

Tuning in to Solar Ear: Measuring the Social Benefit of Applied Social Science for the Public Good



Authors

Myles Sansone, Mary Catharine Duane, & Natalie Lays



**Faculty Advisor
Laura Robinson**

CSTS EDUCATION PROGRAMS

PRACTICAL SOCIAL JUSTICE IN SERVICE TO HUMANITY

Acknowledgements:

We would like to thank the many people who made this extraordinary experience possible. At Santa Clara, we would like to thank Thane Kreiner, Keith Warner, and Laura Robinson. Thanks to them, we are now able to appreciate the importance of programs like the Global Social Benefit Incubator. Dr. Kreiner and Dr. Warner opened our eyes to the promise of social entrepreneurship as a means of promoting social justice. We would like to thank our faculty advisor Professor Laura Robinson for her constant intellectual guidance and mentorship. Thanks to her, we are now well-trained in social science methods that prepared us to succeed in the field this summer and in our future endeavors. In addition, we want to thank Professor Robinson for giving us the keys to unlocking the wonders of Brazilian culture—a vibrant society that has much to offer to the world. In Brazil, our thanks goes to our wonderful translator Katia Arruda, cultural liaison Claudia Magalhães, and members of Solar Ear: Howard Weinstein, Monica Weinstein, James Dijkstra, Claudia Lima, and Andrea Resende. Finally, we would like to express our gratitude to Santa Clara University for its commitment to extraordinary undergraduate education through the GSB Fellows Program that makes the SCU experience so unique.

Table of Contents

Part I

Measuring the Social Benefit of Applied Social Science to Benefit Society.....4

In Part I, we provide a report summarizing our research in Brazil that resulted in a measuring and evaluation tool (MET) that will be gifted to Solar Ear.

Overview.....	5
Literature Review.....	5

Part II

Measuring and evaluation tool (MET).....8

In Part II we provide a copy of the MET that we created for Solar Ear.

MET.....	9
Methodological Approach and Measurement Rationale for Questions.....	21
Field Testing of MET.....	26
Suggested Administration.....	26
Conclusions and Implications.....	27

Part III

Supporting Documentation: Glasgow MET, APHAB, & Informed Consent Script.....29

In Part III, we provide copies of all supporting documentation central to our research. This documentation includes key measurement and evaluation tools from previous literature and a copy of the informed consent script we used for our research.

Glasgow Hearing Aid Benefit Profile (GHABP).....	30
Abbreviated Profile of Hearing Aid Benefit (APHAB).....	32
Copy of Informed Consent Script and Information Sheet.....	35

Part IV

Solutions to Fieldwork Challenges for Solar Ear.....36

In Part IV, we provide goals, strategies, and solutions to Solar Ear for successful future researchers conducting onsite research. Additionally, providing tools to successfully implement the MET.

Goals, Strategies, Solutions.....	37
Instructions to Translator.....	38
Contact Us.....	41

Executive Summary

Solar Ear Brazil has asked for research assistance in order to enhance its social impact among the deaf in several more countries. Solar Ear attempts to improve the quality of life of hearing impaired individuals by providing low-cost solar-powered hearing aids. Hearing loss is prevalent in Brazil because of a lack of prevention efforts, limited access to affordable health care and treatment of diseases, and higher noise pollution levels in several employment sectors. As the severity of the problem increases, otherwise healthy children and adults are prevented from attending school or working because they are considered deaf, even if their hearing loss is not complete.

Solar Ear is making large advances in bringing its hearing aid technology into lower socioeconomic sectors of a variety of countries. Currently, however, Solar Ear is facing significant challenges to receiving the funding necessary to expand. Our research delivers a comprehensive report developed from both qualitative and quantitative measurement of the social impact of frugal hearing aid technologies. Through a detailed analysis of existing monitoring and evaluation tools, as well as personal interviews, we develop and analyze a new monitoring and evaluation tool (MET) reflecting our observations in the field. This new MET serves as an instrument to collect quantitative statistics on the hearing aid product as Solar Ear looks to expand into other countries and increase its revenue. Furthermore, our final research concludes with an investigated review of technological means in hopes of finding a way hearing aid beneficiaries could report the social benefits of the device through an IT-platform based MET rather than relying on trained interviewers or survey takers. Based on extensive research it appears there is no existing report that seeks to measure the social benefits of frugal health technology and specifically this solar powered hearing aid. As a whole, our report can support ongoing operational improvement of the enterprise, and that the MET makes Solar Ear more attractive to funders.

Part I

Measuring the Social Benefit of Applied Social Science for the Public Good

OVERVIEW

Our goal is to create a measurement and evaluation tool (MET) to quantify social benefit that individuals receive from hearing aids. Previous METs target the clinical outcomes resulting from hearing aids. The previous literature has focused on the auditory improvement provided by hearing aids. For example, previous METs seek to find answers to questions such as: “When in noisy environments, do individuals with hearing aids find it easier to understand speech and maintain conversations?” The most prominent of such measures are the Glasgow Hearing Aid Benefit Profile and the Profile of Hearing Aid Benefit. Both the Glasgow Hearing Aid Benefit Profile and the Profile of Hearing Aid Benefit measure the post-intervention auditory impact of hearing aids.

Although these METs are very effective in assessing the satisfaction of the hearing-aid user and minor lifestyle changes, they do not measure the social benefit of receiving a hearing aid. Our MET aims to meet this challenge by assessing the social impact of hearing aids based on key dimensions: health, self-confidence and empowerment, education, and work. These dimensions were selected because we thought they would be the most robust predictors of improved condition of life. An investigation of all these dimensions would provide us with well-rounded data representation of hearing aid receivers. By using our measurement tool, alongside established measures such as those listed above, Solar Ear will be able to assess the social impact of their products. Our MET provides a more holistic measurement of the impact than can be measured by clinical measurement of auditory improvement alone.

