When *promotoras* and technology meet: A qualitative analysis of *promotoras'* use of small media to increase cancer screening among South Texas Latinos

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Abstract

Computer-based multimedia technologies can be used to tailor health messages, but *promotoras* (Spanish-speaking community health workers) rarely use these tools. *Promotoras* delivered health messages about colorectal cancer screening to medically underserved Latinos in South Texas using two small media formats: a "low-tech" format (flipchart and video); and a "high-tech" format consisting of a tailored, interactive computer program delivered on a tablet computer. Using qualitative methods, we observed *promotora* training and intervention delivery, and conducted interviews with five *promotoras* to compare and contrast program implementation of both formats. We discuss the ways each format aided or challenged *promotoras'* intervention delivery. Findings reveal that some aspects of both formats enhanced intervention delivery by tapping into Latino health communication preferences and facilitating interpersonal communication, while other aspects hindered intervention delivery. This study contributes to our understanding of how community health workers use low- and high-tech small media formats when delivering health messages to Latinos.

Keywords

community health workers; tailoring; cancer screening

INTRODUCTION

Community health workers provide culturally-relevant health messages to increase access to health care and improve health outcomes of underserved communities (Altpeter, Earp, Bishop, & Eng, 1999; Earp et al., 1997; Elder, Ayala, Parra-Medina, & Talavera, 2009; Perez & Martinez, 2008). Usually members of the community in which they work, community health workers can be health advocates for their priority population on local, state, and federal levels (Eng & Smith, 1995; McCloskey, 2009; Plescia, Groblewski, & Chavis, 2008). *Promotoras* are community health workers for Spanish-speakers who typically educate peers in a culturally appropriate manner (Elder, et al., 2009). *Promotoras* commonly use low-tech tools such as flipcharts, printed material, or videos in their health communication efforts. Rarely do they use high-tech communication tools such as hand-held mobile devices or tablet computers with interactive software to help them deliver health messages. This study, the *Promotoras + Technology Study*, sought to compare *promotoras'*

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use of two different types of multimedia tools—low-tech and high-tech—to deliver a colorectal cancer screening intervention to medically underserved Latinos.

There is increasing evidence that two health promotion strategies—1) the use of one-on-one strategies; and, 2) small media—can effectively improve and increase cancer screening rates (Task Force on Community Preventive Services, 2008). For example, one-on-one strategies, such as programs delivered by *promotoras*, have been found to increase measurable health outcomes including breast and cervical cancer screening rates for many populations, including Latinos (Balcazar, Alvarado, Cantu, Pedregon, & Fulwood, 2009; Elder et al., 2005; Eng & Smith, 1995; Fernandez-Esquer, Espinoza, Torres, Ramirez, & McAlister, 2003; Fernandez et al., 2009; Ingram et al., 2007; Navarro et al., 1998; Ngoc Nguyen, Tanjasiri, Kagawa-Singer, Tran, & Foo, 2008; Yu et al., 2007). Small media materials can include video, print material, and interactive software programs that deliver tailored messages based on user input and delivered on mobile technologies such as phones or tablet computers (Task Force on Community Preventive Services, 2008). The use of small media is an effective strategy to improve health behaviors such as increasing breast, cervical, and colorectal cancer screening across a range of settings and populations (Robinson, Patrick, Eng, & Gustafson, 1998; Strecher, Greenwood, Wang, & Dumont, 1999; Task Force on Community Preventive Services, 2008).

Most small media materials developed with a particular population in mind and designed to include messages and images that are relevant, culturally acceptable, and appealing to the priority population are considered "targeted" materials. In contrast to *targeting*, in which messages and materials are designed to reach a specific segment of a population, *tailoring* is used to create messages and materials to reach one specific person based upon characteristics unique to that person, related to outcome of interest, and derived from an assessment of that individual (Kreuter, Strecher, & Glassman, 1999; Schmid, Rivers, Latimer, & Salovey, 2008).

With advanced technologies such as touch-screen computers and interactive software, small media can now be designed to tailor information in real time so that it is more salient to individuals and culturally appropriate for a particular population than targeted print or video formats (Gustafson et al., 2002). Messages in interactive health programs can include theory-based tailoring that permits streamlining information and constructing messages consistent with an individual's responses to certain questions concerning one or more of many measured characteristics such as stage of change, interests, language, and cancer experience and worry. Furthermore, this type of delivery has the potential for making the delivered health information more consistent between clients (McTavish et al., 1995; Science Panel on Interactive Communication and Health, 1999). The characteristics of tailoring contribute to the finding that tailored small media programs are often more efficacious than material that are designed to reach a more general audience (Jibaja et al., 2000; Kreuter, Lukwago, Bucholtz, Clark, & Sanders-Thompson, 2003; Mathews, Darbisi, Sandmann, Galen, & Rubin, 2009; Suggs & McIntyre, 2009; Wilkin et al., 2007). While there is some evidence to suggest that tailored approaches using interactive communication technologies can increase cancer control behavior for one-on-one interventions, there were insufficient studies for a community guide recommendation supporting the use of tailored materials (Task Force on Community Preventive Services, 2008). It is possible that since one-on-one interactions are typically responsive to individual needs, the addition of tailored material does not necessarily represent an additional benefit. On the other hand, for *promotoras*, the use of tailored materials may decrease *promotora* burden and may increase effectiveness of their efforts (Elder et al., 2006).

