Eating Behavior and Qualitative Assessments



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# Perceived Advantages and Disadvantages of Online Grocery Shopping among Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Participants in Eastern North Carolina

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#### **ABSTRACT**

This study's purpose was to qualitatively examine perceived advantages and disadvantages of online grocery shopping among participants (n=7) in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Initial in-depth, qualitative interviews were conducted, after which participants completed an episode of online grocery shopping, picked up the online order at the store, and completed an in-store shopping episode and a follow-up in-depth interview. Interviews were audio-recorded, transcribed verbatim, and analyzed deductively. Participants stated that in-store impulse purchases occurred at the check-out and cookie aisles and included chips and candy, but sometimes healthier foods such as fruit. Advantages of online grocery shopping included ease, convenience, and saving time. Disadvantages included inadequate substitutions, the online shopping fee, lack of control over selection of perishable goods, and inability to find good deals online versus in the store. Further research is needed to determine how to encourage healthy grocery purchases online. *Curr Dev Nutr* 2020;4:nzaa076.

**Keywords:** online grocery shopping, impulse purchases, federal food-assistance programs, shopping practices, Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

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Supplemental Tables 1 and 2 are available from the "Supplementary data" link in the online posting of the article and from the same link in the online table of contents at https://academic.oup.com/cdn/.

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# Introduction

Obesity remains a major public health threat in the United States (1–4). The majority of excess dietary energy comes from items purchased in supermarkets and supercenters (5, 6). Supermarkets and supercenters are engineered to maximize sales, which include purchases of unhealthy items (7, 8). Thus, public health researchers are attempting to collaborate with store leaders to incorporate healthy food interventions within brick-and-mortar supermarkets and supercenters (9, 10). While online grocery shopping has been available since the early 2000s (11), online grocery shopping for perishables is only now gaining increased momentum (12). Early research suggests that grocery shopping online might help reduce unhealthy impulse purchases (13, 14). At present, there is both concern and hope that the online environment might also evolve and result in more targeted marketing and promotion of either unhealthy or healthier options (15).

There have been 3 US-based studies examining the feasibility and use of online grocery shopping among low-income individuals (16–18).

These studies were conducted in urban areas of the United States including Chicago (16), New York (17), and Baltimore (18), and none specifically recruited participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Learning about the use of online grocery shopping among WIC participants is important to inform future nutrition education attempts within WIC and to further inform ongoing online grocery shopping pilot studies occurring among participants in the Supplemental Nutrition Assistance Program (SNAP) (19, 20). Implementing online grocery shopping in federal food-assistance programs could potentially help encourage healthier food choices through providing increased access to nutrition information (21) and through reducing barriers to healthy food access experienced by low-income populations (22). Therefore, we conducted a pilot study to examine qualitative perceptions about the location and types of typical impulse purchases in the store, and the perceived advantages and disadvantages of online grocery shopping before and after an online shopping episode among 7 WIC participants.

#### **Methods**

#### Participant recruitment and enrollment

We recruited WIC participants from the Pitt County Health Department WIC clinic waiting room (Greenville, NC) using informational flyers. Eligible participants were enrolled in WIC, >18 y of age, a primary food shopper, and had never shopped for groceries online. Interested participants called the principal investigator and scheduled an enrollment visit, during which the study was explained, and informed consent was signed. This project was approved by the East Carolina University Institutional Review Board (UMCIRB# 16-001167).