LITERATURE REVIEW

A recent survey investigated the importance of self-reported auditory assessment for auditory measurement (Lindley, 2006).¹ Self-reported assessments provide more accurate measurement than do assessments of outcomes in laboratory settings where assumptions are made by the investigator about the condition of the hearing aid user due to a lack of dialogue between the investigator and the user. When professionals rely on laboratory measures, they neglect an important resource: patients’ self-evaluation. Self-reported measures are particularly important as clinical measures in laboratory settings fail to replicate hearing situations as they take place in real life and fail to capture the true experiences of hearing aid use in everyday life (Cox, Alexander, and Beyer, 2003).²

Watson and Tolan³ initially uncovered the need for self-reported measures of hearing aid benefit outcome. These researchers addressed the importance of gathering information from the patient’s

¹ Lindley, G. (2006). Current hearing aid fitting protocols: Results from an online survey. *Audiology Today*, 18(3), 19.

² Cox, R. M., Alexander, G. C., & Beyer, C. M. (2003). Norms for the international outcome inventory for hearing aids. *Journal of the American Academy of Audiology*, 14(8), 403-413.

³ Watson, L. A., & Tolan, T. (1967). *Hearing tests and hearing instruments*. New York: Hafner.

perspective rather than the clinician's perspective. Their study was first conducted during an initial 6-month trial period with hearing aids in everyday listening environments. Twenty hearing aid users participated in the investigation of the benefit hearing aids provide in everyday listening outcomes. Results showed that aided speech discrimination scores did not accurately predict how much benefit was obtained after the hearing aid intervention. These conclusions emphasized the need for self-reported measures of hearing aid outcome. As the researchers concluded, "We need to pay attention to the patient's experience with hearing aids under everyday listening conditions in each individual case when a hearing aid is selected."

Today, there are two key METs relying on self-reported measures.⁴ One widely used MET is The Profile of Hearing Aid Benefit (PHAB) (Cox, Gilmore & Alexander, 1995),⁵ which was developed at Memphis University and consists of sixty-six items in seven subscales including familiar talkers, ease of communication, reverberation, reduced cues, background noise, averseness of sounds, and distortion of sounds. The goal of the PHAB is to measure hearing-aid benefit (unaided vs. aided) across these seven dimensions. Another such self-reported measure is the Glasgow Hearing Aid Benefit Profile (GHABP) (Gatehouse, 2000).⁶ As a subjective patient oriented, post-interventional questionnaire, this particular measurement tool examines six dimensions of outcome including disability, handicap, hearing aid use, benefit, satisfaction, and residual disability. The GHABP uses a combination of open-ended and closed-ended questions measuring auditory outcomes of hearing aid use in a variety of life situations (see Part III for copies of these tools).

These METs provide a standardized method for collecting self-reported data on the auditory benefit provided by hearing aid use. They are particularly well-suited to capture patients' experiences across a number of environments including: movie theatres, community events, and other public spaces in which hearing aids are vital. It is essential to note that these two measurement tools were designed with the intention of collecting health and clinical data. There is no interest in the social benefit of hearing aids. The PHAB and GHABP are purely a form of medical review.

We take our cue from both the PHAB and GHABP: the potential of self-reported data appears substantial. In the development of the Solar Ear MET, we created similar question formats to those used by the PHAB and GHABP because both of these measures have been proven as reliable measurement tools. However, our MET differs from these pre-existing tools in that it captures the socioeconomic factors and social benefit of receiving a hearing aid, not just the

⁴ Cox, R. M., Gilmore, C., & Alexander, G. C. (1991). Comparison of two questionnaires for patient-assessed hearing aid benefit. *Journal of the American Academy of Audiology*, 2(3), 134.

⁵ Cox, R. M., & Alexander, G. C. (1995). The abbreviated profile of hearing aid benefit. *Ear and hearing*, 16(2), 176-186.

⁶ Gatehouse, S. (2000). The Glasgow Hearing Aid Benefit Profile: What it measures and how to use it. *The Hearing Journal*, 53(3), 10-12.

medical benefits. Whereas the PHAB and GHABP are administered only once, ours product is a monitoring tool that should be administered at different time increments allowing for longitudinal data collection. This will allow administers to tract the progress of the impact of their product and gather essential information regarding the sustainability of their product.

We designed our questions to measure the social benefit of receiving a hearing aid. This social benefit was along three dimensions: changes in educational achievements or goals, improvements in health maintenance and management, and improvements in socio-economic conditions. We also developed questions pertaining to post-intervention changes in independence, confidence, and autonomy. Using the GHABP and PHAB as models, we drew on them as strong foundations to build upon. Our finalized version of the MET reflects their influence and, at the same time, enlarges the scope of the benefits measured. As we explain in this report, our Solar Ear MET emphasizes social benefits resulting from a hearing aid intervention.

Part II

Measuring and Evaluation Tool (MET) and Question Rationale

Welcome!

Thank you very much for taking the time to answer these questions for Solar Ear.

The information you provide will be used to measure the benefits provided by Solar Ear technologies.

Your participation is optional. If you do not wish to answer some or all of the questions, you are free to leave them blank.

Your name and/or personal information will not be shared. All of your answers will remain anonymous.

Thank you very much!

