K: Sampling Scheme 30/30

L: Questionnaire 40/50

M: Sample Size 20/20

90/100

36-303 | Team E
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Proposal: Analysis of the Off-Campus Housing Search for CMU Students

A. Why is this topic interesting? Why does this survey need to be done now? Is there a client for whom you might do the survey?

Finding an off-campus housing, a residence with less certainty and safety compared to common homes and school dormitories, is essentially the first independent search for the majority of college students. It is not hard to associate this searching experience with difficulty and frustration. In particular, some Carnegie Mellon University (CMU) students found such experience below satisfactory. Armed merely with such tools as “Craigslist.org”, “Rent.com”, and “CMU Misc. Market”, CMU students can be jeopardized, especially by the lacking of efficiency, safety, and validity of information. This survey is intended to identify the existing difficulty and provide a strong basis for viable resolutions as soon as possible. Moreover, we are interested in the students’ preference in off-campus housing. The result of this survey will be of great interest to many, such as CMU Student Affairs, property managers, college students and college student parents.

B. What question(s) do you propose to study? Give a brief answer that would have been understandable by a non-statistician.

From a randomized sample of CMU students, we plan on measuring CMU student housing preferences along with the most common difficulties that CMU students currently face in searching for off campus housing. We are looking to gather data from CMU students who have looked for or are currently looking for off campus housing. Therefore, to ensure we obtain the appropriate data, we must first ask if the participant has looked for or is currently searching for off campus housing. From those who have looked for or are currently looking for off campus housing, we wish to ask questions concerning their housing preferences and difficulties in searching for housing. Examples of such questions are as follows:

1. What are the common platforms used in the search of off-campus housing? What is the level of accessibility, accuracy of information, likelihood of success, etc. of such platform? We will assess each category above by having respondents rating the platform (on a scale of 1 to 5) with respect to the category. Also, we will provide examples for the scale so respondents follow a similar scale (possibly using the Anchoring Vignettes method).

2.What is your preference for an off-campus housing? [i.e. Do you prefer an apartment or a house? What is your acceptable distance from your residence to campus (5-minute-walk, 10 minutes by bus, etc.)?]

3. Do you think this searching experience can be improved, if so, in what ways?

C. What research has already been done on the topic or on the theoretical construct of central importance to your topic? What could be learned from survey results?

Emily: http://www.ctpost.com/local/article/Students-don-t-often-consider-fire-safety-2755535.php (Jan 29, 2012)
This article, “Students Don’t Often Consider Fire Safety”, from the Connecticut Post by Linda Conner Lambeck discusses important features that should be looked for by college students when looking for off-campus housing, including fire safety features. The article is important in helping to identify college student off-campus preferences and important housing features that should be considered.

Zhi: http://www.bsudailynews.com/mobile/students-share-stories-advice-about-off-campus-

housing-1.2684146
"Students share stories, advice about off-campus housing" by Victoria Ison is an article supplemented with various interviews. It is helpful in identifying some prominent problems that exist in other student bodies. We can use information above as a guideline for our survey questions.

Terence: http://www.studentaffairs.duke.edu/communityhousing/resources/neighborhood-reports
Duke University has conducted housing surveys in the past. The Duke Student Affairs website contains such past surveys, which we can use for reference for our survey.

Jessica:
http://www.nytimes.com/2012/01/29/realestate/the-hunt-off-campus-with-elbow-room.html?pagewanted=1&_r=1
"Off Campus, with Elbow Room," by Joyce Cohen is an article detailing the personal experience of an NYU law student looking for off-campus housing. The article reveals some options a similar student may use, such as going through a broker to circumvent inaccurate online listings. We also see preferences that may be taken into account, such as personal (bedroom) space, social space, neighbors, and a community that appeals to people in our age range. This article is useful because it gives us a good idea of what the housing search process may be like for our target demographic

Kayco:
http://oip.georgetown.edu/isss/OFHsurvey.pdf
This is a survey result done at Georgetown with the international students to learn more about the trend and experiences of finding an off campus housing

D. What is the sampling frame? What population or populations do you plan to sample from? (This is the question many tend to miss).

