Design of a Culturally-Informed Virtual Human for Educating Hispanic Women about Cervical Cancer

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Cervical Cancer and Latina Women

- High rates of cervical cancer incidence and mortality

- Limited information about cervical cancer, screening , and HPV in Spanish

- Difficulty accessing screening, diagnostic, and treatment services

Extending Existing Solutions

Patient Navigation Intervention

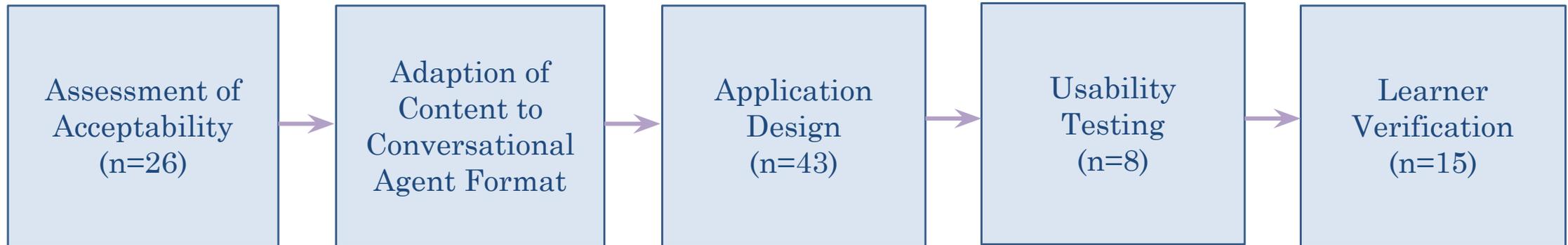Increased Access to Cervical Cancer Early Detection Care

Cancer education not standardized

Simply not enough time for health workers to provide sufficient information

So why use a Virtual Patient Educator (VPE)?

• Need for acceptable ways to inform women about HPV, cervical cancer, and cervical cancer screening that…

- can be utilized by women in the clinic while they wait

- be used by women with a large range of literacy levels

- can be used relatively independently without need to interact with health care providers or staff

Development of a VPE

| Assessment of Acceptability (n=26) | → | Adaption of Content to Conversational Agent Format | → | Application Design (n=43) | → | Usability Testing (n=8) | → | Learner Verification (n=15) |

Community Background

- Latinas living in a rural farmworker community in central Florida

- Medically underserved

- Low-literacy

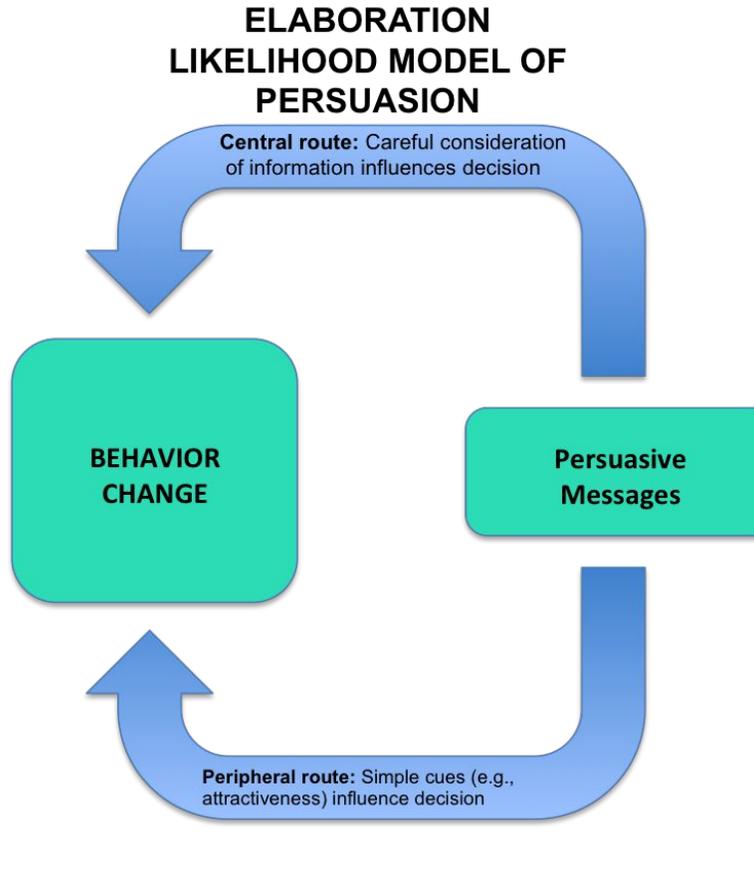- Low-income

Content and Dialogue

SOCIAL COGNITIVE THEORY

Environment
(physical environment, health system, social environment)

