Measuring behavior and its determinants: A theory based approach

Dominick L. Frosch, Ph.D.

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Behavior matters

- Actual causes of preventable death in the population are largely behavioral, see:
  - McGinnis & Foege, JAMA, 1993
  - Mokdad et al, JAMA, 2004
- Clinical interventions aimed at improving patient health outcomes often require behavior change.
- Improving performance of health care system also requires changing behavior – of health care providers
  - e.g., quality improvement, reducing medical errors

What is a behavioral theory?

- A set of inter-related propositions (i.e., theoretical constructs) that constitute a framework for describing, explaining and predicting a given behavior.
- By nature, abstract and applicable to a wide variety of behaviors.

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Why theory matters

- Theory improves our understanding of the underlying mechanisms by which behavior occurs, which in turn increases the likelihood that effective interventions can be designed.

- Systematic reviews find that theory-based interventions are more likely to be successful.

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Which theory?

- "Although there are probably an infinite number of variables that may directly or indirectly influence the performance (or non-performance) of any behavior, there is a growing consensus that there are only a limited number of variables that need to be considered in order to predict, understand, change or reinforce a given behavior."

Martin Fishbein, Ph.D. (1936-2009)

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Which theory?

- This limited set of variables is defined by, or represented in, four major theories of behavior and behavior change:
    1. The Health Belief Model
    2. Social Cognitive Theory
    3. The Theory of Reasoned Action
    4. The Theory of Planned Behavior

Behavioral intentions

- Intentions are the most immediate determinants of behavior.
- But even if an individual holds positive intentions, different factors might prevent him or her from acting upon these intentions.
- These factors include skills and abilities and the presence of environmental constraints.

Predictors of intention

- There are three primary determinants of intention to engage in a behavior:
  - Attitudes: a positive or negative evaluation of the consequences of performing the behavior.
  - Perceived normative pressure : does the person perceive that other persons important to them think s/he should (or should not) engage in a behavior (injunctive social norms), and/or do they believe that others like them are performing the behavior (descriptive social norms)?
  - Self-efficacy : does the person perceive that they have the necessary skills and abilities to perform the behavior if they really want to do so.

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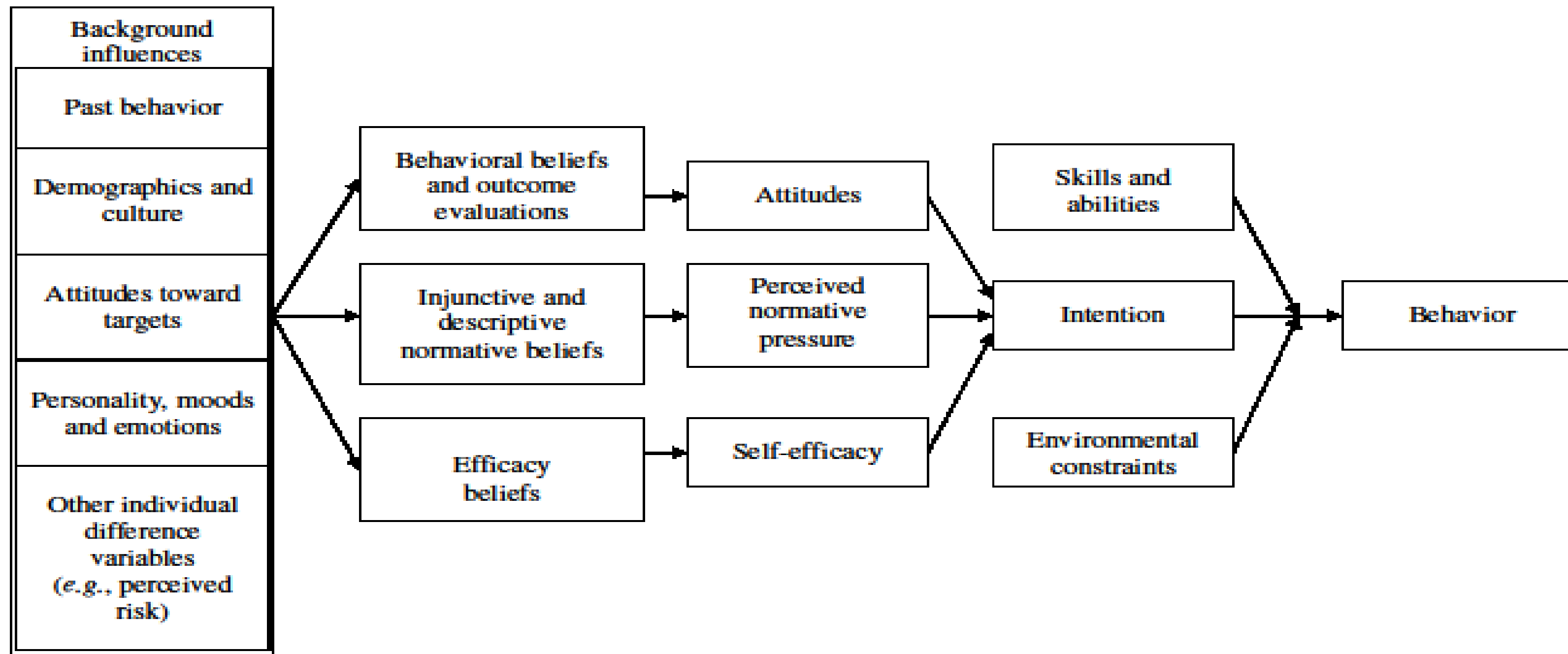
Fishbein's Integrative Model



