

Hybrid Methods of Communication Research: Going beyond qualitative and quantitative approaches to explore new questions

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Today's Objectives

Introduce a framework comprised of hybrid research methods to address a novel problem --- the study of oral literacy burden of medical dialogue

Describe a simulation and analogue study designed to address the assessment and consequences of oral literacy burden on genetic counseling process and client outcomes of satisfaction and learning.

Describe a simulation study within the context of primary care to address elements of oral literacy burden and simulated patient outcomes of satisfaction

National and International Functional Literacy Surveys

National Adult Literacy Survey (NALS) – US
1992; 2003

International Adult Literacy Survey (IALS)

22-country common literacy test (1994 to 1998) administered at home to nationally representative samples of adults in the country's national language (ages 16-65).

Functional Adult Literacy

Below Basic Literacy (Level 1)

42.6% - Poland

22.6% - Ireland

21.8% - UK

20.7% United States

19.3% - Switzerland (German)

18.4% - Belgium (Flanders)

18.4% - New Zealand

17.6% - Switzerland (French)

17.0% - Australia

16.6% - Canada

14.4% - Germany

10.5% - Netherlands

7.5% - Sweden

Marginal Literacy (Level 2)

35.7% - Switzerland (German)

34.5% - Poland

34.2% - Germany

33.7% - Switzerland (French)

30.3% - United Kingdom

30.1% - Netherlands

29.8% - Ireland

28.2% - Belgium (Flanders)

27.3% - New Zealand

27.1% - Australia

25.9% United States

25.6% - Canada

20.3% - Sweden

Health Literacy Demand is routinely assessed in print materials

Adaptation of informed consent print materials to meet the needs of low literate patients (aiming for a ceiling of 8th grade level) is now routine – even mandated in the US (Paasche-Orlow, NEJM, 2004).

Thousands of studies have analyzed the suitability and reading level of health education materials for diverse patient and community populations (Rudd et al, 2004).

