What's Unique
about Health Dialog?

2004 AAAI Fall Symposium:
Dialog Systems for Health Communication

Panelists: Toni Giorgino
                           Rob Friedman, MD
                           Lewis Johnson
                           Gary Kreps

Moderated by: Susann Luperfoy

Panel Topic

- Does "health dialog systems" constitute a unique discipline (or could it in the future)?
- In what ways are health dialog systems different from other application areas of dialog systems?
  - risk (health and safety, legal exposure, user rejection)
  - privacy and security issues
  - continuity across sessions (style change with familiarity)
  - user-computer relationship
  - affective dialog
- How would you characterize applications within the space of health dialog systems?
- Is this a discipline worthy of targeted research?

Suggestions from Bickmore, et al., (2004)

Panel Format

- Goal is to uncover *interesting* controversies that help us approach the panel question
- Ground rules
  - informal and interactive (no slides)
  - make at least one interesting statement or claim
    - test: who in this symposium will disagree?
    - no quibbles about definitions or ontologies
  - obey time keeper
- Guidelines for panelists
  - select an application class in the health dialog domain
  - address one or more of the suggested questions
  - plus "How will we know?" (HWWK)

Axes of Variation in Application

- Health related purpose
- Dialog participants and roles in the dialog
    - computer system
    - synthetic agents that coach, inform, empathize…
    - patient or patient representative (parent)
    - physician, triage RN, IT-enabled case manager
    - medical care giver in training
- Sufficiency criteria
    - "do no harm" plus…?

Suggested Questions + HWWK

- How lifelike does the dialog need to be?
- What is the best delivery mechanism?
- What knowledge does the dialog system need?
- What reasoning is the dialog system required to do at runtime?
- What authoring tools would be required to integrate the system into the user community?

Each question is in the following context from previous slide.

"…for the purpose you have selected, with the dialog participants you see as involved, in the roles that the participants play…"

Panelists

- Toni Giorgino - University of Pavia
  - Health dialog systems in the context of data collection, aggregation, analysis, and use.
- Lewis Johnson - UCI, ISI
  - Health dialog systems that use synthetic dialog agents
- Gary Kreps - GMU (formerly NIH
  - Health dialog from the perspective of the broader health communication domain
- Rob Friedman, MD - BU
  - Mentoring from the communities of adoption : medical care and medical research
- Susann - Stottler Henke Associates
  - health dialog involving multiple human and synthetic agents.

Toni Giorgino

- Integration issues are more important than technology
  - keeping patients involved and motivated to use the technology (they need to know that someone is paying attention to their data because there's no other reward)
  - you must provide an integration into some organization where managers, physicians, are providing feedback to patients

<young man from RTI>:counters that there are very simple systems like exercise support agents (nags) for which you don't need a human; we developed such a system.

Louis: maybe it's not a mandate so much as a missed opportunity

Toni: the organizational issues (EU, Italian local) have a profound effect on the decision

Candy: Louis should have said that the tutor does the educating, (we don't need no human instructor)

Louis: you need both, or at least you benefit from both (both= with and without a human in the communication loop)

Louis Johnson

- I disagree with what I'm about to say…
- We need systems that are relational
  - relate to the user
  - relate to…? <ask Louis>
- At ISI we built a training system that replaced a system of physical pamphlets and human follow-up dialogs, called Carmen's Bright Ideas™
  - we used animated scenarios, made them believable by using facial expressions in order to be as evocative as possible, we even succeeded at this, but…
- <here's the contradiction/surprise>
  - while some users related well to the characters, if the scenario didn't fit the individual's real life situation, then being specific (to someone else's situation) actually caused user to reject it

Carmen's Bright Ideas™ (cont'd)

- Conclusions led to design responses
  - we offer a variety of scenarios
  - we let users influence the unfolding story
  - since certain counselors are just plain more effective than others ("Sandra effect"), we try to model Sandra in our dialog agents
- also guided our design of the handheld device
- One of the best ways to convey responsiveness is through tone of voice but it's too slow for a long-term relationship, so we should
  - start with ?anthropomorphic? pre-designed agent but
  - scale back on responsiveness over time so that people can focus on the task/intervention more than the politeness/relationship of the dialog

HWWK when/degree of relational intervention?