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The importance of beliefs

- Underlying each of the predictors of intentions are beliefs.
- Beliefs are the ultimate determinants of behavior.
- Attitudes – outcome evaluations
  – Action X leads to outcome Y, which is viewed as positive/negative
- Perceived normative pressure – injunctive and descriptive normative beliefs
  – Which important others think I should do X? Do others do X?
- Self-efficacy – efficacy beliefs
  – Can I perform X under a variety of different circumstances?

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Putting theory into action

Step 1: Defining the behavior

- One of the most important tasks in utilizing behavioral theory (and in developing an intervention) is to clearly define the behavior of interest.
- Identifying a behavior is not as simple as it might appear.
- Important to distinguish between:
  – goals (make a shared decision with your doctor)
  – behavioral categories (communicate with your doctor about the options)
  – specific behaviors (ask questions, discuss preferences, disagree with a preference incongruent recommendation).

The TACT principle

- A complete definition of any behavior involves four elements:
  - Target – e.g., health care provider
  - Action – e.g., ask questions
  - Context – e.g., consultation
  - Time – e.g., next time you see him/her
- A change in any one of these four elements changes the behavior under consideration.

Step 2: Eliciting underlying beliefs

- Identify population of interest.
- Recruit participants from target population for focus groups.
- Good target is to conduct 6 focus groups with ~8 participants each.
- Focus groups are generally better than individual interviews for this purpose.

Putting methods into action

- Focus group study conducted from October to December 2009 in Palo Alto, CA.
- 48 primary care patients (age 40+) participated in 6 focus groups.
- To provide context about preference sensitive decisions, participants first saw excerpt of a decision support intervention on heart disease treatment.

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Putting methods into action cont'd

- Focus group discussion focused on 3 key behaviors necessary for SDM:
  - Asking questions
  - Discussing preferences
  - Disagreeing with a recommendation
- First two behaviors are necessary for exchanging information.
- Disagreeing may be necessary if a recommendation is incongruent with patient preferences.

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Beliefs underlying attitudes

- What are the advantages of asking questions, discussing preferences, disagreeing with a recommendation?
- What are the disadvantages of asking questions, discussing preferences, disagreeing with a recommendation?
- What other things come to mind when you think of asking questions, discussing preferences, disagreeing with a recommendation?