The sampling frame is CMU students who are in the CMU directory and are currently taking at least 9 units' worth of courses. Therefore, we plan on sampling from the population of enrolled CMU students found in the CMU directory, i.e. those who have not objected to having their information listed in the directory.

E.

•What is the *target population?* To what population(s) do you wish to make inferences?
The target population is CMU students who have searched or are searching for off-campus housing. We are looking to make an inference about CMU undergraduate and graduate students. Specifically, we are looking to make an inference about CMU undergraduate and graduate students' housing preferences and difficulties in finding housing.

• How does the *target population* differ from the *sampling frame,* for your survey?
They are different since not everyone in the directory has had the experience of searching for off-campus housing. Also, we cannot find everyone who has searched or is searching for off-campus housing. Therefore, our sampling frame cannot be the same as the target population.

• What possible sampling and non-sampling errors could arise in the survey that you plan to conduct?
Possible errors that could arise in our survey are coverage error, sampling error, measurement error and non-response error.

• Explain each possible error, how it could occur, and how you suggest tackling it.

Coverage errors refer to discrepancies that can occur between data on our sampling frame and on the target population. There will be overcoverage error from sampling CMU students in the directory who are not searching for or have not searched for off-campus housing. This can be minimized through targeting the survey towards current/previous off-campus students through advertising and question design.

Sampling error can occur when there are differences between the sample and the sampling frame. Since our sample is only 1000 students out of the entire sampling frame of CMU directory students, there is bound to be some sample error. This will be minimized through simple random sampling.

Measurement error arises from inconsistencies between what the surveyors intend to measure through their questions and the respondents' interpretations of those questions. This is an error that can be reduced by avoiding ambiguously worded or overly complex questions.

We encounter non-response error when our sample population is insufficient and thus likely misrepresents our target population. The design of this survey attempts to reduce non-response error by creating an incentive, in this case a raffle, to participate.

F. What is the mode of data collection? How do you plan to carry out the survey(e.g.,by telephone, e-mail) and why?

For the early stages of the survey implementation, we focus on ensuring the randomness of the sample as well as a decent response rate. In order to do so, we will follow the steps below. First, we will create a random sample of 1000 students from the CMU directory as our respondents. This will be done by Zhijun's advisor, Carol Goldburg. By having a CMU advisor create a sample from the listed students in the directory, we ensure that we do not contact people who do not wish to be contacted. Then, we will email the randomly selected respondents a notification that he/she is selected to enter the survey. This notification will include a description of the survey, stating its purpose, and appropriate information such as privacy protection and respondents' right to not to respond the survey. When the survey is designed, we will pretest the survey and make amendments. Finally, we will send out the surveys to the random selected respondents and follow up for their response. In addition, we will have tabling and online advertisement for the survey, to help assure sample students of the legitimacy of the study. [Note: As stated in the attached document, part of the SURG grant will be used to purchase prizes in a raffle for participants in the survey.]

G. What variables do you propose to measure?

Type of off-campus housing (apartments /houses), characteristics of off-campus housing that students are searching for, and characteristics of current off-campus housing search options.

J. How do you plan to protect the privacy and assure the confidentiality of respondents? Talk about data collection, protection, and disclosure.

We will not be using any identifiers when collecting data from respondents. However, since participants will take our survey in the location of their choosing, it will be up to the participants to ensure their privacy while responding. Data will be collected through the use of an online survey, hosted on ZhiJun's team member's website. The raw data we collect will be stored online and will only be accessed by us and the SURG team. Since identifiers are not used, disclosure of respondent's information by the interviewers are not something that should be worried.

* Please see attachments for work done by the SURG team so far:

1. Developed the proposal.
2. Created a rough daft of the survey.

K.

We will be using a stratified simple random sample without replacement. The stratas will be undergraduate and graduate students. We decided not to break down the undergraduate student population by year, as undergraduates have similar off campus housing options, preferences, and means of finding off campus housing. We have chosen to break the student population into undergraduate and graduate students. There are many differences in what graduate and undergraduate students are looking for in off campus housing and how they go about looking for such housing.

