Appendix A: Script for hands-on modeling

Step-by Step Instructions for Health Educator	Health Educators Script (to be read)
• When finished with the home safety check see if they know how to properly use an alarm	"I actually have a practice alarm here with me. This alarm has the hush button feature. This feature will be on the alarms that we will give you. It's so easy to forget what these buttons do. Have you ever used an alarm with this feature?"
• If yes, have them show you. • If no, continue with the modeling.	***Demonstration of Knowledge*** "Great, do you think you could show me you how you use the smoke alarm on this practice one?" 1. Can you show me how to test the alarm to see if it still worked? 2. Can you show me what you would do if the alarm goes off while you are cooking? 3. What have you done before when the batteries in the alarm needed to be changed?
• If they agree and demonstrate wrong, read the modeling script. Then continue to next box.	***Modeling*** "I had trouble with this until I did it a few times. It's so easy to get these buttons confused and mixed up. I have two alarms just like this at home. I've found that the best way to test this alarm to see if it works is to push this little button right here. Hold it until the alarm sounds. When it sounds let it go. Have your alarms ever gone off when there was no fire? Maybe this happened when you were cooking? If this happens all you do is push this button right here. Pushing it will stop the alarm from chirping. I have found that it likes to go off when I fry things. Also when there's a lot of steam in my kitchen. Just remember to use the hush button. That is what it is for. It's also a good idea to open the window and fan the smoke outside. We know these alarms are annoying when they go off. It is also important to know when to change the batteries. This should happen once a year or when the alarm chirps. To change the batteries first twist off this cover. Then take the battery out of its holder. Next put the new battery in the holder. Then twist the cover back onto the alarm and you are done."
• If they agree and demonstrate correctly, go to **(Box 15)** and continue with the home safety checklist results.	"Great job! Now let's go over the home safety results."
• If they don't want to show you, demonstrate and then continue with the home safety checklist results.	"Ok, what I'll do is quickly show you how to use the alarm. Then we will go over the home safety checklist results."
• When finished demonstration ask the resident if (s)he is confident using and testing the alarm.	"After watching me can you now show me how to test the alarm? Then can you show me how to change the batteries?"

• If they agree, have them demonstrate one last time on the practice alarm. When done go to **(Box 15)** and continue with the home safety checklist results.	**DEMONSTRATION OF KNOWLEDGE** "Great, do you think you could show me you how you use the smoke alarm on this practice one?" ***(Praise everything they do right)*** 1. What would you do if you wanted to test the alarm to see if it still worked? 2. What would you do if the alarm goes off while you are cooking? 3. What would you do if the alarm didn't work and you needed to change the batteries?
• If done correctly, continue with the results of the smoke alarm check. • If done incorrectly, model one last time. Then continue with the scripts.	"Great job! Now on to the smoke alarms. The installer did a safety check. They tested all of your smoke alarms. They did that to see if they work. This way you would be warned if there was a fire. "Ok, I'll quickly show you one more time how to (change the batteries, test the alarm, or use the hush button)." ***(When finished continue with script above)***
• After completing the walk-around & agreeing on alarms to install/replace	**INSTALLATION CONSENSUS** (Installer's name) tested all of your smoke alarms. (He/She) did that to see if they work. This way you would be warned if there was a fire. I think it would be a great idea if you put the battery in the alarm before (Installer's name) puts it up. It can be tricky and we can help you with it now.

Appendix B: Knowledge, Attitudes, and Behavior Survey

Instructions: This form is to be completed by smoke alarm project personnel. Questions should be directed towards the person who is giving consent to participate in the study. **(Read the following to the participant)** I am going to ask you some questions about fire and falls. I'm going to hold up a card with answers on it. After each question, say your answer or point to it on the card.

By filling in the dot ○, please select the choice which you believe is true.

1. It is likely that there will be a fire in a house in my neighborhood in the next few years.

   ○Agree Strongly ○ Agree ○No Opinion ○ Disagree ○Disagree Strongly

2. I am afraid that there will be a fire in my house in the next few years.
3. House fires cause a lot of bad injuries.
4. I am afraid of losing everything in a house fire.
5. Smoke alarms save lives.
6. I would worry less about my family if I knew my smoke alarm was working.
7. Smoke alarms hardly ever work.
8. I am sure that I can test my smoke alarm to see if it is working.
9. I am sure that I can use the hush button on my smoke alarm.
10. I am sure that I can change the battery in my smoke alarm.
11. Batteries for smoke alarms are too expensive.
12. It is easy to reach my smoke alarm to change the battery.
13. Changing the battery in my smoke alarm takes too much time.