#### Initial and follow-up in-depth interviews

At the start of the study, participants completed an initial in-depth interview, providing information about supermarkets/supercenters at which they shopped, commonly purchased items, restaurants frequented, impulse purchases, and their perspectives on the advantages and disadvantages of online grocery shopping. All interviews were conducted with the principal investigator, a PhD researcher trained in qualitative methods. After the in-depth interview, the participant was then instructed to order a maximum of \$30 worth of groceries online (each was provided a \$40 Visa gift card to cover a \$4.95 online shopping fee and taxes). The online grocery shopping episode occurred in the research office and participants arranged a time to pick up the groceries. Participants then completed an in-store shopping episode wherein they were instructed to purchase \$30 worth of groceries in the store (each was given a \$35 Visa gift card to cover the groceries and taxes). After completion of the in-store shopping episode, the participants completed a second indepth interview, this time about their experiences with online shopping and the advantages and disadvantages of in-store versus online shopping. After each shopping episode (online and in-store), participants 3-7 were presented with their receipt and asked to record whether each purchase was an impulse or planned purchase. Participant 1 completed the in-store shopping exercise but did not complete the follow-up interview or receipt annotation because she was called away on a work emergency and the interviewer failed to obtain the receipt annotation for participant 2. Each participant received a \$10 gift card for completion of the initial in-depth interview and a \$15 gift card for the follow-up interview.

# Data analysis

All interviews, including the online shopping and in-store shopping experiences, were audio-recorded and transcribed verbatim, resulting in 14 transcripts. Baseline and follow-up interviews and shopping experiences were analyzed separately. Four data-rich interviews (2 baseline and 2 follow-up) were read by 2 coders who came up with independent codebooks and operational definitions. The independent codebooks were reviewed and synthesized to create 1 consensus codebook, which was used by 3 coders (SBJP, SP, CJK). Each transcript was coded by 3 independent coders (SBJP, SP, CJK), and coding discrepancies were identified and reconciled by going through each transcript line by line. Final coding decisions were entered into Nvivo Version 11 (QSR International). Of particular interest, coders abstracted information about what was purchased on impulse and whether impulse purchases occurred online or in-store. Transcripts were analyzed to determine perceived advantages and disadvantages

TABLE 1 Ratio of impulse to total purchases in each modality (online vs. in-store)<sup>1</sup>

Participant ID	Impulse purchases/total purchases online	Impulse purchases/total purchases in store
1	NA	NA
2	NA	4/10 = 0.40
3	4/8 = 0.50	4/9 = 0.44
4	3/11 = 0.27	13/19 = 0.68
5	2/9 = 0.22	1/10 = 0.10
6	3/10 = 0.30	1/6 = 0.17
7	4/10 = 0.40	1/5 = 0.20

<sup>&</sup>lt;sup>1</sup>NA, not applicable.

of online shopping, also comparing pre- with post-online shopping experiences.

## Results

### Participant characteristics

Seven participants were interviewed. Participants were, on average, 34.7 y of age (range: 29-44 y); all were female (1 couple jointly participated); 5 were African American and 2 were white; and participants had between 1 and 3 children <18 y old living in the household.

Participants discussed in-store and online impulse purchases comparing pre- and post-online shopping experiences, as well as the perceived advantages and disadvantages of online grocery shopping comparing pre- and post-online shopping episodes.

# In-store impulse purchases

Table 1 shows the ratio of impulse to total purchases in each modality for participants 3-7. The ratio of impulse to planned purchases was higher online versus in the store for 4 out of 5 participants and impulse purchases were higher in-store versus online for 1 of the 5 participants.

Supplemental Table 1 shows planned versus impulse purchases made by each participant in each modality. Participants noted that impulse purchases were often those that were on sale and items that seemed like a good value for the money spent. Impulse purchases included sodas, items on sale, and treats (e.g., ice cream, potato chips). In general, participants noted that in-store impulse purchases were made on the candy, snack, chips, and check-out aisles, and were frequently unhealthy. However, 3 participants noted that impulse purchases were considered healthy (fruits and/or vegetables mentioned by participants 4, 6, and 7). Self-reported planned purchases included staples (e.g., cereals) or ingredients for a meal.

While most participants had more impulse purchases online versus in-store, participants also noted they were more tempted to make impulse purchases in the store, versus online, as participant 4 noted:

"In-store, definitely, gives me more of a chance to do like the impulse because I'm walking around and ... I'm seeing the prices and that kind of helps me ... calculate it in my head.... versus online it's like you can't virtually walk through and see everything that's listed."

