

Final Progress Report for Research Projects Funded by Health Research Grants

Instructions: Please complete all of the items as instructed. Do not delete instructions. Do not leave any items blank; responses must be provided for all items. If your response to an item is “None”, please specify “None” as your response. “Not applicable” is not an acceptable response for any of the items. There is no limit to the length of your response to any question. Responses should be single-spaced, no smaller than 12-point type. The report **must be completed using MS Word**. Submitted reports must be Word documents; they should not be converted to pdf format. Questions? Contact Health Research Program staff at 717-783-2548.

1. **Grantee Institution:** Temple University of the Commonwealth System of Higher Education
2. **Reporting Period (start and end date of grant award period):** 01/01/2009 – 12/31/2012
3. **Grant Contact Person (First Name, M.I., Last Name, Degrees):** Germaine A Calicat
4. **Grant Contact Person’s Telephone Number:** 215.204.7655
5. **Grant SAP Number:** 4100047651
6. **Project Number and Title of Research Project:** 15 - Developing Radiological Risk Communication for Low-literacy Populations
7. **Start and End Date of Research Project:** 9/15/2009 – 6/30/2012
8. **Name of Principal Investigator for the Research Project:** Sarah Bauerle Bass, Ph.D., MPH
9. **Research Project Expenses.**

9(A) Please provide the total amount of health research grant funds spent on this project for the entire duration of the grant, including indirect costs and any interest earned that was spent:

\$ 28,646.88

9(B) Provide the last names (include first initial if multiple individuals with the same last name are listed) of **all** persons who worked on this research project and were supported with health research funds. Include position titles (Principal Investigator, Graduate Assistant, Post-doctoral Fellow, etc.), percent of effort on project and total health research funds expended for the position. For multiple year projects, if percent of effort varied from year to year, report in the % of Effort column the effort by year 1, 2, 3, etc. of the project (x% Yr 1; z% Yr 2-3).

Last Name	Position Title	% of Effort on Project	Cost
Bass	Principal Investigator	17.5	\$14,410.53
Mora	Graduate Assistant	50	\$6,806.67
Wolak	Graduate Assistant	50	\$6,806.67

9(C) Provide the names of **all** persons who worked on this research project, but who *were not* supported with health research funds. Include position titles (Research Assistant, Administrative Assistant, etc.) and percent of effort on project. For multiple year projects, if percent of effort varied from year to year, report in the % of Effort column the effort by year 1, 2, 3, etc. of the project (x% Yr 1; z% Yr 2-3).

Last Name	Position Title	% of Effort on Project
Gordon, T	Consultant	17 (summer)
Gordon, R	Intern	17 (summer)
Ruggieri	Pre-Doc Intern	17 (summer)

9(D) Provide a list of **all** scientific equipment purchased as part of this research grant, a short description of the value (benefit) derived by the institution from this equipment, and the cost of the equipment.

Type of Scientific Equipment	Value Derived	Cost
None		

10. Co-funding of Research Project during Health Research Grant Award Period. Did this research project receive funding from any other source during the project period when it was supported by the health research grant?

Yes _____ No X _____

If yes, please indicate the source and amount of other funds:

11. Leveraging of Additional Funds

11(A) As a result of the health research funds provided for this research project, were you able to apply for and/or obtain funding from other sources to continue or expand the research?

Yes _____ No X _____

If yes, please list the applications submitted (column A), the funding agency (National Institutes of Health—NIH, or other source in column B), the month and year when the application was submitted (column C), and the amount of funds requested (column D). If

you have received a notice that the grant will be funded, please indicate the amount of funds to be awarded (column E). If the grant was not funded, insert “not funded” in column E.

Do not include funding from your own institution or from CURE (tobacco settlement funds). Do not include grants submitted prior to the start date of the grant as shown in Question 2. If you list grants submitted within 1-6 months of the start date of this grant, add a statement below the table indicating how the data/results from this project were used to secure that grant.

A. Title of research project on grant application	B. Funding agency (check those that apply)	C. Month and Year Submitted	D. Amount of funds requested:	E. Amount of funds to be awarded:
None	<input type="checkbox"/> NIH <input type="checkbox"/> Other federal (specify: _____) <input type="checkbox"/> Nonfederal source (specify: _)		\$	\$

11(B) Are you planning to apply for additional funding in the future to continue or expand the research?

Yes X No _____

If yes, please describe your plans:

We intend to continue to work with populations with limited literacy, utilizing both the literacy screening techniques (REALM-R) and the psycho-physiological measures tested in this project. We found through this project that these methods are acceptable to and viable with low-literacy populations and they provide valuable information on how to develop literacy appropriate health communication materials. Future grant applications will utilize these measures.

12. Future of Research Project. What are the future plans for this research project?

There are no specific plans for this research project. It was a pilot to test the feasibility of using psycho-physiological measures with populations with limited literacy. The project demonstrated this feasibility, which will benefit future projects.

13. New Investigator Training and Development. Did students participate in project supported internships or graduate or post-graduate training for at least one semester or one summer?

Yes X No _____

If yes, how many students? Please specify in the tables below:

	Undergraduate	Masters	Pre-doc	Post-doc
Male	1			
Female		2	1	
Unknown				
Total	1	2	1	

	Undergraduate	Masters	Pre-doc	Post-doc
Hispanic				
Non-Hispanic	1	2	1	
Unknown				
Total	1	2	1	

	Undergraduate	Masters	Pre-doc	Post-doc
White	1	2	1	
Black				
Asian				
Other				
Unknown				
Total	1	2	1	

14. Recruitment of Out-of-State Researchers. Did you bring researchers into Pennsylvania to carry out this research project?

