# Rural adults reactions to colorectal cancer risk and screening information delivered by race and gender concordant virtual health assistants

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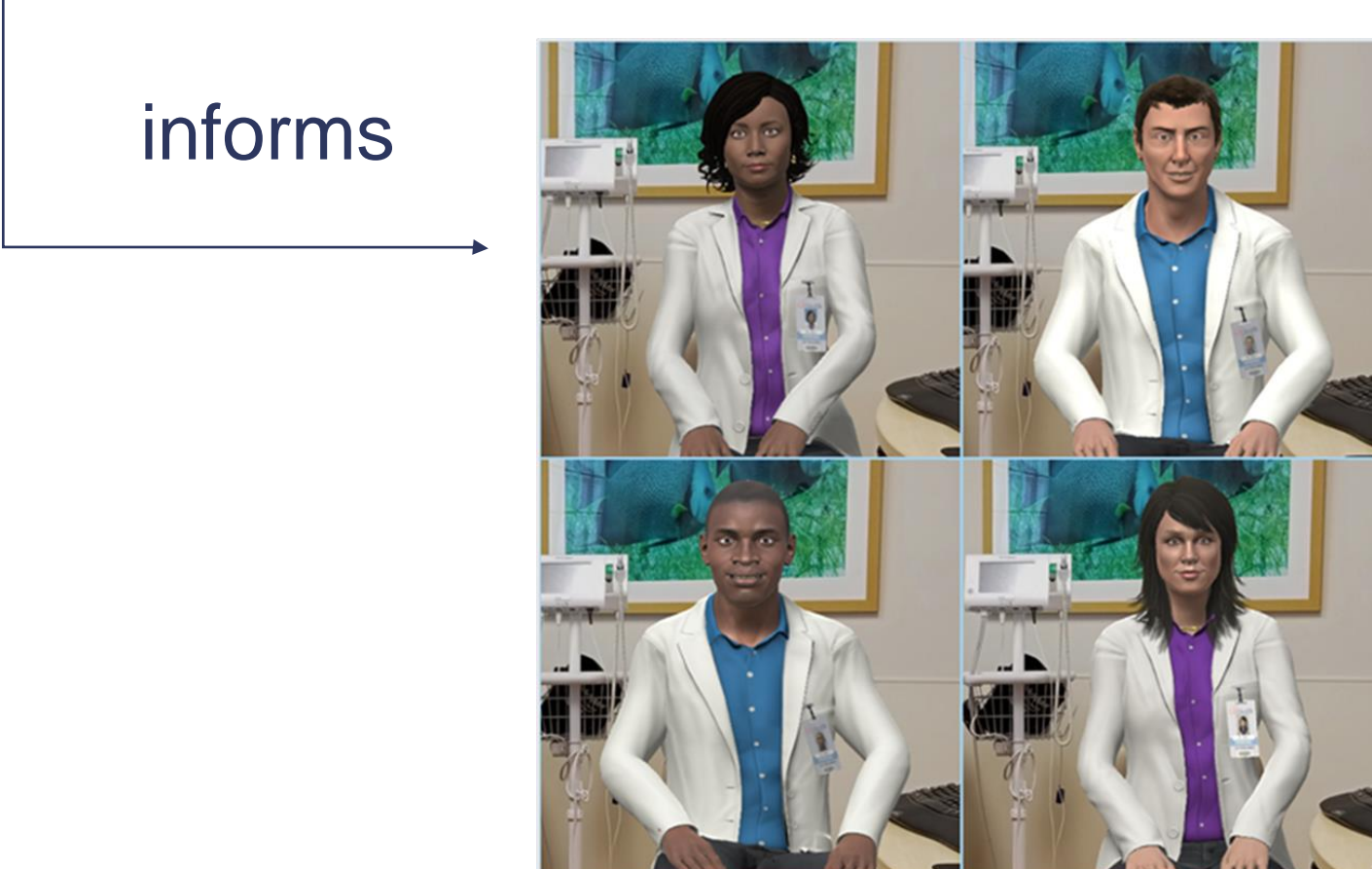Correspondence: mgraveley@ufl.edu

