Toward Conducting Motivational Interviewing with an On-Demand Clinician Avatar for Tailored Health Behavior Change Interventions

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How to motivate behavior change?
Recent research reveals that best way to motivate patients to change behavior is by:
- Moving away from stereotypic “paternalistic” style of interaction
- Toward a physician-patient (or counselor-client) working alliance
Motivational Interviewing is a recent directive client-centered counseling style to:
- Magnify discrepancies between client goals and current behavior
- Explore and resolve ambivalence about changing behavior

Sterotypical Counseling
• Goal-oriented
• Expert role
• Focus on action
• Direct persuasion
• Medical education
• Give reasons to change
• Clinician talks more

Motivational Interviewing
• Patient-centered
• Collaborative
• Focus on motivation
• Explore ambivalence
• Individualized feedback
• Elicit reasons to change
• Clinicians listens more

Why conduct MI with avatars?
People:
• [Unconsciously] respond in social ways to computers given appropriate social cues
• Can develop personal relationship with computer agent such as mentor, companion, or friend
Advantages of using avatars:
• Confidentiality for sensitive private information
• Appeal of technology for youth
• Ability to tailor feedback health messages to each single user
• Reliability and validity, no variability in quality of expert
• Can be delivered (& customized) across heterogeneous populations
• Barriers-to-access removed
• Can be delivered in schools, homes, clinical & community settings
Feasibility of conducting MI with avatars:
• MI intervention scripts are sufficiently domain/intervention-specific to be computerized, manageable NLP complexity

What is Motivational Interviewing?
Spirit of Motivational Interviewing:
1. Motivation to change is elicited from the client
2. It is the client’s task, not the counselor’s, to articulate and resolve ambivalence
3. Direct persuasion is not an effective method for resolving ambivalence
4. The counseling style is generally quiet and eliciting
5. The counselor is directive in helping the client to examine and resolve ambivalence
6. Readiness to change is not a client trait, but a fluctuating product of interpersonal interaction (stages of change)
7. The therapeutic relationship is a partnership or companionship

What does the system do?
• Conducts and narrates repeatable tailored MI interventions
• Aimed at young students with drinking issues
• Can be re-authored for other MI interventions, e.g. smoking or eating disorders
• Uses MI-style of interpersonal communication with menu-based dialogs

System asks
"On a scale from 1-10 how much do you want to change any aspect of your driving?"

What are the system components?
User-Model Database for Tailoring:
• Collect personal data to tailor interaction (e.g. address user by name, match avatar ethnicity)
• Update drinking patterns and stage of readiness to change from repeatable self-monitoring assessments
Assessment System and Self-Monitoring tool:
• Drinking patterns (e.g. # of drinks, time of day or week, drinking location, with whom)
• Stage of change (pre-contemplation, contemplation, preparation, action, maintenance, [relapse])
Personalized feedback based on Assessment results, e.g.
• Self-reported drinking
• Perceived current and future risks of drinking
• Negative consequences of current consumption patterns
• Personal goals and their relation to alcohol use
• Social supports and their beliefs about drinking
• Intentions and self-efficacy in regard to personal drinking goals
• Change across time w.r.t Stages of change
• Normative statistics graph comparison [enhanced perception]
Expert system:
• Use relevant DBs for comparing individual scores against “peers”
• Generate comparison normative statistics from user’s assessment data

How does the avatar communicate?
Multimodal Communication:
• Text and Text-To-Speech: requires no advanced reading literacy
• Matched ethnicity: implements patient-physician concordance
• Non-verbal communication behavior via dynamic facial expressions: expresses empathy

Challenges and Future Work:
• Address emotional and relational aspect of communication
• Believability: graphical realism vs. social realism, avoid uncanny valley
• User engagement: avoid dialog repetitiveness
• Mobility: develop mobile version from smart phone prototype for “windows of opportunity” interventions
• Implement free text MI dialogs