# Perceived advantages and disadvantages of online shopping

**Supplemental Table 2** shows the differences in the frequency of each code and number of participants mentioning that code for perceived advantages (convenient, easy, saves time) and disadvantages (distrust, fee, order mix-up, and price) pre- and post-online shopping. Convenience was mentioned more frequently as an advantage post-online shopping, and price (e.g., higher perceived prices online versus in-store) was mentioned more frequently as a disadvantage post-online shopping. Below, we discuss each of these perceived advantages and disadvantages in greater detail.

Table 2 provides quotes regarding perceived advantages and disadvantages of online grocery shopping. As noted in Supplemental Table 2, commonly mentioned advantages were ease, time savings, and convenience. Participant 7 provided illustrative statements regarding the ease and convenience overall.

"...convenience is probably the biggest factor, especially for like a single mom. To have to lug her [young child] out of the car, get the stroller out.... So, that personal shopper definitely it's an advantage of convenience to do the online."

Participant 3 noted the advantage of not having to take children into the store:

"I just know if I shop online ... I can kind of be okay like with the kids. Don't really got to be really worrying about them being so antsy like they would in an actual store ...."

Participant 4 reported on the perceived time-saving aspect of online shopping:

"Maybe it would be faster because you could probably do your order at home in your pajamas in the middle of the night, whenever, and then just drive up and pull up and have them load it into your car."

Participants also noted the potential to reduce impulse purchases and save money:

"I'm thinking it would probably be cheaper because you would not have the expectations of 'Oh, I have not had those cookies in a long time.... they look real good up there on that shelf .... Let me get a bag of cookies.' And, just throw it in the cart." —Participant

Participant 5 perceived an additional advantage as being able to determine needs based on looking at the food/beverage inventory at home. Finally, participants also remarked on how online shopping is particularly helpful for those who have physical limitations.

The most commonly mentioned disadvantages were distrust of the personal shopper's ability to select the freshest and highest-quality items, inability to see good deals online, and the online shopping fee. Participants also noted the difficulty of comparing similar items (for quality, size, and cost per unit), perception that there are different (higher) prices online than in store (perhaps different deals online versus in-store), and concerns about product mix and availability online

Participants noted the difficulty of seeing deals online versus in the store:

"That's the first thing I thought about that I have forgotten that I do check the mark-down cart or see if there is anything on sale that I could get real cheap .... I don't know if online if I saw any buy one, get one free...." —Participant 1

Participant 4 reported that potentially higher prices online were a disadvantage:

"So, that's definitely another takeaway of the online, is that the prices seem to be higher and you can't do anything ... I had to pay double for the same 8-ounce block of cream cheese."

A few participants enjoy going into the store and see a disadvantage of online shopping as missing out on the joy of shopping.

Several participants, including participant 2, perceived the fees as a disadvantage:

"That \$5 processing fee, because I could have got \$5 more groceries."

Many participants reported the perceived disadvantage of poor product quality if someone else is selecting the food/beverage items:

"The downfall is not being able to pick your items. So, like the fruits and vegetables, I don't know if the person who's doing my personal shopping knows how to pick out my vegetables the way I like it." —Participant 7

When we asked if participants would be willing to grocery shop online again, most said they would do it occasionally, especially if they did not have the fee to pay. Additionally, participants reported that they would be more likely to use online shopping if it could save time or make shopping more convenient.

## **Discussion**

We found that the majority of in-store impulse purchases occurred in the snack, chips, and cookie aisle and were considered unhealthy by the participants. This accords with findings from Cohen and Babey (8) regarding impulse purchases typically being nutrient poor, caloriedense snack foods. However, some participants noted that impulse purchases were sometimes healthy foods on sale, such as fruit. Similar to prior qualitative studies (23-25), participants in this study noted advantages of online grocery shopping, such as saving time, avoiding crowds and lines, and not having to get out of the car in bad weather or when trying to purchase heavier/bulkier items. Participants cited disadvantages including distrust of the personal shopper to select highquality items, the online shopping fee, and the difficulty finding deals online versus in the store, which also aligned with previous studies (17, 20, 26).

Online grocery shopping could streamline federal food-assistance benefit distribution, especially if SNAP and WIC begin to allow online grocery purchases and be connected with online nutrition education provided within benefit programs more efficiently (27). For example, WIC Nutrition Education could be delivered online, and this could be delivered in tandem with online grocery shopping lists that include healthier, WIC-approved items (27).