Despite the promising findings concerning the use of one-on-one and small media strategies to increase cancer screening the most recent Community Guide systematic review did not result in recommendations for use of one-on-one strategies to increase colorectal cancer screening due to an insufficient number of studies (Task Force on Community Preventive Services, 2008). Similarly, there is insufficient evidence for small media for increasing colorectal cancer screening types other than the FOBT (Fecal Occult Blood Test), one of four recommended tests (Task Force on Community Preventive Services, 2008). It is also unclear exactly which small media formats (e.g. print, video, or tailored, interactive programs) work best when delivered by community health workers. Finally, the available research lacks description of how and under what circumstances a combination of one-on-one education and varying small media formats (targeted or tailored) can effectively increase colorectal cancer screening rates among medically underserved Latinos (Lorence, Park, & Fox, 2006; Wilkin, et al., 2007).

This study, the *Promotoras + Technology Study*, seeks to fill gaps in knowledge about *promotoras* and their use of small media to increase cancer screening by describing how *promotoras* adapt to and use different small media formats to increase colorectal cancer screening among medically underserved Latinos. Using qualitative methods, we observed and interviewed *promotoras* who delivered a colorectal cancer screening intervention to this population in South Texas as a part of a CDC-funded community intervention (*Vale la Pena Prevenir* – Prevention: It's Worth It!). *Promotoras* delivered the intervention via two different small media formats: a low-tech format (flip-chart and video) and a high-tech format (a tailored, interactive multimedia program on a tablet computer).

METHODS

Parent Study Methods

Vale la Pena was designed to increase the rates of colorectal cancer screening with any of the four types of recommended exams (FOBT, colonoscopy, sigmoidoscopy, and barium enema) among Latino men and women living in *colonias* (unincorporated, un-zoned, semi-rural communities often without access to public services) on the South Texas side of the Texas-Mexico border (Warner & Jahnke, 2003). The study included 24 *colonias* in Cameron and Hidalgo counties. *Vale la Pena* used a multilevel, randomized, three group design to test the effectiveness of two small media formats delivered by *promotoras* described elsewhere (Fernandez, Byrd, Arvey, Savas, & Vernon, 2010).

The first small media format (the low-tech fomat) included an educational flipchart and a linear *telenovela* (soap opera) video on DVD. The second small media format (the high-tech format) was a tailored, interactive, multimedia intervention delivered on a touch-screen computer in participants' homes. While the educational content of both small media formats was as similar as possible, the high-tech format also included animations, live-action vignettes from the *telenovela*, and tailoring questions that allowed for the delivery of specific messages and images relevant to the individual participant's level of knowledge about colorectal cancer screening, perceived risk of colorectal cancer, attitudes about screening, readiness to get screening, and specific barriers to screening.

To deliver both formats, *promotoras* visited participants' homes. For the low-tech format they sat with participants to view the *telenovela,* and then reviewed the flipchart material. To deliver the high-tech format, *promotoras* sat with participants and helped them use the interactive program and answer tailoring questions by pushing computer touchscreen buttons with a stylus or finger.

Vale la Pena Promotoras

Six *promotoras* affiliated with two different community health organizations (Org A and Org B) located in South Texas border towns delivered either the low- or high-tech format to 316 participants (1 per household, self-identified Hispanic, 50 years of age, and had not been screened for colorectal cancer within recommended period). Promotoras were paid $10–12 per hour plus travel costs. The investigative team worked with the National Center for Farmworker Health, a non-profit organization dedicated to improving the health status of farmworker families, to develop a *promotora* training curriculum.

During three, 1–2 day sessions, consultants from the National Center for Farmworker Health and the investigative staff trained *promotoras* in cancer, colorectal cancer and screening topics, how to use the low- or high-tech small media format, and basic computer skills. Three separate trainings occurred per group. The first training session lasted four hours and mainly focused on the intervention content and familiarization with small media tools. Upon realizing the promotoras' need for further training on basic computer skills for those delivering the high-tech intervention, we conducted a second four-hour training session a month after the first training. Initially, we assigned Org A *promotoras* to deliver the high-tech format and Org B to deliver the low-tech format; the organizations switched formats mid-study. At this mid-study point, we conducted a third, four-hour refresher on intervention content for Org B *promotoras*, and a four-hour intervention content refresher and computer training with Org A *promotoras*.

Parent Study Methods and Protocols

Study procedures were approved by the University of Texas Health Science Center Institutional Review Board (UTHSC IRB) and we obtained informed consent in accordance with university guidelines using a consent form developed and written in Spanish and English. The consent form described the purpose of the study, detailed the risks and benefits of participation, and included contact information for the Principal Investigator and UTHSC IRB. The interviewer read the form aloud in Spanish to the *promotoras* and gave them a signed copy once they consented. We kept consent forms and data from observations, interviews, surveys, and encounter logs in locked files in Principal Investigator's office. *Promotoras* received $20.00 for their participation.