Background Information

1. Are you male or female?

- ☐ Male
☐ Female

2. How old are you?

- ☐ Under 5
☐ 6 - 10
☐ 11 - 15
☐ 16 - 19
☐ 20 - 24
☐ 25 - 29
☐ 30 - 34
☐ 35 - 39
☐ 40 - 44
☐ 45 - 49
☐ 50 - 54
☐ 55 - 59
☐ 60 - 64
☐ 65 - 69
☐ 70 - 74
☐ 75 - 79
☐ 80 - 84
☐ 85 - 89
☐ 90+

3. What is your race/ethnicity? Please list all with which you self-identify:

4. What country do you live in now?

- ☐ American Samoa
- ☐ Belgium
- ☐ Brazil
- ☐ Canada
- ☐ China
- ☐ Ecuador
- ☐ Holland
- ☐ Israel
- ☐ Jordan
- ☐ New Zealand
- ☐ Southern Africa
- ☐ USA
- ☐ Tunisia
- ☐ West Bank- Palestine

Other (please specify)

5. What is your marital status?

- ☐ Single (never married, divorced, or widowed/widower)
- ☐ Married/Partnered (married, remarried, or living with partner)

Other (please specify)

6. How much schooling do you have? Please choose the highest level or degree you have earned.

- ☐ Grade or Elementary School
- ☐ Junior High Diploma
- ☐ High School Diploma
- ☐ Trade School or Licensing
- ☐ AA Associate of Arts Degree
- ☐ BA/BS Bachelor Degree
- ☐ MA/MS/MBA/JD/PhD Graduate Degree

Other (please specify)

7. What is your current work status?

- ☐ Student (not employed)
- ☐ Student and employed
- ☐ Employed part time
- ☐ Employed full time
- ☐ Homemaker (not looking for paid work)
- ☐ Not employed (not looking for work)
- ☐ Unemployed (looking for work)
- ☐ Retired

Solar Ear Affordability

8. Please describe the price of Solar Ear equipment for your budget:

	Very affordable	Somewhat affordable	Somewhat expensive	Very expensive
Solar Ear Hearing Aid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Solar Ear Charger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Solar Ear Batteries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

9. How important is the money you save by using Solar Ear equipment?

- ☐ Very Important
☐ Important
☐ Not Important

Please describe:

10. Please provide information on your income so that we can best help future Solar Ear recipients afford a hearing aid:

	Your annual income or salary	Your combined household annual income or salary
No income	<input type="radio"/>	<input type="radio"/>
\$9,000 or less	<input type="radio"/>	<input type="radio"/>
\$10,000-\$19,000	<input type="radio"/>	<input type="radio"/>
\$20,000-\$29,000	<input type="radio"/>	<input type="radio"/>
\$30,000-\$39,000	<input type="radio"/>	<input type="radio"/>
\$40,000-\$49,000	<input type="radio"/>	<input type="radio"/>
\$50,000-\$59,000	<input type="radio"/>	<input type="radio"/>
\$60,000-\$69,000	<input type="radio"/>	<input type="radio"/>
\$70,000-\$79,000	<input type="radio"/>	<input type="radio"/>
\$80,000 or more	<input type="radio"/>	<input type="radio"/>

Other (please specify)

Health

11. How has your audiologist diagnosed your level of hearing impairment **WITHOUT** a hearing aid?

	Right Ear	Left Ear
0- 25% - Mild (minimal hearing loss)	<input type="radio"/>	<input type="radio"/>
26-50% - Moderate	<input type="radio"/>	<input type="radio"/>
51-75% - Severe	<input type="radio"/>	<input type="radio"/>
76- 100% - Profound (total hearing loss)	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="text"/>	

12. How has your audiologist diagnosed your level of hearing impairment **WITH** a hearing aid?

	Right Ear	Left Ear
0- 25% - Mild (minimal hearing loss)	<input type="radio"/>	<input type="radio"/>
26-50% - Moderate	<input type="radio"/>	<input type="radio"/>
51-75% - Severe	<input type="radio"/>	<input type="radio"/>
76- 100% - Profound (total hearing loss)	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="text"/>	

13. How long have you had a hearing aid?

	Solar Ear hearing aid	Other hearing aid
Just received today	<input type="radio"/>	<input type="radio"/>
Brand new (1-6 months)	<input type="radio"/>	<input type="radio"/>
Less than a year (6-12 months)	<input type="radio"/>	<input type="radio"/>
1-5 years	<input type="radio"/>	<input type="radio"/>
5-10 years	<input type="radio"/>	<input type="radio"/>
10+ years	<input type="radio"/>	<input type="radio"/>
My whole life	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="text"/>	

14. How often do you use a hearing aid?

	Solar Ear hearing aid	Other hearing aid
Every day including when I sleep	<input type="radio"/>	<input type="radio"/>
Every day but take it out when I sleep	<input type="radio"/>	<input type="radio"/>
Several times per week	<input type="radio"/>	<input type="radio"/>
Several times per month	<input type="radio"/>	<input type="radio"/>
Rarely	<input type="radio"/>	<input type="radio"/>
Never	<input type="radio"/>	<input type="radio"/>

If you take the hearing aid out, please list when and why:

15. How has having a hearing aid improved your health in general?

	Strongly agree	Agree	Neutral/no change	Disagree	Strongly disagree
My health is better in general.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have better control of my health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I communicate better with my doctors and/or healthcare providers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can communicate my symptoms more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can get the healthcare information I need more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I see my family doctor, for any reason, less often.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other please list:

Social Benefit: Self Confidence and Empowerment

16. Please describe how having a hearing aid has affected you:

	Strongly agree	Agree	Neutral/no change	Disagree	Strongly disagree
I feel more motivated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel more in control.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more independent.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can communicate my needs more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can communicate my desires more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can help others more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can participate in conversations with one other person more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can participate in conversations with a group more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can communicate with my family more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can communicate with my friends more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can communicate with people in general more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can make new friends or meet people more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can do my daily activities more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a better quality of life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have more confidence in myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have more confidence in the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

17. Please describe the activities you can do more easily thanks to a hearing aid:

	Strongly agree	Agree	Neutral/no change	Disagree	Strongly disagree
I can use the phone more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can use the Internet more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can listen to music more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can watch TV alone and understand it more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can watch TV with others and understand it more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can understand movies more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can order food or go out for a meal more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can understand religious services or activities more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can be active in a group or organization more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can play sports more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can travel (take public transportation, drive, etc.) more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

Education

18. Please describe how using a hearing aid has affected your education:

	Strongly agree	Agree	Neutral/no change	Disagree	Strongly disagree
I can earn higher grades.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can take new or better classes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have higher educational goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have more educational opportunities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more interested in schoolwork.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can do schoolwork more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more confident at school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can communicate with educators more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can communicate with other students more easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

Work

19. Please describe how having the hearing aid has affected your work or career:

	Strongly agree	Agree	Neutral/no change	Disagree	Strongly disagree
I have a new or better job/career.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have higher professional goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have more work opportunities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I earn more money.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have more responsibilities at work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do more interesting work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more efficient at work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more confident at work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I communicate better with my boss.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I communicate better with my co-workers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

20. What kind of work do you do? How does having a hearing aid help you do your job?

Thank You!