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Outcome expectancies

- Will help me get my preferred treatment
- Will help me get the information that I want
- Will help me make an informed decision
- Will help me build a relationship with my doctor
- Will lead to me being viewed as a difficult patient
- Will damage my relationship with my doctor
- Will give me more information than I can handle

Normative beliefs

- Are there any individuals or groups of people who would approve of you asking questions, discussing preferences, disagreeing with a recommendation?
- Are there any individuals or groups of people who would disapprove of you asking questions, discussing preferences, disagreeing with a recommendation?
- What other things come to mind when you think of asking questions, discussing preferences, disagreeing with a recommendation?

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Normative beliefs

- Who would approve or disapprove:
  - Spouse/Partner
  - Family
  - Friends
  - Medical staff

Efficacy beliefs

- What factors or circumstances enable you to asking questions, discussing preferences, disagreeing with a recommendation?
- What factors or circumstances make it difficult for you to asking questions, discussing preferences, disagreeing with a recommendation?
- Are there any other issues that come to mind when you think of asking questions, discussing preferences, disagreeing with a recommendation?

Efficacy beliefs

- Enabling/disabling factors or circumstances:
  - Having an existing relationship with MD
  - MD is in a hurry
  - MD doesn't show an interest in patient
  - MD doesn't value patient's opinion
  - Feeling that engaging in behavior could damage the relationship, or upset MD
  - Feeling intimidated, MD is the expert
  - Health condition is "serious"

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Step 3: Creating the measures

Behavior Measures

In the past N months, how often did you perform behavior X (e.g., ask your doctor about treatment options)?

Never	Seldom	Sometimes	About half the time	Most of the time	Almost All the time	All the time

A behavioral criterion can be defined at any level of specificity, but once the behavior is defined, all other measures must correspond to, and be compatible with the measure of behavior.

Intention Measures

What is the likelihood that you will ask your doctor questions about treatment options for heart disease when you see him/her for a consultation today?

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extremely unlikely	**quite**	**slightly**	**neither**	**slightly**	**quite**	**extremely likely**

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Attitude Measures

Asking my doctor questions about treatment options for heart disease when I see him/her for a consultation today is:

Bad ______ ______ ______ ______ ______ ______ ______ Good

extremely quite slightly neither slightly quite extremely

Pleasant ______ ______ ______ ______ ______ ______ ______ Unpleasant

extremely quite slightly neither slightly quite extremely

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Beliefs underlying attitudes

Belief:

Asking my doctor questions about treatment options for heart disease will lead to me being viewed as a difficult patient:

Unlikely	______	______	______	______	______	______	______	Likely
	extremely	quite	slightly	neither	slightly	quite	extremely	

Evaluation:

Being viewed as a difficult patient is:

Bad	______	______	______	______	______	______	______	Good
	extremely	quite	slightly	neither	slightly	quite	extremely	

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Injunctive Norms

Most people who are important to me think I should ask my doctor questions about treatment options for heart disease when I see him/her for a consultation today

Unlikely ______ ______ ______ ______ ______ ______ ______ Likely

extremely quite slightly neither slightly quite extremely

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Descriptive Norms

Other people like me would ask their doctor questions about treatment options for heart disease when they see him/her for a consultation

Unlikely ______ ______ ______ ______ ______ ______ ______ Likely

extremely quite slightly neither slightly quite extremely

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Normative beliefs

Normative Belief:

My best friend thinks I should ask my doctor questions about treatment options for heart disease.

Unlikely	______	______	______	______	______	______	______	Likely
	extremely	**quite**	**slightly**	**neither**	**slightly**	**quite**	**extremely**	

Motivation to Comply:

In general, I want to do what my best friend thinks I should do.