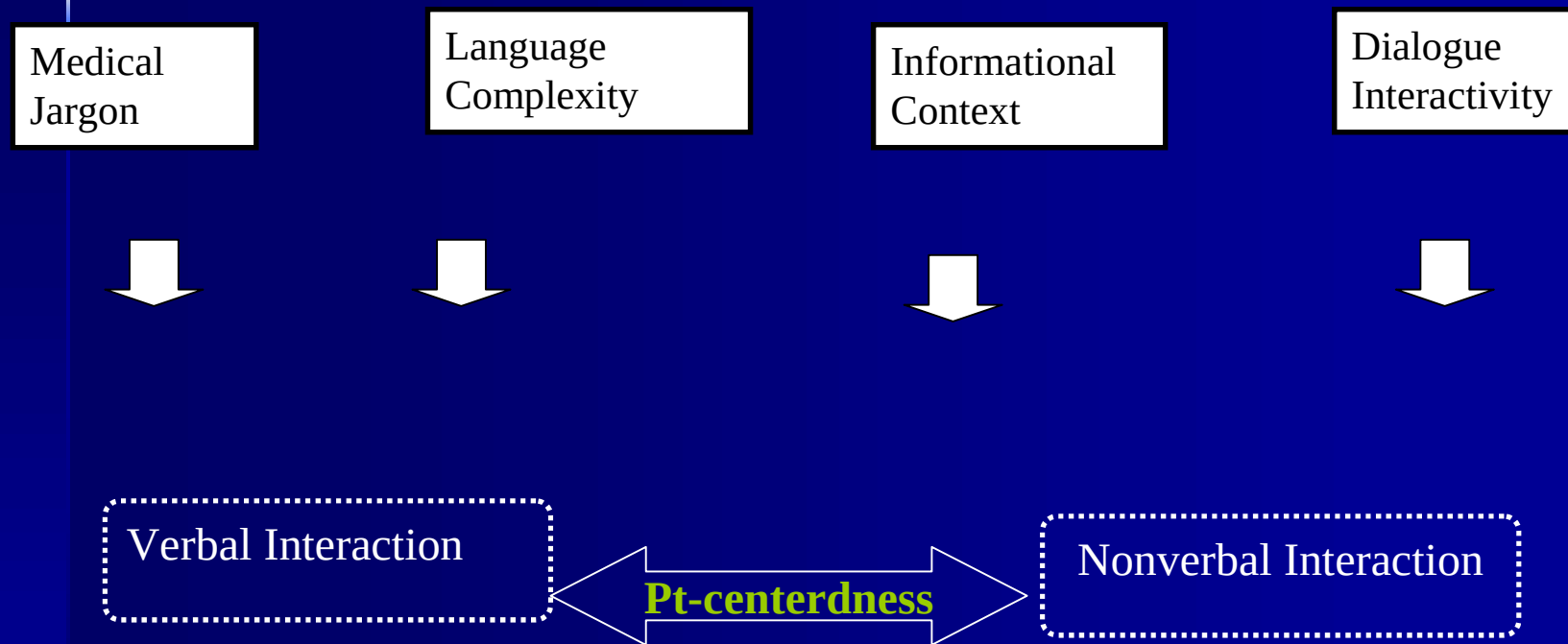
Low literacy affects oral exchange

Low literacy has been associated with poor comprehension and recall of complex oral language. Patients complain they are not given information about their problems *in ways they could understand*. Low literate patients have lower levels of health knowledge even after attending special classes. (Williams et al, 1998; Schillinger et al, 2004; Baker et al, 1996)

Low literacy may also be related to restricted expressive language. Patients note that *they do not feel listened to*. (Baker et al, 1996; Bennett, 2006)

No studies have attempted a systematic assessments of *oral* literacy demand within medical dialogue.

Oral Literacy Demand Framework



Roter et al, 2007

Oral Literacy Burden Indicator 1

---Use of medical jargon

Derived from analyses of session transcripts

Number of different terms used (term coverage)

Average number of repetitions of each terms

*Variation
*Susceptibility
*Sporadic
*Hereditary
*Mutation
*Chromosome
*Abnormality

Uterus
Disorder
Instruction
Generation
Retardation
Surgery
Population
Miscarriage
Development
Condition
Carrier
Insurance
Ultrasound
Syndrome

Use of genetic-specific terminology

Of all 21 tracked genetics-specific terms

On average, 11 different terms were used in each session (range 5 – 17 terms)

Terms were repeated an average of 11 times (range 4 – 23)

Of the 7 most difficult terms (most often missed in a literacy test)

On average, 2.5 different terms were used (range 0–5)

Terms were *very frequently* repeated. Repetitions averaged 22 times (range 4 – 78)

Oral Literacy Burden Indicator 2: --General language complexity

- Measures include:
 - Flesch-Kinkaid grade level
 - Flesch reading ease
 - Average number of syllables per word (ASW)
 - Average number of words per sentence
 - Percentage of transcript sentences in the passive voice

Oral Literacy Burden Indicator 3: Informational context

Informational Context was calculated as the percentage of informational statements (derived from written transcripts) that were given using a personalized rather than depersonalized contextual frame.

Personally Contextualized informational “Based on what you told me about your family history and your age and medical history, there is less than a 1 in 500 chance that your test will show that your baby has one of these genetic mutation”

Depersonalized context “Nobody has a risk of zero --most pregnant women have less than 1 in 500 chance of having a baby with this mutation”

Oral Literacy Burden Indicator 4: Structural characteristics of turn taking as an Indicator of interactivity

The rationale for inclusion of interactivity as a literacy demand indicator is akin to adult education models of experiential learning; processing of information in small chunks that allows for direct and active engagement.

The architecture and structural characteristics of dialogue are content free indices of interaction

Regardless of the research paradigm –CA or IA, the focus of turn taking and sequential analysis has been **descriptive of topic** (i.e., diagnosis, bad news, symptom description, treatment negotiation), **descriptive of intention** (empathic cues or opportunities) **descriptive of function** (i.e., empathy, interruption, questions, partnership building, support, etc) .

Consider the metaphor of the built environment. It provides the setting within which human activity unfolds, but it also has the power to influence, shape and change human behavior.

Interactivity, reflecting the structure of speaker turns, provides the built environment within which the medical dialogue lives.

The starting point: speaker turns

Speaker turn is defined as a continuous block of uninterrupted speech by a single speaker; back channels and other 'out of turn' cues of interest are not considered an interruption.

The number of speaker turns per visit can be interpreted as the frequency of floor exchanges.

