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Survey Design
10.19.2019

Survey Design Final Project

*Introduction – Reasoning & Hypotheses*

Food is an essential part of life, but so many people right here in the city of Pittsburgh don't have reliable access to it. And usually the folks who don't have reliable access to good food in their neighborhood also don't have access to good transit options to get to better food options – food and transit insecurities usually go hand in hand for most communities.[1]

There has been a good amount of research in Pittsburgh on food and transit deserts in the past, most notably from 412 Food Rescue[2] and Pittsburghers for Public Transit[3], but most of that research is based geographically – on where neighborhoods at the most risk for poverty are, or where grocery stores are. But that data doesn't take into account the actual lived experiences of these folks – if you *technically* don't live in a food desert, but you still can't find quality ingredients at the grocery nearest to you, or you can't find the right spices to make your ethnic dishes at that store, you're still not able to access the food that you need to thrive in Pittsburgh, and that's important data. Same with transit – if you're not technically in a transit desert but if you use a wheelchair and the closest bus stop is up a steep hill, that's important data for people that need to plan where to put new bus stops or routes.

Food insecurity is about more than just access or ability to go to a grocery store – it's about what is and isn't available at that grocery store. Whether it's food that fits within people's dietary restrictions, food that's from people's cultural or ethnic backgrounds, or just fresh, quality produce and meats – it's about which stores are giving people what they actually need. Transit is similar – it's not just about access to bus stops or bus routes, it's about whether those that are accessible to you actually go where you need them to, whether they run on time, and if they're always full.

It's important data to know because the current data right now doesn't capture the full story. If the goal is just to figure out places we need more grocery stores, we miss the demographic of people who have grocery stores need them – but they just don't have the food that they want. If the goal is just to figure out where new bus stops need to be created, we miss the demographic of people who might not need new bus stops, but just easier ways of getting to them. This could cause us to waste money and resources fixing a problem that doesn't exist, or ignoring problems that do exist.

We won't be able to fully capture all of these data points in this survey, but the goal of our survey is to showcase that there's more to the story than what's currently being researched with food and transit insecurity, and induce a deeper dive into what individual lived experiences for folks living in Pittsburgh around food and transit are like. We want to predominantly focus on what the difference between people of color's access to food and transit are vs white people in Pittsburgh's access is. We will survey all of Pittsburgh, and see what the variation between respondents looks like based on demographics and neighborhoods.

Our hypotheses are that predominantly black and brown neighborhoods would have lower opportunities to access in both food and transit, and specifically less access to *good* food and *good* transit options, and

[1] https://412foodrescue.org/wp-content/uploads/2018/04/412-Food-Rescue-GIS-Study-.pdf
[2] https://412foodrescue.org/about-us/our-impact/
[3] https://www.pittsburghforpublictransit.org/research-and-resources/transit-deserts/

that predominantly immigrant neighborhoods will not have access to food that fits their cultural background. We would also hypothesize that it takes longer for those folks to get to where they buy their food, that their food options are limited by both money and transit options, and that they would be much more likely to miss out on opportunities because of a lack of reliable transportation.

*Methodology & Limitations*

Our target population for this survey is all households in Pittsburgh – because we are mainly concerned for the differences between black and brown people's food and transit insecurity and white people's food and transit insecurity in Pittsburgh, we will have to sample all of Pittsburgh in order to be able to make any meaningful claims about the differences.

We can get the sampling frame of addresses in Pittsburgh through online retailers like ExactData[4], and find a frame that matches our needs this way. With the data that we are concerned with getting, there is a reasonable assumption that people with email addresses or telephones would have significantly different responses to our questions than those without, so a mailed survey to people with their addresses would both map to what information retailers like ExactData would give us and make sure that we are not introducing more unnecessary levels of error into our survey design.

Depending on budgetary concerns, we could either do a sample or a census from this frame. At only 143,739 households in Pittsburgh[5], for a firm or an institution with the money it wouldn't be completely unreasonable to do a census – especially because in order to get a 3% margin of error at a 95% confidence interval, you need to sample at least 141,829 households in Pittsburgh.[6] But because this survey is being used a precursor for further research, it's fair to save most of that money for the fuller survey and only do a sample for this part of the research, even if the difference is only of about 2,000 households.

While sampling, because what we're interested in is differences between neighborhoods and demographics, it would be fair to use a cluster sampling methodology, but because at 99 neighborhoods in Pittsburgh we'd need to sample all 99 in order to get a 3% MOE at a 95% confidence interval[7] – what we'd end up with is essentially a stratified sample where the strata are neighborhoods in Pittsburgh. We can use software such as QGIS or ArcGIS to map the household addresses and information we obtained from ExactData or similar online retailer to these neighborhoods and then use a random number generator in order to pick the sample of households from those neighborhoods. The number of households we'd need to pick from each neighborhood would depend on the percentage of that neighborhood's population to the population of Pittsburgh in order to make sure that the strata are representative of Pittsburgh as a whole.