Disagree	______	______	______	______	______	______	______	Agree
	strongly	**somewhat**	**slightly**	**neither**	**slightly**	**somewhat**	**strongly**	

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Self-efficacy

I would be in control of asking my doctor questions about treatment options for heart disease when I see him for a consultation today

Unlikely	______	______	______	______	______	______	______	Likely
	extremely	**quite**	**slightly**	**neither**	**slightly**	**quite**	**extremely**	

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Efficacy beliefs

I could ask my doctor questions about treatment options for heart disease even if he/she is in a hurry

Unlikely							Likely
	______	______	______	______	______	______	______
	extremely	**quite**	**slightly**	**neither**	**slightly**	**quite**	**extremely**

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Pre-testing measures

- Cognitive interviews
  - Can you repeat the question in your own words?
  - What does the term “performing behavior X” mean to you?
  - How did you get the answer to “performing behavior X”?
  - How sure are you of your answer?
  - How hard was it to answer this question?

Methods

- Participants (N=1,340) were recruited from an online panel of survey respondents maintained by Amplitude Research.
- Inclusion criteria:
  - Age 40 or older
  - At least one physician consultation in the last 12 months
- Participants read the following vignette before answering survey questions.

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Methods

"Please imagine that you have been diagnosed with moderately severe heart disease. There are 3 primary treatment choices: (1) taking medications only; (2) angioplasty, often including the placement of a "stent"; or (3) bypass surgery.

For people who have moderately severe heart disease, each of these options is equally effective in helping people live longer.

Angioplasty and bypass surgery are more likely to relieve chest pain symptoms sooner than only taking medications. However, because these 2 treatments are invasive they also have more risk.

For people with moderately severe heart disease there is no clear "best" choice."

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Methods

"*The first set of questions is about asking the doctor questions about treatment for heart disease.*

--- Questions assessing intentions, outcome expectancies, normative beliefs ---

The next set of questions is about discussing your heart disease treatment preferences with the doctor.

--- Questions assessing intentions, outcome expectancies, normative beliefs ---

For the next set of questions, imagine that your doctor has recommended a treatment for heart disease, but you disagree because it doesn't seem like the right option for you and you prefer a different option."

--- Questions assessing intentions, outcome expectancies, normative beliefs ---

- Data were analyzed with within-subjects analysis of variance models.