This study is limited by several factors. For example, the order in which the shopping occurred may have biased results, as all participants completed the online shopping first. Online shopping was also a novelty, so participants may have just ordered novel items using this novel modality. While the researcher tried to minimize her role as a

TABLE 2         Perceived           Participant         Participant	dadvantages and disadvantages of o Perceived advantages before	TABLE 2         Perceived advantages and disadvantages of online grocery shopping among WIC ( $n = 7$ ) participant         Perceived advantages before         Perceived advantages before         Perceived advantages before	= 7) participants before and after on Perceived disadvantages before	ine shopping¹ Perceived disadvantages after
<u></u>	Reduce impulse purchases: "It would probably cut down on the excessive stuff. It might be cheaper because you're just sticking to what you need and you're not being drawn into those sales and ending up with a whole bunch of stuff you don't need. Like 20 things of toothpaste because I have a coupon."	None noted.	More difficult to spot deals online versus in store: "Well, I'm thinking, would it be, would the online stuff oh, another thing I like to do is, is I like to find the mark down section at the grocery store And see I might just look. I go there every time. So, with online I might not be able to see the markdown."	More difficult to spot deals online versus in store: "And then you get the, sometimes the deals with the meats that are marked down And you wouldn't necessarily see that."
2	Saves time: "Avoiding the lines it saves time you don't have to worry about having the stroller, putting the baby in the car and then going up and down the aisle, you just go sit in front the computer or smartphone, just click, clicksomebody else does the work for you."	Easy/convenient: "If, you need something from the grocery store Like my daughter, she's little, and if I wanted to go grocery shopping I wouldn't have to really take her out of the car, I could just, you know, just pull up and get my groceries."	Poor product quality/distrust of personal shopper: "somebody might not pick out the, the, um, best looking item when you say you might want bananas, they might pick you out them um the real ripe ones instead of picking out the greener ones so they'll last longer."	Problems with the website: "You just have to know the categories in which the items you're looking for are located. Because when I did my online shopping, I just didn't really know where to look for them at."  Enjoys going into the store: "Really cool seeing people." [doesn't get to see them when shopping online]
т	Easy/convenient: I guess you get to mainly, like, relax and stuff, not having to actually go down aisle by aisle, just relax or something. You know, focus on, you know, the screen and put down what you want in your little cart So you can pretty much just relax instead of doing all that walking.	Easy/convenient: "I guess with the online shopping you don't have to wait like instead of having to wait for a line and waiting for your turn to come up next, you have a time to come and stuffs already ready. I like that. It's so chaotic, so much traffic in here [the store]"	Having to wait to pick up items: "the wait, and going to get it. I like just having it right there when I pay for it." Missing or incorrect items: "Um, maybe they don't have the brand that you want, or you may get the wrong things off of it"	Having to wait to pick up items: "You get your stuff right then and there lin the storel instead of having to select a time." Store employees are not available online to help with questions: "like online, if you have a question or anything or you're lost, you can't really get help But, in here they got people by the cash register, and they are able to help you out with your every need."

(Continued)

