. No, I don’t because I enjoy cooking. I do it the hard way. I take the knife and cut stuff up, the broccoli. I make a salad every day, which is time consuming. I don’t really buy any products to save time. If I wanted to save time I would buy processed foods that you throw in the microwave but they taste horrible. If you’re worried about taste, you just have to do everything from scratch. There is something to be said about homemade.

For Emanuel, the benefit of all the time and effort of preparing food is that it tastes better. The drive for tasty food was described by several participants as motivating their grocery shopping. Deborah succinctly explained during her interview her grocery shopping philosophy and the importance of taste to it when I asked her about the right way to grocery shop.

DEBORAH. I actually do tell my husband and myself food should be two of three things. It should be cheap, healthy, or taste good. We’ll buy it
if it’s cheap and healthy, or if it’s healthy and tastes good but may be more expensive, but it can’t just taste good and be expensive and be unhealthy. As long as it’s two of the three then it makes sense to buy it.

Taste is one of the three most important factors Deborah considers when grocery shopping, and it is weighed against the other important aspects of grocery shopping: price and nutrition.

Taste was also used as a source of information in selecting which version of a particular grocery item to purchase. Wilma provided an excellent example of how taste factors into purchase decisions when she described her thinking while choosing which brand of carbonated water she was going to purchase.

**WILMA.** I’ve tried every brand, just wanted to see which one is better. This one, even though it has more or less sodium it still kind of tasted salty. This is the cheapest one so . . . This is $3.79 and that’s $4.29, that’s $4.49 so I’m going to buy this one.

**INTERVIEWER.** Why did you get that one?

**WILMA.** My middle shake I guess between a . . .

**INTERVIEWER.** That’s not the most expensive and not the cheapest.

**WILMA.** It just tastes better I guess, better than the cheapest one. I don’t come here often so I’m just going to get.

Like Deborah, Wilma used her previous experience tasting the different brands of carbonated water as a source of information and weighed it against another source of information, the price of the item.

In addition to being an important factor in helping shoppers make decisions in the grocery store, taste also provides information that is associated with culture. During his shopping observation, Julius described his habit of finding unique items in the grocery store and sending them to his nephew who is serving in the military overseas.

**JULIUS.** I’m always looking for stuff that he might like, and I finally got him to email me and tell me what he does and doesn’t like about what I’ve been sending. Although he didn’t say he didn’t like anything, but I found some bacon jerky. It was at Sam’s, and I never tried it, so I got some and I sent it to him, and of all things, he really liked it, so did all the guys. The guys said, “Ooh, it tastes like America!”

Items can taste good or bad, but, as Julius describes, sometimes taste is tied up in much more. Certain food can remind us of our past and can even be tied to identity or cultural associations.

**Touch.** Some items in the grocery store are harder to select than others. Several participants commented on the hit-or-miss nature of selecting avo-
cados, due to their mostly uniform appearance. While Katie was selecting avocados during her shopping observation, she said, “The last avocado I bought from here was actually bad, so I’m crossing my fingers that the next one I pick isn’t bad, and if it is I probably won’t buy them from here again.” Katie, a recent primary grocery shopper, was unfamiliar with how to select avocados and was relying on luck to help her make a good choice. More seasoned shoppers like Patsy, Gina, and Carole all selected avocados using touch to feel and evaluate the texture and determine the ripeness. Patsy explained, “The ones that are pretty firm are the ones that need more time. Then the ones that are a little bit softer, like this one, are ready now I guess.”

Avocados are just one of many grocery items that can best be selected using touch. Tonya selected bakery bread because it was “still warm” and that suggested a comfort and freshness.

Sometimes an item’s texture is important in evaluating its quality. Participants described the texture of items as making them more or less likely to be purchased. Carole worried about the density of some bakery pretzel rolls she encountered while shopping.

**CAROLE.** Those pretzel buns are really good. I’m trying to decide if there’s anything in our future that we might eat them with.