Behavioral capability
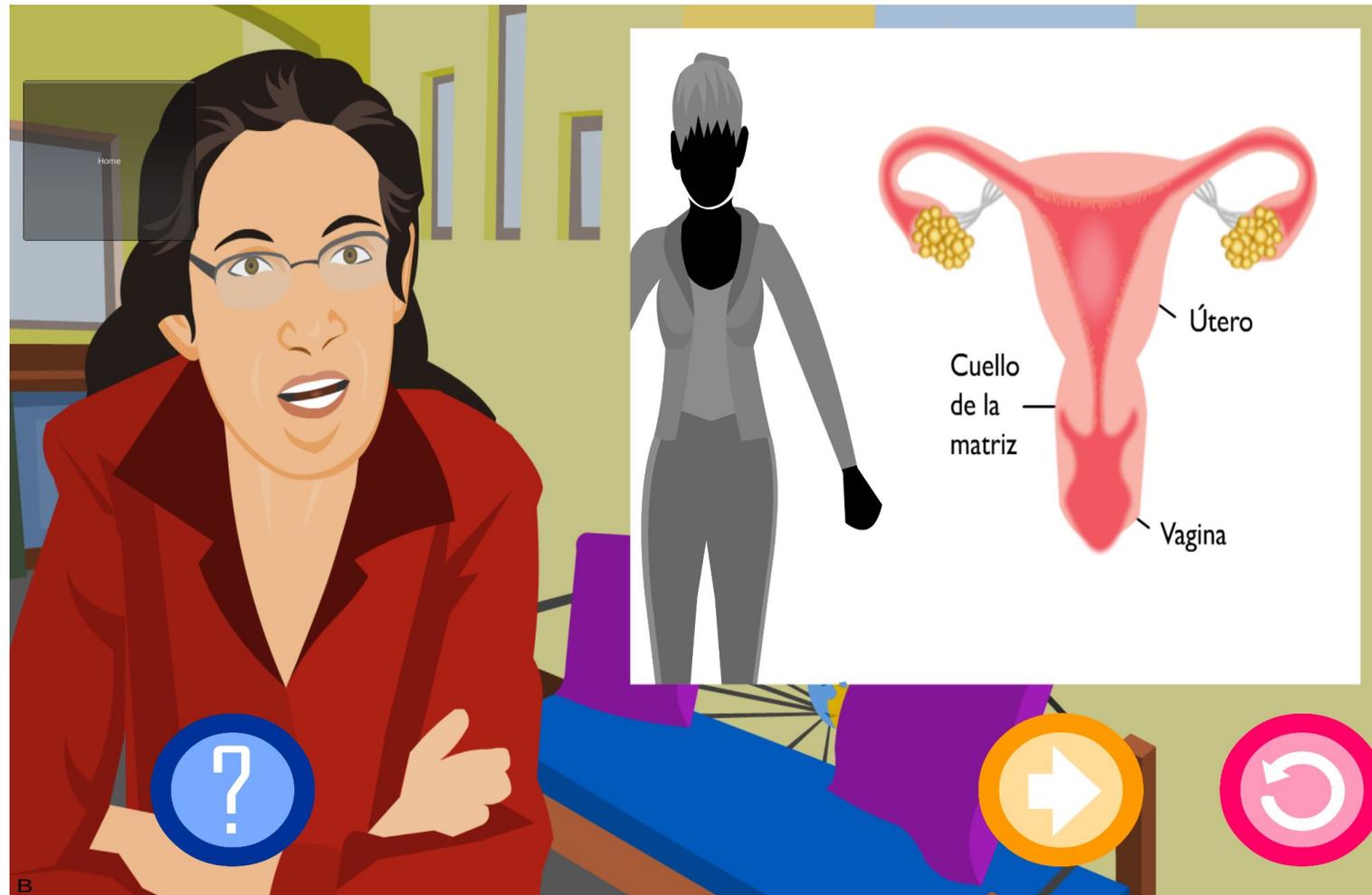(knowledge and skill to perform a behavior)

Outcome expectations
(anticipatory outcomes of a behavior)

Outcome expectancies
(value a person places on an outcome)

Self-efficacy
(person's confidence in performing a behavior)