TABLE 2 (Continued)	ed)			
Participant	Perceived advantages before	Perceived advantages after	Perceived disadvantages before	Perceived disadvantages after
4	Convenient for those who have	Easy/convenient: " it was	Associated fees: "And, I know	Enjoys going into the store: "I
	physical limitations: "My	convenient, where you know,	that there is a fee with it, so	like coming in the store 'cause
	perception has always this is	like assuming I was doing it at	you know I'm all about saving	you can find deals, you know,
	for like maybe elderly people	home, I can just click through	money so why would I pay	in-store It's that you might
	or people who are sick and	at my own leisure and you can	when I can just go down and	miss out on some deals that
	can't necessarily get out the car	put your stuff in the cart and	pick out my own things."	otherwise, if you hadn't come
	and walk around the grocery	almost like due like a virtual	Poor product quality: " maybe	in the store "
	store or maybe somebody that	grocery list. I can leave it and	if I get a bad batch of	Having to plan day around
	has a new baby."	come back to it if I wasn't	strawberries so maybe the	picking up groceries: "So,
	Easy/convenient: "it's easier.	gonna place that order for	person picked out one that	you'd have to definitely plan it
	You just stay in your car, you	pick-up today It was really	wasn't as fresh as I would have	so that it would be like your
	pull up, and they load	easy to be honest with you. I	liked for it to be if you had a	last stop before going home.
	everything that you had on	didn't even I've never done	list and they forgot one of your	Which you might do that
	your list into your car. It's	before and I didn't expect it to	items."Higher prices online:	anyway, if you were coming to
	definitely very easy, very	be that easy."	"cause I feel like they're more	buy groceries that were like
	convenient."		expensive online."	refrigerated anyway."
2	Easy/convenient: "it seems like a	Easy/convenient: "Scheduling	Having to plan day around	Seeing items/deals in the store:
	really good idea to avoid	and convenience Timing,	picking up groceries:	"easier to see the deals
	pester power or just to simplify	like being able to just do it and	"Coordinating the timing so	easier to remember things we
	a trip a whole lot. "	pick a time to pick it up"	that frozen stuff is still	might want [in the store] "
	Could see deals more easily	Saves time: "guess a	frozen." Associated fees: "the	Poor product quality: "like we
	online: "Could see the deals	disadvantage is it seems to	convenience fee."	wouldn't have bought the
	more easily."	take more time in the storel	Seeing items/deals in the store:	bananas or the oranges online.
	Saves time: "a big time-saver"	don't know. At home, we could	"A lot of times we will	'cause we wanna come out
		be doing other things at the	remember things as we walk	and find the fresh ones. Same
		same time."	buy and see themjust	with bread not being able
			noticing things that are on sale	to pick your own produce, um,
			by walking around. Don't know	like they would just pick out
			if they have the clearance rack	whatever."
			as well posted online"	
9	Saves time and potential for	Saves time: "So, that saves time	Poor product quality: "'cause will	Missing or receiving the wrong
	discounts: "Advantage is time.	the workers know where	they look at the dates like I	items: "That's a disadvantage
	You know it saves on time I	everything is because they	look at the dates, are they	because when you're in the
	probably would think that they	can get to the stuff a lot quicker	feelin' the bread like I feel the	store yourself you know you
	offer some type of discount,	than we can The time saver	bread? Yeah, 'cause I'm like,	can go ahead and pick your
	maybe, for you shopping	and, you know, Make your	well with the eggs, are they	product, the one that you're
	online."	grocery list and, then, send it	gonna open the eggs and	gonna replace it with"