21. Is there anything else you would like to say about Solar Ear?

METHODOLOGICAL APPROACH & MEASUREMENT RATIONALE FOR QUESTIONS

Below is a complete list of the questions in our MET for Solar Ear.

Each question is followed by a brief rationale for the measures that may be derived from each question. We pay special attention to how each question sheds light on the social benefit provided by hearing aid use. There are four categories *Background*, *Affordability*, *Health*, and *Social Benefit*.

Recoding: Each question, when appropriate, is also followed by a brief explanation of potential recoding that may be used to enhance analysis. For example, questions on age may be used to create larger income categories by combining categories. Additionally, Solar Ear may find the need to develop three categories by bundling respondents who strongly agree and agree AND respondents who strongly disagree and disagree. This would result in three categories: Agree, Neutral, Disagree. Lastly, we suggest that once the MET has been administered that Solar Ear generate a list of all possible employment categories and benefits to create a question with fixed-choice responses.

BACKGROUND QUESTIONS

Question 1

Are you male or female?

Rationale: This is a general background question. The purpose of this question is to determine gender to generate male versus female results from data collected. By sorting the data by gender, Solar Ear will be able to measure any potential gender differences in the benefit provided by hearing aid use. For example, Solar Ear may find that females benefit more from hearing aid use than do males in different life realms.

Question 2

How old are you?

Rationale: This is a general background question. The purpose of this question is to determine if age is a factor that determines the degree of social benefit provided by hearing aid use. For example, Solar Ear may find that younger or older respondents derive benefits from hearing aid use.

Solar Ear may wish to create broader recoded categories based on further analysis and implementation of the tool. One option would be to create the following categories by bundling respondents into broader age categories. For example:

Children may be recoded as under 5 to 10

Youths may be recoded as ages 11-19
Young Adults may be recoded as 20-29
Adults may be recoded as 30-59
Mature Adults may be recoded as 60+

Question 3

What is your race/ethnicity? Please list all with which you self-identify:

Rationale: This is a general background question. The purpose of this question is to determine if race/ethnicity is associated with benefit from hearing aid usage. Given that this question is highly context dependent, Solar Ear will want to consult with local social scientists to use categories appropriate to each cultural environment. For example, in the United States we would suggest using the categories employed by the US Census. These categories may be obtained at: <http://www.census.gov/prod/cen2010/briefs/c2010br-02.pdf>

Question 4

What country do you live in now?

Rationale: This is a general background question. The purpose of this question is to determine if residents of different countries derive different levels of social benefit from hearing aid use. Response categories are taken from the list of Solar Ear distributors. The question could also be reworded as a state-level or city-level measurement tool to capture variation across local populations.

Question 5

What is your marital status?

Rationale: This is a general background question. The purpose of this question is to determine marital status across two broad categories: Single and Married/Partnered. The underlying goal was to analyze data regarding their current marital status, we were not concerned at the age in which the respondent was married. Under single, we account for never married, divorced, or widowed/widower. Under married/partnered, we account for married, remarried, or living with partner. This question will allow Solar Ear to measure potential variation between coupled and non-coupled hearing aid users.

Question 6

How much schooling do you have? Please choose the highest level or degree you have earned.

Rationale: This is a general background question. The purpose of this question is to determine if educational background is associated with benefit from hearing aid usage. For example, Solar Ear may find that those with more or less education derive different levels of social benefit from

hearing aid use. Like Question 3, given that educational institutions are highly context dependent, Solar Ear will want to consult with local social scientists to use categories appropriate to each cultural environment. We have inserted categories appropriate to the U.S. case.

Question 7

What is your current work status?

Rationale: This is a general background question. The purpose of this question is to determine if work status is associated with benefit from hearing aid usage. For example, Solar Ear may find that those with different employment situations may derive different levels of social benefit from hearing aid use.

SOLAR EAR AFFORDABILITY

Question 8 & Question 9

Please describe the price of Solar Ear equipment for your budget:
How important is the money you save by using Solar Ear equipment?

Rationale: These are Solar Ear affordability questions. The purpose of these questions is to determine the financial costs as perceived by the respondent and the importance of money saved through the use of Solar Ear products. The purpose of these questions is to determine the financial benefit provided by low-cost Solar Ear hearing aids. These questions will allow Solar Ear to indicate the financial benefit provided to economically disadvantaged populations. The response categories were modeled after the GHABP model. Furthermore, the main goal of this question is to examine the price of Solar Ear equipment compared to more expensive models being sold.

Question 10

Please provide information on your income so that we can best help future Solar Ear recipients afford a hearing aid:

Rationale: This is a Solar Ear affordability question. This question will allow Solar Ear to sort the data by income to make fine-grained analyses of 1) the relative financial burden of hearing aid costs by income categories and 2) potential correlations between levels of income and variations in social benefits across income categories. Here again, the response categories will need to be tailored to local context. Additionally, Solar Ear should be concerned about the sensitivity of this question and be aware of respondents objecting to respond. Based on respondent willingness to respond, Solar Ear may or may not choose to remove this question.

Solar Ear may wish to create broaden the categories by consolidating them. Like the question on age, here Solar Ear may wish to create larger income categories by combining categories.

