A CASE STUDY: DETECTING COUNSELOR REFLECTIONS IN MOTIVATIONAL INTERVIEWING

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STORY

MISC: hard to learn, costly to implement, does not scale, inconsistent, boring?

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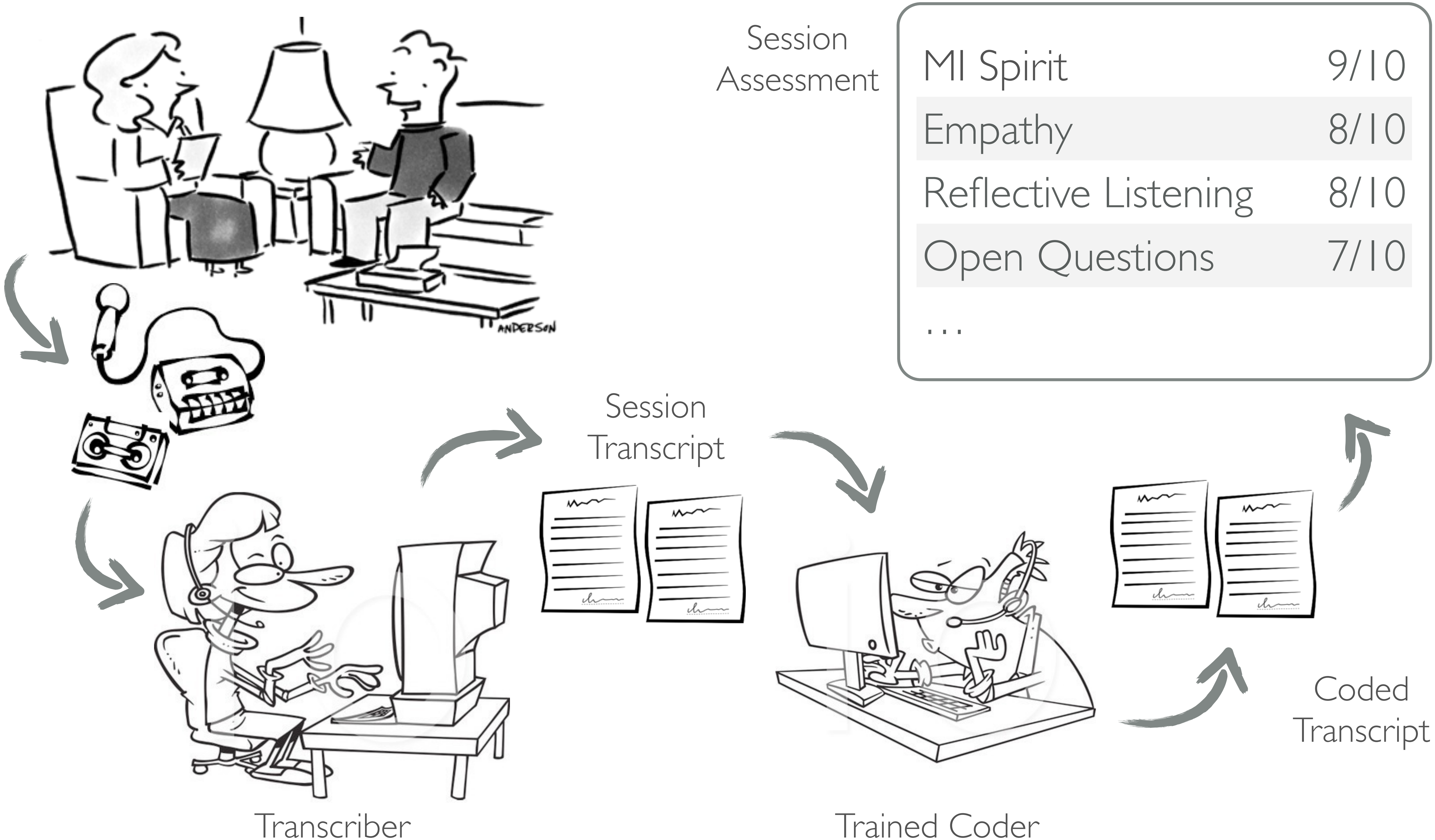
Automatic Coding or: How I Learned to Stop Worrying and Love MISC

"Gee, I wish I had one of them automatic MI assessment machines."