out And, by the time you get make sure all of them are not Productive food. And, they full prick out your prices per unit parents who have a really busy control they were full that would be the only with all the sufficient of the companient."—I would think Easy/convenient. "They laws that would be the only work and to not the you. They'll even how easy it is though, like it advantage of in the middle of your dropping they fiscenshing that qualifies for it."  Convenient. "I would think Easy/convenient. "The advantage of the process and look at the price." It would think that would be the only of online, you will all the suffice and come back to shopping they go the resonal stopper."  Come and continue where you left of the companient of my full and come back to shopping they and you can go afterd to the trassmebody eless that they read and continue where you left of the website: "They would the store."  Associated fees. "We have the middle of your and the store in and the store in and the store in and they with all the suffice and come back to shopping they are something of the prices."  Associated fees. "I would the store in and come back to shopping they are something that qualifies for it."  Associated fees. "I was like they read that they read in a down back to shopping they are something that qualifies for it."  Associated fees. "I was like they read they are something they are something to process." "I was like they read to be a strictly to my the something they are something to put mores for prices."  Associated fees. "I was like they read they are something to put more in the internet is running slowly or your these in the put they are something to put more in the internet is running slowly or your species."  Being able to put more something they would be a strictly the internet is running slowly or your and and they would be a strictly they are something they are something they are something	Dorticion+	Porcios positional	Portion advantage and	Porceived disappropriate postorio	Porcio de la contracta de la c
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great for single parents or look for my prices per unit parametrs who have a really busy compare the size of the Easy/convenient: "Online, you personally have to do the package, but now I don't have to do the convenient to that that would think that that would be the only of online is convenience factor thing, like conveniente."  Convenient: " I would think that that would be the only of online is convenience factor thing, like convenience."  Easy/convenient: "The advantage of it must be store: "I will see to only of online is convenience factor and prick it up compare the in your car" So, an I would think the store work that the price."  Easy/convenient: "The advantage of it when the papers then it your car" So, an I would think the store work to so on the work to personally and come back to shopping trip if something one I don't know if and come back to shopping the shopping trip if something the stuff it and come back to shopping the shopping trip if something the stuff it and come back to shopping the shopping trip if something the stuff it and come back to shopping the shopping trip if something the stuff it and come back to shopping trip if something to must some back to shopping trip if something the stuff it and come back to shopping trip if something to must some back to shopping trip if something to must some back to shopping trip if something to must some back to shopping trip if something to must some back to shopping trip if something to must some like. "It's gotten have to built something to must some back to shopping trip if something to must some some propers."  Poblems with the website: "I have to pull something to must be seen to some some some some some some some som			food. And, that would work	Difficult to compare prices: "I	turning it over and looking at
parents who have a really busy when liget the meat then life			great for single parents or	look for my prices per unit	the expiration date. I'm not
Easy/convenient: "! would think  Convenient: "! would think  Easy/convenient: "! would think  Hat that would be the only by our dot."."  Convenient: "! would think  Easy/convenient: "The advantage of the price."  Convenient: "! would think  Hat that would be the only by our you. They'll even of online is convenience factor thing. [ike convenience."  Convenient: "! would think  Easy/convenient: "The advantage of the middle of who how it works if you order thing. [ike convenience."  So you don't have to personally or of online is convenience factor an item and then it's out of conne in and to it So, an an item and then it's out of advantage of in the middle of your shopping this far and you who all the suff and continue where you left of general point where you left of the items of your personal shopper."  Hat qualifies for it."  Easy/convenient: "The advantage of on the middle of who how it works if you order they conne in and you your shopping thing is convenience factor and it your shopping the far something all you while it they far and you who they it lay far and you who they it lay for it and continue where you left of it myself: 'So. like it wasn't, to me and on the your shopping it you shoul to your ty to pull something up and it's not there is noning slowly or you pull something up and it's not there."  Problems with the website: 'the it wasn't, to me your you pull something up and it's not there."  Problems with the website: 'the your and you you to you pull something up and it's not there."			parents who have a really busy	when I get the meat then	sure if the workers pay that
Easy/convenient: "online, you package, but now I don't have to do the foot woulk. You don't have to go foot wouk. You don't have to go foot work. You don't have to go wark around the store. They'll seen in your car"  Convenient: " I would think Easy/convenient: "The advantage in you car to you can yo up. You just sit there could pick it up compare the in your car"  Convenient: " I would think Easy/convenient: "The advantage of online is convenience."  Convenience."  Convenience."  Convenience."  Convenience."  Easter: "But, essentially, Ilke cone in and doit So, an item and then its our off cone in and doit So, an item and very five it and come back to shopping the presonal that qualifies for it."  I and continue where you left off so attend for your shopping the presonal shopping the picking out. It's like I have to your personal shopper."  Associated fees: "I was alter it and come back to shopping shopping knows what they're picking out. It's like I have to your personal shopper."  Associated fees: "I was alter it and come back to shopping shopping knows what they're picking out. It's like I have to your personal shopper."  And onthine was your shopping the your my fruit."  And onthine was your shopping when you left off my fruit."  Associated fees: "I was alter we have you left off my fruit."  Problems with the website: "The area of your and you left off my fruit."  And continue where you left off my fruit."  Problems with the website: "The propertion of your personal shopper."  And continue where you left off my fruit."  Problems with the website: "The propertion of your with each off your description of your shopping with and you with the your personal and continue where you left off my fruit and your your shopper."  And continue where you left off my fruit and you you have you left off when the your your shopper."  And continue when you will will we			life"	compare the size of the	much attention to detail when
Convenient: " I would think Essy/convenient: " I would think Essy/convenient: " I would think Essy/convenient: "The advantage thing, like convenience."  Convenient: " I would think Essy/convenient: "The advantage that that would be the only of online is convenience factor thing, like convenience."  Seeing items/deals in the store. "I'm used to being hards-on. I load you up. You just sit there outled pick it up compare the in your rad or So, an could pick it up compare the only of online is convenience factor an term and then it's out of Essier. "But, essentially, like is advantage of in the middle of whom it works if you order how easy it is though, like if advantage of in the middle of when it and to me back to shopping the from the fiyer and you you find to not five you file have to your personal and comback to shopping the prices of the prices." I was like five the prices of the prices of the prices of			Easy/convenient: "online, you	package, but now I don't have	they're shopping for others,