HEALTH

Question 11 and Question 12

How has your audiologist diagnosed your level of hearing impairment WITHOUT a hearing aid:
How has your audiologist diagnosed your level of hearing impairment WITH a hearing aid:

Rationale: These are question in the Health Section. The purpose of these questions is to determine the improvement of hearing ability with a hearing aid. The responses encompass both the left ear and the right ear per previous clinical METs.

Question 13

How long have you had a hearing aid?

Rationale: This is a question in the Health Section. This question indicates the duration of hearing aid usage for both Solar Ear and other hearing aid users. The responses can be used to measure the social benefit providing by hearing aids as a function of duration of hearing aid use. Note, as some respondents may choose the answer “Today is the first day.” This may be used as a control group that has not received the hearing aid intervention.

Question 14

How often do you use a hearing aid?

Rationale: This is a health related question. This question indicates the intensity of hearing aid usage for both Solar Ear and other hearing aid users. The responses can be used to measure the social benefit providing by hearing aids as a function of intensity of hearing aid use. Note, as some respondents may choose the answer “Never.” This may be used as a control group that has not received the hearing aid intervention.

Question 15

How has having a hearing aid improved your health in general?

Rationale: This is a question in the Health Section. This question measures how using a hearing aid may positively affect health related outcomes across several dimensions. The response categories were modeled after the GHABP model.

As mentioned earlier, this is an example of a question where Solar Ear may wish to create broader recoded categories. One option would be to create three categories by bundling respondents who strongly agree and agree AND respondents who strongly disagree and disagree, resulting in three categories: Agree, Neutral, Disagree.

SOCIAL BENEFIT: SELF-CONFIDENCE AND EMPOWERMENT

Similarly to question 15, for questions 16 and 17, Solar Ear may wish to create three categories in order to create a narrower fixed-choice answer selection

Question 16

Please described how having a hearing aid has affected you:

Rationale: This is a question regarding social benefit in terms of self-confidence and empowerment. The question may be used to measure the positive social outcomes associated with hearing aid use. Questions from this section are the strongest indicators of social benefit that hearing aid users may receive in terms of self-confidence. Many of the response categories were modeled after the GHABP model.

Question 17

Please describe the activities you can do more easily thanks to a hearing aid:

Rationale: This is a question regarding social benefit in terms of self-confidence and empowerment. The question may be used to measure the positive social outcomes associated with specific activities common in everyday life. Questions from this section are the strongest indicators of social benefit that hearing aid users may receive in terms of empowerment. Many of the response categories were modeled after the GHABP model.

EDUCATION

Question 18

Please describe how using a hearing aid has affected your education?

Rationale: This question covers all education-related queries related to social benefit. The aim of the question is to measure positive outcomes in the realm of education related to hearing aid use. Unlike question 6 that measures education as a control variable, this question measures educational achievement as an outcome or result of hearing aid usage.

WORK

Question 19

Please describe how having a hearing aid has affected your work or career?

Rationale: This question is in the section on employment and employment outcomes. Question 19 offers a selection of fixed-choice responses for quantification of results. These responses measure social benefit related to employment.

Question 20

What kind of work do you do? How does having a hearing aid help you do your job?

Rationale: This question is in the section on employment and employment outcomes. Question 20 is an open-ended question in order to capture the diversity of employment and employment-related benefits that result from using a hearing aid.

THANK YOU

Question 21

Is there anything else you would like to say about Solar Ear?

Rationale: This is a general question asking respondents for additional opinions or statements about hearing aid usage. This question could enable interviewees to cover any topic they wish.

FIELD TESTING OF THE MET

After reviewing existing clinical MET, we developed queries related to social benefit that did not exist in previous studies. Whenever possible, we borrowed the pre-existing scales in use by the GHABP and the APHAB. Working with Solar Ear Brazil we traveled to Candido Mota and Assis to administer the first version of our MET to Solar Ear recipients. With each wave of responses, we edited and refined the response categories for each query. Our goal was to assemble all possible responses from Solar Ear recipients to ensure that the MET reflects their self-reported experiences. After thirty-two interviews and seven iterations of respondent-based editing, we finalized the survey and administered it to respondents. Based on their answers, final minor edits were made to the MET. By interviewing each person available, we are confident that the data we collected is a valid representation of the hearing impaired community. Through this iterative testing, we are confident that the final version of the MET faithfully captures the diversity of responses within the population of Solar Ear users in Brazil.

SUGGESTED ADMINISTRATION

We suggest that Solar Ear create a baseline measure by administering the survey to all future recipients of the Solar Ear hearing aid after the audiologist fits them for their respective hearing aid. By giving the survey after the recipient has begun to use the hearing aid, Solar Ear will have a baseline from which to compare future results. Solar Ear should then administer the same survey at several time intervals. Should Solar Ear wish to create the baseline, Solar Ear will need

to create a database of names so that survey respondents can be matched at each time interval to determine improvement over time. The baseline will be used for preliminary qualitative and quantitative analysis reflecting opinions of the tool. Following the completion of the baseline, this tool can be used as an ongoing monitor, flexible to adjustments on a yearly basis.

In lieu of honoraria, we found that Solar Ear's strategy of giving the survey at the time of an appointment with audiologist worked well. We suggest that Solar Ear institutionalize this recruitment strategy with their networks of audiologists to standardize the administration of the survey, at least until the baseline is well established. Furthermore, should Solar Ear choose to continue conducting surveys, they should consider beginning interviews with the following script validating. This script validates interviewees' expertise and voice. It allowed interviewees to speak with authority to their own experience. We feel that beginning with this script sets a positive tone for the interview. In addition, we wrote a script for the translator to read at the beginning of the interview to express our interests in the interviewees' authority and voice.

Here is a copy of the script:

Hello! Thank you so much for speaking to us today!

We are excited to hear about your life stories and experiences.

We want to understand how you see the world and your unique perspectives.

So, as you answer the questions, please give us lots of details

Telling us about your life and experiences will help us understand.

It will also help us tell others about the importance a hearing aid can make to improve people's lives.

So we really want to hear everything that you have to say and for you to share your experiences with us.