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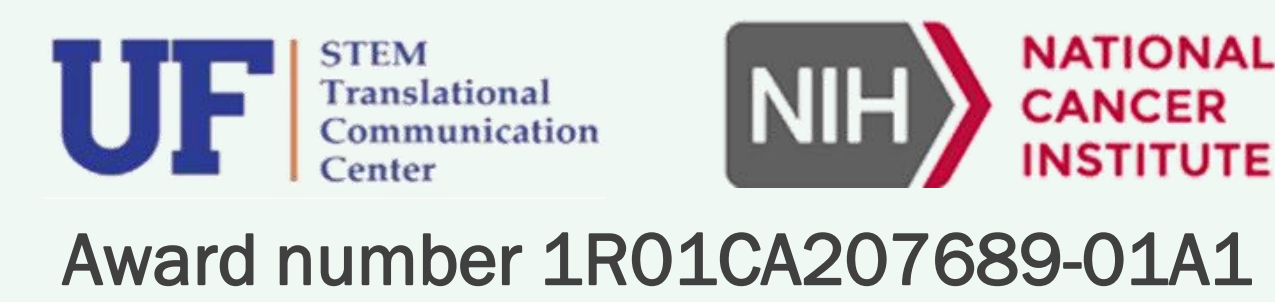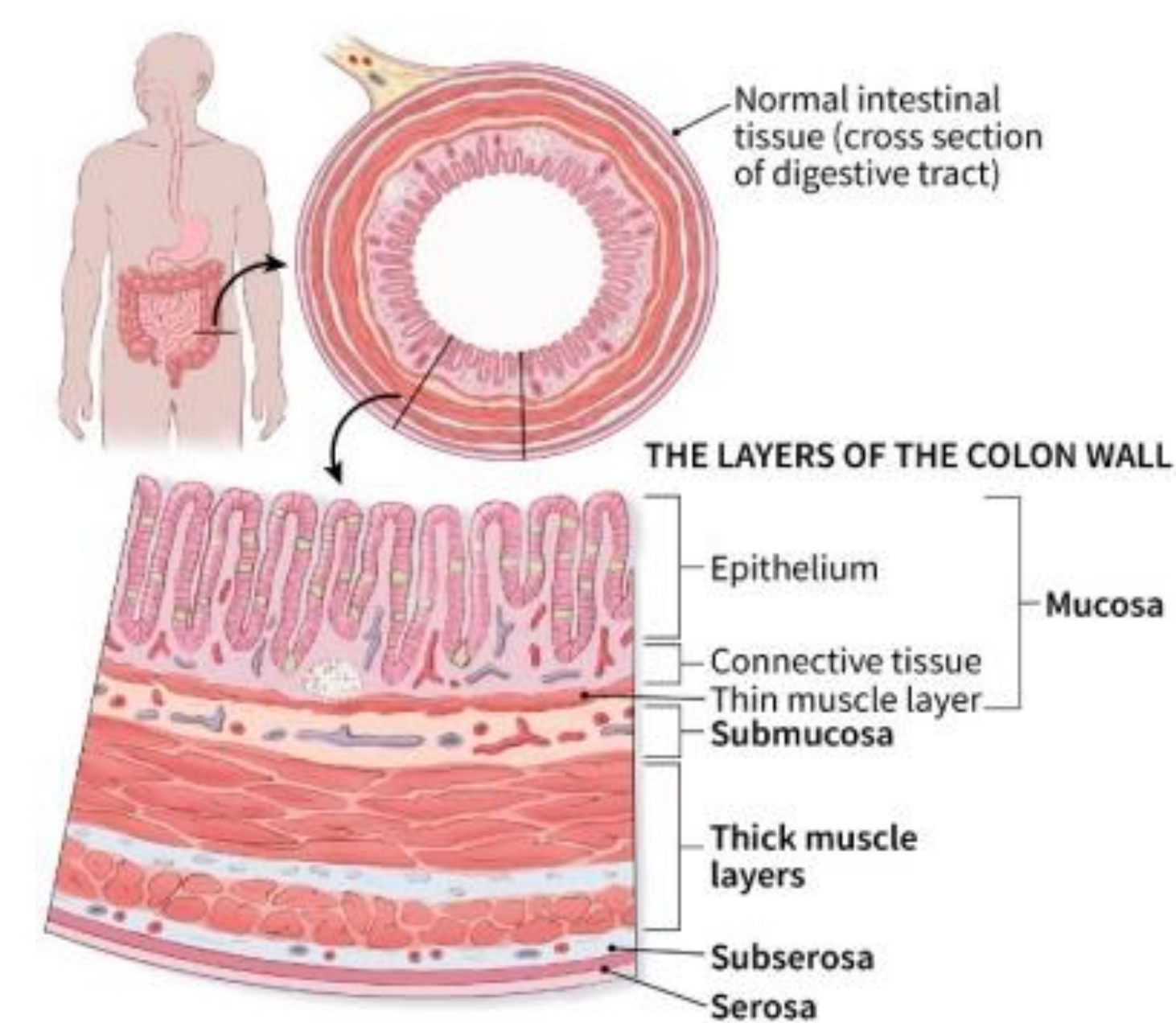
(A) Colorectal cancer (CRC) is a cancer in the colon or rectum. Most CRCs begin as a growth (polyp) on the inner lining (mucosa) and can grow outward to other layers. Screening is recommended for all adults 50 or older.