14. Smoke alarms are annoying because they go off when someone is cooking or smoking.
15. It is likely that someone will be injured in a fall in my home in the next few years.
16. Falls in the home cause a lot of bad injuries.
17. Many people are injured in falls from beds.
18. Falls down stairs and steps cause injuries in people of all ages.
19. Having lights in my stairways protects my family from falls.
20. Keeping clutter off my floors and stairs is a good way to keep my family from falling.
21. I can do many things to keep people from falling in my home.

Appendix **C. Covariates, Sensitivity Analysis and Regressions Differentiating Effects of Full Education Versus Practice**

Table C1 summarizes household structure and the demographic characteristics of the household member who we educated during the initial visit. We included these characteristics as covariates in preliminary regressions, then dropped those with coefficients that did not differ significantly from 0 at the 80% probability level and did not substantially increase the percentage of variance that the model explained (measured by r-squared). Specifically we collected seven demographic variables:

- Household size
- Number of children, with a dichotomous variable indicating the household included more than 3 children proving most appropriate
- Number of residents over age 60
- Annual household income group (Less than $10,000, $10,000 - $19,999, $20,000 - $29,999, and $30,000 and over). Income group is set to the mean if refused, with a 0-1 variable added to the regression to denote when this occurs. This procedure allows the regression to adjust the income weighting for households that did not provide this information.
- Sex of person trained
- Race of person trained (black, white non-Hispanic, other)
- Education of person trained (elementary school, some high school, high school graduate/GED, some college, college graduate, graduate school).

A count of perceived barriers was summed from Knowledge-Attitudes-Behavior (KAB) survey items 8-14. A measure of perceived fire risk was summed from items 1-4.

Tables C2 and C3 show regressions testing the significance of the effects of Full Education versus Practice plus typical fire department education (Current Norm). The independent effects are significant or marginally significant. For the most part, the regressions, especially the Table C3 regression predicting if a home has any working alarms, suggest that the KAB questions were well-chosen. The final regressions omit KAB question 7, a belief that smoke alarms hardly ever work, because it had no significant effect on the likelihood that the home had at least one working alarm (p=.582). The effect of question 5, a belief that alarms reduce worry, was wrong-signed. Concerns about false alarms were predictive that the household kept alarms operating. The other KAB questions had correct signs but only very modest ability to predict the outcomes.

Table C1. Demographic Distribution of Participants by Arm

	Full Education	Practice	Current Norm	Total	P
Race/Ethnicity of Person Educated					
Cases	120	54	129	303	.211
Black	74.2%	79.6%	81.4%	78.2%	
White non-Hispanic	11.7%	1.9%	6.9%	7.9%	
Other	14.2%	18.5%	11.7%	13.9%	
Female Educated	72.6%	71.2%	66.7%	69.8%	
Cases	124	59	138	321	.562
Education of Person Educated					
Cases	114	46	112	272	.622
Elementary school	4.4%	0.0%	2.7%	2.9%	
Some high school	5.3%	4.3%	8.9%	6.6%	
Completed high school/GED	39.5%	39.1%	39.3%	39.3%	
Some college	23.7%	26.1%	27.7%	25.7%	
College graduate	16.7%	23.9%	17.0%	18.0%	
Graduate school	10.5%	6.5%	4.5%	7.4%	
Annual Household Income					
Cases	141	58	125	324	.144
Less than $10,000	5.6%	1.6%	0.0%	2.4%	
$10,000 - $19,999	1.6%	3.3%	1.4%	1.8%	
20,000 - $29,999	4.0%	3.3%	4.3%	4.0%	
$30,000 and over	17.6%	23.0%	14.9%	17.4%	
Refused	71.2%	68.9%	79.4%	74.3%	
Household Structure					
Cases	115	48	121	284	
Household size					
1	27.0%	20.8%	29.8%	27.1%	.095
2	40.0%	39.6%	28.9%	35.2%	
3	10.4%	18.8%	19.8%	15.8%	
4	10.4%	12.5%	7.4%	9.5%	
5	3.5%	0.0%	9.9%	5.6%	
6-13	8.7%	8.3%	4.1%	6.7%	
Children in household					
0	72.2%	58.3%	67.8%	68.0%	.225
1	13.9%	20.8%	14.0%	15.1%	
2	5.2%	14.6%	9.1%	8.5%	
3	5.2%	0.0%	7.4%	5.3%	
More than 3	3.5%	6.3%	1.7%	3.2%	.310
Someone over age 60 in the home	60.0%	43.5%	48.8%	52.5%	.064

The KAB results also are weakly consistent with the tenets of the health belief model. The weakness of their relationship, however, suggests that the educational aspects of the health belief model may not affect behavior very much. To test that hypothesis, Tables C4 and C5 test the differential effects of the Full Education and Practice arms. Their effects on both primary outcomes are statistically similar at the 97 percent confidence level.

Sensitivity Analysis

The effectiveness estimates were largely unaffected by a range of alternate regression modeling choices. Retaining the three homes with no survey responses and no education delivered or including time to follow-up, an indicator of which educator delivered the education, or an indicator of whether the family trained still was in residence minimally affected the estimates or their significance.