Convenient: " I would think that the convenient are and the says convenient thing like convenients and your up. You just sit there and you up. You just sit there and just that would be the only froiling is convenience factor thing. Ilke convenience is o you don't have to personally south find it on the filver and you weave it is tough, like advantage of in the middle of wasn't is tough, like advantage of in the middle of your sour shopping thip if something on that qualifies for it."  Being able to put notes for that qualifies for it."  Being able to put notes for that source from it in the vitate and your spensonal shopper."  Problems with the website: "He store in the strong in the word it it you shopping the your shopping the personal that qualifies for it."  Associated fees: "I was like, 'It's gotta have a fee. Uh, I'll do it myself'. So like it weart, to me, a worth it type situation."  Problems with the website: "He personal that it was a fee. Uh, I'll do it myself'. So like it weart, to me, a worth it type situation."  Problems with the website: "He internet is unning slowly or you there you and it's not there."			don't actually have to do the	the size right here. I have to go	'cause they've got a big list
convenient: " I would think Easy/convenient: " I would think that that the the only our car"  Convenient: " I would think that the the out to your read only in your car"  Convenient: " I would think that the the out of confine is convenience factor thing, like convenience."  Convenient: " I would think that the the out car"  Easiler: "Easy, "Easiler: "The advantage of in the middle of your shopping trip if something want it, you clike on it and fits comes up you can go attend to that qualifies for it."  Easiler: "I would think that qualifies for it."  Easy/convenient: "The advantage of in the middle of your shopping trip if something want it, you clike to it and if some back to shopping that qualifies for it."  Easiler: "I want for the five and you with all the stuff and continue where you left off work it and if some back to shopping that qualifies for it."  Easiler: "I would think the work it works if you order the price."  So you don't have to personally the preson they got personal that qualifies for it."  So your personal shopper."  Associated fees: "I was like." If so gotta have a fee. Uh, I'll do it may any they work it to yoe sixth or your personal shopper."  Problems with the website: "The or the internet is running slowly or you tyto pull something up and it fire internet is running slowly or you the type."			foot work. You don't have to	by reading very carefully."	and maybe more than one
Convenient: " I would think Easy/convenient: "The advantage that would be the only so you don't have to personally like if you graphoping trip is comen in and doi. " So, an you don't have to personally like if you shopping trip is something fruits and vegetables so I get a want it, you click on it and come back to shopping that qualifies for it."  Being able to put notes for trust somebody else's and continue where you left of trust source in the stuff in the register is and continue where you left of special source in the preson they got personal shopper."  Problems with the website: "then it is nonling slowly or your typ out got personal shopper."  Problems with the website: "then in the stuff in the remains slowly or your typ opil got your personal shopper."  Problems with the website: "then in the website: "then in the stuff in the first in want, to me, a worth it type situation."  Problems with the website: "then in the price."  It is necessarially like if any or trust somebody else's intended to the price."  Problems with the website: "the middle of trust somebody else's intended to the price."  Problems with the website: "the middle of trust somebody else's intended to the intended to the price."  Problems with the website: "then in the price."  Problems with the website: "then your personal shopper."  Problems with the website: "then your personal shopper," if the intennet is running slowly or your typ to pull something up and its not the price."			walk around the store. They'll	Seeing items/deals in the store:	order and just moving as fast
Convenient: " I would think Easy/convenient: "The advantage that that would be the only of online is convenience factor thing, like convenience."  Convenient: "But, essentially, I like consequence, and you don't have to personally an item and then it's out of Easier: "But, essentially, I like advantage of in the middle of want it, you click on it and it's conse up you can go attend to gonn pop up with all the stuff and come back to shopping the person they got personal that qualifies for it."  Easy/convenient: "The advantage condition is convenience factor and it may advantage of in the middle of work than then it's out of store in and of it. "So, an want it, you click on it and come back to shopping from so with all the stuff and come back to shopping show what they're middle of shopping from the where you left off shopping knows what they're middle of shopping from the where you left off shopping knows what they're middle of shopping from the where the trust somebody elses judgement of my fruit and I'm proper and your personal shopper."  Problems with the website: "The internet is running slowly or your typ to pull something up and it's not there."			bring it out to you. They'll even	"I'm used to being hands-on. I	as they can"
Convenient: " I would think Easy/convenient: "The advantage that that would be the only of online is convenience and look at the price."  Convenient: " I would think of online is convenience and object thing, like of online is only don't work of its out of the sesentially, I like advantage of in the middle of want it, you click on it and on the open pop up with all the stuff and come back to shopping that qualifies for it."  Cone in and do it So, an how how it works if you order an order mand then it's out of advantage of in the middle of want it, you click on it and your shopping from the your shopping that qualifies for it."  Associated fees: "I was like, 'It's and on the website: "then if the internet is running slowly or you try to pull something up and it's not there."			load you up. You just sit there	could pick it up compare the	Higher prices online: "'cause in
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Convenient: " I would think that that would be the only be that that that that that that that tha					have to come to the store and
Convenient: " I would think that that that that that that that tha					look for the sales."
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your shopping trip if something comes up you can go attend to comes up you can go attend to it and come back to shopping and continue where you left off you left off continue where you left off continue where you left off you left		how easy it is though, like if	advantage of in the middle of	Not being able to smell my	don't get the deal that you saw
comes up you can go attend to hit and come back to shopping and continue where you left off and		you find it on the flyer and you	your shopping trip if something	fruits and vegetables so I get a	online"
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<b>5.</b> 0			your personal shopper."	trust somebody else's	couldn't find that bakery bread
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if the internet is running slowly or you try to pull something up and it's not there."				Problems with the website: "then	
or you try to pull something up and it's not there."				if the internet is running slowly	
and its not there."				or you try to pull something up	
				and it's not there."	