Structural elements of a turn

Dialogue interactivity is the number of speaking turns per session minute. For example, a 13 minute PC visit may have 52 complete turn exchanges with an interactivity rate of 3.9 exchanges per minute

Turn density: the number of statements within a turn excluding the count of any second speaker back channels. Turn density can be calculated separately by speaker. Physician turns are likely to be more dense than patient turns (4.2 statements vs 1.4 statements per turn, respectively).

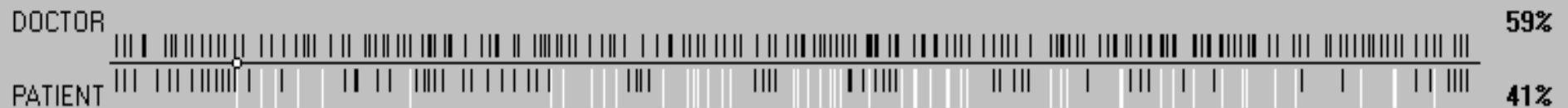
- Turn duration: seconds spanning the block of uninterrupted speech by speaker (including back channels). In the above example, turn duration averaged 13.7 seconds for physician and 2.9 seconds for patient.
- Statement pace: pace of within-turn statements (duration divided by density) – for physicians, one statement every 3 seconds; for patients one statement every 2 seconds.

HIGH INTERACTIVITY VISITS

00000802.U02 -- 7:46



Special Marks Hatching

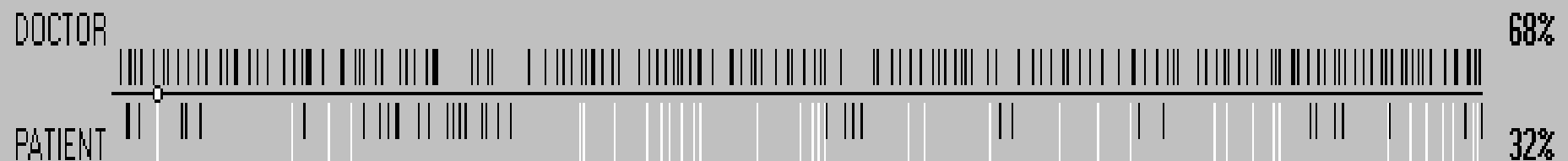


LOW INTERACTIVITY VISITS

00001201.U02 -- 10:14



Special Marks Hatching





Special Marks Hatching

DOCTOR

59%

PATIENT

41%

Turn	Count	Elapsed Time	Cat#	Description	Speaker
			1	personal	Doctor
Patient turn	1	00:00	1	personal	Patient
Doctor turn	1	00:03	34	?opinion	Doctor
Patient turn	1	00:00	16	GIVES- <u>ps</u>	Patient
Doctor turn	1	00:00	20	check	Doctor
			34	?opinion	Doctor
Patient turn	2	00:03	14	GIVES- <u>thera</u>	Patient
Doctor turn	1	00:03	18	agree	Doctor
			23	[?]med	Doctor
Patient turn	2	00:05	13	GIVES-med	Patient
Doctor turn	1	00:03	23	[?]med	Doctor
Patient turn	1	00:01	13	GIVES-med	Patient
Doctor turn	1	00:01	18	agree	Doctor
			23	[?]med	Doctor
Patient turn	2	00:02	13	GIVES-med	Patient
Doctor turn	1	00:03	18	agree	Doctor
			28	?med	Doctor
Patient turn	2	00:02	15	GIVES- <u>ls</u>	Patient
Doctor turn	1	00:00	25	[?]/s	Doctor
Patient turn	1	00:03	15	GIVES- <u>ls</u>	Patient
			19	BC	Doctor
			9	concern	Patient
Doctor turn	3	00:03	31	? <u>ps</u>	Doctor
			25	[?]/s	Doctor
Patient turn	2	00:02	15	GIVES- <u>ls</u>	Patient
Doctor turn	1	00:01	23	[?]med	Doctor
Patient turn	1	00:01	13	GIVES-med	Patient
Doctor turn	1	00:01	28	?med	Doctor
Patient turn	1	00:01	13	GIVES-med	Patient
			13	GIVES-med	Patient
Doctor turn	2	00:02	20	check	Doctor
			18	agree	Patient
			23	[?]med	Doctor
Patient turn	3	00:05	13	GIVES-med	Patient
Doctor turn	1	00:04	13	GIVES-med	Doctor
			18	agree	Patient
			13	GIVES-med	Doctor
			18	agree	Patient
Patient turn	3	00:07	13	GIVES-med	Patient
Doctor turn	2	00:01	13	GIVES-med	Doctor
			13	GIVES-med	Doctor