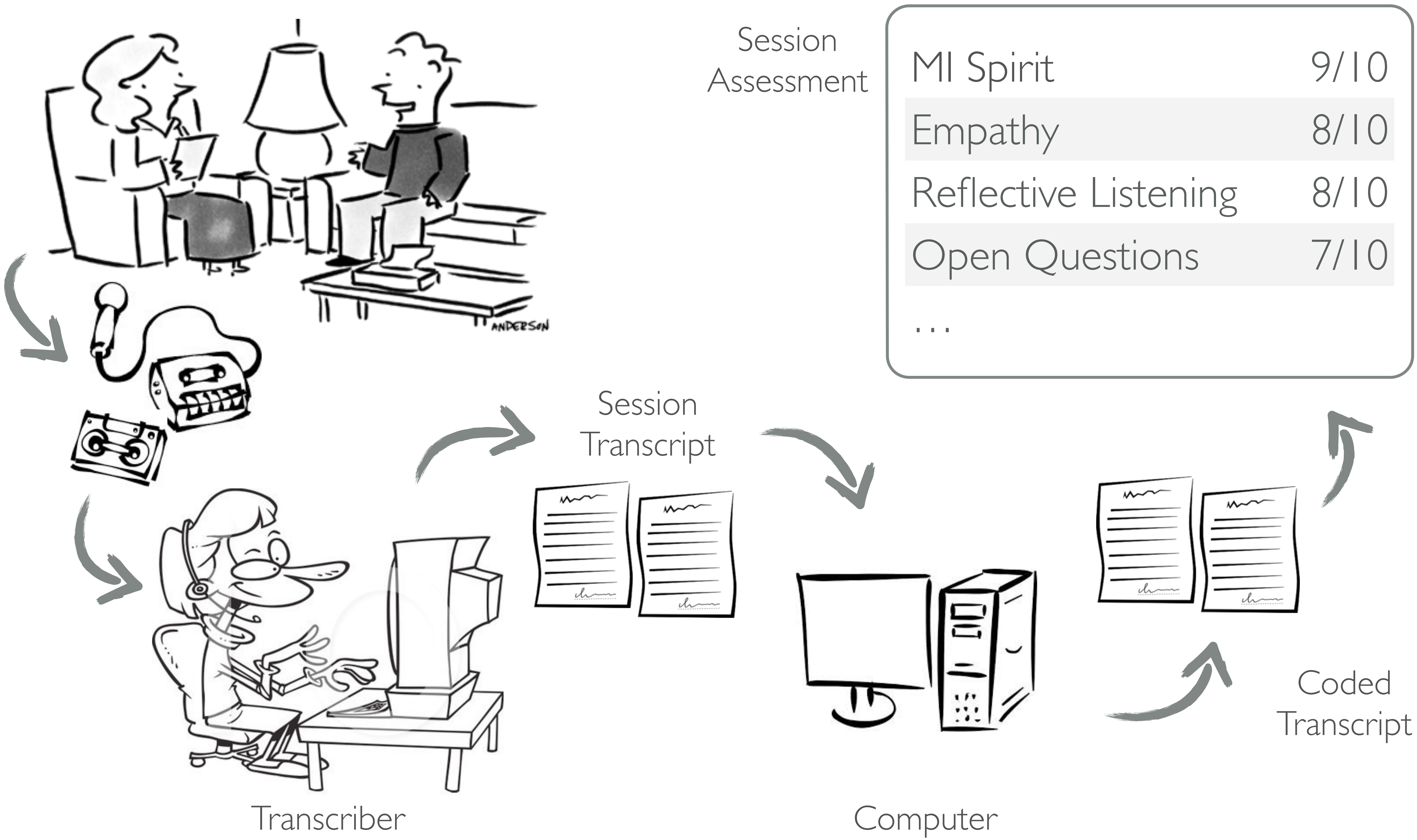
General "Buck" Turgidson

MI RESEARCH PROCESS



MI Spirit	9/10
Empathy	8/10
Reflective Listening	8/10
Open Questions	7/10
...	

AUTOMATIC CODING



AUTOMATIC CODING

T On the one hand, you have decided that to quit drinking is going to be the best thing for you...