**INTERVIEWER.** Why’d they catch your eye?

**CAROLE.** Well, I noticed that they were buy one get one free, but I don’t know if I would really need all of those, and I’m not sure if they freeze well because they’re kind of dense already. They feel pretty fresh, but I’m trying to think of other bread we have right now.

Texture also was a driver for Arturo’s preference for mushrooms.

**ARTURO.** I like to get the portables [sic] because they add meat to stuff. I like meatiness. Even though I eat meat, I like that particular texture. The white mushrooms I can add to almost anything. Both it’s a textures thing.

The feel of different grocery items provides information that is otherwise hidden from visual or olfactory inspection alone. Texture also impacts different experiences with the food in terms of mouth feel, which affects taste, and the feeling when grasped to determine ripeness. Sometimes the only way to know the quality of item is to touch or even squeeze it.

**Smell.** Grocery stores are designed to draw shoppers in with two departments typically placed by the entrance to the store—the produce department to show of the colorful cornucopia to appeal to the eyes and the bakery with the smell of fresh baked bread to appeal to the nose.
Although, smell was the least described sensory-based information source among the participants, for a few it was very important. Joseph described using his sense of smell to select produce. While shopping for mushrooms during his observation, he explained how he considers smell as a source of information.

**JOSEPH.** Price is always an issue, but I’m just also looking for like how many of these will we reasonably use so we don’t have pearl mushroom farms growing someplace. I also like to smell them.

**INTERVIEWER.** What are you smelling for?

**JOSEPH.** I want an earthy smell, but I don’t want an, not necessarily a manure smell. It should smell . . . Do you do much gardening.

**INTERVIEWER.** No.

**JOSEPH.** Okay. Compost. People think of compost that’s just garbage and stuff like that. Compost, actually if it’s done right, is really relatively odorless. People I think confuse manure, . . . humus and compost. If I get a manure or humus smell in here I tend to reject them. If the smell kind of reminds me of compost, and it is a little like compost.

Joseph’s description of the smell of mushrooms and how to identify the freshest package is strongly tied to his memories and experience with gardening.

Although not all participants had the scent-based food knowledge of Joseph, others did describe how memories of particular smells influenced their grocery shopping. Lorraine explained that she was purchasing Big Red gum because of a childhood memory. She said, “I think it’s because my mom used to chew big red gum when I was a kid and I remember everything of hers kind of smelled like it.” The association between the gum, the smell, and her mother were why she purchased it. Another scent-based positive childhood memory was described by Faye during her interview.

**FAYE.** I would go with my mom as a kid to the grocery. . . . As a kid, Mom would take us to the grocery store because we were around and she had to get groceries. I would kind of shadow her on that front, and I remember her taking great joy in grinding the coffee beans in the coffee grinder at the store and relishing that smell. Then, she would also take us . . . There’s so much about my mom and my upbringing.

Although what Faye is describing does not seem to impact her purchase decisions in the grocery store, it influences the way she thinks about grocery shopping in general. Her memory is not only of her own enjoyment spending time with her mother, but of her mother enjoying the simple sensory pleasures of grocery shopping. It is no surprise that in other parts of her interview Faye described enjoying grocery shopping and even just spending time in the grocery store.
Sensory-based information sources described by participants provide additional information that assists them in their grocery shopping. Sight provides important details about the messaging and care put into particular items. Taste can be good, bad, or “American.” Touch relates the freshness of items that visually appear the same. Smell reminds shoppers of food and grocery-shopping memories past. Each source is used for different items in different ways, and they all function as an internal source of created information, uncovered through casual direct observation (Krikelas 1983). Although internal sources are not new to the information behavior field, a focus on the sensory inputs creating information provides a new source type to study.

The variety of information provided by sensory-based information sources demonstrates the information richness of the grocery store and how in this everyday space traditional sources do not explain enough of how shoppers navigate the information environment of the grocery store. The sources alone show the variety of information a grocery shopper may interact with in the store, but sources are only one part of understanding how shoppers interact with and avoid information (Case and Given 2016).