Doctor turn	2	00:01	13	GIVES-med	Doctor
			13	GIVES-med	Doctor
			18	agree	Patient
			13	GIVES-med	Doctor
			9	concern	Doctor
			9	concern	Doctor
			18	agree	Patient
			14	GIVES- <u>thera</u>	Doctor
			25	[?]/s	Doctor
Patient turn	9	00:21	15	GIVES- <u>ls</u>	Patient
Doctor turn	1	00:01	25	[?]/s	Doctor
Patient turn	1	00:02	15	GIVES- <u>ls</u>	Patient
			15	GIVES- <u>ls</u>	Patient
Doctor turn	2	00:04	18	agree	Doctor
			30	? <u>ls</u>	Doctor
			25	[?]/s	Doctor
			30	? <u>ls</u>	Doctor
Patient turn	4	00:04	15	GIVES- <u>ls</u>	Patient
Doctor turn	1	00:02	25	[?]/s	Doctor
			25	[?]/s	Doctor
Patient turn	2	00:02	15	GIVES- <u>ls</u>	Patient
Doctor turn	1	00:03	18	agree	Doctor
			40	C-l/s, p/s	Doctor
			18	agree	Patient
			24	[?]thera	Doctor
Patient turn	4	00:06	14	GIVES- <u>thera</u>	Patient
Doctor turn	1	00:02	29	?thera	Doctor
Patient turn	1	00:01	14	GIVES- <u>thera</u>	Patient
Doctor turn	1	00:01	2	laughs	Doctor
Patient turn	1	00:00	2	laughs	Patient
Doctor turn	1	00:01	2	laughs	Doctor
			24	[?]thera	Doctor
Patient turn	2	00:01	14	GIVES- <u>thera</u>	Patient
			14	GIVES- <u>thera</u>	Patient
Doctor turn	2	00:04	20	check	Doctor
			29	?thera	Doctor
			24	[?]thera	Doctor
Patient turn	3	00:06	16	GIVES- <u>ps</u>	Patient
			19	BC	Doctor
			14	GIVES- <u>thera</u>	Patient
			15	GIVES- <u>ls</u>	Patient
Doctor turn	4	00:06	24	[?]thera	Doctor
			24	[?]thera	Doctor



Special Marks Hatching

DOCTOR

68%

PATIENT

32%

Turn	count last turn	Elapsed Time	Cat#	Description	Speaker
			1	personal	Doctor
Patient turn	1	00:02	1	personal	Patient
			1	personal	Patient
Doctor turn	2	00:01	1	personal	Doctor
			18	agree	Doctor
			34	?opinion	Doctor
Patient turn	3	00:05	14	GIVES-thera	Patient
Doctor turn	1	00:01	18	agree	Doctor
			13	GIVES-med	Doctor
			18	agree	Patient
			13	GIVES-med	Doctor
			13	GIVES-med	Doctor
			29	?thera	Doctor
Patient turn	6	00:18	14	GIVES-thera	Patient
			14	GIVES-thera	Patient
Doctor turn	2	00:03	18	agree	Doctor
			20	check	Doctor
Patient turn	2	00:05	5	disapprove	Patient
Doctor turn	1	00:03	18	agree	Doctor
			18	agree	Doctor
			9	concern	Doctor
			13	GIVES-med	Doctor
			9	concern	Doctor
			13	GIVES-med	Doctor
			13	GIVES-med	Doctor
			13	GIVES-med	Doctor
			20	check	Doctor
			18	agree	Patient
			18	agree	Doctor
			23	[?]med	Doctor
Patient turn	13	00:44	13	GIVES-med	Patient
Doctor turn	1	00:01	18	agree	Doctor
			20	check	Doctor
			18	agree	Doctor
			9	concern	Doctor
			18	agree	Patient
			13	GIVES-med	Doctor
			9	concern	Doctor
			18	agree	Patient