- Potential for relational teaching systems
  - compare versions of our tutor that use politeness compared to a system with no politeness
  - results: consistent with CBM, there are benefits of the politeness in terms of efficacy
- May not be good for long-term relationships

Discussion:

Stacy: individual differences as well as current level of stress

Rob (RTI)?: relational dialog is not as important for tutorial applications

Louis: to what extent are you exploiting identification for your application purpose and what does that tell you about the degree of identification needed

Curry: users get more frustrated when they can't model the system's true cognitive capability; makes the system seem brittle to the user if it pretends to have more empathy, emotion, etc.

Louis: we have two strategies, one for when the system cannot truly model the subtle nuances and another when

Candy: consider this as a computer mediated (asynchronous) dialog versus a true dialog with the synthetic agent; what is the nature of the role of affect in these two situations?

Gary Kreps

- Ways of coordinating human-human and human-machine so that
  - the health care team functions and feels like a team
  - electronic dialog systems can expand reach of both health care provider and consumer
- Huge body of literature in human communication should guide development of dialog systems
  - compliance gaining dialog (code for "persuasion")
  - therapeutic communication (e.g., Burleson's comforting communication)
  - conflict management/resolution dialog
- Develop technology with awareness of
  - deployment and delivery and regulatory issues (DRGs..)
  - body of research in human communication

Louis: there are gaps in the literature; once we have constructed agents we can manipulate the degree of relational intimacy and do side-by-side comparison

Gary: there are gaps but it's a dispersed literature;

<RTI-dude>: philosophers have looked at argument structure since Plato;

Gary: there is also a more current literature once can consult

Stacy: persuasion literature includes conversational analysis but the empirical evidence reporting tends to be thin; we psychologists are more rigorous but everyone tends to look at one-session dialogs and so the conclusions we draw might not generalize to long-term patient care

Gary: It's even worse than you might imagine; some role play studies tell freshmen to pretend to be MD's

Linda Harris: what counts as evidence (what are the minimum requirements for a simulation) is a question to address

<RTI-dude>: all presentations here seem to address a known, existing need…

What's Unique about the Health Care R&D Environment?

Rob's 'diagnosis' of EECS

- So you want to 'build a bridge' …
  1. …using your tools/technology/artifacts…
     - this is your passion (he says)
  2. …that behaves like this (immediate effects)…
     - believable, affective results they engender
     - recognizes X (measurement, other technical feature)
     - etc.
  3. …and goes here (distal effect)
     - teaches
     - changes behavior,
     - improves outcomes

Rob: agrees with Gary Kreps (about the need to consult the non-engineering) literature.

Amy: many people in this community care deeply about our deployment community (whether it's health or something else

Stacy: those of us with background in training systems we *DO* care about and even measure outcomes

Louis: There's more too it than this paradigm, if you just focus on 3 you will never get to 3; you have to do a lot of iterative design;

David: "in your first diatribe yesterday morning…" CS, cognitive scientist really do care about #2, we don't care about the hardware/software platform details

12

Rob's postulates regarding the people in this room

- professionally driven to design and implement elegantly engineered structures ('bridges')
- choose to work in healthcare because it is important, well funded, and not the military
- work in the dialog technology space
- build applications involving tutoring, coaching, behavior modification, etc.
- work on R&D in universities, research institutes, non/for-profit companies R&D division
- need time and resources (funds and supporting cast of subcontractors/partners) to accomplish this bridge work
- want to make a **contribution and achieve recognition** in the health care sector

- Therefore…

Rob Friedman insults the room

- Poll results: 16 CS; 1 Medical
- Claim: CS and Health

Dr. Friedman's Mentoring Advice

- Pick a problem, question, arena that…
  - the outside world of health care views as important
  - is now performed by humans
- …is not adequately covered (inadequacy is a minimum requirement)
  - not well done
  - done well but too expensive
  - done well but with restricted reach
- Qualify your domain by defining success criteria
  - especially if you can't rely on medical outcomes
- Find a collaborator who
  - knows the content area
  - is not a clinician but a researcher
    - behavioral medicine
    - health services
  - gold standard is published outcomes research
  - collect pilot data that's relevant to proposal reviewers

Final comments

- Linda Harris: announcement of a relevant conference next spring
- Linda: we would like to see match-ups between CS, engineers and users and we are developing a website
- Linda: we can learn a lot about what's possible (easy/hard) by understanding what can be done from EECS
- Rob: academic discipline of using computers in health communication needs people in this room.

Topics for AAAI Fall 200n

- <none from this panel; see Tim's slide from Sunday morning>