The main analysis includes cases where we tested alarms and ones with self-reported alarm status. Omitting the self-reported cases yielded a significant probability that Practice increased the number of homes with working alarms (Odds Ratio = 4.41, p=.05, 95% CI = 1.02, 19.02, n=246). Dropping demographic variables with several missing values raised the number of cases entering the regression to 304 but reduced the odds ratio for Full Education to a marginally significant 2.16 (p=.07, 95% CI = 0.94, 4.95). These changes minimally affected magnitude and significance in the pooled treatment group analyses or the analysis of number of working alarms reported in Table B1.

Table C2. Increase in Working Alarms at Follow-up by Treatment Arm Relative to Increase with Current Norm

	Coefficient	95% Confidence Interval		p-value
Constant	-0.03	-1.22	1.15	0.955
Full Education arm	0.30	0.05	0.55	0.020
Practice arm	0.37	0.04	0.7	0.027
Baltimore	0.26	-0.03	0.55	0.074
Pilot test home	0.07	-0.35	0.5	0.734
# alarms working pre	-0.76	-0.86	-0.65	>0.001
# alarms installed	0.20	0.09	0.31	0.001
Income group (DK=0)	0.15	-0.07	0.37	0.189
Income question refused	0.16	-0.09	0.42	0.209
Belief that alarms reduce worry	0.18	0.01	0.35	0.041
Belief that false alarms make smoke alarms annoying	-0.12	-0.24	-0.003	0.044
# Cases				308
Adjusted R-squared				0.46

Note: Coefficients for Full Education and Practice show the increase in number of working alarms in these arms relative to the increase in the Current Norm arm. Beliefs were assessed prior to education delivery.

Table C3. Did Homes Had Any Working Alarms at Follow-up, Differentiating Full Education from Practice

Independent Variable	Odds Ratio	95% Confidence Interval for Odds Ratio		P-value
Full Education arm	2.68	0.99	7.24	0.051
Practice arm	3.01	0.82	11.04	0.097
Baltimore	1.85	0.58	5.9	0.298
Pilot test home	0.69	0.18	2.66	0.589
Spanish materials	0.21	0.02	2.05	0.181
Black race/ethnicity	1.59	0.51	4.95	0.424
More than 3 children	0.19	0.03	1.04	0.055
Education	0.91	0.61	1.33	0.613
Income group	1.45	0.79	2.64	0.231
Income refused	1.99	0.81	4.88	0.132
GE 1 working alarm pre	1.79	0.71	4.5	0.214
Belief that fire risk is large	1.38	0.99	1.93	0.058
Belief that alarms save lives	0.49	0.17	1.36	0.17
Belief that alarms reduce worry	1.57	0.86	2.87	0.14
Belief that batteries are costly	2.28	0.92	5.67	0.076
# of perceived barriers	0.79	0.58	1.09	0.16
Cases				263
Pseudo R2				0.14

Note: Coefficients for Full Education and Practice show the increased likelihood of a household having working alarms at follow-up in these groups relative to the comparison group.

Table C4. Test of Equivalence of the Increase in Working Alarms at Follow-up in the Full Education and Practice Arms

	Coefficient	95% Confidence Interval		p-value
Constant	1.69	1.45	1.92	>0.001
Practice arm	-0.006	-0.34	0.33	0.971
Current Norm arm	-0.27	-0.53	-0.02	0.037
Baltimore	0.42	0.13	0.7	0.005
Pilot test home	0.09	-0.35	0.52	0.687
# alarms working pre	-0.77	-0.87	-0.66	>0.001
# Cases				324
Adjusted R-squared				0.43

Note: Coefficient for Practice shows the increase in number of working alarms in the Practice arm relative to the increase in the Full Education arm.

Table C5. Probability of Having Working Alarms at Follow-up and Test of Equivalence in the Full Education and Practice Arms

Independent Variable	Odds Ratio	95% Confidence Interval for Odds Ratio		P-value
Practice arm	1.03	0.3	3.47	0.967
Current Norm arm	0.52	0.21	1.31	0.164
Baltimore	1.50	0.5	4.47	0.468
Pilot test home	1.09	0.29	4.09	0.903
Spanish materials	0.24	0.03	1.93	0.178
Black race/ethnicity	1.53	0.53	4.45	0.434
More than 3 children	0.20	0.04	0.96	0.044
Education	0.95	0.66	1.36	0.777
Income group	1.33	0.74	2.38	0.347
Income refused	1.89	0.81	4.4	0.139
GE 1 working alarm pre	1.64	0.69	3.9	0.259
Cases				266
Pseudo R2				0.07

Note: Coefficient for Practice shows the differential odds of a household having working alarms at follow-up in the Practice arm relative to the Full Education arm.