¹WIC,

public health nutrition scientist, this fact, combined with the study occurring in the research office, may have influenced participants to be more health conscious than the normal population. Thus, participant bias and researcher bias may have affected results. This study had a small sample size, limiting our ability to generalize findings to broader populations. However, data saturation was reached regarding key themes related to perceived advantages and disadvantages. Finally, participants were not spending their own money but were given gift cards to complete each shopping episode, which may have influenced what was purchased. Strengths include the detailed quotations and the use of actual shopping experiences among

Future studies using larger and more representative samples are needed to fully understand the potential for online grocery shopping to improve public health nutrition. In order to reduce the high level of perobservation investment in the current study, future studies with larger samples could include collecting automated purchase data via loyalty cards and the use of individuals' own financial resources to simulate the real-world experience. Due to increasing interest in incorporating online grocery shopping into federal food-assistance programs (19), it is critical to consider and test ways to encourage healthy purchasing in the online modality.

## **Acknowledgments**

The authors' responsibilities were as follows—SBJP, SWN, JLB, and AG: conceived of the study and collaborated on creation of in-depth interview guides; SBJP: oversaw the study, conducted the in-depth interviews, collected all data, and drafted the manuscript; SBJP, CJK, SP, and HW: collaborated on data analysis and all authors contributed to interpretation of the data; and all authors: gave substantial intellectual and conceptual feedback and read and approved the final manuscript.

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