**Information Behaviors**

Information sources are an important part of understanding information behaviors. The relationship between an information source and an information behavior provides a greater understanding of the source itself. Sources are sought out, encountered, or shared to assist in decision making, discovering new things, and in teaching others how to grocery shop. In the present study, all but thirteen sensory-based information sources were related to at least one information behavior described by the participants. Table 3 shows that the majority of information behaviors using sensory-based sources were information seeking, with much fewer occurrences of encountering, sharing, and browsing.

**Seeking.** Information seeking is historically the most commonly discussed information behavior (Case and Given 2016). It is defined as “a conscious effort to acquire information in response to a need or gap in your knowledge” (6). Most of the information seeking described by the participants related to sensory-based sources involved making purchase decisions. For example, during her shopping observation, Tonya explained how she selects the bunch of bananas she is going to purchase from the available options.

Tonya. With bananas, I just pay attention to how they need to be a little bit green, because they tend to lay around a little bit. I think they taste better when they ripen, but if they’re ripe when I buy them then they’re mushy by the end.
Tonya is describing the look, taste, and texture of bananas as all affecting her rationale behind her purchase decisions.

Like Tonya, most of the participants sought out information using their senses to decide which piece of produce to select from a display or which brand to purchase. The previous section contains many examples of this. Henrietta approached her shopping in terms of seeking the freshest items and developing her meals and the rest of her shopping trip around them. Arturo chose his chips based on his affection for brown packaging. Santiago chose items with less visually interesting packaging because he was seeking out cheaper items based on his belief that packaging and price are closely related.

The information provided by the shopper’s senses assisted in their seeking out of the best items to buy and the best way to shop. Even when shoppers enter the grocery store with a carefully curated shopping list, they still seek out information to help decide which apple to buy or which brand of carbonated water balances price and taste the best.

_Encountering_. Whether it is a sample of black bean guacamole or a display of sale-priced pretzel buns, shoppers are inundated with temptations to stray from their shopping lists and engage in unplanned buying (Park, Iyer, and Smith 1989). Grocery stores make more money when they encourage shoppers to encounter new products or sales; this also makes grocery stores ideal to study information encountering with sensory-based information. _Encountering_ is defined as “the accidental or serendipitous exposure to information that turns out to be relevant to a preexisting information need, or which sparks curiosity about an emerging topic of interest” (Case and Given 2016, 369). In the grocery store, information encountering frequently occurs because of in-store displays and sale tags. Participants described encountering sensory-based information using their senses both in the grocery store and during the planning process of a shopping trip.

Joseph, Robin, and Patsy all were affected by unfortunate visual encounters with mold on items they purchased that impacted their future grocery shopping trips. Joseph and Robin both described encountering “green” mold after opening a roast from a local grocery. Patsy explained that her habit of always reading expiration dates began after a bad experience: “I’ve had some like traumatizing experiences of like finding mold on things so, I feel like I’ve become really paranoid.”

Marcella shared a much more positive visual encounter when she saw an advertisement for baby shampoo that left a strong impression on her.

_Marcella_. I think just this morning I watched a TV commercial about Johnson’s, the baby’s shampoo. Because the baby they shot in the TV commercial is really, really sweet. Her smiles, and I think that’s very impressive. I think I may look at the Johnson’s products in the future.
Though not right now, because that TV commercial made me, left an impression on me about this brand.

The advertisement was so affecting to Marcella because of the baby’s expression and the way the commercial used that visual to relate a happy baby with their product. Other positive encounters include Jenna’s sample of black bean guacamole that she encountered while shopping and Felix’s description of how the aroma or pictures of food often drive his grocery shopping.

Felix. A lot of times if I smell something, like if I’ll smell fried chicken, I’ll be like, “Man, I need fried chicken,” that’ll influence me, or a picture of it a lot of the times too. I don’t notice any abrupt change in anything. Sometimes I’ll just go when I want to cook something specifically. The other day I wanted to make sesame noodles so I was like, “Okay, I need to go get pasta, sesame oil, rice vinegar, green onions, a few things like that.” I just went and bought those, went home and made it.