Should face-to-face administration not be possible, Solar Ear may administer the survey using the Internet or some version of a web-based mobile application. However, web-based surveys have lower response rates than does face-to-face administration. Should web-based survey administration be used, we suggest that the link to surveys be provided in a consistent manner to all Solar Ear recipients. The MET tool above is an only an example based on the online survey creation tool SurveyMonkey. Depending on the extent and compatibility of said application, the questions may need to undergo edits and adjustments to make it not only user friendly, but overcome the restrictions of the operating system it would run on.

CONCLUSIONS AND IMPLICATIONS

We are delighted to provide this MET to Solar Ear. Our goal in creating this MET was to provide Solar Ear with a measure of the many positive social outcomes of their product, including quality of life consequences of hearing aid usage, such as health, self-confidence and empowerment, education, and work. Specifically, we expect that Solar Ear will be able to assess the social benefits that individuals experience as a result of being provided with a hearing aid. In crafting

this MET, we hope to create a model for assessing the social benefits provided by publically minded organizations like Solar Ear.

Part III

Supporting Documentation:

GHABP

APHAB

Informed Consent Script

According to the MRC Institute of Hearing Research:

“The GHABP is a self-reported questionnaire for assessing aspects of auditory disability, auditory handicap, and hearing-aid benefit. The questions cover scales of initial disability, handicap, hearing aid use, hearing aid benefit, satisfaction, and residual disability. It is designed to be used in routine clinical practice, both for individual patient management and as part of a quality-assurance programme.”

See: <http://www.ihr.mrc.ac.uk/products/display/questionnaires>

1. Has the result of the operation/intervention* affected the things you do?				
Much worse	A little or somewhat worse	No change	A little or somewhat better	Much better
1	2	3	4	5

2. Have the results of the operation/intervention* made your overall life better or worse?				
Much better	A little or somewhat better	No change	A little or somewhat worse	Much worse
5	4	3	2	1

3. Since your operation/intervention*, have you felt more or less optimistic about the future?				
Much more optimistic	More optimistic	No change	Less optimistic	Much less optimistic
5	4	3	2	1

4. Since your operation/intervention*, do you feel more or less embarrassed when with a group of people?				
Much more embarrassed	More embarrassed	No change	Less embarrassed	Much less embarrassed
1	2	3	4	5

5. Since your operation/intervention*, do you have more or less self-confidence?				
Much more self-confidence	More self-confidence	No change	Less self-confidence	Much less self-confidence
5	4	3	2	1

6. Since your operation/intervention*, have you found it easier or harder to deal with company?

Much easier 5	Easier 4	No change 3	Harder 2	Much harder 1
------------------	-------------	----------------	-------------	------------------

7. Since your operation/intervention*, do you feel that you have more or less support from your friends?

Much more support 5	More support 4	No change 3	Less support 2	Much less support 1
------------------------	-------------------	----------------	-------------------	------------------------

8. Have you been to your family doctor, for any reason, more or less often, since your operation/intervention*?

Much more often 1	More often 2	No change 3	Less often 4	Much less often 5
----------------------	-----------------	----------------	-----------------	----------------------

9. Since your operation/intervention*, do you feel more or less confident about job opportunities?

Much more confident 5	More confident 4	No change 3	Less confident 2	Much less confident 1
--------------------------	---------------------	----------------	---------------------	--------------------------

10. Since your operation/intervention*, do you feel more or less self-conscious?

Much more self-conscious 1	More self-conscious 2	No change 3	Less self-conscious 4	Much less self-conscious 5
-------------------------------	--------------------------	----------------	--------------------------	-------------------------------

11. Since your operation/intervention*, are there more or fewer people who really care about you?

Many more people 5	More people 4	No change 3	Fewer people 2	Many fewer people 1
-----------------------	------------------	----------------	-------------------	------------------------

12. Since you had the operation/intervention*, do you catch colds or infections more or less often?

Much more often 1	More often 2	No change 3	Less often 4	Much less often 5
----------------------	-----------------	----------------	-----------------	----------------------

Abbreviated Benefit (APHAB)

According to Cox and Alexander, published in *Ear and Hearing* in 1995, 16(2):176-86:

“The Profile of Hearing Aid Benefit (PHAB) is a 66-item self-assessment, disability-based inventory that can be used to document the outcome of a hearing aid fitting, to compare several fittings, or to evaluate the same fitting over time...”

“The APHAB uses a subset of 24 of the 66 items from the PHAB, scored in four 6-item subscales. Three of the subscales, Ease of Communication, Reverberation, and Background Noise address speech understanding in various everyday environments. The fourth subscale, Aversiveness of Sounds, quantifies negative reactions to environmental sounds. The APHAB typically requires 10 minutes or less to complete, and it produces scores for unaided and aided performance as well as hearing aid benefit...”

“The APHAB is a potentially valuable clinical instrument. It can be useful for quantifying the disability associated with a hearing loss and the reduction of disability that is achieved with a hearing aid.”

See: <http://www.ncbi.nlm.nih.gov/pubmed/7789669>

Please note, *Ear and Hearing* is the official journal of the American Auditory Society.

See: <http://journals.lww.com/ear-hearing/pages/default.aspx>

Abbreviated Profile of Hearing Aid Benefit

Name: _____ Date of Birth: _____ Today's Date: 7/3/2013

Hearing Aid Experience	Daily Hearing Aid Use	Degree of Hearing Difficulty (Unaided)
<input type="checkbox"/> None <input type="checkbox"/> Less than 6 weeks <input type="checkbox"/> 6 weeks to 11 months <input type="checkbox"/> 1 to 10 years <input type="checkbox"/> Over 10 years	<input type="checkbox"/> None <input type="checkbox"/> Less than 1 hour per day <input type="checkbox"/> 1 to 4 hours per day <input type="checkbox"/> 4 to 8 hours per day <input type="checkbox"/> 8 to 16 hours per day	<input type="checkbox"/> None <input type="checkbox"/> Mild <input type="checkbox"/> Moderate <input type="checkbox"/> Moderately-Severe <input type="checkbox"/> Severe

Instructions:

Please indicate the answers that come closest to your everyday experience. Notice that each choice includes a percentage. You can use this to help you decide your answer. For example, if a statement is true about 75% of the time, indicate "C" for that item. If you have not experienced the described situation, try to think of a similar situation that you have been in and respond for that situation. If you have no idea, leave the item blank.