We can evaluate our survey instrument via focus groups or cognitive interviewing – we would find the people for these focus groups in a similar way to the way that we'd sample for the larger survey. This is important to make sure that the measurement error in the survey is minimized, although of course we will still have some.

Every survey instrument has its limitations, and ours is no different. As mentioned above, our questions might not be understandable to everyone we're trying to survey, or not be understood in the same way around important demographic distinctions. Hopefully most of these issues will be sorted out in the focus groups and presurvey testing, but there is always a nonzero amount of measurement error, even when we

[4] https://www.exactdata.com/local-mailing-lists/pa/pittsburgh.html
[5] http://pittsburgh.areaconnect.com/statistics.htm
[6] https://www.surveysystem.com/sscalc.htm
[7] https://www.surveysystem.com/sscalc.htm

do our best, because the construct that we are trying to measure might not be able to be measured by the question we're asking, even if the question is reliable in its understanding.

Our sampling error (if we choose to go the sampling route, rather than the census route), would be exactly 3% since that's what our margin of error is. Coverage error is also a thing we'll have to be wary of, depending on which online retailer we end up going with – where they're getting their data is important to know, especially if it's old or bad data. We're almost inherently going to miss certain folks that just moved, just died, or even just weren't counted in the most recent US census as well.

Nonresponse error is where this survey most majorly has limitations – however we sample our households, there is a huge risk in the folks who have the time, resources, and energy to fill out our survey being significantly different in the factors we're trying to test than the folks who don't. People in poverty who are more likely to be people in food and transit deserts don't usually have the extra time necessary to fill out a survey about their experiences – and they usually experience survey fatigue because of how many studies want them to fill out surveys about poverty or food and transit insecurity. This could wildly skew our data if the nonresponse error was significant in the demographics of those who filled out our survey and who didn't. This is especially hard to combat in our survey design because of the questions we are interested in asking about people's lived experiences. Hopefully, incentives – monetary or otherwise – might help us in gaining more respondents. Since incentives usually work in favor of getting poorer people to fill out surveys, this may balance out the issues of more well-off people who have more time and would be more inclined to fill out the survey anyway.

Another potential issue in this survey – not necessarily a source of error, but a possible limitation – is that we are only looking at households in Pittsburgh in this survey, while a lot of the data and research that has already been done was looking at the whole of Allegheny County. It's possible that once this survey is done, the larger study could be done in all of Allegheny County, but the results of this survey are only generalizable to the city of Pittsburgh since that's what our population and sampling frame was from.

*Survey Instrument*

My main worry is that this survey is cognitively difficult – we're jumping from demographics (which are also first, which can be hard for people to want to fill out, especially at the beginning of a survey) to questions about grocery stores to questions about bus stops and transportation usage. Even within the sections some of the questions can be cognitively demanding (such as the ones that ask you to rank why you do or don't shop at certain stores or ranking certain kinds of food at grocery stores) and could lead to satisficing or acquiescing from folks.

The wording on the questions about the different grocery stores that people shop at could also be confusing for folks, and just generally that the skip patterns could also be confusing for people to follow.

*Survey*

## Demographics

1. Which of these programs do you and/or your family qualify for? Please choose "yes" or "no" for each program.

|  | Yes | No |
|---|---|---|
| a. Supplemental Nutrition Assistance Program (SNAP) | ☐ | ☐ |
| b. Temporary Assistance for Needy Families (TANF) | ☐ | ☐ |
| c. Section 8 Housing | ☐ | ☐ |
| d. Medicaid | ☐ | ☐ |

2. What is your race or ethnicity? Check all that apply.

| | |
|---|---|
| ☐ | White/Caucasian |
| ☐ | Black/African American |
| ☐ | Latinx |
| ☐ | South Asian |
| ☐ | East Asian |
| ☐ | SouthEast Asian |
| ☐ | Pacific Islander |
| ☐ | Native American |
| ☐ | Other |

3. Specifically, what is your race/ethnicity if not specified appropriately above? (ie Indian, Filipino, Guatemalan, etc)

   _____

4. How many years have you lived in the US? (Please estimate based on how long your *permanent residence* has been located within the US.)

   _____

5. How many years have you lived in Pittsburgh? (Please estimate based on how long your *permanent residence* has been located within Pittsburgh.)