Therapist (T)
you
you have decided
for you
best thing for you

Code Predictor

RES	0.4
REC	0.3
QU	0.1
FA	0.1
...	...

independent variables (a.k.a. features)

think of multinomial logistic regression

predictions

Session Transcripts

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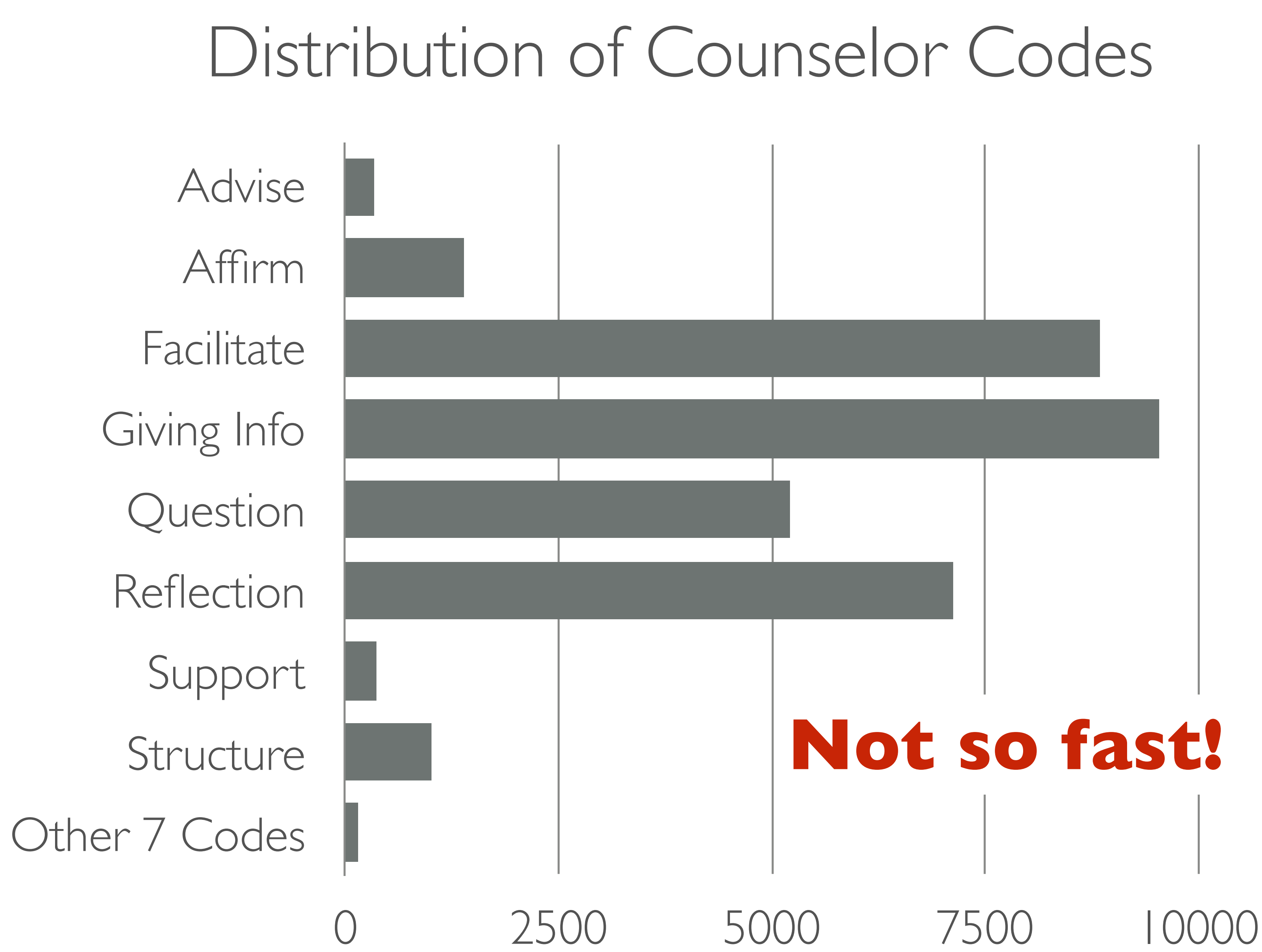


57 sessions, 2 coders per session (on average)