Yes _____ No X _____

If yes, please list the name and degree of each researcher and his/her previous affiliation:

15. Impact on Research Capacity and Quality. Did the health research project enhance the quality and/or capacity of research at your institution?

Yes X _____ No _____

If yes, describe how improvements in infrastructure, the addition of new investigators, and other resources have led to more and better research.

The ability to demonstrate the feasibility of using eye tracking, EKG, pupilometer and skin conductance measures with low literacy individuals was valuable to inform other research projects. The results from this project will be used as evidence for the benefit of using these methods and the potential effects tailored, literacy appropriate materials may have on populations with limited literacy.

16. Collaboration, business and community involvement.

16(A) Did the health research funds lead to collaboration with research partners outside of your institution (e.g., entire university, entire hospital system)?

Yes _____ No X _____

If yes, please describe the collaborations:

16(B) Did the research project result in commercial development of any research products?

Yes _____ No X _____

If yes, please describe commercial development activities that resulted from the research project:

16(C) Did the research lead to new involvement with the community?

Yes X _____ No _____

If yes, please describe involvement with community groups that resulted from the research project:

Recruitment for participants included community agencies around the Temple University area. Specifically we formed a relationship with the Philadelphia Senior Center and were able to recruit three individuals from that center for the project.

17. Progress in Achieving Research Goals, Objectives and Aims.

List the project goals, objectives and specific aims (as contained in the grant agreement). Summarize the progress made in achieving these goals, objectives and aims for the period that the project was funded (i.e., from project start date through end date). Indicate whether or not each goal/objective/aim was achieved; if something was not achieved, note the reasons why. Describe the methods used. If changes were made to the research goals/objectives/aims, methods, design or timeline since the original grant application was submitted, please describe the changes. Provide detailed results of the project. Include evidence of the data that was generated and analyzed, and provide tables, graphs, and figures of the data. List published abstracts, poster presentations and scientific meeting presentations at the end of the summary of progress; peer-reviewed publications should be listed under item 20.

This response should be a DETAILED report of the methods and findings. It is not sufficient to state that the work was completed. Insufficient information may result in an unfavorable performance review, which may jeopardize future funding. If research findings are pending publication you must still include enough detail for the expert peer reviewers to evaluate the progress during the course of the project.

Health research grants funded under the Tobacco Settlement Act will be evaluated via a performance review by an expert panel of researchers and clinicians who will assess project work using this Final Progress Report, all project Annual Reports and the project's strategic plan. After the final performance review of each project is complete, approximately 12-16 months after the end of the grant, this Final Progress Report, as well as the Final Performance Review Report containing the comments of the expert review panel, and the grantee's written response to the Final Performance Review Report, will be posted on the CURE Web site.

There is no limit to the length of your response. Responses must be single-spaced below, no smaller than 12-point type. If you cut and paste text from a publication, be sure symbols print properly, e.g., the Greek symbol for alpha (α) and beta (β) should not print as boxes (\square) and include the appropriate citation(s). DO NOT DELETE THESE INSTRUCTIONS.

Project Overview

The overall goal of these two pilot studies was to provide data to indicate the feasibility of using literacy screening tools and psycho-physiological measures with populations with lower literacy. The project was completed in two phases: PILOT ONE tested two different literacy tools with patients of Temple University's General Internal Medicine clinic to assess which was easier and more acceptable to patients. PILOT TWO tested the feasibility of using psycho-physiological equipment, specifically eye tracking, pupilometer, EKG and skin conductance, with individuals with limited literacy. These phases allowed us to understand the special needs of limited literacy populations when using these research measures. We proposed to use the following methods:

1. PILOT ONE: Conduct a pilot with 30 patients of the General Internal Medicine clinic at Temple University Hospital using both the Rapid Estimate of Adult Literacy in Medicine (REALM-R) (N=15) and the Short Test of Functional Literacy in Adults (STOFHLA) (N=15) to assess general literacy levels of patients as well as assess the feasibility of using both measures in the clinical setting. Patients who were waiting to see the doctor were asked if they would be willing to participate in the study. Once consented, the subject was asked to either read words (REALM-R) or circle the correct answers (STOFHLA) in the tool. When the subject was done, the participant was given a \$10 gift card and the examiner scored the test. This pilot test allowed the investigator to provide data illustrating that she was able to find sufficient numbers of people with low literacy to take part in the research as well as information about which measure was easiest to use in the setting.
2. PILOT TWO: Conduct a pilot (N=10) to assess the feasibility of using psycho-physiological measures with subjects with limited literacy. Because the equipment tracks eye movements it was important to be able to demonstrate that this equipment was not too difficult for the study population to use. Subjects had sensors attached for skin resistance monitoring and heart-rate monitoring, and a headset for eye-tracking/pupil-dilation measures. Subjects were then shown either a colorectal cancer (CRC) screening decision aid or a "dirty bomb" decision aid while data from the sensors and eye-tracking measures were being recorded. Sensors and the eye-tracking headset were then removed and subjects completed a survey on their experience using the psycho-physiological measures and given a \$20 gift card. This pilot utilized low-

literacy level decision aids that had been developed for other projects by the investigator as a mechanism to evaluate the acceptability of the equipment as well as the validity of results in a low-literate population.