			11	partner	Doctor
			18	agree	Patient
			9	concern	Doctor
			40	C-l/s, p/s	Doctor
			18	agree	Patient
			40	C-l/s, p/s	Doctor
			40	C-l/s, p/s	Doctor
			18	agree	Patient
			14	GIVES-thera	Doctor
			18	agree	Patient
			13	GIVES-med	Doctor
			14	GIVES-thera	Doctor
			14	GIVES-thera	Doctor
			18	agree	Patient
			13	GIVES-med	Doctor
			18	agree	Patient
			14	GIVES-thera	Doctor
			18	agree	Patient
			14	GIVES-thera	Doctor
			9	concern	Doctor
			9	concern	Doctor
			21	trans	Doctor
			13	GIVES-med	Doctor
			14	GIVES-thera	Doctor
			18	agree	Patient
			34	?opinion	Doctor
			39	C-med/thera	Doctor
			39	C-med/thera	Doctor
			39	C-med/thera	Doctor
			18	agree	Patient
			9	concern	Doctor
			18	agree	Patient
			39	C-med/thera	Doctor
			18	agree	Patient
			37	?understand	Doctor
			39	C-med/thera	Doctor
			18	agree	Patient
Patient turn	49	02:14	13	GIVES-med	Patient
Doctor turn	2	00:06	29	?thera	Doctor
Patient turn	1	00:02	14	GIVES-thera	Patient
			14	GIVES-thera	Patient
			15	GIVES-ls	Patient

Why and how does structure matter and how does it relate to other qualitative and quantitative measures of dialogue?

Study AIMS

Explore the manifestation of oral literacy burden within the context of genetic counseling practice and its effect on simulated and analogue patient outcomes

Hypotheses predict that: high oral literacy burden (defined as greater use of technical jargon, greater language complexity, depersonalized informational context, and lower levels of dialogue interactivity)

- will be associated with lower levels of satisfaction and learning

- the effects will be greatest for analogue patients with restricted literacy skills.

Genetic counseling presents particular, but not unique, oral literacy challenges. The field is rapidly evolving, its language is complex and largely unfamiliar to the lay public, and genetic counseling sessions tend to be long, informationally dense and abstract.

Study Methods: Simulated GC sessions

- **Genetic Counselors:** 96 prenatal genetic counselors (US and Canada) recruited at the NSGC national conference to conduct a counseling session with a simulated client.
- **Simulated Clients:** Six female and three male partners (African American, Latino, and White)
- Counselors randomly assigned to simulated patients of varying ethnicity (AA, Latino, White, with/without spouse)
- Taping in hotel rooms at the NSGC meetings in Charlotte, NC



Use of Analogue Clients



- **Analogue Clients: 309** subjects recruited in two cities: Baltimore and Salt Lake City to watch the session videotapes while imagining they are the session client or spouse.
- (Eligibility criteria: men and women between 35 and 50 with at least one child)

Outcomes

Simulated Clients

- Satisfaction with the communication process, measures of nonverbal sensitivity and affective demeanor

Analogue Clients

- Knowledge scores (prenatal)

Simulated client outcomes: Nonverbal Effectiveness, Communication Satisfaction and Affective Demeanor

Correlations between literacy measures and simulated client ratings of communic

Literacy measures	Simulated client ratings ($n = 147$)		
	Nonverbal behavior	Satisfaction with communication	Affect
<i>REAL-G variables</i>			
All REAL-G words	-.05	-.06	-.08
Unique REAL-G words	-.02	-.05	-.13
Mean REAL-G repetitions	-.03	.00	.03
Ratio of REAL-G words to total transcript words	-.15 ⁺	-.18 ⁺	-.07
<i>Language complexity</i>			
Average syllables per word	-.07	-.10	-.09
Average words per sentence	-.19 [*]	-.21 [*]	-.08
Flesch-Kincaid Reading Grade level	-.23 ^{**}	-.28 ^{***}	-.12
Flesch Reading Ease	.21 [*]	.26 ^{**}	.14 ⁺
% passive sentences	-.24 ^{**}	-.29 ^{***}	-.19 [*]

Simulated client outcomes: Nonverbal Effectiveness, Communication Satisfaction and Affective Demeanor

Table 5
Correlations between literacy measures and simulated client ratings of communication

Literacy measures	Simulated client ratings ($n = 147$)		
	Nonverbal behavior	Satisfaction with	Affect
Syllables/ second	.02	.00	.00
<i>Dialogue density</i>			
Number of turns	.31 ^{***}	.35 ^{***}	.15 ⁺
Turn density	-.35 ^{***}	-.40 ^{***}	-.19 [*]
<i>Interactivity</i>			
Interactivity (turns/min)	.28 ^{**}	.30 ^{***}	.12
+ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.			