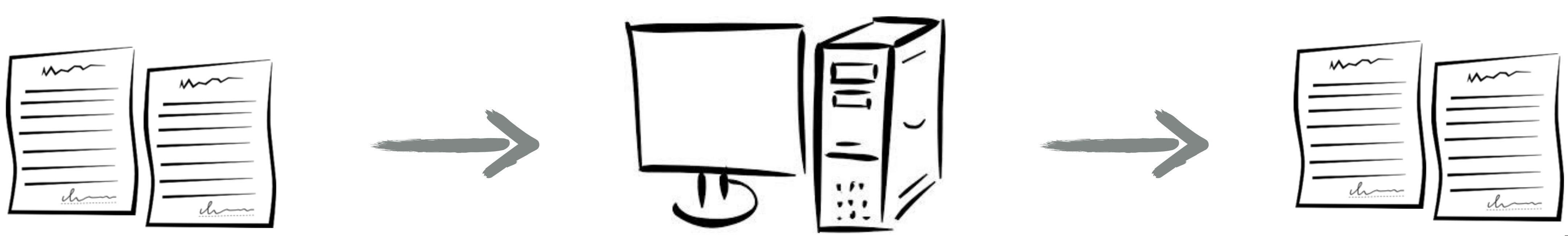
Session Transcripts

Coded Transcripts

AUTOMATIC CODING

T	Good morning, Susan	FA
T	I'd like to start by talking about our last conversation.	ST
...	...	...
T	What will you put in place of drinking?	QU
P	That's what I'm trying to find out.	O+
...	...	...
T	On the one hand, you have decided that to quit drinking is going to be the best thing for you...	RES
P	Uh-huh.	FN
T	and on the other hand you feel like it's going to be really tough.	REC
P	Yeah.	FN

Session Transcripts

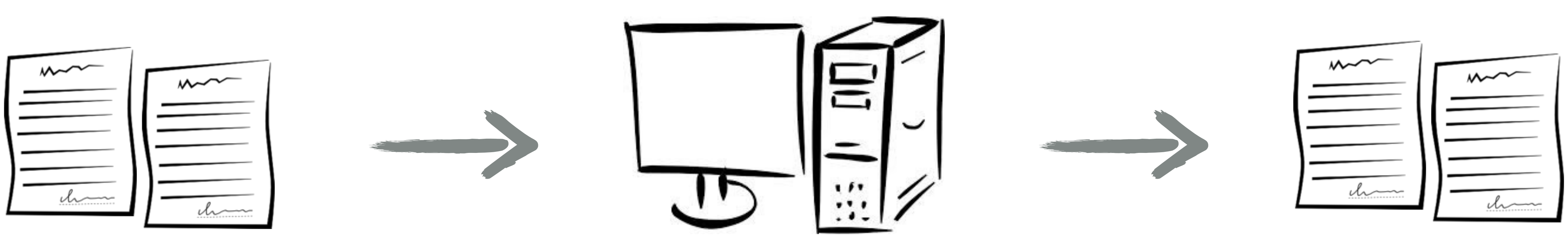


Coded Transcripts

REFLECTION DETECTION

T	Good morning, Susan	TH
T	I'd like to start by talking about our last conversation.	TH
...	...	...
T	What will you put in place of drinking?	TH
P	That's what I'm trying to find out.	CL
...	...	...
T	On the one hand, you have decided that to quit drinking is going to be the best thing for you...	RE
P	Uh-huh.	CL
T	and on the other hand you feel like it's going to be really tough.	RE
P	Yeah.	CL

Session Transcripts



Reflections

WHY REFLECTIONS?

1. They are believed to be critical for MI efficacy.
2. They encode a non-trivial counselor behavior.
3. They are challenging to model/describe.

CAN LANGUAGE PREDICT REFLECTIONS?

1. Reflections are semantically similar to prior client talk.

2. A common language is shared across reflections.

   Counselors tend to use predictable language constructs while reflecting, e.g. "From what I'm hearing", "It seems like"

3. Local dialog context can predict reflections.

   Reflections tend to occur in bursts. They usually prompt the client to confirm or deny, e.g. "Yeah", "Not really"

Reflections

Typical reflective constructs:

- repeat, rephrase or summarize
- add meaning or emphasis
- analogies, metaphors, similes, etc.
- in response to client statement
- trigger confirmation by client
- collaborative, non-judgmental, emphatic

Independent Variables

Expert knowledge driven features:

Reflections

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Expert knowledge driven features:

n-grams (n consecutive words)

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n-grams (n consecutive words)