   _____

6. What is your first language?

   _____

7. What Pittsburgh neighborhood do you live in?

   _____

## Access to Food

8. In a typical week, how many days per week do you eat at least:

| | 0 Days | 1-2 Days | 3-4 Days | 5-6 Days | Every Day |
|---|---|---|---|---|---|
| a. Two cups of fruit in one day | ☐ | ☐ | ☐ | ☐ | ☐ |
| b. Two and a half cups of vegetables in one day | ☐ | ☐ | ☐ | ☐ | ☐ |
| c. Three ounces of whole grains | ☐ | ☐ | ☐ | ☐ | ☐ |
| d. 5.5 Ounces of Protein | ☐ | ☐ | ☐ | ☐ | ☐ |
| e. 3 Cups of Dairy | ☐ | ☐ | ☐ | ☐ | ☐ |

9. To what extent do the following factors affect where you decide to shop for food?

| | Strongly Affect | Moderately Affect | No Effect | N/A |
|---|---|---|---|---|
| a. Quality of food | ☐ | ☐ | ☐ | ☐ |
| b. Price of food | ☐ | ☐ | ☐ | ☐ |
| c. Variety of food | ☐ | ☐ | ☐ | ☐ |
| d. Having a selection of food from your ethnic background | ☐ | ☐ | ☐ | ☐ |
| e. Having a selection of food that fits your dietary restrictions | ☐ | ☐ | ☐ | ☐ |
| f. Other (Write in) _____ | ☐ | ☐ | ☐ | ☐ |
| g. Other (Write in) _____ | ☐ | ☐ | ☐ | ☐ |

*Think of the closest grocery store to where you live. Please answer the following the questions based on that grocery store, whether or not you typically shop for food there.*

10. Which of the below chains, if any, is this grocery store?
    a. Whole Foods
    b. Trader Joe's
    c. Giant Eagle
    d. Aldi
    e. Save A Lot
    f. Other
    g. If other, what is it called? _____

11. How do you typically get there to shop for food?
    a. Walking
    b. Biking
    c. Public Transportation (go to #13)
    d. Car (go to #12)
    e. Other: _____

12. If you drive, how easy is it to find parking close to the store?
    a. Very easy
    b. Relatively easy
    c. Not easy

13. If you take public transportation, how easy is it to find a bus to the nearest grocery store?
    a. Very
    b. Relatively easy
    c. Not easy

14. How long would it take you to get there using your preferred form of transportation?
    a. <15 min
    b. 15-30 min
    c. 30-45 min
    d. >45 min

15. How frequently do you shop there?
    a. A couple times a week or more
    b. About once a week
    c. A couple times a month
    d. About once a month
    e. Less frequently than once a month
    f. Never

16. How would you rate the quality of these different categories at this grocery store?

| | Very Bad | Bad | Just Okay | Good | Very Good | N/A (This doesn't exist in my store) | Don't Know |
|---|---|---|---|---|---|---|---|
| a. Meat | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| b. Fish | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| c. Dairy Products | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| d. Eggs | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| e. Fresh Vegetables | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| f. Fresh Fruits | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| g. Herbs & Spices | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| h. Frozen Food | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| i. Baking Supplies | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| I. Food of your ethnic origin | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| j. Food that fits your dietary restrictions | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| k. Other Household Items (Paper towels, cleaning supplies, etc) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| l. Other (Write in) _____ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

17. Do you frequently shop at this store for food?
    a. Yes (skip to next section)
    b. No (go to 18)

18. If no, to what extent do these factors affect why you don't shop here?

| | Strongly Affect | Moderately Affect | No Effect | N/A |
|---|---|---|---|---|
| a. Quality of food | | | | |
| b. Price of food | | | | |
| c. Variety of food | | | | |
| d. Having a selection of food from your ethnic background | | | | |
| e. Having a selection of food that fits your dietary restrictions | | | | |
| f. Other (Write in) _____ | | | | |
| g. Other (Write in) _____ | | | | |

***Now think of the place you most frequently shop for food.***

19. Is this the same grocery store that's closest to you? (The one you answered the last section about.)
    a. Yes (skip to next section)
    b. No (Go to #20)

20. Which of the below chains, if any, is this grocery store?
    a. Whole Foods
    b. Trader Joe's
    c. Giant Eagle
    d. Aldi
    e. Save A Lot
    f. Other
    g. If other, what is it called? _____

21. How do you typically get there to shop for food?
    a. Walking
    b. Biking
    c. Public Transportation (go to #23)
    d. Car (go to #22)
    e. Other: _____

22. If you drive, how easy is it to find parking close to the store?
    a. Very easy
    b. Relatively easy
    c. Not easy

23. If you take public transportation, how easy is it to find a bus to the nearest grocery store?
    a. Very
    b. Relatively easy
    c. Not easy