Results of PILOT STUDY ONE

FY 2009-2010

PILOT STUDY ONE of this project was to determine which health literacy tool (the REALM-R or the STOFHLA) was easier and most efficient to administer to General Internal Medicine Clinic patients, as well as which tool provided superior results for assessing health literacy.

The REALM-R, the mostly commonly used health literacy tool, takes less than 5 minutes to administer and score. The REALM-R is a word-recognition test comprising 11 medical terms, arranged in order of complexity by the number of syllables and pronunciation difficulty, starting with simple one-syllable words (e.g., pill) and ending with multi-syllable words (e.g., osteoporosis). Of these 11 words, 8 are scored. Patients read down the list, pronouncing aloud as many words as they can while the examiner scores the number of words pronounced correctly using standard dictionary pronunciation as the scoring standard. Scores on the REALM-R vary from 0 (no words pronounced correctly) to 11 (all words pronounced correctly.) A score of 6 or less is considered low health literacy.

The STOFHLA takes approximately 10 minutes to administer and score. The STOFHLA is a timed reading comprehension test that uses the modified Cloze procedure, in which every 5th to 7th word in a passage is omitted and replaced with a blank space. The patient must select a word to fit into the blank spaces from the 4 multiple-choice options provided for each space. The STOFHLA is scored on a scale of 0 to 36. Patients are categorized as having adequate health literacy if the STOFHLA score is 23–36, marginal health literacy if it is 17–22, and inadequate health literacy if the score is 0–16.

Subject Recruitment and Accrual

During September and October 2009, thirty patients (N=30) ages 18 and over were recruited from the General Internal Medicine clinic located at Temple University Hospital in Philadelphia. The clinic primarily serves low income African Americans who have Medicare or Medicaid insurance, the majority of whom have low health literacy.

Research Procedure

Research assistants used scheduling records to determine eligibility. A convenience sample of volunteers was obtained. Patients who refused typically cited that they could not stay after their visit because they did not have time, had to leave immediately to go to work or to another doctor's appointment, or were accompanied by a caretaker. Other patients declined because they were not interested or were focused solely on their health issues during the visit.

Two research assistants recruited patients and obtained informed consent prior to administering the health literacy instrument, the REALM-R or the STOFHLA, and socio-demographic questions. The directions were read aloud by the research assistants to the patients who were asked to either pronounce a set of words or fill in the word that best fit each sentence. The data were collected prior to or after patients had been seen by the resident physicians. Administration of all research consent forms and instruments took from 5-10 minutes. Of the 30 patients, 15 were administered the REALM-R and 15 were administered the STOFHLA. Research assistants kept track of how much time each test took and scored the tests using the standard scoring rubrics. Each subject received a \$10 gift card and two SEPTA transit tokens as compensation.

The Temple University Institutional Review Board (IRB) approved use of both instruments, the patient recruitment plan and procedures for maintaining anonymity.

Demographic Distribution of Sample

Table 1 illustrates the demographic description of participants. Statistics indicate the two groups were similar, with the majority of both groups African American and indicating they had either not graduated from high school (average of 40% for both samples) or had a high school diploma (average 53.4% of both samples) but had no college level education; thus, over 90% of the samples had no higher education. There were two differences between the two groups. One was gender distribution; those in the REALM-R group were equally divided between male (N=7; 46.7%) and female (N=8; 53.3%), while those in the STOFHLA group had more females (N=10; 66.7%) than males (N=5; 33.3%). The second was age; those in the STOFHLA group were slightly older, with 80% of the sample between the ages of 51 and 70, compared to 40% of the sample taking the REALM-R. The overall average age of the sample was 53, with a range from 21 years of age to 72. These differences are a limitation of the data but it is not believed to have significantly affected the data.

Health Literacy Testing Results

Results indicate very low health literacy in the clinic population, despite half of the population reporting high school graduation. Those taking the REALM-R were able to pronounce on average only 5 of the 8 scored words with 93% falling in the “low” or “very low” literacy categories. The lowest score was a zero (meaning the subject was not able to pronounce/read any of the words) and the highest was an 8, meaning they could pronounce/read all the words (see Table 2).

Of those taking the STOFHLA, the average score was a 17.9 out of 36 points, with 86.7% falling in the “inadequate” or “marginal” literacy categories. The lowest score in the sample was a 10 out of 36 and the highest was a 33 (See Table 3).

Research assistants estimated the time it took each individual to complete the literacy testing. On average, it was found that the informed consent, protocol narrative, REALM-R test and demographic questions took on average three to four minutes to administer. On the other hand, the STOFHLA protocol tool on average 12 to 15 minutes. We also had many patients become frustrated by the STOFHLA test, feeling inadequate or unsure of how to answer the questions.

We had no patients express concern about the REALM-R and patients did not question why we were asking them about the ability to read or pronounce words. These significance differences are crucial findings when designing a study that uses health literacy testing as an outcome.

Conclusions

Of the two measures, the REALM-R took less time (3-4 minutes vs. 12-15 for the STOFHLA) and patients felt less threatened or confused by what was expected of them. While the STOFHLA results showed slightly more variation by health literacy category and identified a few individuals who would be considered to have adequate literacy compared to the REALM-R, the negativity towards the STOFHLA and the amount of time it took most patients to take it indicate the REALM-R is a more practical health literacy assessment to use with this population. We found that using the STOFHLA would alienate our patients by making them feel marginalized. When working with a low-literacy population, you want to make all study protocols, interventions and materials accessible and appropriate; our findings indicate that the use of the STOFHLA would be counter-productive to that goal and we will be using the REALM-R in future studies.