The first difference is that graduate students are required to find off campus housing, while undergraduate students can live on or off campus. Graduate and undergraduate students also may have different financial situations. Additionally, graduate students and undergraduate students may look for different features in an off campus house or apartment. Therefore, undergraduate and graduated should be broken up into different stratas.

k looks fine. there will be a handout tues with suggestions about stratified sampling

L.

Part I: General Information

1. What is your Gender?
   - Female
   - Male
   - Other: _____

2. What is your ethnicity? (Please circle all that ~~is~~ are applicable.)
   - African American
   - Asian/Pacific Islander
   - Caucasian
   - Hispanic
   - Other: _____

3. What is your Year in School?
   - Undergraduate
     - Freshman
     - Sophomore
     - Junior
     - Senior
   - Graduate

5th yr senior?

4. Do you hold an international student visa?
   - Yes
   - No

5. Do you own a car in Pittsburgh?
   - Yes

- No

6. Do you currently reside On- or Off-Campus?
   - If On-campus,

     Please indicate the name of your residence hall:_____
     Would you consider moving off-campus?
     - Yes
     - No
   - If Off-campus,
     List the street of your current residence:_____

some streets (baum, forbes, bigelow, liberty, shady) are quite long, so this doesn't locate people well yet.

split apart into two questions. otherwise you don't know which one someone is responding to.

Part II: Identifying Difficulties in Off-Campus Housing Search

7 When looking for a place to live off-campus, which method would you be most likely to use or which method have you used the most?

- Housing and Dining / housing fair
- Craigslist or other online agents
- Word of Mouth
- Other: _____

do you have some prior evidence that these are the most frequent sources? pretesting might help you identify a couple of other sources, so that fewer people will need to use the "other" category.

What abotu people who use multiple resources?

8. Have you attempted to search for off-campus housing?
   - If Yes, please proceed with questions (answer questions 9-10).
   - Otherwise, please proceed with questions (10). 11?

use the software at survey monkey or some other service to execute this branch

~~For people who have searched for off-campus housing:~~

9. For the above method that you chose in question 7, please rate each of the following aspects of that method by circling your choice (1 = lowest, 4 = highest)

will need to replicate for multiple methods

Ease of use/Accessibility:	1	2	3	4
Accuracy of Information:	1	2	3	4
Level of information:	1	2	3	4
Likelihood of Success:	1	2	3	4

Can you make a table for the new questions 7, 9 and 11 that looks a bit like question 20 below?

10. How would you rate your overall experience of searching off-campus housing?

1	2	3	4
Not Satisfied			Very Satisfied

~~For people who have not searched for off-campus housing:~~

11. For the above method that you would use in question 7, please rank the importance of the following aspects (1= most important, 5=least important).

Ease of use/Accessibility:	_____
Accuracy of Information:	_____
Level of information:	_____

Pretesting will help you identify likely things that you will ahve to code for #12.

12. What are some other features you would look for in a website that specializes search in housing?(Open-ended)

Part III: Identifying Preferences in Off-Campus Housing Search

*** Important note - Apartment : Housing with multiple separate units**
House : Housing with separate rooms but under the same unit what does this mean?

13.Would you prefer to live in an apartment or a house?

- Apartment
- House

14. Would you prefer to live by yourself or share the housing with other?

- Live by myself
- Share the housing unit

convert into a quesiton and branch on it.

If you are sharing the type of housing you chose (i.e. either apartment or house):
15. How many other people would you prefer to live with?

_____

16. What is the maximum number of other people that you would be willing to live with?

_____

17. Would you only be willing to live with friends or would you be willing to live with people you are not familiar with?

- Only friends
- Unfamiliar people
- I am indifferent.

18. Would you prefer to share a room with a roommate or have a single?

- Roommate
- Single
- I am indifferent.

relevant for dorm life but not so much for apt or house life

19. How far are you willing to live away from campus in terms of walking time (in minutes)?

_____

20.

Questions 7-19 would be better if they were organized into blocks that cover coherent topics. Also, greater care should be given to separating questions for those who live in a dorm vs apartment vs house, and those who live alone vs those who live with others.

How important are the following things in affecting your decision to choose a particular house or apartment? (1 = not important, 5 = extremely important)

who are these questions relevant for? dorm residents? apt? house?