Notes:

- A: Always (99%)
- B: Almost Always (87%)
- C: Generally (75%)
- D: Half the Time (50%)
- E: Occasionally (25%)
- F: Seldom (12%)
- G: Never (1%)

	Without Hearing Aid	With Hearing Aid
1. When I am in a crowded grocery store, talking with the cashier, I can follow the conversation.	A B C D E F G	A B C D E F G
2. I miss a lot of information when I'm listening to a lecture.	A B C D E F G	A B C D E F G
3. Unexpected sounds, like a smoke detector or alarm bell are uncomfortable.	A B C D E F G	A B C D E F G
4. I have difficulty hearing a conversation when I'm with one of my family at home.	A B C D E F G	A B C D E F G
5. I have trouble understanding the dialogue in a movie or at the theater.	A B C D E F G	A B C D E F G
6. When I am listening to the news on the car radio and family members are talking, I have trouble hearing the news.	A B C D E F G	A B C D E F G
7. When I'm at the dinner table with several people and am trying to have a conversation with one person, understanding speech is difficult.	A B C D E F G	A B C D E F G
8. Traffic noises are too loud.	A B C D E F G	A B C D E F G
9. When I am talking with someone across a large empty room, I understand the words.	A B C D E F G	A B C D E F G
10. When I am in a small office interviewing or answering questions, I have difficulty following the conversation.	A B C D E F G	A B C D E F G

Abbreviated Profile of Hearing Aid Benefit

Notes:

A: Always (99%)
 B: Almost Always (87%)
 C: Generally (75%)
 D: Half the Time (50%)
 E: Occasionally (25%)
 F: Seldom (12%)
 G: Never (1%)

	Without Hearing Aid	With Hearing Aid
11. When I am in a theater watching a movie or play and the people around me are whispering and rustling paper wrappers, I can still make out the dialogue.	A B C D E F G	A B C D E F G
12. When I am having a quiet conversation with a friend, I have difficulty understanding.	A B C D E F G	A B C D E F G
13. The sounds of running water, such as a toilet or shower, are uncomfortably loud.	A B C D E F G	A B C D E F G
14. When a speaker is addressing a small group and everyone is listening quietly, I have to strain to understand.	A B C D E F G	A B C D E F G
15. When I'm in a quiet conversation with my doctor in an examination room, it is hard to follow the conversation.	A B C D E F G	A B C D E F G
16. I can understand conversations even when several people are talking.	A B C D E F G	A B C D E F G
17. The sounds of construction work are uncomfortably loud.	A B C D E F G	A B C D E F G
18. It's hard for me to understand what is being said at lectures or church services.	A B C D E F G	A B C D E F G
19. I can communicate with others when we are in a crowd.	A B C D E F G	A B C D E F G
20. The sound of a fire engine siren near by is so loud that I need to cover my ears.	A B C D E F G	A B C D E F G
21. I can follow the words of a sermon when listening to a religious service.	A B C D E F G	A B C D E F G
22. The sound of screeching tires is uncomfortably loud.	A B C D E F G	A B C D E F G
23. I have to ask people to repeat themselves in a one-on-one conversation in a quiet room.	A B C D E F G	A B C D E F G
24. I have trouble understanding others when an air condition or fan is on.	A B C D E F G	A B C D E F G

	Without Hearing Aid	With Hearing Aid	Benefit
Ease of Communication			
Background Noise			
Reverberation			
Aversiveness			
Global Score			

Disability Improvement Score:

Print...

COPY OF INFORMED CONSENT SCRIPT AND INFORMATION SHEET

Hello,

Thank you very much for taking the time to speak with us today. Before we begin we would like to give you information about the project and interviews we are doing. We are students at Santa Clara University in the Global Social Benefit Fellowship. Here is a copy of the project information and how the information will be used.

We are doing interviews with recipients of hearing aids and their families and friends. We would like to talk to you about your experiences either receiving a hearing aid or your experience with someone you know that has received a hearing aid.

We will use the interviews to write a report on the benefits of hearing aids that we will share with educators and professionals that will help them better serve the hearing impaired community.

Your participation is optional and will be anonymous. We will never use or reveal your name or personal information. Pseudonyms will be used for all interviewees.

If you do not wish to answer some or all of the questions you are free to say "pass" or "next question." You can stop the interview at any time for any reason.

We would really appreciate your permission to record our interview so that we can get as much information as possible. We will erase the recording as soon as the project is done.

If you have any questions, our email and information about our program are listed below.

May we interview you? (YES answer necessary to proceed)

May we record our conversation? (YES answer necessary to proceed with recording)

Thank you very much!

Part IV

Solutions to Fieldwork Challenges for Solar Ear

Solutions to Fieldwork Challenges for Solar Ear

Based on the Solar Ear Team's fieldwork in Brazil during the summer of 2013, the following presents a list of fieldwork and interviewing challenges and solutions. For each we present a general goal, strategies, and successful solutions. We hope that it will help the enterprise with handy suggestions and problem solvers for potential sticky wickets.

GOAL: Be prepared each day to follow the work plan BUT also be ready to adapt

Although we were given an in-country work itinerary before leaving for our placement in Brazil, it was important for us to be amenable to schedule changes. We found that we needed to be ready to change our work plan and working style to take advantage of opportunities as they arose in order to collect important data and information.