Table 1. Demographic Characteristics of Participants

	REALM-R Participants N=15	STOFHLA Participants N=15
Race		
African American	12 (80.0%)	15 (100%)
Other	3 (20.0%)	0
Hispanic Origin		
Yes	3 (20.0%)	0
No	12 (80.0%)	15 (100%)
Gender		
Male	7 (46.7%)	5 (33.3%)
Female	8 (53.3%)	10 (66.7%)
Education Level		
Some High School	6 (40.0%)	6 (40.0%)
Graduated High School	7 (46.7%)	9 (60.0%)
Some College	1 (6.7%)	0
Graduated College	1 (6.7%)	0
Age		
20-30	3 (20.0%)	0
31-50	5 (33.3%)	2 (13.3%)
51-70	6 (40.0%)	12 (80.0%)
71+	1 (6.7%)	1 (6.7%)

Table 2. REALM-R Results

<i>Literacy Category</i>	<i>Number/Percent</i>
Literate	1 (6.7%)
Low Literacy	9 (60.0%)
Very Low Literacy	5 (33.3%)
<i>Words Pronounced (Average 5.1 words/8; 63.8%)</i>	
Minimum Words Pronounced	0
Maximum Words Pronounced	8

Table 3. STOHFLA Results

<i>Literacy Category</i>	<i>Number/Percent</i>
Inadequate Literacy	7 (46.7%)
Marginal Literacy	6 (40.0%)
Adequate Literacy	2 (13.3%)
<i>Scores (Average score 17.9/36 points; 49.7%)</i>	
Minimum score	10
Maximum Score	33

Results of PILOT STUDY TWO

FY 2010-2011

Overview

This fiscal year of the project was directed at completing PILOT STUDY TWO of the study. We encountered a number of technical problems with getting our psycho-physiological equipment ready for use, as well as adapting the existing Colorectal Cancer Screening tutorial we developed previously for use with the equipment, during this time period. These issues were resolved and testing then began in FY2011-2012.

Specific Accomplishments

Adaptation of Existing Colorectal Cancer Screening Tutorial

The Colorectal Cancer (CRC) screening tutorial that was used for PILOT STUDY TWO was developed for an NIH funded R21. This tutorial was used with patients at a primary care clinic using a touch screen computer monitor and was accessed using a web link to our research partner, a patient education company that develops web-based health tutorials. Thus, the tutorial was “housed” on their website and accessed via a high speed internet connection at the clinic. This was done because of the size of the tutorial, which utilizes graphics, voice-over and video “testimonials”.

When adapting this tutorial to use with our psycho-physiological measures, however, we realized that we would be unable to utilize the web-based link because the eye-tracking and biofeedback equipment require a stable picture on screen that can be coordinated with an “advance” key to distinguish where eye tracking on one image stops and eye tracking of another image begins on a separate page. To analyze eye tracking you also have to have separate .bmp files to superimpose eye tracking data to visually understand where participants were looking. Thus, we had to re-do the tutorial to adapt to these limitations. This required creating a stable powerpoint presentation with text and graphics. We then had to embed audio voice-overs for each slide, as well as video “testimonials” into the presentation, so that the end result was similar to the original. We worked with our research partner, Patient Education Institute, who provided us with audio and video files. Because there was no monies budgeted to pay them, however, we had to do all the programming ourselves. This required finding a student with the correct computer programming background to do this and then working with him on his timeframe to get the tutorial in the right format. This was completed by 12/2010.

Updating Psycho-Physiological Measure Equipment and Training of Staff

Through the rest of the fiscal year, 1/2011 through 6/2011, we worked on updating our current psycho-physiological equipment and moving it to a secure and private location. The equipment was set up in a large room, the Risk Communication Laboratory, which has desks for graduate research assistants and other meeting space. This room originally only had one or two graduate students working in it at any time but with increased grant and research activity, by the spring there were over five undergraduate and graduate students working in the lab and we felt we could no longer provide privacy to those participating in the research. We secured a separate, smaller room to set up the psycho-physiological equipment that would provide privacy and silence during the testing. We then had to move all the equipment into this space and ensure its functionality. During this process we uncovered a number of problems with the equipment and had to work with the company who makes the equipment to update software. In addition, because the tutorial has over 25 separate slides, the eye tracking and biofeedback equipment software had to be coordinated so that when we gathered data we could distinguish when participants started and stopped looking at one slide and went to the next. This required us to be able to start, pause and stop the data collection, as well as start the eye tracking/pupilometer and biofeedback data collection at the same time. The current psycho-physiological software does not do this so we had to create a set of computer programming “macros” that would accomplish this. We again had to enlist the help of a computer programming student to help us since there was no budget to pay a professional or have the psycho-physiological equipment company provide consulting services. We were able to identify a student who was able to develop two macros that now enable us to start, pause and stop the eye tracking, pupil dilation, skin response and heart rate data monitoring software together. We are also able to pause between slides so that in data analysis we will be able to differentiate how they looked at and responded to each slide individually. During this time we also developed a script and study protocol to ensure smooth testing of participants.

As a result, all equipment was functional and the rest of the fiscal year was spent training undergraduate interns and graduate research assistants on how to use the equipment.

FY2011-2012

Overview

During this fiscal year, PILOT STUDY TWO of the project was completed. We tested five participants with the existing colorectal cancer screening tutorial and another five participants piloting a low literacy “Dirty Bomb” decision aid developed for another project. This allowed us to test the feasibility of the using the equipment with two public health issues and whether the types of findings were consistent across the issues.