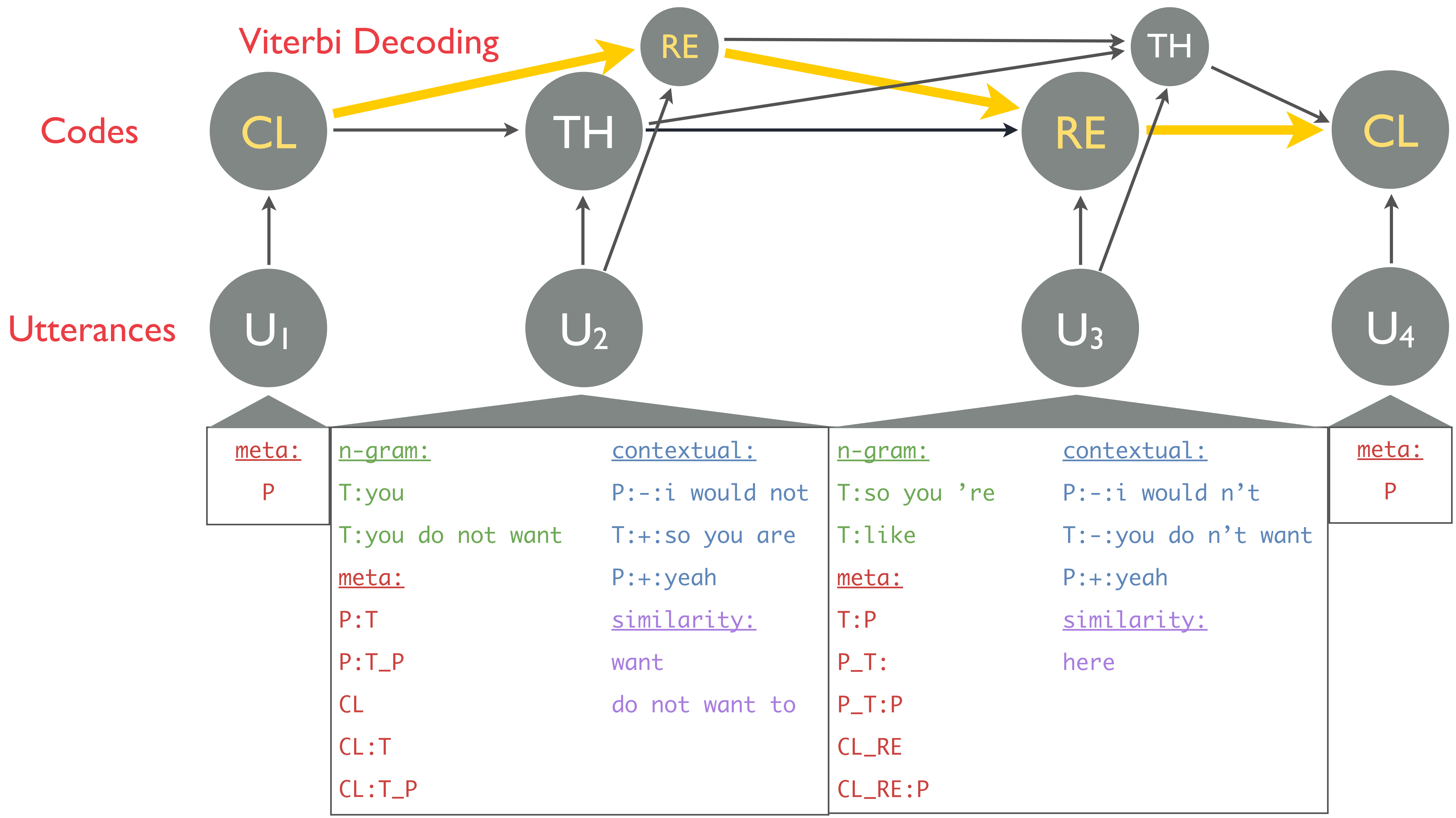
contextual n-grams

meta (speaker, codes)

similarity (n-gram sharing)

P	I wouldn't mind coming here for treatment but I don't want to go to one of those places where everyone sits around crying and complaining all day.	CL
T	You don't want to do that.	RE
T	So you're kind of wondering what it would be like here.	RE
P	Yeah	CL

n-gram:	meta:	similarity:
T:=:you	P:T	want
T:=:you do not want	P:T_P	do not want to
contextual n-gram:	CL:	
P:-:i would not	CL:T	
T:+:so you are	CL:T_P	
P:+:yeah		