24. How long would it take you to get there using your preferred form of transportation?
    a. <15 min
    b. 15-30 min
    c. 30-45 min
    d. >45 min

25. How frequently do you shop there?
    a. A couple times a week or more
    b. About once a week
    c. A couple times a month
    d. About once a month
    e. Less frequently than once a month
    f. Never

26. How would you rate the quality of these different categories at this grocery store?

| | Very Bad | Bad | Just Okay | Good | Very Good | N/A (This doesn't exist in my store) | Don't Know |
|---|---|---|---|---|---|---|---|
| a. Meat | | | | | | | |
| b. Fish | | | | | | | |
| c. Dairy Products | | | | | | | |
| d. Eggs | | | | | | | |
| e. Fresh Vegetables | | | | | | | |
| f. Fresh Fruits | | | | | | | |
| g. Herbs & Spices | | | | | | | |
| h. Frozen Food | | | | | | | |
| i. Baking Supplies | | | | | | | |
| j. Food of your ethnic origin | | | | | | | |
| k. Food that fits your dietary restrictions | | | | | | | |
| l. Other Household Items (Paper towels, cleaning supplies, etc) | | | | | | | |
| m. Other (Write in) _____ | | | | | | | |
| n. Other (Write in) _____ | | | | | | | |

27. How frequently do you shop for food at places other than the store at which you most frequently shop?
    a. A couple times a week or more
    b. About once a week
    c. A couple times a month
    d. About once a month
    e. Less frequently than once a month
    f. Never (I only shop at this one.) (skip to next section)

28. If you shop at food at places other than this one, however infrequently, please tell us why - what does this store lack that you are looking for?

    _____

**Access to Transportation**

29. In a typical week, how frequently do you utilize the following methods of transportation?

| | 0 (I Don't Use this) | 1-2 Days | 3-4 Days | 5 or more days |
|---|---|---|---|---|
| a. Walking | | | | |
| b. Biking | | | | |
| c. Car | | | | |
| d. Public Transportation | | | | |
| e. Other | | | | |

30. How long does it generally take you to commute to each of the following?

| | 10 minutes or less | 11-30 minutes | 31-45 minutes | 46-60 minutes | More than 60 minutes | N/A |
|---|---|---|---|---|---|---|
| a. Doctors' Appointments | | | | | | |
| b. Grocery Shopping | | | | | | |
| c. Social Events | | | | | | |
| d. Work | | | | | | |
| e. Meetings with benefit providers | | | | | | |
| f. Childcare (dropping off, picking up) | | | | | | |
| g. School | | | | | | |
| h. Other | | | | | | |

31. How frequently throughout the week do you find yourself **unable** to go to any of the following due to a lack of reliable transportation?

| | Almost always | Very often | Often | Not Often | Almost Never | N/A |
|---|---|---|---|---|---|---|
| a. Doctors' Appointments | | | | | | |
| b. Grocery Shopping | | | | | | |
| c. Social Events | | | | | | |
| d. Work | | | | | | |
| e. Meetings with benefit providers | | | | | | |
| f. Childcare (dropping off, picking up) | | | | | | |
| g. School | | | | | | |
| h. Other _____ | | | | | | |

32. How frequently throughout the week do you find yourself **late** to any of the following due to a lack of reliable Transportation?

| | Almost always | Very often | Often | Not Often | Almost Never | N/A |
|---|---|---|---|---|---|---|
| a. Doctors' Appointments | | | | | | |
| b. Grocery Shopping | | | | | | |
| c. Social Events | | | | | | |
| d. Work | | | | | | |
| e. Meetings with benefit providers | | | | | | |
| f. Childcare (dropping off, picking up) | | | | | | |
| g. School | | | | | | |
| h. Other | | | | | | |

**Access to Public Transportation**

33. How often do you use public transportation in a typical week?
    a. Never (go to #6)
    b. 1-2 days a week
    c. 3-4 days a week
    d. 5-6 days a week
    e. Daily

34. If you answered "Never" to the previous question, which of these is a reason why you don't use public transportation? Please choose "yes" or "no" for each reason.

|  | Yes | No |
|---|---|---|
| a. Too Expensive | | |
| b. Not reliable | | |
| c. Difficult to access | | |
| d. Transportation is not available to take me where I want to go | | |
| e. Don't need to | | |

35. How long does it take you to walk to the nearest bus stop that you regularly use?
    a. <15 minutes
    b. 15-30 minutes
    c. 30-45 minutes
    d. >45 minutes

36. How often is the bus that you need late?
    a. Very often late
    b. Often late
    c. Not often late
    d. Never late

37. How frequently in a typical week does your bus never arrive?
    a. 5 or more times
    b. 3-4 times
    c. 1-2 times
    d. 0 (it always arrives)