STRATEGIES AND SOLUTIONS

In order to be continually prepared for each day's work, we requested that an electronic copy of the schedule be emailed to us whenever any change was made, regardless of how insignificant the change may seem. Often, our schedule changed at the last minute. As a team, we decided that we would always be ready to collect data. To do so, we brought twenty copies of our measurement and evaluation tool with us at all times. This strategy ensured that we would always have the option of distributing our survey should the opportunity arise. Furthermore, we always carried our notebooks and voice recorders with us so that we were fully prepared for any potential jottings or opportunities for data collection.

GOAL: Establish effective communication in and out of country

Our goal was to establish effective communication with colleagues in and out of country using Internet communications for problem solving and support. While in our placement, we needed input regarding the research and data collection processes. We wanted to ensure that we could problem solve by consulting our colleagues both back in the United States and around the globe.

STRATEGIES AND SOLUTIONS

The most effective method of communication proved to be Skype. Using the Internet connection available at our hotel we could use our computer to call any professor or Solar Ear employee on their cell phone. With the use of Skype credits we were given increased access to our colleagues and could simultaneously email them documents to review while on Skype together. We also used on a smartphone application called Viber for communication. We also found it helpful to maintain these ongoing lines of communication open to keep everyone updated on the progress of our research.

GOAL: Establish an effective communication channel with the translator

Upon starting our research, we knew it would be essential to establish an effective method of communication with the translator. This would be necessary in order to ensure that little information would be lost in translation. The information we were collecting needed to an accurate translation of the informant's responses without the translator's voice biasing the data.

STRATEGIES AND SOLUTIONS

To achieve this goal, we created a set of instructions to make this goal clear. Before our first day of work with our translator, we composed a document outlining the strategies we wished the translator to follow. We decided to put our specifications in an initial hard copy memo so that at any point during the course of our interviews the translator could refer to the instructions.

Here is a copy:

Dear Translator,

Thank you for taking the time to work with us on our research.

Please read the following instructions carefully. It is very important that our data be collected according to these guidelines.

- 1. Please ask each question that we have indicated to be asked. Do not skip ahead.*
- 2. Please translate word for word each question that was indicated. If there are translation issues, please translate the questions in the exact same way for each person.*

3. Please translate each person's responses word for word. Avoid summarizing or paraphrasing responses as this will bias our data.

4. Please avoid comments or personal opinions while you are translating.

5. Please ask personal questions after the interview process is complete.

We really appreciate your effort as you are a major, vital part of this effort. Thank you again for your time and your assistance. We look forward to seeing and working with you in the field.

GOAL: Establish an understanding of cultural differences for accurate data collection

In the time before piloting the survey in Brazil, our team did a lot of preparation in understanding Brazilian culture and the cultural differences that we would come in contact with during our research. Our faculty mentor, Laura Robinson, had conducted research there previously. She brought another Brazilianist to campus and also hosted a session in which she explained to our team varying social norms we would encounter while we lived in Brazil. It was important for our team to be aware of certain differences upon going into the field. Being prepared for cultural differences allowed us to embrace Brazilian culture and get the most out of our placement in this amazing country.

STRATEGIES AND SOLUTIONS

Through observation and talking to key informants, we learned more about the people of Brazil and aspects of the culture we needed to keep in mind during our field research. For example, in Brazil it is common for families to live under one roof for an extended period of time. A key informant explained to us that it is common for a son to live with his parents until the age of thirty in cities like São Paulo where the cost of living is high. This was important for us to know upon inquiring about income in our survey. Often interviewees would list the household income rather than the personal income of the Solar Ear recipient. Marriage is another cultural difference in Brazil in which people use the word "wife" or "spouse" even if the couple is not legally married. A key informant in Rio explained that many people say that they are "married" but have never had a wedding ceremony nor do they have a marriage certificate. Instead if they live together many people will consider that "married".

We used this information to improve our research and use appropriate vocabulary in our survey. Knowing these cultural differences was vital to understanding our data and to conducting research in the field. Knowing this information about the different norms within the country and within households allowed us to make the appropriate changes to our survey. In asking the question about marital status, we created a category that would include married and living with partner as a single response category. In terms of the question regarding income we created two response categories to the question: “What is your household income?” These categories were “Your annual income or salary” and “Your combined household annual income or salary.”

GOAL: Continual improvement of research on a daily basis

Our goal was to make sure that each day our team reviewed the information we had received. We immediately applied it to survey that would be distributed to interviewees the following day. It was important to make sure that each day we improved the research instrument before continuing the research.

STRATEGIES AND SOLUTIONS

The strategy in which we made daily edits to the survey was effective because it allowed us to continually improve the research tool in response to data from the field. Each day, we reviewed the data and discussed needed changes. We reviewed jottings, field notes, and the data we received. As a team, we decided: what questions needed revision, which questions did not elicit appropriate responses for our research goals, and any new questions that needed to be added to the survey.

RESULTING DATA OR MEASUREMENT TOOL

A question in our survey is “Please describe the activities you can do more easily than to a hearing aid.” Many, if not all of the response categories result from gathering data in the field. The first day gathering data, an interviewee explained, “with the hearing aid it will be easier for me to go to church.” After reviewing the collected data as a team we found that church was a common response to that question and then inserted it as a fixed choice in the next draft of the survey. Other responses included: “I see movies a lot more now,” “I can participate at church and

listen to the pastor,” and “I now work in international design and I travel a lot.” We made sure that these options were included in the list of responses.

Solar Ear Team

Team Members: Myles Sansone, Natalie Lays, Catharine Duane

(<http://www.scu.edu/socialbenefit/education/GSB-Fellows/profiles/Solar-Ear-Team-2013.cfm>)

Contact Info: solarearteam@gmail.com

GSBI: Global Social Benefit Incubator

(<http://cms.scu.edu/socialbenefit/entrepreneurship/gsbi/>)

Center for Science, Technology, and Society at Santa Clara University

<http://www.scu.edu/socialbenefit/>



Thank you!!

Myles Sansone, Mary Catharine Duane, & Natalie Lays