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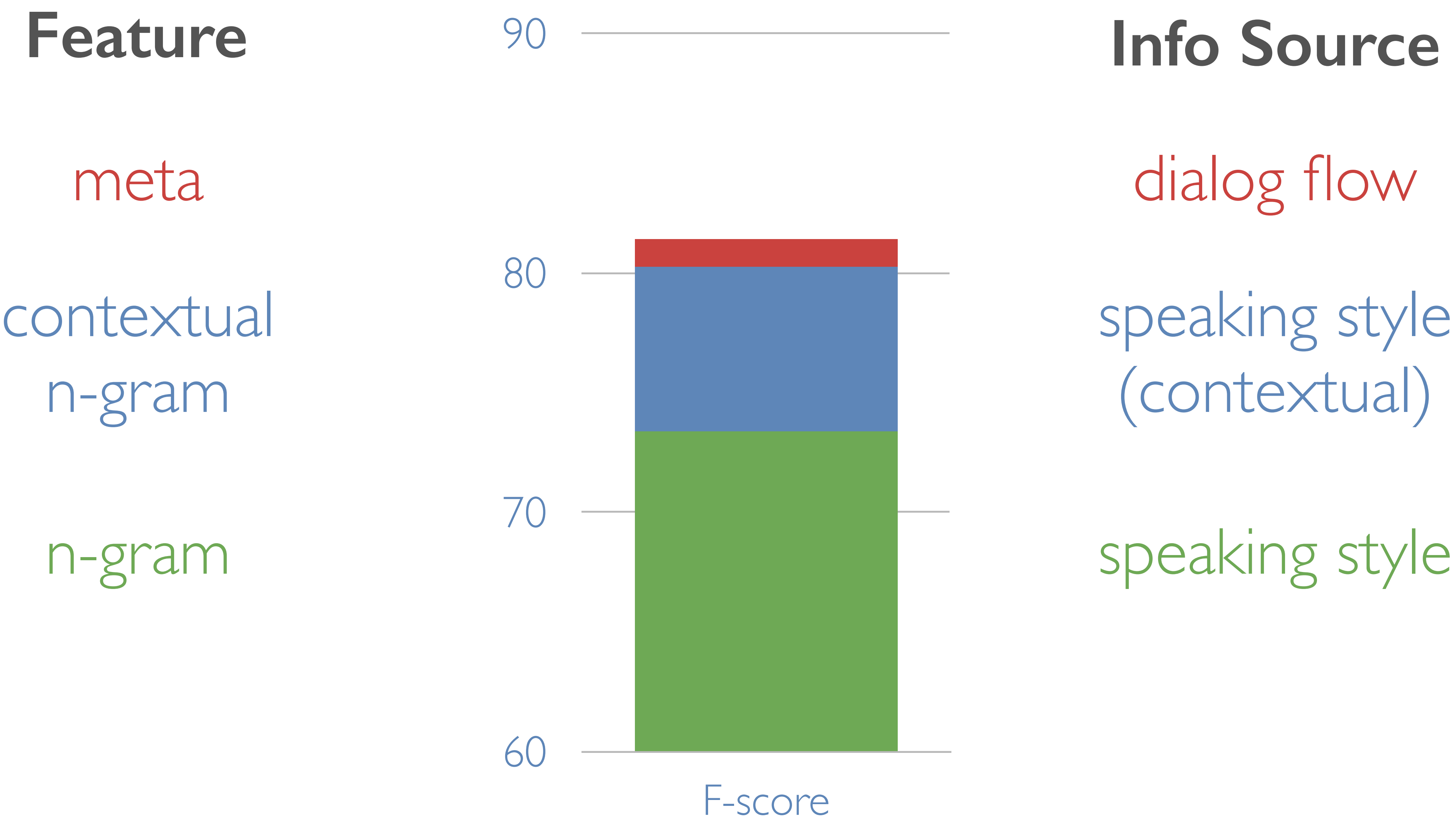
STYLE AND FLOW PREDICT REFLECTIONS



Average numbers from leave one out cross validation experiments.
F-score: harmonic mean of precision (positive predictive value) and recall (sensitivity)
F-score = 2 x TruePos / (2 x TruePos + FalseNeg + FalsePos)

STYLE VS CONTENT

Reflection Production

- Is style as important as the content?
- Is reflection a local process?

Reflection Perception

- Are coders affected by the speaking style?

N-gram sharing not helpful?