ELABORATION LIKELIHOOD MODEL OF PERSUASION

Central route: Careful consideration of information influences decision

BEHAVIOR CHANGE

Persuasive Messages

Peripheral route: Simple cues (e.g., attractiveness) influence decision

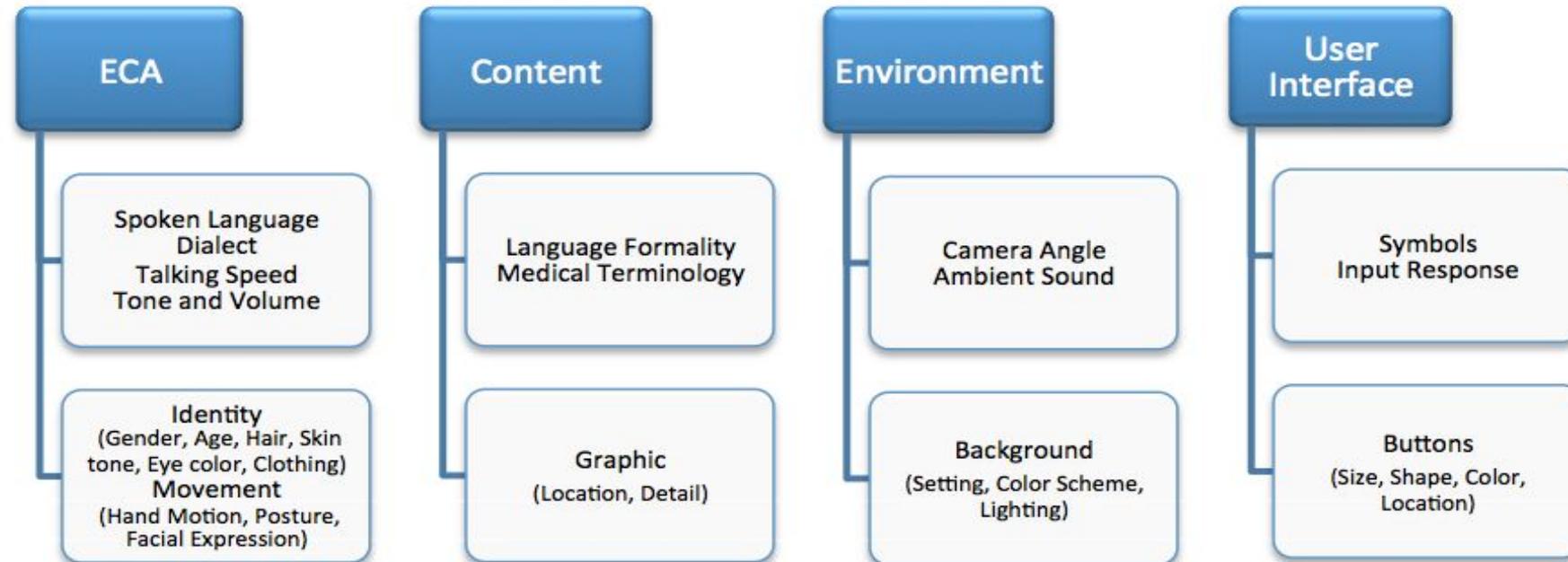# Virtual Agent and Interface

Dialogue Sample
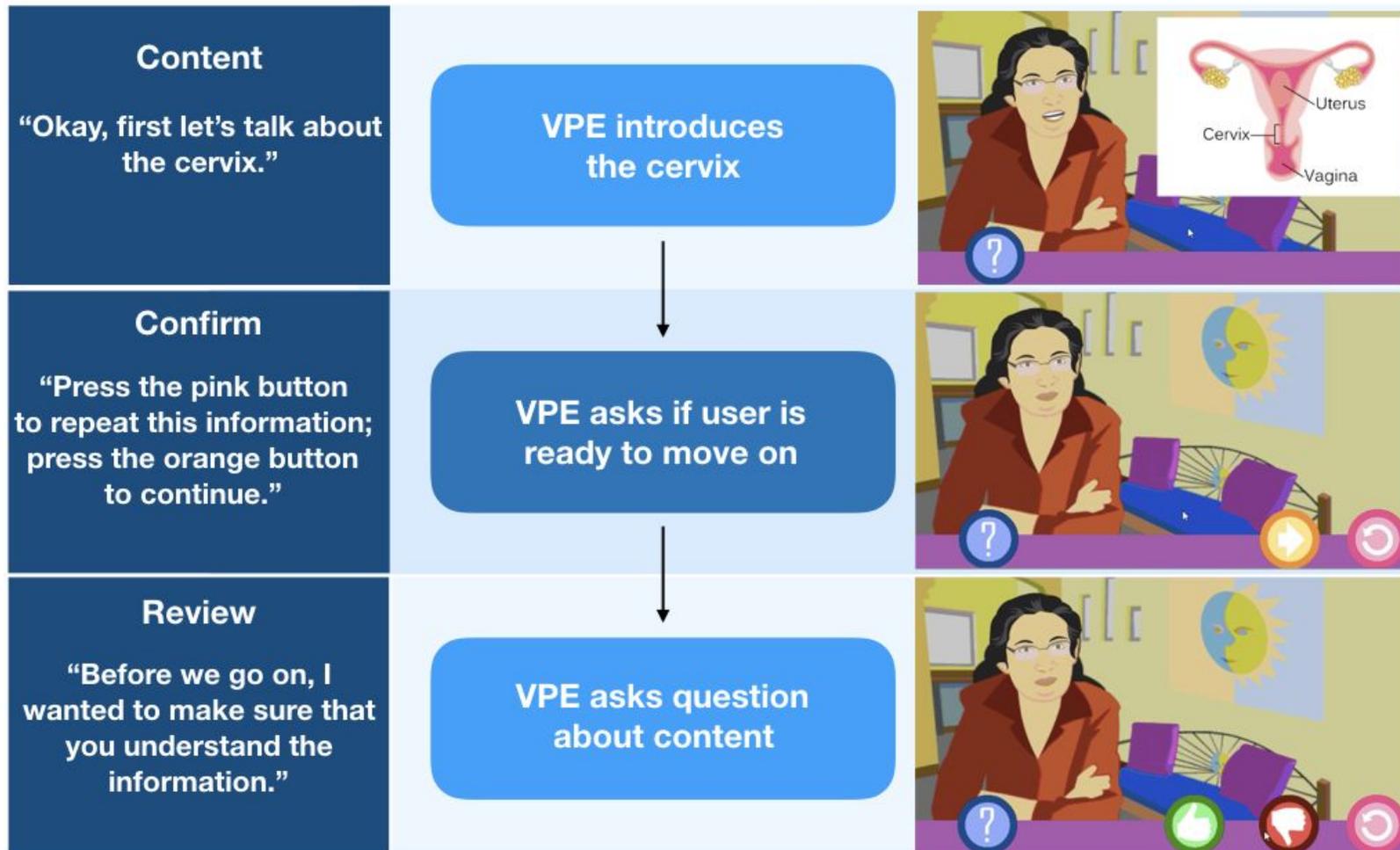
Acceptability Interviews