Specific Accomplishments

Recruitment of Subjects with Low Literacy

Ten people were recruited for testing in the Risk Communication Laboratory. Recruitment efforts included developing and posting flyers in and around Temple University and reaching out to service workers at Temple University. We also reached out to a nearby senior center and recruited three of our participants from there. When people responded to the flyers, literacy testing was done to confirm low literacy (assessed as a score of 5 or below on the REALM-R), as well as other eligibility criteria (not having dyslexia, a rapid heart rate or a medical condition that causes profuse sweating). If eligible, participants were consented and an appointment was made for the person to come in for testing. All recruitment materials were approved by the Institutional Review Board.

We recruited a total of ten people. Nine were African American and one was white; all scored below a 5 on the REALM-R (average 3.1). Specific demographics are shown in TABLE 4 below. Five of the subjects were shown the colorectal cancer tutorial described in the previous annual report. The remaining five subjects were shown a low literacy decision aid on “dirty bombs” that was created for another project and served as a pilot of that material. Both projects had the same inclusion criteria and we felt that by using the measures on two separate public health decision aids we could assess whether the measures themselves were acceptable, regardless of the public health topic.

Testing of Subjects with Low Literacy

Ten subjects with low literacy were tested in the Risk Communication laboratory with psycho-physiological measures. Protocol for appointments included consenting and asking demographic information from participants prior to testing. Once testing occurred, we then asked them about their feelings about being tested and about the material they saw. They then received their gift card.

Specific psycho-physiological measures used included eye tracking, pupilometer and EKG measures. The purpose of the pilot was to assess whether using these measures was a viable strategy for low-literacy populations. Specific questions we wanted to assess during this study included:

1. Could participants with limited literacy follow directions during the testing, including sitting still, not moving their head and participating in the eye tracking system?
2. Would eye-tracking results indicate that participants with limited literacy were able to follow materials reading and looking at graphics on a screen in front of them?
3. Would EKG and skin conductance results show that participants with limited literacy were unduly stressed by the process of being connected to wires and machines?
4. Were there any other barriers to using these methods with participants with limited literacy?
5. Were the psycho-physiological measures acceptable to the participants?

Results

1. Following directions: We had little problem with participants having the ability to follow directions during the testing. This included understanding what we were testing for, how to sit during the eye tracking, not moving during the testing etc. The only issue we found with a few of the older adults was them getting sleepy during the testing because of the length of time it took to get a “lock” on their eye movement and the darkness of the room. As our skill at locking a person’s eye movement increased, the amount of time it took decreased. We also were able to do the subsequent testing with the lights on, helping eliminate this problem.

In addition, we found that with older people it was harder to get an eye lock due to drooping eyelids. This is a problem not specific to those with limited literacy but a limitation of the equipment.

2. Eye-tracking results: We found that those with limited literacy were able to follow the decision aids that were expressly developed for them. As illustrated by FIGURE 1 below, eye tracking shows that participants were able to follow the text and seemed to spend an appropriate amount of time on the material. This is significant and helps support the concept that using these methods with limited literacy populations is viable and that they are a valid way to understand use of and physical reaction to public health education materials.

3. EKG and skin response results: We found that those with limited literacy were no more agitated during the testing process than others with higher literacy. EKG and skin response results (see FIGURE 2) were average and similar to those we have found in other studies. This was also an encouraging finding. Though it means the health education materials did not have a noticeable physical effect on the participants, it does mean that the process of using the physiological measures did not cause undue stress.

3. Other barriers: We did not find other significant barriers to using psycho-physiological measures that were unique to low-literacy individuals. Most barriers were related to age, color of pupil (sometimes if the pupil was very dark it was hard to get a ‘lock’) or other physical issues that we did not screen for (for example only having one eye). This is encouraging as it suggests that using these measures is a viable option with all types of populations as long as materials are crafted to specific literacy needs.

4. Acceptability of using measures: We found that participants were generally accepting of the psycho-physiological protocol if they were explained in plain language and we provided answers

to any questions. In general their questions did not differ from participants with higher literacy. This was important in that some may feel that special circumstances may make this testing invalid in a low literacy population. We did not find this at all; participants were happy to participate and exhibited no special barriers to using the methods than other higher-literacy populations.

Results of acceptability of the decision aid they viewed were also favorable of the content, meaning the use of the psycho-physiological testing did not inhibit their ability to understand or think favorably of the education itself. This was found for both the CRC decision aid and the “Dirty Bomb” decision aid. TABLE 5 illustrates the results of survey questions asking about the acceptability of the decision aid. As illustrated, average scores on all the questions are high, indicating they liked the decision aid and felt it provided the correct amount and type of information.

Conclusions

Overall, we found that the ability to test individuals with limited literacy was very beneficial in allowing us to identify potential problems using the measures and underscore the general acceptability of using the measures in this population. This will benefit future study applications and will provide important pilot data to describe the use and acceptability of using these measures in individuals with limited literacy.