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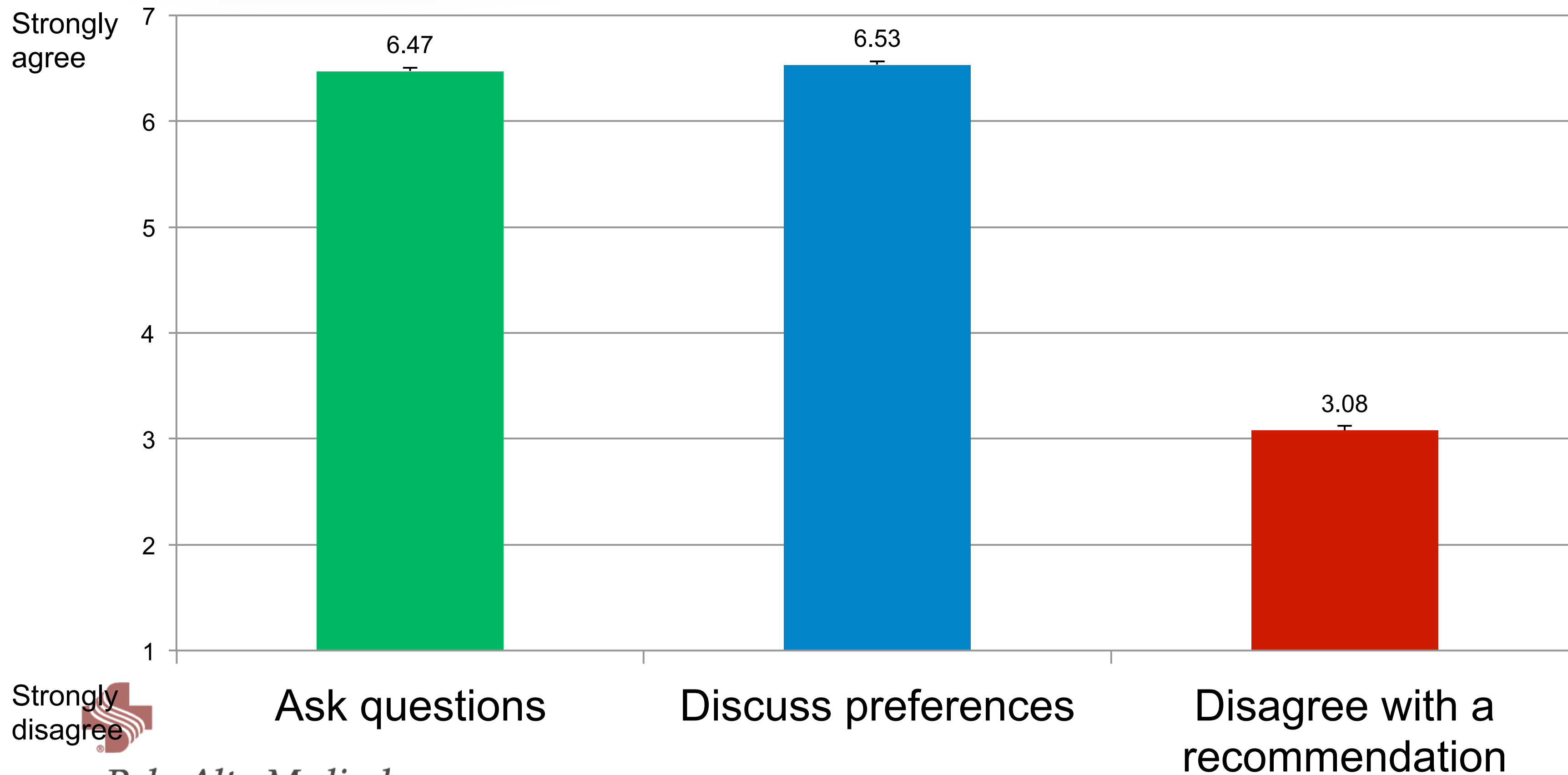
Results – Communication intentions



p<.0001

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Results – Communicating will lead me to being viewed as a difficult patient

	Ask questions	Discuss preferences	Disagree with a recommendation
Mean (1 = Unlikely, 7 = Likely)	2.11	2.29	4.18

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p<.0001

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Results – Communicating could hurt the relationship with the physician

	Ask questions	Discuss preferences	Disagree with a recommendation
Mean (1 = Unlikely, 7 = Likely)	1.74	2.03	3.91

p<.0001

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Results – Communicating will help me get the treatment I prefer

	Ask questions	Discuss preferences	Disagree with a recommendation
Mean (1 = Unlikely, 7 = Likely)	6.35	6.39	4.56