- Weak feature for measuring similarity, data sparsity
- High baseline: nature of dialog + professional counselors

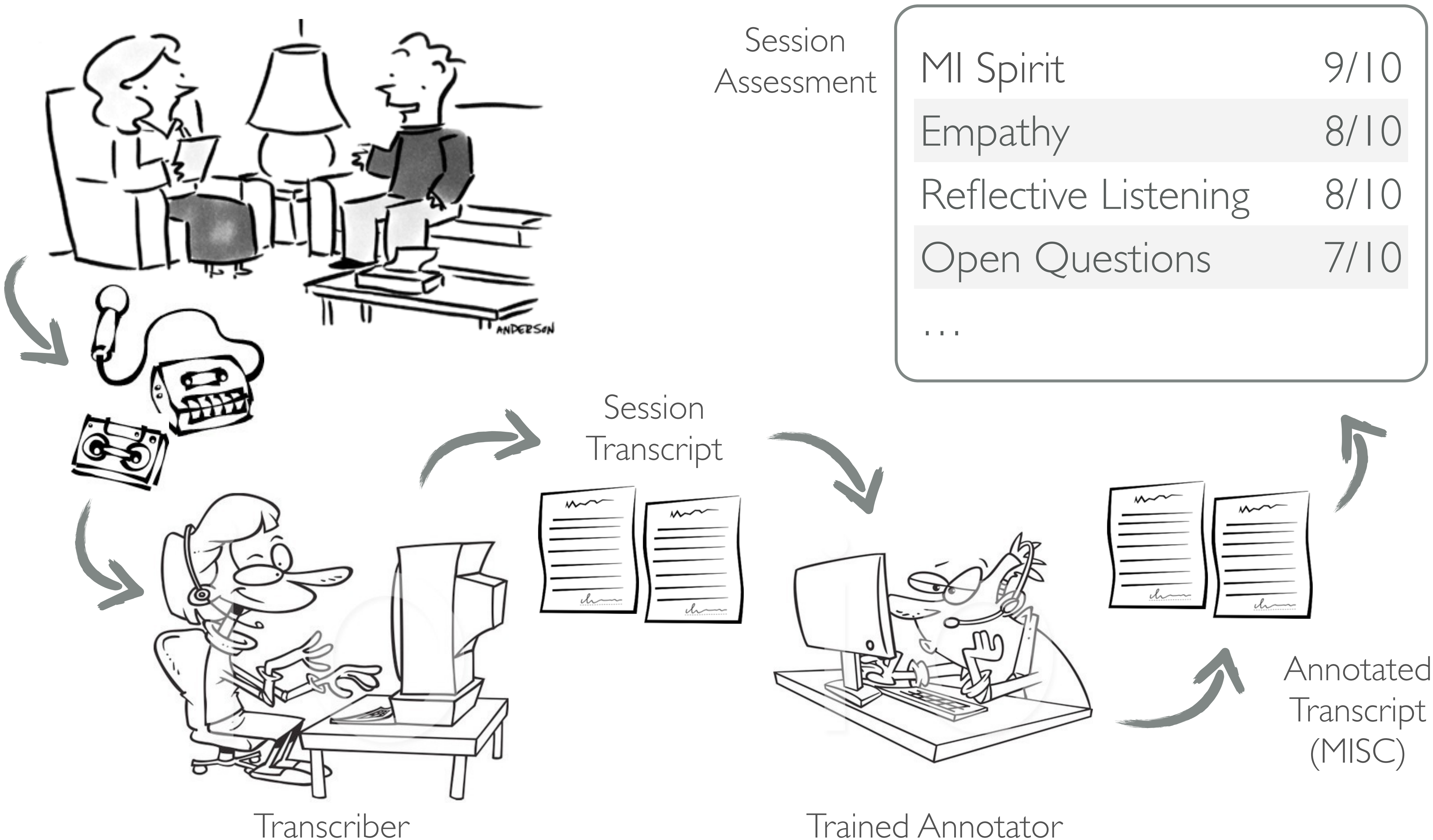
IN THE WORKS

1. Extension to the larger code sets

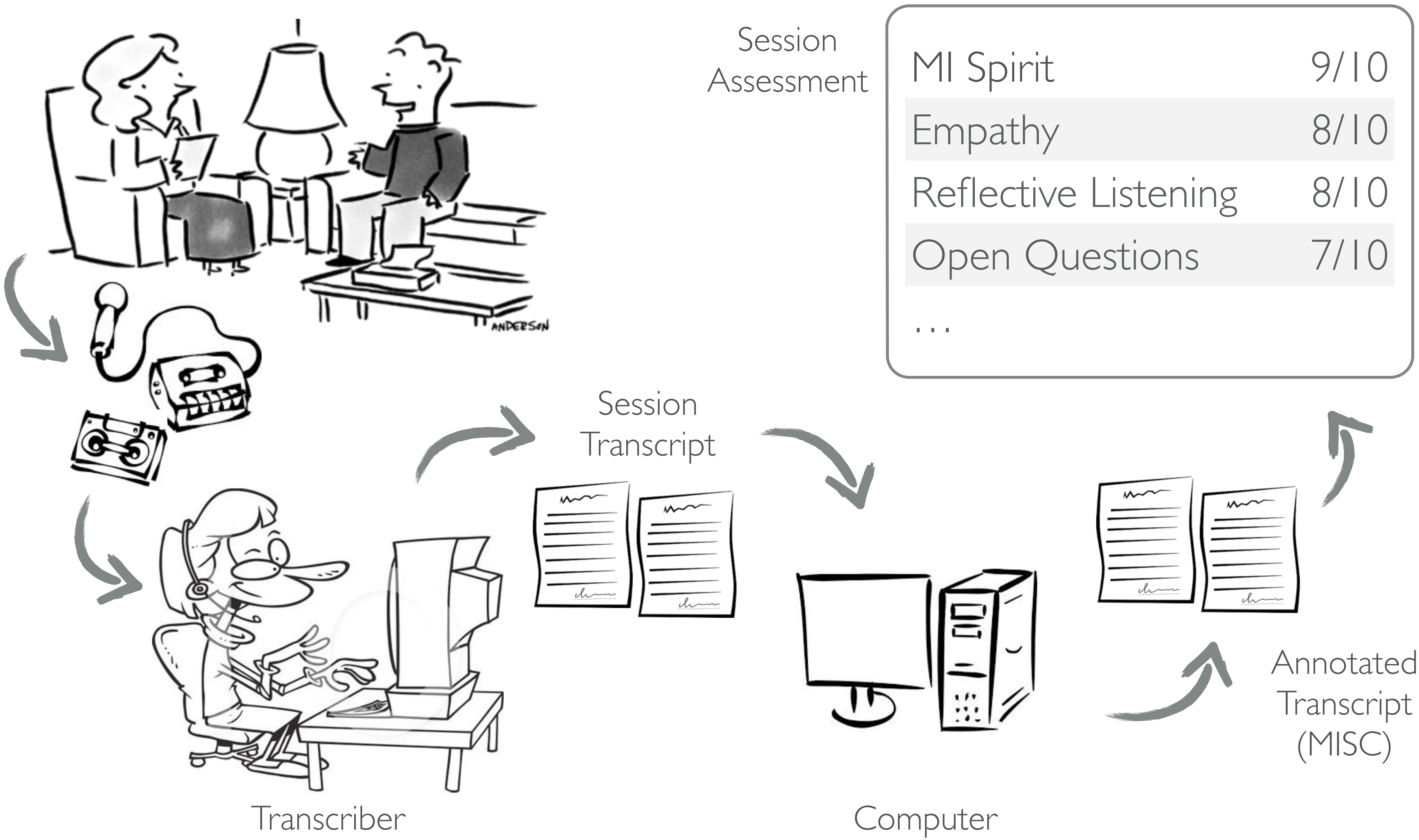
2. Acoustic/prosodic features

3. Speech recognition instead of manual transcripts

MI RESEARCH PROCESS



DO WE NEED ANNOTATORS?



DO WE NEED TRANSCRIBERS?

Session Assessment

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Empathy	8/10
Reflective Listening	8/10
Open Questions	7/10
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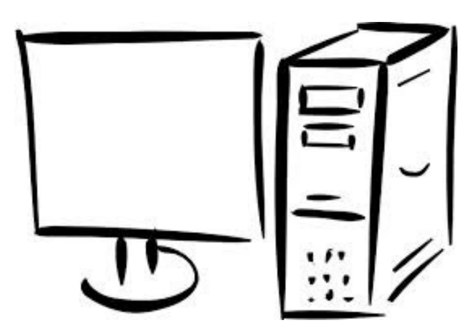

Annotated Transcript (MISC)

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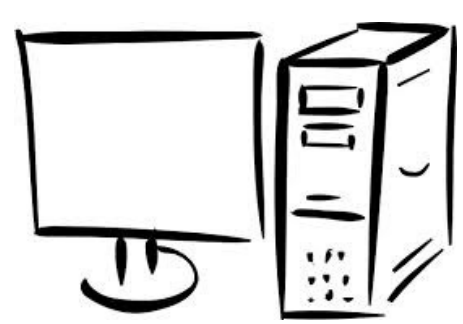

WHY NOT DO IT ONLINE?

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Profit!