Promotora + Technology Study Methods

Study Design—As a process evaluation of *Vale la Pena*, the *Promotoras + Technology Study* employed qualitative methods and analysis based upon ethnography including direct observation and semi-structured interviewing of a purposive sample. The first author, a medical anthropologist, conducted multi-site direct observation during the second and third *promotora* trainings. The first author observed *promotoras*' intervention delivery, and trained three research assistants who conducted direct observations of *promotoras*' intervention delivery as well. The first author conducted in-depth, semi-structured, open-ended, interviews with the *promotoras* three months after the intervention implementation stage of the study (Bernard, 2002; Sobo, 2009).

Observations—As part of the process evaluation, we attended and observed two training sessions. During and after the sessions, we recorded detailed, unstructured field notes. Additionally, the first author and three research assistants observed each of the five *promotoras* delivering both low- and high-tech formats in 14 different sessions. Observations occurred during five separate, six-hour periods over the course of one year. All *promotoras* were observed at least once, and four were observed two to three times by the first author. Research assistants observed at least one *promotora* deliver the intervention one to two times. As part of our direct observations, we recorded detailed structured and

unstructured field notes during and after intervention delivery. Structured field notes were recorded on a template used during and after observations of the intervention sessions. The template had columns in which the observer recorded: 1) the time of each noted observation during an intervention; 2) descriptions of the contextual aspects (i.e. of the site where intervention took place); 3) a verbatim description of some of the verbal and non-verbal interactions that took place; and 4) the observers' subjective interpretation of the session and the communication between the *promotora* and the client. Unstructured field notes were recorded by hand after the sessions, and were typed and saved as documents using word-processing software. During the training sessions and the *promotora*-delivered intervention sessions, the first author spoke informally with the *promotoras*, asking them about their impressions of the sessions they had just had or their opinions of the intervention content and the small media formats.

Promotora Logs—*Promotoras* used "encounter logs" to record the time spent with each participant, topics covered, questions asked and answered, and referrals and/or recommendations given. We used MSExcel to calculate the time it took a *promotora* to deliver each intervention and compare average intervention times by small media format.

In-depth Interviews—The first author conducted in-depth, open-ended, semi-structured interviews in Spanish with five of the six *promotoras* (one was unavailable due to illness), three from Org A and two from Org B. Interviews took place in a public setting (University of Texas Brownsville private office or outside a public library) at the *promotoras'* convenience. The interviewer asked *promotoras* to describe their work history and then to reflect upon their experiences with *Vale la Pena* (See interview questions, Appendix A). We digitally recorded, transcribed in Spanish, and downloaded the interviews into Atlas.ti 5.2, a qualitative software program designed to manage large bodies of qualitative data and enable systematic coding and analysis. Here, to maintain confidentiality, we have changed the names of the *promotoras* and identify their quotations with female pseudonyms.

Data Analysis of Interviews—The first author is fluent in Spanish, the second and third authors are native Spanish-speakers, and the fourth author is an English-only speaker. The first and second authors individually coded Spanish transcriptions for emerging themes. They later met to compare, discuss, agree upon, and add and eliminate shared codes and themes emergent in the data. The first author then refined the coding of the transcripts based upon these codes and thematic content. With the use of Atlas.ti visual displays, we examined the relationships between different codes and themes and explored interconnected sets of concepts and relationships that arose from transcripts (Green & Thorogood, 2005; Miles & Huberman, 1994; Weitzman, 1999). Finally, using the coded transcripts, the first author selected quotations illustrative of the emergent themes and integrated them into the manuscript text. Selected quotations were translated into English by first and third authors and reviewed by all four authors.

RESULTS

Promotoras + Technology Study Participant Demographics

All five *promotoras* who participated in this study lived in Cameron or Hidalgo County. All self-identified as Hispanic and primarily spoke Spanish in and outside of the home. Some, but not all, spoke and read English with a low-to-mid level of fluency. While one promotora had obtained a general education diploma, none had received education beyond the ninth grade. *Promotoras'* ages ranged from 43 to 50 years. While all five *promotoras* had been born in Mexico, most had lived in the U.S. for at least 20 and up to 40 years. Although we

identify the *promotoras* using the female form of the noun to maintain participant confidentiality, one *promotor* was a man.

It is likely that the *promotoras* had a work history similar to that of the *Vale la Pena* study participants. Two had worked as migrant laborers; two had worked in *maquiladoras* (assembly factories on the Mexico-U.S. border) and one had worked in a small family-owned retail business. At least two of the *promotoras'* parents had been migrant farmworkers. Four had worked as *promotoras* for at least 6 and up to 25 years, and only one had worked as a *promotora* for less than 1 year. One *promotora* worked voluntarily without pay (with the exception of the *Vale la Pena* study), while the other four had been monetarily compensated for most of their *promotora* activities.

Emergent Themes—Major findings can be grouped by two descriptive themes that reveal: (1) how each small media format enhanced communication between *promotora* and study participant (theme: Small Media as Aid); and (2) how each small media format hindered communication between *promotora* and participant (theme: Small Media as Burden). Related subthemes that describe the ability of both formats to: 1) enable more than one study participant to view the intervention as it was delivered; 2) enable the *promotores* to deliver the session in various types of settings: and, 3) either facilitate or hinder the *promotores' ability* to control the pace of the low-tech format are identified.