These encounters left an impression in part because they were so unexpected. Participants encounter a sight or smell and suddenly decide to purchase or avoid an item. Felix’s description of what influences his grocery shopping clearly demonstrates how sensory-based information can be encountered and then directly impact a grocery shoppers’ actions.

Sharing. Visual information can be received by grocery shoppers in terms of the ambiance of a store or the freshness of an item. Visual information can also be used to assist others in grocery shopping and to share information about a grocery shopper. Information sharing is an information behavior that refers to transmitting information from one person to another (Case and Given 2016). Seven participants described sharing visual information with another person or receiving it. Three of the participants, Kendra, Grace, and Katie, described sending pictures to other members of their household of specific grocery items to assist in their grocery shopping. Kendra explained how she assisted her husband when he briefly took on shopping duties for their family.

Kendra. So, I did have to take pictures of items that I frequently got because he would come home . . . He would try. I’d say, “Get almond milk, make sure it’s unsweetened,” and he’d come home with unsweetened, but it was vanilla. So, it’s like, “Here’s a picture of what it looks like so this is what I want you to get.”

Grace described how her husband would text her pictures from the grocery to confirm that he was selecting the right items. During Katie’s shopping observation, she took a picture on her phone and sent it to her room-
mate when she noticed a product she and her roommate could not find during a previous shopping trip. All three sent visual information to others because the textual descriptions of grocery items were not as useful as a visual representation.

In addition to the very purposive act of sending pictures to others in the act of grocery shopping, four other participants also described the perception they believed their purchases were presenting visually. Deborah provided the best explanation of how visual information can be shared between shoppers in the grocery store after I asked her about what her purchases say about her.

Deborah. Sometimes it’s as simple as I think it says I’m a single person or a married person. Maybe that’s just because I just got married. Sometimes I’ll go, and all I pick up, I don’t know, if I just pick up Lean Cuisines and iced coffee and a box of tampons or something, I’ll look at that on the conveyor belt and be like I bet it looks like I’m single. Another time I’ll go through and there’s a big gallon of milk, and there’s a bunch of healthy produce, and there’s all of my meat and fish that I picked up at Whole Foods and that will be wrapped up. I usually get a plastic bag from the produce area so that way the blood and whatnot from the protein doesn’t get on everything else and I bag that up. I’m like, oh it looks like I’m a clean person who’s got a household that I’m buying for, that I’m a healthy eater, and I probably like to cook. I feel like that’s a good thing to say about me. If I ever buy certain stuff in the pharmacy department, then I’m always wondering what the judgment is on that and I’ll put it face down. I don’t like that opinion.

Three other participants similarly described how they perceived grocery items on a conveyer belt and in a refrigerator. For these participants, the visual information was not about a particular item, but how all of the items together tell a story about the grocery shopper and their life outside of the store—a story that they think other shoppers see when viewing their grocery items.

**Browsing.** A critical aspect of all types of shopping is browsing, an information behavior concept strongly tied to marketing research (Chang and Rice 1993). Among information behavior scholars, *browsing* is defined as “an examination of unknown items of potential interest by scanning or moving through an information space in order to judge the utility of the items, to learn about something of interest in the item, or to satisfy curiosity about something” (Chang 2009, 73). Browsing differs from encountering because it is more purposive, for example, a shopper may encounter a free sample while grocery shopping without seeking it out, whereas a shopper may browse a store looking for the best free sample if they shop during a time when they know samples are common.
Browsing was a very common information behavior among the grocery shopper participants, but I only identified five times when browsing was related to sensory-based information. Felix and Wilma described their general enjoyment of browsing. Felix also mentioned how his browsing is influenced by the visual presentation of the grocery store, and Henrietta (see her comments on radishes above) and Paul described themselves browsing specific sections of the grocery store. Felix and Paul’s comments provide the clearest examples of how browsing relates to the sensory experience of grocery shopping.