Table 4: Demographic Characteristics of Participants

<u>Variable</u>	<u>Result</u>
Average Age	48
Average REALM-R Score	3.1
Gender	
Male	1 (10%)
Female	9 (90%)
Race	
African American	8 (80%)
Other	2 (20%)
Education Level	
Grade School	1 (10%)
Some High School	3 (30%)
Graduated from HS/GED	6 (60%)

Table 5. Average Scores on Acceptability of Decision Aid (n=10)

Variable	Mean
The length of this education was...	2.07 (1=too long, 2=too short, 3=just about right)
The amount of information about the topic...	2.76 (1=too much, 2=too little, 3=just right)
How useful was the information on the topic...	1.14 (1=very useful, 2=somewhat useful, 3=not very useful, 4= not at all useful)
How hard or easy was it for you to understand.	1.52 (1=very easy, 2=somewhat easy, 3=somewhat hard, 4=very hard)
Do you think the education would be helpful to others...	1.31 (1=yes, 2=no, 3=not sure)
Did we include enough info for a person to make a decision...	1.17 (1=yes, 2=no, 3=not sure)

Figure 1. Example of Eye Tracking of Individual with Low Literacy

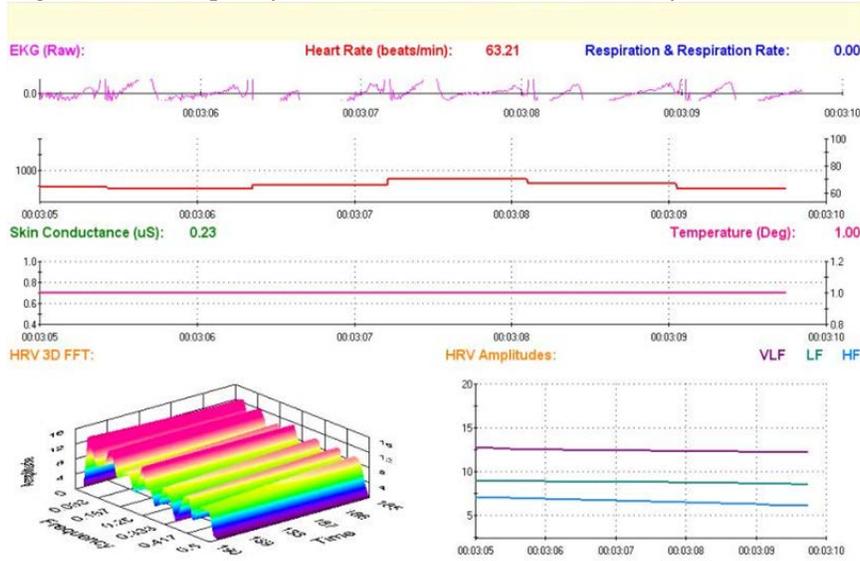
WHAT ABOUT MY KIDS AND FAMILY?

If they are with you, stay together. Do the same things for your family that you would for yourself.

- If your family isn't with you, they should stay where they are until you are told it is safe to go outside.**



Figure 2. Example of EKG and Skin Conductance of Individual with Low Literacy



Presentations Resulting from Research

An abstract outlining PILOT STUDY ONE results was submitted to and accepted by the American Public Health Association for presentation at their annual meeting in November, 2010. The specific title and authors for that presentation were: “Use of REALM-R vs. S-TOFHLA in an urban African American clinic population to assess health literacy: Practical Implications.” SB Bass, CN Wolak, GM Rovito, TF Gordon and L Ward. American Public Health Association Annual Conference. November 2010. Denver, CO

18. Extent of Clinical Activities Initiated and Completed. Items 18(A) and 18(B) should be completed for all research projects. If the project was restricted to secondary analysis of clinical data or data analysis of clinical research, then responses to 18(A) and 18(B) should be “No.”

18(A) Did you initiate a study that involved the testing of treatment, prevention or diagnostic procedures on human subjects?

Yes
 No

18(B) Did you complete a study that involved the testing of treatment, prevention or diagnostic procedures on human subjects?

Yes
 No

If “Yes” to either 18(A) or 18(B), items 18(C) – (F) must also be completed. (Do NOT complete 18(C-F) if 18(A) and 18(B) are both “No.”)

18(C) How many hospital and health care professionals were involved in the research project?

_____ Number of hospital and health care professionals involved in the research project

18(D) How many subjects were included in the study compared to targeted goals?

_____ Number of subjects originally targeted to be included in the study

_____ Number of subjects enrolled in the study

Note: Studies that fall dramatically short on recruitment are encouraged to provide the details of their recruitment efforts in Item 17, Progress in Achieving Research Goals, Objectives and Aims. For example, the number of eligible subjects approached, the number that refused to participate and the reasons for refusal. Without this information it is difficult to discern whether eligibility criteria were too restrictive or the study simply did not appeal to subjects.

18(E) How many subjects were enrolled in the study by gender, ethnicity and race?

Gender:

_____ Males

_____ Females

_____ Unknown

Ethnicity:

_____ Latinos or Hispanics

_____ Not Latinos or Hispanics

_____ Unknown

Race:

_____ American Indian or Alaska Native

_____ Asian

_____ Blacks or African American

_____ Native Hawaiian or Other Pacific Islander

_____ White

_____ Other, specify: _____

_____ Unknown

18(F) Where was the research study conducted? (List the county where the research study was conducted. If the treatment, prevention and diagnostic tests were offered in more than one county, list all of the counties where the research study was conducted.)

19. Human Embryonic Stem Cell Research. Item 19(A) should be completed for all research projects. If the research project involved human embryonic stem cells, items 19(B) and 19(C) must also be completed.

19(A) Did this project involve, in any capacity, human embryonic stem cells?

Yes
 No

19(B) Were these stem cell lines NIH-approved lines that were derived outside of Pennsylvania?