Small Media as Aid

Promotoras' reports and observational data revealed that two technological aspects of both small media formats enhanced *promotoras'* intervention delivery. First, both small media formats enabled "mobility" because *promotoras* could deliver the intervention either inside or outside the home. Second, in some cases both low- and high-tech formats provided "expanded viewing capacity" because the study participant and other household members were able to view the intervention as the *promotoras* delivered it. Finally, we describe our observations of and *promotoras'* reported preferences for the low-tech format due to their ability to control the pace of the intervention when using it.

Mobility—Being able to power the high-tech format computer or the low-tech format portable DVD player with a battery enabled *promotoras* to conduct the intervention in spaces outside the home, i.e. in the yard, which in some cases, was a culturally appropriate site for intervention delivery. For example, we observed a situation in which a *promotora* visited a male study participant who lived by himself. In this case, the participant indicated that he wanted to receive the high-tech format intervention outside in his yard, which was open to view from the road. During the intervention cars passed the yard where we were sitting and the participant waved at the people, presumably his neighbors. Delivering the intervention outside may have enabled *promotoras* to avoid violating Latino cultural norms concerning the impropriety of unrelated people of the opposite sex sharing private space, particularly if one or more persons are married.

Indeed, when asked about potential problems related to *promotoras* visiting participants of the opposite sex, one *promotora* told us that she believed that when male *promotoras* visited the homes of married females the husbands of these women might be uncomfortable. She said, "It all depends on if the women [who is home alone] is married, you know, perhaps it would make the husband uncomfortable if a male [promotor] visits her." Some of this caution was also related to concerns for personal safety. The same promotora mentioned that she was sometings afraid because "you could run into people out there, people who don't think anything about their actions." Other promotoras mentioned that the organizations they worked for did not want *them* entering homes to deliver interventions to men who were

alone and, that they themselves were wary of doing so. In contrast, others told us that because *promotoras* were professionals conducting legitimate business, they thought that people should have no qualms about *promotoras* working inside the homes of people of the opposite sex.

Expanded Viewing Capacity—When *promotoras* initially began to use the DVD player to play the *telenovela* during the low-tech intervention format, they found that the volume on the DVD player could not be raised high enough when certain degrees of ambient noise were present. Even after speakers were ordered and distributed, *promotoras* often asked to use the participants' own DVD player and television. Using the participant's media equipment produced better audio and viewing ability and, because the *telenovela* was played in a communal or family setting, it enabled other household members (family, friends, and/ or neighbors) who were present but not enrolled in the parent study to view the video.

In contrast, the high-tech format could not be viewed on a communal television. One *promotora* thought this was a disadvantage; she said that she could only deliver the high-tech format "to one person and only one person would be watching, the other person [in a couple] couldn't." Despite her assertion, in some instances a family member *would* sit beside the study participant as the high-tech format played. For example, we witnessed a female study participant's adult daughter sit next to her mother throughout the entire session. At some points during the intervention, the mother would quietly confer with the daughter and seek approval of the selection that she was planning to make on the touchscreen.

Although we witnessed several cases in which household or family members (spouse or daughter or caretaker) sat with the study participant during the high-tech format sessions, *promotoras* claimed that this shared viewing situation mainly occurred with the low-tech format. They reported that study participants liked the low-tech format more because the whole family could benefit from the intervention despite the fact that only one person per household was enrolled in the study. When accompanying the *promotoras*, we observed cases where multiple household members of varying ages watched the *telenovela* together. In one home, the husband, wife, and their teenage daughter talked to each other and laughed about the content of the *telenovela* as it played. *Promotoras* mentioned this advantage of the low-tech format, saying, "there were occasions when the spouse was present…or a friend. I think that they also spread the information to…mainly to their close family members or friends who were older than 50 years" (Pamela). Another *promotora* said, "There is a big difference [between the two formats]….With the low-tech format, two people could watch it and if one person had questions, right, then both of them would get the information."

Controlling the Pace of the Intervention: Benefits of Low-tech Format and Challenges of the High-tech Format—When comparing the small media formats, *promotoras* reported that the low- and high-tech formats produced different quality interactions and communication between themselves and participants and, for the most part, they preferred the communication style engendered in low-tech format sessions. The pace of the high-tech format was determined by the computer program and participants' input, while with the low-tech format, *promotoras* described having more control over the pace and flow of information and, thus, of their communication with participants. One exchange in particular exemplifies the *promotoras*' preferences for using the low-tech format and their perceptions of how it affected the pace of the intervention and of communication between themselves and participants:

> Interviewer: Did you notice that participants asked you more questions in either type of intervention?

Rosa: They asked me more in the flipchart and video….

Interviewer: What does this mean to you? That they could ask more [in the low-tech format]?

Rosa: Because, with the [high-tech format]…they didn't ask many questions because there it was all given to them, for example, if they wanted more information, they just poked the screen and out came the information. But with the video, sometimes it didn't work that way. The video would run and they would want to know something, right, so I could press "pause" and I'd ask them, 'Look, this is the information,' and then with the flipchart I'd explain a little bit more.

Interviewer: So would you say that the high-tech format was almost a substitute for you?

Rosa: Sure, something like that.

Interviewer: Hmm, did you like this?

Rosa: Well, I liked the video [low-tech format] more because I could express myself more with them and give them [the participants] more, you know? With the other one, with the [high-tech format], it was something faster that just raced by. Probably if they did have a question they were left in doubt because not a lot of information came out in it.