- **100%** of participants said…
  - the VPE should speak <u>Spanish</u>
  - they would be interested in using this type of computer program to obtain health information
  - they would <u>trust</u> health information provided through a similar program.

- Much interest in adapting VPE to address other health topics

- VPE could "calm someone's nerves before they go in with the doctor."

Design Interviews

- **7** rounds of design interviews

- Questions from each round tailored to specific design features

ECA

Spoken Language
Dialect
Talking Speed
Tone and Volume

Identity
(Gender, Age, Hair, Skin tone, Eye color, Clothing)
Movement
(Hand Motion, Posture, Facial Expression)

Content

Language Formality
Medical Terminology

Graphic
(Location, Detail)

Environment

Camera Angle
Ambient Sound

Background
(Setting, Color Scheme, Lighting)

User Interface

Symbols
Input Response

Buttons
(Size, Shape, Color, Location)

Design Interviews

- **7** rounds of design interviews

- Questions from each round tailored to specific design features

Category	Content Covered	Design Interview Round						
		R1	R2	R3	R4	R5	R6	R7
Environment/Interface	Background/Setting	■		■	■	■		
	Button Function and Appearance	■		■	■	■		
	Introduction + Navigation Clarity				■	■		

Design Interviews

- **100%** of participants approved of virtual agent's initial <u>appearance</u>, <u>authenticity</u>, and <u>trustworthiness</u>.

- Participants named VPE **"Esperanza"**, or "Hope"

- Women responded positively to avatar modeled after local PN

- **83%** of participants <u>identified culturally</u> with the VPE (Mexican)

- Some participants requested more images with audio

- **100%** of participants said that a computer program would be useful for giving people health information.

Usability Interviews

- Metrics based on backend data collection built into prototype

- Analyzed clickstream, duration per module, review quiz responses, and module path log

- **100**% of participants answered the majority of review questions correctly.

- **< 50**% of participants correctly identified the virus that causes cervical cancer

Learner Verification Interviews

- **100%** of participants found the VPE to be both <u>acceptable and attractive</u>

- **87%** of participants <u>understood the material</u> provided in the VPE and provided specific information regarding what they had learned

- Still some confusion regarding the content regarding HPV and HIV.

Conclusions

- *"I could help my family and my own daughters learn more about how to prevent all these infections"*

- *"It helps us learn more, more about the illness, about cancer. And we can give more information to those who don't know."*

- Population is receptive to VPE as source of health information

- Virtual character matters (Name, Expressiveness, Confidence, Voice, Trust)

- **Consistent positive feedback shows potential for VPE to augment health education for Hispanic women**

Future Work

- Final pilot study evaluating VPE + patient navigation vs. patient navigation complete and data analysis under way

- Adapt to address various health topics and other groups

- Diversify cultural features embedded in technology

- Establish framework for developing culturally-tailored health technology

Questions?