(B) Virtual Health Assistants (VHA) This intervention used VHAs to communicate CRC risk and screening options (non-invasive home FIT screening test). VHAs are computer-generated human characters that interactively engage users and can be tailored for user preferences.

(C) A patient-centered approach to understanding how users engage with digital health content can facilitate equity in CRC prevention efforts. Results from this study identify important considerations for VHA interventions seeking to engage demographically diverse patient populations in health behaviors broadly, and CRC screening specifically.

Summary

- Identifying cues for credible (expert + trustworthy) messages is important for communicating risk.

- Participants (50 – 73 years old) in focus groups (N=25) used mobile phones to test a ~12-minute, CRC screening intervention delivered by a race and gender matched VHA (e.g., black woman, black man, white woman, white man)

- We analyzed comments to identify perceptions of cancer prevention messages, cancer prevention intentions and variations by race to inform culturally-sensitive cancer prevention strategies.

Results

Authority, friendliness, and expertise were essential VHA characteristics. Participants had varied intentions to engage in a number of CRC prevention behaviors after viewing the intervention including,(1) information seeking (2) information sharing and (3) pursuing screening (FIT or colonoscopy).

All groups were interested in learning about risk, however Black adults were interested in learning about risk via the app compared to White participants who indicated they were interested in talking with a doctor or conducting further research for additional risk information.

All groups expressed interest in sharing content. Black adults wanted to share content with networks "at a younger age".

Participants were familiar with non-invasive home screening from commercials; however, few recalled learning about these options from their primary care provider. When screening intentions favored FIT it was largely due to perceived elimination of hassles of colonoscopy prep. Black adults also frequently expressed interest in screening with FIT compared to White participants. Preferences for colonoscopy seemed due to concerns over FIT accuracy or lack of clarity about benefits of FIT over colonoscopy.

Strategies & Insights

Authority

Iterative testing revealed community health workers were less acceptable sources of screening messages compared to a when the VHA was perceived as a medical professional. Authority was described as coming from the VHA or from one's physician recommending the VHA.

Friendliness

Adjusting VHA movements made it more realistic. Improving VHA appearance (e.g., smiling) and allowing users to choose from various voice options contributed to improved perceptions of friendliness.

Expertise

Adjusting attributes of VHA (e.g., age) to match how users discussed evaluations of health expertise. (e.g., adjusting voice). Participants perceived the VHA as being able to integrate extra information into the interaction.

Table 1. Application of strategies to improve perceptions of VHA credibility derived from focus group with adults (50-73 years old)		
VHA cue	Definition	Sample quotes
Authority	Perception of observable VHA credentials or training as a medical authority. Perception of having a formal position/job indicating specific training, education, or requiring relevant experience (e.g., doctor).	· BW: when you look at the way she was dressed...you knew that she was a doctor or a nurse. She was 100% · BM: Being that he [the VHA] was a brother-doctor...it was more acceptable to listen to. · WW: I would say phooey, because if [my] doctor hasn't asked me to do an exam, the question is, then why are you asking me to do this? · WM: I just think if you're going to do it [create a VHA], you might as well go all the way and have a medical doctor
Friendliness	The affective bond that an individual may feel toward the VHA (e.g., People agree with those they like based on the reasoning that "people I like usually have correct opinions on issues".	· BW: Make her a little more friendly. · BM: He look like he more could be a doctor or a friend or something. Somebody that's concerned about your problem with cancer—that you could trust, really trust. · WW: It would have been nice to be a little more human, a little bit warmer. I want to hear the smile. · WM: I like the woman's voice on my GPS, and I would like to have a VHA that was a nice friendly woman that was knowledgeable, an artificial intelligence that when I ask it a question, it could become my best friend in terms of getting me the right answer.
Expertise	The degree to which a message recipient believes the VHA to be knowledgeable about a topic. (e.g., Can the VHA provide accurate, valid information?)	· BW: She sounded young. Like she was too young to be a doctor giving us this important advice. · BM: If you wanted the [virtual] doctor to seem an expert, I probably would have done a better job on the animation...I hadn't seen many doctors dressed that way. He had his shirt tail out...but his voice was very clear, and his diction was really good. · WW: I would enjoy it - because the virtual human is backed by the research and profession, it's not just a website or some testimony. · WM: But a virtual doctor with a resource of background information that can bring this together, I think would actually be better than an actual doctor.

*VHA = virtual health assistant, BW = black woman, BM = black man, WW = white woman, WM = white man