Outcomes

Analogue Clients

Knowledge about prenatal genetic testing

Literacy Demand and Analogue Patient Knowledge



	Prenatal Visits (n)		
	All (309)	LL (152)	HL (157)
Genetics Specific Terminology			
All REAL-G words	.03	.02	-.16**
Unique REAL-G words	.02	.07	-.04
Ratio of REAL-G words to total transcript words	.03	.02	-.11*
General Language Complexity			
Average syllables per word	-.02	-.04	-.02
Flesch-Kincaid Reading Grade	-.04	-.07	.15*
Dialogue Structures			
Syllables/ second	.01	.03	0
Number of turns	.03	.09	-.03
Turn density	-.15	-.35***	.05
Turn duration	-.11	-.34**	.13*
Interactivity	.04	.16*	-.11+
% Information Personalized	.08	.18*	.02

Beta coefficients from regression equations using GEE to account for nesting, degree to which AC identified with patient and AC ethnicity

How does oral literacy burden (interactivity and turn structure) relate to primary care dialogue and patient outcomes?

50 Primary Care Physicians
Videotape with simulated patient
presenting with uncontrolled hypertension.

Simulated patient ratings of demeanor,
nonverbal effectiveness, satisfaction,
participatory decision making

Interactivity and turn structure is related to patient centeredness

Primary Care Hypertension Visits; Roter et al, Pt Ed CnsIng, 2008

Table 4: Relationships between dialogue variables and RIAS based measures

RIAS measures	Speaker turns	Interactivity	Physician turn density	Patient turn density	Physician turn duration	Patient Turn duration	Physician rate of statement delivery	Patient rate of statement delivery	Total physician within-turn talk	Total patient within-turn talk	Visit length
Patient centeredness	.29*	.30*	-.07	-.10	-.26+	-.30*	.39**	.25+	.22	.31*	.16

The RIAS constructed variable of patient-centeredness is correlated (in bivariate analysis) with more speaker turns, higher interactivity, shorter duration turns (patient and physician), faster rate of physician and patient statements, and more total patient talk; it is not related to visit length, total physician talk, or turn density for either patient or physician.

Turn Structure predicts simulated client ratings

Primary Care

Table 3: Relationships between dialogue variables and simulated patient ratings

Simulated patient ratings	Speaker turns	Interactivity	Physician turn density	Patient turn density	Physician turn duration	Patient Turn duration	Physician rate of statement delivery	Patient rate of statement delivery	Total physician within-turn talk	Total patient within-turn talk	Visit length
Physician demeanor	.45****	.17	-.10	-.22	-.27+	-.33*	.34**	.14	.35**	.47***	.32*
Nonverbal effectiveness	.19	.17	-.19	-.11	-.28*	-.25+	.24+	.15	.11	.24+	.08
Inter-personal satisfaction	.33*	.17	-.06	-.04	-.26+	-.19	.37**	.10	.24+	.38**	.21
Decision-making partnership	.43**	.24+	-.19	-.33*	-.35*	-.47**	.38**	.34*	.30*	.42**	.24+

**** p<.0001; *** p<.001; ** p<.01; * p<.05; + <.10

Roter et al, Pt Ed & Cnsing 2007

Oral literacy demand study: Implications

- Challenges of tailoring communication to ameliorate literacy demands

- jargon use -- not a consistently strong predictor of satisfaction or learning for low literate subjects

- Language complexity – not consistently negative for low literate subjects and *positively* associated with learning among literate subjects

- Personally contextualize information –Positive predictor of learning low literate subjects; not related to literate learning

- Interactivity is a predictor of satisfaction for all; a predictor of learning for low literate subjects