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p<.0001

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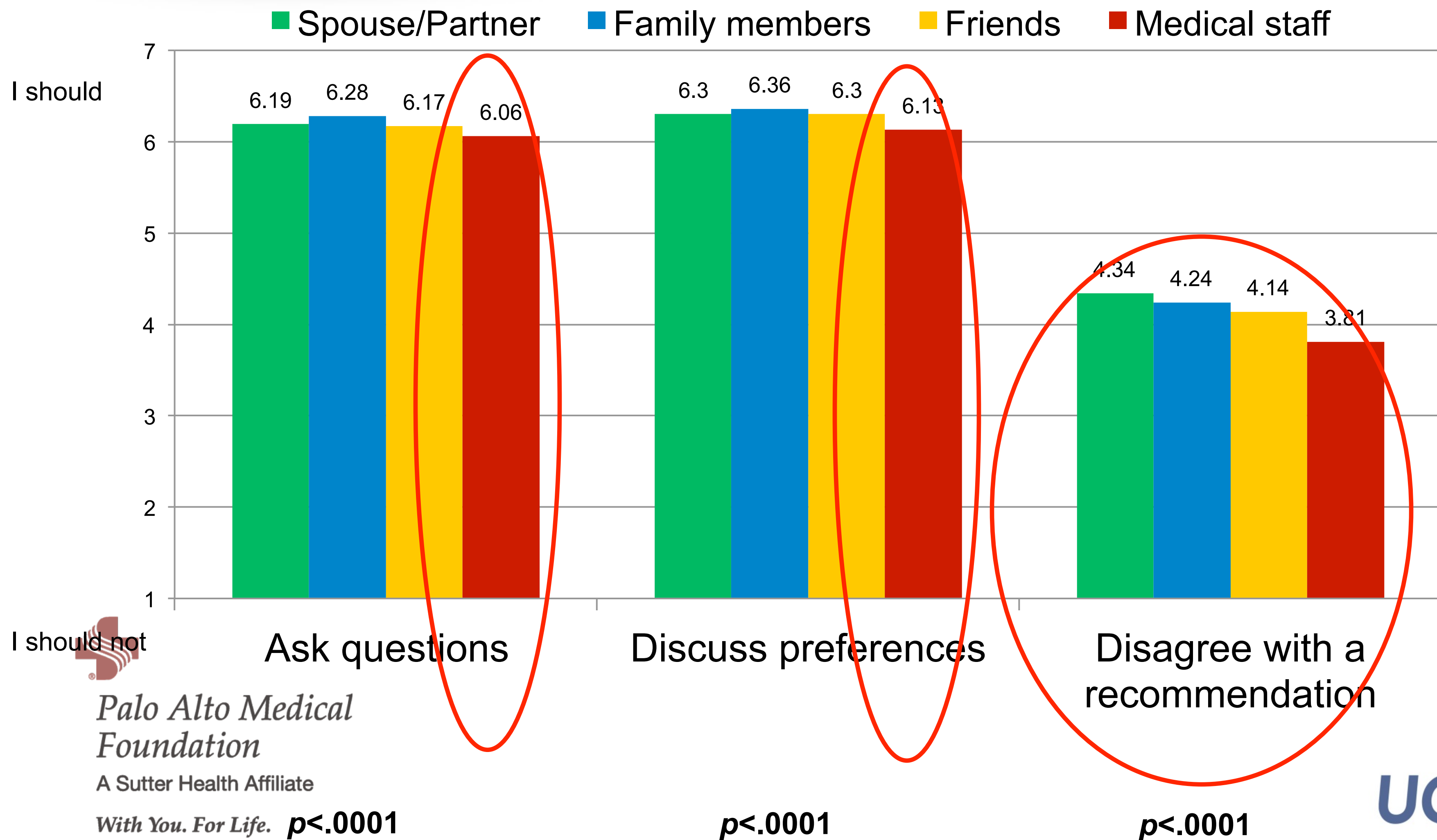
Results – Social approval for communicating



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Conclusion & limitations

- Participants had little difficulty envisioning exchanging information with their physicians.
- But they were much less likely to envision disagreeing with a preference incongruent recommendation.
- Paradoxically, respondents felt that disagreeing would lower the likelihood of getting their preferred treatment.
- These data illustrate the medical-cultural barriers to shared decision making.
- Findings limited by hypothetical scenario.

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Additional resources

- Frosch, D.L., Légaré, F., Fishbein, M., & Elwyn, G. (2009). Adjuncts or adversaries to shared decision making? Applying the Integrative Model of Behavior to the role and design of decision support interventions in health care interactions. Implementation Science, 4:73. doi: 10.1186/1748-5908-4-73.
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Thank you

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