Yes
 No

19(C) Please describe how this project involved human embryonic stem cells:

20. Articles Submitted to Peer-Reviewed Publications.

20(A) Identify all publications that resulted from the research performed during the funding period and that have been submitted to peer-reviewed publications. Do not list journal abstracts or presentations at professional meetings; abstract and meeting presentations should be listed at the end of item 17. **Include only those publications that acknowledge the Pennsylvania Department of Health as a funding source** (as required in the grant agreement). List the title of the journal article, the authors, the name of the peer-reviewed publication, the month and year when it was submitted, and the status of publication (submitted for publication, accepted for publication or published.). Submit an electronic copy of each publication or paper submitted for publication, listed in the table, in a PDF version 5.0.5 (or greater) format, 1,200 dpi. Filenames for each publication should include the number of the research project, the last name of the PI, the number of the publication and an abbreviated research project title. For example, if you submit two publications for PI Smith for the “Cognition and MRI in Older Adults” research project (Project 1), and two publications for PI Zhang for the “Lung Cancer” research project (Project 3), the filenames should be:

Project 1 – Smith – Publication 1 – Cognition and MRI

Project 1 – Smith – Publication 2 – Cognition and MRI

Project 3 – Zhang – Publication 1 – Lung Cancer

Project 3 – Zhang – Publication 2 – Lung Cancer

If the publication is not available electronically, provide 5 paper copies of the publication.

Note: The grant agreement requires that recipients acknowledge the Pennsylvania Department of Health funding in all publications. Please ensure that all publications listed acknowledge the Department of Health funding. If a publication does not acknowledge the funding from the Commonwealth, do not list the publication.

Title of Journal Article:	Authors:	Name of Peer-reviewed Publication:	Month and Year Submitted:	Publication Status (check appropriate box below):
1. None				<input type="checkbox"/> Submitted <input type="checkbox"/> Accepted <input type="checkbox"/> Published

20(B) Based on this project, are you planning to submit articles to peer-reviewed publications in the future?

Yes _____ No X

If yes, please describe your plans:

21. Changes in Outcome, Impact and Effectiveness Attributable to the Research Project.

Describe the outcome, impact, and effectiveness of the research project by summarizing its impact on the incidence of disease, death from disease, stage of disease at time of diagnosis, or other relevant measures of outcome, impact or effectiveness of the research project. If there were no changes, insert “None”; do not use “Not applicable.” Responses must be single-spaced below, and no smaller than 12-point type. DO NOT DELETE THESE INSTRUCTIONS. There is no limit to the length of your response.

None

22. Major Discoveries, New Drugs, and New Approaches for Prevention Diagnosis and Treatment. Describe major discoveries, new drugs, and new approaches for prevention, diagnosis and treatment that are attributable to the completed research project. If there were no major discoveries, drugs or approaches, insert “None”; do not use “Not applicable.” Responses must be single-spaced below, and no smaller than 12-point type. DO NOT DELETE THESE INSTRUCTIONS. There is no limit to the length of your response.

None

23. Inventions, Patents and Commercial Development Opportunities.

23(A) Were any inventions, which may be patentable or otherwise protectable under Title 35 of the United States Code, conceived or first actually reduced to practice in the performance of work under this health research grant? Yes _____ No X

If “Yes” to 23(A), complete items a – g below for each invention. (Do NOT complete items a - g if 23(A) is “No.”)

- a. Title of Invention:
- b. Name of Inventor(s):
- c. Technical Description of Invention (describe nature, purpose, operation and physical, chemical, biological or electrical characteristics of the invention):
- d. Was a patent filed for the invention conceived or first actually reduced to practice in the performance of work under this health research grant?
Yes_____ No____

If yes, indicate date patent was filed:

- e. Was a patent issued for the invention conceived or first actually reduced to practice in the performance of work under this health research grant?
Yes_____ No____
If yes, indicate number of patent, title and date issued:
Patent number:
Title of patent:
Date issued:

- f. Were any licenses granted for the patent obtained as a result of work performed under this health research grant? Yes_____ No____

If yes, how many licenses were granted?_____

- g. Were any commercial development activities taken to develop the invention into a commercial product or service for manufacture or sale? Yes___ No___

If yes, describe the commercial development activities:

23(B) Based on the results of this project, are you planning to file for any licenses or patents, or undertake any commercial development opportunities in the future?

Yes_____ No ___X_____

If yes, please describe your plans:

24. Key Investigator Qualifications. Briefly describe the education, research interests and experience and professional commitments of the Principal Investigator and all other key investigators. In place of narrative you may insert the NIH biosketch form here; however, please limit each biosketch to 1-2 pages. *For Nonformula grants only – include information for only those key investigators whose biosketches were not included in the original grant application.*

BIOGRAPHICAL SKETCH

NAME Sarah Bauerle Bass		POSITION TITLE Associate Professor of Public Health; Temple University Department of Public Health	
eRA COMMONS USER NAME (credential, e.g., agency login)			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
Temple University	Ph.D.	5/2001	Health Education
Temple University	MPH	5/1996	Public Health
Temple University	Grad. Cert.	5/1996	Women's Studies
Northwestern University	BS	5/1986	Communications-R/TV/F

A. Personal Statement

Dr. Bass has over 20 years of experience working in the public health field, and specifically in risk communication. As co-director of the Risk Communication Laboratory at Temple University, she is co-PI on a NCI funded R21 and PI on a NIBIB funded RO3. This research has primarily been with low-income, low health literacy minority communities and has been successful in helping understand barriers to care and develop culturally and developmentally appropriate messages. Specifically, research has been done in the areas of colorectal cancer screening, radiological terror, smallpox vaccination, avian flu attitudes towards vaccination and quarantine, public perceptions of emergency preparedness and perceptions of patients by HIV/AIDS caregivers. She has also worked in message development for HIV/AIDS prevention as public information coordinator for the West Virginia Department of Health and developed and implemented multiple community-based programs while Director of Health Education for the American Red Cross.