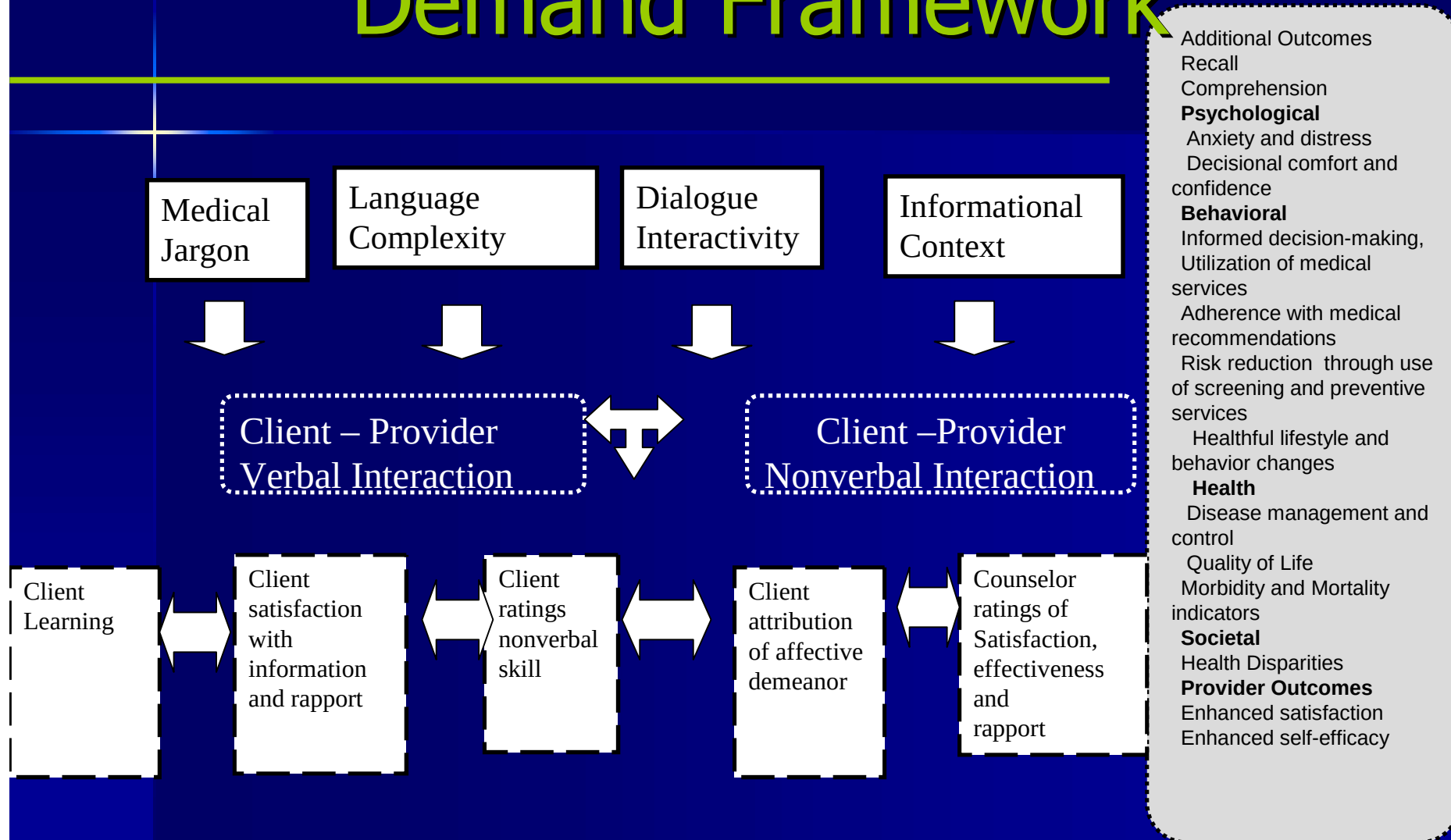
CONCLUSIONS

Oral literacy burden can be measured and the methods carry both face and predictive validity.

Interactivity may be the single strongest predictive marker of oral literacy burden.

This measure is neither qualitative nor quantitative in history or origin and may cross paradigmatic domains. It may also represent a structural proxy for patient-centeredness.

Fully Elaborated Oral Literacy Demand Framework



Roter et al, 2007