Here, Rosa describes not only being able to control the pace of the intervention, but also her ability to disrupt the linear *telenovela* and use the flipchart at will in order to enhance and explain aspects of the video as it played. With the high-tech format, promotoras complained that it was difficult for participants to ask questions and for *promotoras* to answer question or to offer detailed explanations. For example, one *promotora* said, "I couldn't interject my information like I wanted to, because it [the intervention] was between the machine and the participant….Those [participants] with the high-tech format sat there in silence because, well, they had to be attentive when the [tailoring] questions came up."

The *promotoras* also reported that the low-tech format facilitated better quality interactions and stronger relationships between themselves and the participant than the high-tech format did. For example, one *promotora* stated, "I saw that people…were more partial to the flipchart, [because] there were more words, more playfulness, more back and forth between the *promotora* and the participant." She explained further, "As they watched the *telenovela*, [the participants] formed questions, got familiar [with the intervention format], and they liked it, they liked it because they didn't have to be poking screens, or waiting..." Another *promotora* said that she preferred the low-tech format to the high-tech format because, "I could explain things to them in more detail and I could show them bigger pictures [in the flipchart], because sometimes people can't read and in the flipchart the pictures were bigger and I could explain things better." Finally, a third *promotora* believed that the low-tech format was "easier to use and to explain, right, because they [participants] understood more…, and [in the high-tech format] they got a little lost."

Although we only observed a sample of intervention sessions, in contrast to *promotoras*' reports about the low-tech format facilitating better quality interactions between *promotoras* and participants than the high-tech format, the interactions we observed were fairly informational rather than interactive or "playful." We found that *promotoras* often described or read the educational material with little inflection or visible engagement. *Promotoras* did ask study participants throughout the low-tech intervention if the participants understood the material, and they were able to explain the material in detail.

One factor that might have influenced *promotoras*' perceptions is the fact that that low-tech format sessions generally lasted longer than high-tech format sessions. The average time a study participant spent receiving the intervention was approximately 20 minutes more with the low-tech format (89.5 minutes average among all) than with the high-tech format (69.7 minutes average among all) (Lairson, Fernandez, Misra, Williams, & Chan, Work in Progress).

While most *promotoras* favored the low-tech format, two of the *promotoras* mentioned that the high-tech format made their job easier and was more "entertaining" for study participants. One *promotora* claimed, "[The high-tech format], well, for me it was easier to use because you would just show up and connect it." Observations of high-tech format sessions with the *promotoras* support this *promotora*'s assertion that being able to use the high-tech format to communicate complicated health messages related to colorectal cancer lessened the amount of time spent during an intervention delivery session and limited their role in various ways that will be discussed below.

Small Media as Burden

In addition to *promotoras* feeling less in control of the high-tech format, *promotoras'* reports and our observations suggest that a combination of demands of the computer and the *promotoras'* inexperience with computers hindered their delivery of the high-tech format. *Promotoras* reported anxiety, discomfort and lack of control related to required password protections and general computer functioning combined with nervousness about their inexperience with computers. Additionally, *promotoras'* described the discomfort they felt from having to act as technological experts to help study participants overcome their own nervousness about using the tablet computer.

Technological Issues: *Promotoras'* and Study Participant's Inexperience with Computers—Initially, the requirement for computer passwords was the greatest obstacle for the *promotoras'* intervention delivery. We observed that *promotoras* were not confident about creating or memorizing passwords that fulfilled password requirements. Powering the computers posed another technological problem. If a battery ran out in the middle of an intervention session, the *promotora* would have to restart and re-initialize the high-tech computer program, a process that could take up to five minutes. Furthermore, restarting the computer posed potential obstacles to the completion of a session: if the study participant did not remember the exact identifiers he or she had initially input, the program would require the *promotora* to abandon the unfinished session and begin a new session with new participant identifiers. Ultimately, these issues caused promotoras to be anxious about their work. One *promotora* explained, "I had problems with the password…one time I had to come to the office so [the project coordinator] could help me fix it. I had to suspend the session…we met at eight a.m. but I couldn't enter the password and had to travel from here [the *colonia*] to [Org B to fix the problem]. But, thank God, [Org B's manager] gave me the password, and I went back to the participant and was able to finish the encounter." Another *promotora* mentioned that in order to restart the program after the battery ran out, participants would "mess up" and "try to erase their mistake [the incorrect identifiers] and that this process was "a little complicated."

The high-tech format was delivered on computers that took a relatively long time to initialize and were slow to move from screen to screen. This slowness also made *promotoras* nervous. For example, one *promotora* believed that her computer was "breaking down" because it took so long for it to navigate [from screen to screen]. Additionally, when asked if technical problems with the high-tech format made her feel uncomfortable when she was with a study participant, another *promotora* revealed, "Well, yes…because if I had an

appointment and this happened to me, I had to say 'hold on a moment, wait a moment,' I mean, you feel desperate [when this happens]."

Finally, because participant input determined the high-tech software sequence, it was possible for the study participant to mistakenly choose touchscreen options which would elicit unwanted program sections or repeated information. For example, one *promotora* reported that many study participants were frustrated by the high-tech format because "it was too long and sometimes the video would replay, for example, if they [participant] pushed the same button, the video would start again and they'd say 'look at what is happening, it is going back, this is going to take up too much time, how much time will this take?'"