Parking Space Available:	1	2	3	4	5
Cleanliness inside:	1	2	3	4	5
(Apartment) Which floor it is on	1	2	3	4	5
(Apartment) Attractiveness of Apartment Building	1	2	3	4	5
(Apartment) Frequency/availability of maintenance	1	2	3	4	5
(House) Basement	1	2	3	4	5
(House) Attic	1	2	3	4	5
(House) Backyard	1	2	3	4	5
(House) Porch	1	2	3	4	5
(House) Having more than one story	1	2	3	4	5
(House) Attractiveness of House	1	2	3	4	5
(House) Attractiveness of Neighborhood	1	2	3	4	5
(House) Responsiveness and Availability of landlord	1	2	3	4	5

21. If you decided to look for off-campus housing, up to how much are you willing to pay for an off-campus housing per month ?

- less than $300
- $300-399
- $400-499
- $500-599
- $600-699
- $700~799
- $800 or above

This is a good start on questions.

A. questions should be better oganized into logical groupings

B. check to make sure that all "common knowledge" terms are really common knowledge, and define any that might not be

C. use branching feature of online survey service to deliver just the questions appropriate to the differnt types of respondents in your survey

D. definitely pretest with sevearl different kinds of respondents to identify questions that are hard to understand, hard to respond to, etc.

22. What is your preferred means of monthly rent payment?

- Cash
- Check
- Credit Card

23. What is your preferred method of monthly rent payment?

- Mail
- Online
- In person

M.

We have calculated a sample size of 146 undergraduate students and 108 graduate students. We looked at the question, “When looking for a place to live off-campus, which method would you be most likely to use or which method have you used the most?” This question has four choices, housing and dining / housing fair, Craigslist or other online agents, word of mouth, and other. We believe that Craigslist and other online agents will be the most popular response based on a small group survey. Therefore, we chose to code this problem as a yes or no type question, where “yes” would be coded as using Craigslist or online sources, and “no” would be coded as using housing and dining / housing fair, word of mouth, or other. For the

undergraduate strata, we set the probability of “yes” equal to 0.5 based on our small group survey. For the graduate strata, we set the probability of “yes” equal to .75, as graduate students, particularly first year graduate students might be new to the area and have less access to the other options, like word of mouth. From the CMU Factbook, we found that there are 5,843 CMU undergraduate students and 5,670 CMU graduate students (excluding branch campus students). Based on the calculations below, we decided that the largest reasonable sample sizes are 146 undergraduate students and 108 graduate students, based on a margin of error of 0.08.

ok

Undergraduate Students:
p=0.5

standard deviation = $[p(1-p)]^{0.5} = 0.5$

$$n' = \frac{(Z_{\frac{a}{2}}{}^2)(SD^2)}{(ME)^2}$$

$$n' = \frac{(1.96^2)(0.5^2)}{(ME)^2}$$

$$n \geq \frac{(N)(n[?][?][?])}{(N + n[?][?][?])}$$

$$n \geq \frac{(5843)(n[?][?][?])}{(5843 + n[?][?][?])}$$

MOE cases:
ME = .06: n = 255.12 → 255
ME = .07: n = 189.64 → 189
ME = .08: n = 146.30 → 146
ME = .09: n = 116.20 → 116

better to round up for this sort of thing..

Graduate Students
p=0.75

standard deviation = $[p(1-p)]^{0.5} = 0.43$

$$n' = \frac{(Z_{\frac{a}{2}}{}^2)(SD^2)}{(ME)^2}$$

$$n' = \frac{(1.96^2)(0.43^2)}{(ME)^2}$$

$$n \geq \frac{(N)(n[?][?][?])}{(N + n[?][?][?])}$$

$$n \geq \frac{(5670)(n[?][?][?])}{(5670 + n[?][?][?])}$$

MOE cases:

ME = .06: n = 190.67 → 190
ME = .07: n = 141.34 → 141
ME = .08: n = 108.85 → 108
ME = .09: n = 86.36 → 86

Total:
ME = .06: 255 + 190 = 445
ME = .07: 189 + 141 = 330
ME = .08: 146 + 108 = 254
ME = .09: 116 + 86 = 202

* We chose ME = .08, as it's the smallest ME we can have without making our total sample size unreasonably large.

looks good

-BJ