B. Positions and Honors

Positions and Employment

1988-1990 Public Info. Director, HIV/AIDS Program, WV Dept. of Health, Charleston, WV
 1990-1993 Director of Health Ed. Programs, American Red Cross, Philadelphia, PA
 2003-2008 Asst Prof., Dept. of Public Health, Temple University, Philadelphia, PA
 2008-current Asso. Prof., , Dept. of Public Health, Temple University, Philadelphia, PA
 2007-current Co-Director Risk Communication Laboratory, Temple University

C. Selected Peer-Reviewed Publications/Presentations

Most Relevant to Application

1. **Bass SB.** How will Internet use affect the patient: A review of computer network and interactive technology studies and the implications in understanding how the use of the Internet affects patient populations. *Journal of Health Psychology.* 2003; 8(1): 23-36.
2. **Bass SB,** Ruzek SB, Fleisher L, McKeown-Conn N, Gordon TF, & Moore D. Relationship of Internet health information use with patient behavior and self-efficacy: Experiences of

- newly diagnosed cancer patients who contact the National Cancer Institute's Cancer Information Service. *Journal of Health Communication*. 2006; 11: 219-236.
3. **Bass SB**, Gordon TF, Ruzek SB, & Hausman AJ. Mapping perceptions of factors related to acceptance of smallpox vaccination under varying levels of threat among hospital emergency room personnel. *Biosecurity and Bioterrorism*; 2008; 6(20): 179-189.
 4. Ward SH, Lin K, Meyer B, **Bass SB**, Parameswaran L, Gordon TF, & Ruzek SB. Impact of risk perceptions and screening guidelines on colorectal cancer screening in African Americans: A review of the literature. *Journal of the National Medical Association*; 2008; 100(6): 748-758.
 5. **Bass SB**, Gallo R, Crookes D, Berger T, & Fleisher L. *Your Resource Guide to Health Literacy*. Pennsylvania Department of Health, Fox Chase Cancer Center, Health Communications and Public Health Program; 2009; <http://www.fccc.edu/docs/prevention/hchd/health-literacy-guide.pdf>
 6. **Bass SB**, Ruzek SB, Ward L, Gordon TF, Hanlon AL, Hausman AJ & Hagen M. "If you ask them will they come? Predictors of quarantine compliance during a hypothetical avian influenza pandemic: Results from a statewide survey". *Disaster Medicine and Public Health Preparedness*; 2010; 4:1-10.
 7. **Bass SB**, Gordon TF, Ruzek SB, Wolak C, Ward S, Paranjape A, Lin K, Meyer B & Ruggieri D. "Perceptions of colorectal cancer screening in urban African American clinic patients: Differences by gender and screening status". *Journal of Cancer Education*; 2010; 26(1): 121-8.
 8. Ruggieri, D.G., **Bass, S.B.**, Rovito, M.J., Ward, S., Gordon, T.F., Paranjape, A., Lin, K., Meyer, B., Parameswaran, L., Wolak, C., Britto, J. and Ruzek, S.B. (In Press). Perceived colonoscopy barriers and facilitators among urban African American patients and their medical residents. *Journal of Health Communication (in press)*.
 9. **Bass, SB**, Gordon, TF, Ruzek, SB, Wolak, C, Ruggieri, D, Mora, GM, Rovito, MJ, Britto, J, Parameswaran, L, Abedin, Z, Ward, S, Paranjape, A, Lin, K, Meyer, B, Pitts, K. Developing a Computer Touch-Screen Interactive Colorectal Screening Decision Aid for a Low-Literacy African American Population: Lessons Learned. *Health Promotion and Practice*; 2012 (in press).
 10. Wolak, C, **Bass, SB**, Tedaldi, E, VanDenBurg, M, Rohrer, C. Minority HIV Patients' Perceptions of Barriers and Facilitators to Participation in Clinical Research. *Current HIV Research*; 2012 (in press).

D. Research Support

Ongoing Research Support

RO3EB00956

Bass (PI)

6/2009 - 12/2012

NIBIB –National Institute of Biomedical Imaging and Bioengineering
 Developing Radiological Risk Communication Materials for Low-literacy Populations. This grant is developing low-literacy risk communication messages for low-income urban populations using perceptual mapping and psycho-physiological measures to test effectiveness.

Role: PI

Temple Univ., Office of Vice Provost for Research Bass (PI)
1/2009-12/2012

Pilot Studies to Help Develop Radiological Risk Communication Materials for Low-literacy Populations. The major goal of this project is to pilot test use and appropriateness of biophysical measures with low-literate populations.

Role: PI

Completed Research Support

1R21CA120122

Gordon (PI)

01/01/2007 – 12/31/2010

NIH-National Cancer Institute

Using Perceptual Mapping to Develop Low Literacy CRC Screening Decision Aids. The major goal of this project was to use perceptual mapping and vector message design techniques to develop more effective colorectal-cancer screening decision aids for low literacy populations.

Role: Co-PI