Technological Inexperience and Promotoras' New Role as Technological Expert—During the *promotora* training, we observed that most of the *promotoras* did not have basic computer skills (for example, they had difficulty turning on the computer, using the keyboard, inputting passwords, using the mouse or touchpad, or choosing the correct icon to initiate the program). Further, our observations of the *promotoras*' intervention delivery suggested that *promotoras'* lack of experience with computers made them afraid of the computer interface, fearful that they would lose important study data being collected, and embarrassed that they would appear to be incompetent or inexperienced when delivering the intervention to study participants. This was confirmed by the *promotoras*' feedback in our interviews. For example, one *promotora* said, "…the only thing that we lacked was a little [experience] with the computer.…Adding this to the fact that I was afraid [of the computer] because I thought 'Ay, I'm going to erase something, some work,…' and even though they told us this couldn't happen…I was afraid."

Similar to the *promotoras*, many study participants lacked experience with computers. To navigate the high-tech format, study participants used a touch screen and stylus to input data and to answer multiple choice questions. Direct observations in conjunction with *promotoras*' reports revealed that study participants often expressed fear about using the computer and stylus and asked the *promotora* for help. One *promotora* explained, "At first they'd [i.e. participants] be afraid [and say], 'No, I'm going to ruin it, I've never used this before.' But when we would explain to them specifically what they had to do…I sat by their side to tell them how and what they had to do." Another *promotora,* described participants' reactions, "[Participants would say] 'Ay, I can't work a computer.' And I'd tell them, 'Don't rush, whatever you cannot do I'll tell you how to do it because really it is easy.' I'd say this to them to give them confidence, confidence in themselves and [to help them] see that they were able to work a computer."

Sometimes participants' fear of the computer limited the extent of their participation and disrupted the intervention delivery. For example, in one case a participant asked the *promotora* to read the high-tech format prompts out loud to him and to input his responses because he did not want to use the stylus. One *promotora* reported that when the high-tech format prompted them to choose a touch screen option, participants would ask her, "'Is this the right choice?' And I'd tell them, 'Well, you tell me what you think, if you want to know more information about this or not.' They'd say yes, and so I'd push the button with the information that they wanted." Another *promotora* agreed with this point and said, "Yes, I had to act like a mother [to get the participant through the high-tech format]."

Participants expected *promotoras* to act as technological experts and computer teachers during the high-tech format intervention sessions. One *promotora* explained, "We had to guide them bit by bit with the high-tech format so that they could familiarize themselves with the touch screen, with having to touch the screen with the stylus.…This is what made

them less afraid, that we could say to them, 'No, you're not going to have to type, you only have to use this [the stylus].' And participants would be scared, first because they thought they would have to write or something with it, you know, and I would tell them, 'no, no you don't have to mess with a keyboard.' This helped them a lot…they'd lose their fear and accept it."

Promotoras suggested that, due to the age group of the participant population (=50), the low-tech format was a better tool with which to deliver the intervention than the high-tech format. They stated that older study participants were more inclined to be afraid of using the tablet computer. One *promotora* insinuated that age was the primary factor for their fear and the reason she had to help them get used to the high-tech format. Another *promotora* said, "I remember it [whether they liked the low- or high-tech format] more according to their age, you know. I think that older people, the oldest were more interested in the flipchart and *telenovela* ….And the younger folk also liked the high-tech format."

DISCUSSION

While *promotoras* may "naturally" tailor the health information they deliver to their clients (Elder, et al., 2006), we expected that the use of a high-tech computer-based interactive program could improve the delivery of a colorectal cancer screening intervention in that it would deliver messages and content that was more relevant for participants. Since recommendations for colorectal cancer screening are relatively complex and require not only information and motivational messages to address screening barriers but also decision support to help participants choose an appropriate test, we hoped that a tailored program would help *promotoras* better address participant needs. Furthermore, we expected that these advanced technologies may help ease *promotoras*' burden of having to learn large amounts of detailed information and tailor a health program "on the spot," especially health programs that entail complex explanations and decision-making choices due to multiple screening options such as for colorectal cancer. Our results show that *promotoras'* use of this technology created new, unanticipated challenges to their program delivery, and that *promotoras* in general preferred to use the low-tech small media materials.

Research indicates that *promotoras*' delivery of breast cancer screening messages is often inconsistent. In one study to increase breast cancer screening, findings showed that *promotoras* tended to emphasize less important points, such as self-exam, and deemphasize important points, such as mammography (Fernandez, et al., 2009; Fernandez, Gonzalez, Tortolero-Luna, Partida, & Bartholomew, 2005). While Fernandez, et al. recognized that these advanced technologies may pose new problems or challenges compared to traditional, low-tech small media strategies, they proposed that a tool that could help *promotoras* be more consistent, repeat important information, tailor information to the client, and reduce *promotora* burden should be tested. The *Promotoras + Technology Study* explored the *promotoras'* use of such a tool used to improve colorectal cancer screening among Latinos in South Texas.