**Felix.** I enjoy grocery shopping. I find it fun as long as the grocery store is not too crowded. You probably messed up getting me coming for this interview because I love grocery shopping, I could talk about it forever. I like looking at all the different stuff on the shelves, walking around the supermarket, as long as there’s not too many people there. I feel like they do a good job in grocery stores of presenting food in a way that makes it look appealing, like when you look at a whole bunch of products on the shelf together, it looks comforting because you see a whole bunch of them there, and just the idea of being full of food is a happy, comforting feeling. I guess that’s basically how I feel about grocery shopping.

**Paul.** Well, we love going to . . . We were just at [high-end food store] the other day. We love going there because there were fifteen different kinds of salt. We went to the . . . What’s that called? The bulk goods section. It was fifteen different kinds of sea salt. It was like . . . Going in the produce section there is great because there’s just so much interesting, different stuff to look at and . . . which doesn’t . . . which can be distracting, but . . . Yeah, we like going there for the diversity, seeing a bunch of different things.

Browsing for Felix, Paul, and several other participants was one of the most enjoyable aspects of grocery shopping. The visual diversity of grocery items mixed with the smells and tastes of free samples all combine to make the grocery store an enjoyable sensory experience for many food lovers.

The information seeking, encountering, sharing, and browsing described by the participants provide a greater understanding of how sensory-based information sources are used to motivate and influence the act of grocery shopping. The above examples show that like documents or personal conversation, sensory-based information is used like other information sources in the act of various information behaviors (Case and Given 2016). The variety of information behaviors also demonstrates that sensory-based information can be used actively, such as with information seeking, or passively, such as with information encountering. The findings of this work clearly show that, in order to gain a full and holistic understanding of information, behavior scholars must also address embodied information, including sensory-based information sources.
STRENGTHS AND LIMITATIONS
Research focused on the lived experience of individuals is key to exploring embodied information. The research presented in this work was designed to highlight the voice and lived experience of grocery shoppers. Both studies used small purposive samples of eighteen individuals to gain a variety of detailed perspectives on grocery shopping. The findings are not exhaustive, and larger or more diverse samples may have provided additional examples of the sensory experience of grocery shopping.

The use of semistructured interviews allowed for the fruitfulness of this research by enabling the researcher to adapt the interview protocols to the experiences and opinions of each participant. This allowed the participants to explain their grocery shopping experience in their own words, with the majority describing how they use their senses to interact with information in the grocery store. Semistructured interviews also limit the ability to compare the findings at the question level. Through iterative coding I was able to overcome aspects of this limitation, but comparisons at the participant level provide less useful insights than looking at general trends in the data as a whole.

Future work that more directly addresses a participant’s sensory experience is likely to find more examples of sensory-based information sources. Even with these limitations, the findings of the present work clearly demonstrate that embodied information is present throughout the grocery-shopping process, and future work on embodied information dealing with grocery shopping or food more generally will be able to continue growing this exciting new area of research.

CONCLUSION
The present work has demonstrated how embodiment’s focus on the body’s impact on information can provide useful insights to information behavior research (Lloyd 2010). The work also demonstrates that everyday information behavior research can be used to explore embodied information in new spaces outside of the workplace (Lloyd 2009, 2014; Olsson 2016; Veinot 2007) or sensuality-based hobbies and lifestyles (Harviainen 2015; Keilty and Leazar 2014). The newly articulated concept of sensory-based information sources was found to be present throughout the everyday task of grocery shopping and to function similarly to other traditional sources. The present work also shows how although individuals bring their own unique experiences to bear on their grocery shopping, the use of sensory-based information in the grocery store was prevalent throughout both research studies on different types of grocery shoppers. Even more strongly, the findings show clear similarities of experience among participants, such as how to choose an avocado. While the grocery store stands out as an everyday space filled with items with varied visual presentation, aromas, textures, and tastes, this work suggests that other food-focused
and everyday spaces may be filled with potential for gaining a deeper understanding of sensory-based information sources and their relationship to information behaviors.

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