Our observations and analysis of *promotoras*' program training, program delivery sessions, and in-depth interviews shed light on the ways that two different small media formats (low- and high-tech) enhanced or hindered *promotoras*' delivery of a colorectal cancer screening program for Latinos. Findings suggest that the more advanced technological format challenged *promotoras'* intervention delivery more than the low-tech format The low-tech format did not require *promotoras* to memorize passwords nor were they required to learn new skills and techniques. Furthermore, *promotoras* reported that because they could control the pace of the low-tech format, it enabled them to establish better interpersonal communication with their clients. The high-tech format essentially created a new role for

promotoras in which they had to be, or at least appear to be, technological experts in order to deliver the intervention, a role they were not comfortable playing. Findings also suggest how certain technological aspects of both small media formats, i.e. being able to be played outside and being able to be viewed simultaneously by multiple household or family members, enhanced *promotoras'* communication with participants and the cultural fit of the program for Latinos in South Texas.

While *promotora*-delivery of both the low- and high-tech formats tapped into some of the known strengths of community health workers working in Latino communities, it appears that the low-tech format facilitated some of those strengths more so than the high-tech format. As intended, both small media formats utilized a one-on-one strategy by way of the *promotoras* who belonged to the same cultural group as study participants. Nevertheless, the expanded viewing capacity of the low-tech format tapped into the health communication strategy of involving multiple family or household members in public health programs. Health communication experts have stressed the importance of family involvement in strategies for Latinos (Ayala et al., 2007; Coatsworth, Pantin, & Szapocznik, 2002; Elder, et al., 2009; Tejeda, Thompson, Coronado, & Martin, 2009). Engaging more than one individual in the health education and possibly in the decision-making process concerning colorectal cancer screening was incidental to the original program intent of helping individuals make the best decision for themselves. We are not sure how intervention effectiveness was affected when more than the participant was involved.

A concern recently voiced by Pasick and colleagues is that most health promotion theory places undue importance upon the individual as a health decision maker and fails to take into account the importance and prioritization of relational culture among Latinas and other ethnic groups (Pasick et al., 2009). Relational culture is the "process of interdependence and interconnectedness among individuals and groups and the prioritization of these connections above virtually all else" (Pasick, et al., 2009). Other scholars have documented the importance of the influence of Hispanic adult daughters on their mothers' health-related decision-making (Tejeda, et al., 2009; Washington, Burke, Joseph, Guerra, & Pasick, 2009). While we observed one instance when the high-tech format was viewed by a mother/ daughter dyad, we also observed, and *promotoras* reported, that the low-tech format was more conducive to being played and viewed in a communal space by more than one household member. This suggests that the low-tech format may have a greater potential communicating health messages to Latinos than the advanced technology used for the high-tech format because it can easily involve multiple family members or other persons important and influential to the participant.

According to the *promotoras*, the low-tech format facilitated more and better quality communication between themselves and study participants than the high-tech format. In our observations, we did not notice obvious differences. However, findings reveal that on average more time (~20 minutes more) was spent delivering the low-tech format than the high-tech format. During the low-tech interventions, *promotoras* actively communicated with participants throughout the entire session. In contrast, during the high-tech interventions *promotoras* spent most of the time quietly sitting by participants' sides. *Promotoras* described feeling more connected to study participants when they used the low-tech format. They claimed that during a low-tech format intervention they were able to answer participant's questions during actual program delivery and explain concepts in more detail with flipchart pictures that they felt were superior visual aids than the high-tech format program. Additionally, some *promotoras* reported improvising with the low-tech format intervention, using flipchart material during the video demonstration to further illustrate certain points. Although this method was not in line with study protocol (the video

was supposed to be shown first, and then the *promotoras* were supposed to go through the flipchart material), it may have further enhanced their intervention delivery.

Interestingly, we did not necessarily observe what we describe as superior "quality" interaction between *promotora* and participant during the low-tech sessions. We speculate that because *promotoras* spent the majority of the intervention verbally delivering the material, as well as controlled the pace of the delivery of the information when using the low-tech format as compared to the high-tech format, they perceived their activities as better quality and more playful. In essence, with the low-tech format, the *promotoras* were the vehicles of information transfer, whereas with the high-tech format, a computer played that role.

A crosscutting way in which both small media formats enhanced *promotoras'* intervention delivery was that both formats could be viewed inside or outside the home, thus accommodating Latino cultural norms about when and where it is appropriate for unrelated people of opposite sex to share or occupy private space. Much of the literature on *promotoras* does not discuss this particular concern, perhaps because the majority of *promotoras* are women (U.S. Department of Health and Human Services, 2007) and because it is assumed that the wife/mother "bears the brunt" of instigating behavior change within the Latino family and should be the primary target of health promotion interventions for Latinos (Elder, et al., 2009). Nevertheless, as this study demonstrates, in programs delivered by *promotoras* to members of the opposite sex it may be important to consider Latino cultural norms such as these when thinking about possible program delivery sites.

Finally, our observations suggest that *promotoras* for Latino populations of low-socioeconomic status and low-education levels may lack the technological skills necessary to conduct health education programs using advanced technologies such as computers with the same ease and confidence that they report having when using the low-tech, usual practice material. *Promotoras* were thrust into a new role beyond that of peer educator: not only were they supposed to be knowledgeable about colorectal cancer screening, but they also had to appear to be, at the very least, at ease with the computer. While it may be that *promotoras'* preference for the low-tech format could have been due to their familiarity with this "usual practice" media format, it is not clear that this would have been the case even if they were comfortable with using computers. Having to use the computer in front of study participants took a toll on the *promotoras'* confidence, especially during the initial stages of intervention implementation. Many *promotoras* believed that the technological problems they encountered hindered their ability to conduct the intervention and induced their anxiety about their capability to effectively and correctly deliver the *Vale la Pena* program. It should be noted that the password requirements in place were imposed by institutional regulations and human subjects concerns that would not typically be present during program implementation outside the context of a research study.

Limitations

Some limitations to this study warrant mention here. Ideally, we would have conducted more observations of *promotoras'* intervention delivery. While we were able to observe 14 sessions, more thorough saturation of observational data would have been met with a larger sample size (~25). Concerning *promotoras'* preference for the low-tech format, it may be that their lack of experience biased them towards the format that was easier for them to use. Additionally, we concede that conducting in-depth interviews with the parent study participants as well as the *promotoras* would have shed more light on participants' perceptions of the two intervention formats and the *promotoras'* role in intervention delivery. Unfortunately, these additional observational opportunities were not built into the study design, nor were the authors able to conduct them once the study was underway.

It should be noted that tthe observers (the first author and research assistants) participated in the training of the *promotoras* and this relation could have acted as a constraint upon promotoras' intervention delivery and interactions with the study participants as they were observed. Nevertheless, the first author conducted the majority of the direct observations and believes that she achieved substantial rapport with the *promotoras* such that they delivered the intervention while with her as they delivered it when they were not observed.

Despite these limitations, we strongly believe that the *Promotoras + Technology Study* provides great insight into *promotoras'* use of these different small media formats and the ways the low- and high-tech formats enhance or hinder *promotoras'* intervention delivery. These findings are valuable in light of the movement to develop and use new and innovative health communication strategies for medically underserved populations.

Implications

The high-tech format was clearly a challenge to *promotoras*, and findings suggest that we must pay attention to the ways the technology might disrupt interpersonal communication between *promotoras* and their clients. While the interactive format may be worth further investigation because its potential advantages of tailoring specifically to individuals, this study makes clear some of the obstacles and challenges that researchers must consider when deciding to do so. The findings of this study have important implications for health promotion researchers who wish to use a combination of two effective health communication strategies to increase cancer screening rates for medically underserved Latinos: small media and one-on-one strategies. For this population in particular, medically underserved Latinos, it is very important to design and utilize health communication tools that take advantage of cultural norms concerning gender and relational culture. And, we know that *promotoras* can be an effective way to deliver interventions. They also seem to "be" behavior change methods in-and-of themselves – providing role modeling and persuasion from a credible community source. What seems to be at issue here is how to create small media tools that interact with what the *promotoras* do normally in a way that enhances what *promotoras* already offer communities. Recent technological advances that offer more intuitive ways of accessing and delivering information (voice recognition technology) or delivery tools (such as with the Apple ipad or Android) may represent new opportunities to avoid some of the issues we saw in the current study while still capitalizing on the potential advantages of interactive multimedia. Clearly, however, without more research, we cannot assume that these approaches will improve *promotora* interactions with their clients. Perhaps two recommendations are in order: First, we need to learn more about the communication processes that occur between *promotoras* and their clients and to particularly discern which ones are crucial to effective interaction. Second, we need to further explore how materials (tailored or untailored, low-tech or high-tech) can be used to enhance the effective interactions, and to improve colorectal cancer screening among medically underserved Latinos.

Acknowledgments

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Appendix A

In-depth interview questions

- Can you please describe the 2 types of formats you used in the *Vale la Pena* program?

- Describe your process of conducting interventions:

- Describe a typical day.

- Describe a typical intervention session.

- How were your sessions different from each other with the high-tech or with the low-tech format?

- Can you tell me a story about one of your participants' reactions to your session?

- Which format do you think participants liked best: the low-tech or high-tech format?

- Why?

- Describe a time when a person really liked either the low-tech or the high-tech format. What kinds of reactions did they have?

- Describe a time when a person did not like the low-tech or the high-tech format that you used in the session. What kinds of reactions did they have?

- Do you think that the participants identified with the people in the video?

- What do you think we could do to make the video better when we do it next time?

- What would you suggest would make the flipchart better next time?

- How do you think we can make the high-tech program better next time?

- Do you think this program motivated people to get screened for colorectal cancer (CRC)?

- Do you think this program increased peoples' knowledge about cancer in general?

- Do you think this program increased peoples' knowledge about CRC?

- Do you think this program helped them understand that not all cancer leads to death and that some types of cancer can be treated and cured?

- Do you think that it might be possible that this program scared people or made them less willing to be screened because they were worried about cancer?

- Did many people ask you to help them:

    – Make an appointment to get CRC screening?

    – Arrange transportation?

- Do you think this program motivated people to take better care of themselves in general?

- Did people ask you about other health problems they or they families had?

- Were there times when participants needed or asked for help with others?

- What kinds of questions did they ask you? What kinds of stories did they tell you?

- What kinds of help were you willing and able to give them?

- Were there times when people wanted or needed help with something that you could not help them with? What did you do? What did you tell them?