

Annotation of verbal feedback expressions & turn-taking in PAGE

MichElina Savino

Dept. of Education, Psychology, Communication
University of Bari, ITALY

Research questions in PAGE & Requirements

Entrainment in feedback expressions:

- ▶ type/frequency, prosody of backchannels
- ▶ verbal vs gestural modalities

also

- ▶ turn-taking (incl. turn-transition cues)

→ Annotation scheme: basic set of pragmatic categories in backchannels + turn transitions

→ also which linguistic forms to be annotated

Verbal feedback expressions

- ▶ Broad definition: “Utterances which give discourse-structuring feedback” to the listener (Jurafsky et al. 1998)
- ▶ Feedbacks, backchannels, acknowledgements...
- ▶ A large number of different pragmatic functions, also depending on communicative contexts
- ▶ Polarity: positive/negative
- ▶ Different forms: lexical/non-lexical, single or multi-word, phrases, utterances (repetitions, rephrasing, etc...)

Basic pragmatic functions in task-oriented dialogues (like in PAGE)

- ▶ Grounding
- ▶ Regulation of turn-taking
- ▶ Agreement/alignment

- ▶ Possibly also conveyed by visual cues (e.g. head movements/gaze direction)

Basic acknowledgement functions in PAGE dialogues

- ▶ Passive Reciprocity (“continuers”): “I’m attending/understanding you and I don’t take the turn” → **ACK-PR**

EXAMPLE (from one of the Italian “tangram” pilot sessions):

S1: ci sono due triangoli [*there are two triangles*]

S2: sì [*yes*] → **ACK-PR**

S1: separati<ii> rispetto ad un trapezio che è posto<oo> più in sotto [*separated <er> with respect to a trapezium which is located <eer> further down*]

S2: sì [*yes*] → **ACK-PR**

Basic acknowledgement functions in PAGE dialogues

- ▶ Incipient Speakership (“non-continuers”): “I’m attending/understanding you and now I take the turn” → **ACK-IS**

EXAMPLE (from one of the Italian “tangram” pilot sessions):

S1: con il vertice dell’ipotenusa verso l’esterno a sinistra [*with the hypotenuse vertex towards outside on the left*]

S2: **okay** | però non hai una forma indefinita [*okay | but you don’t have a vague shape*]

Basic acknowledgement functions in PAGE dialogues

► agreement, alignment, accept. → ACK

EXAMPLES (from the Italian “tangram” pilot sessions):

S1: credo che sia la stessa [*I think it's the same*]

S2: **okay**

S1: **okay** è la stessa [***okay** it's the same*]

S1: mi sa che non abbiamo la stessa figura perché sono otto a me [*I think we don't have the same figure as mine are eight*]

S2: **okay**

S1: **okay**

(also end of “game round”)

S1: composta da tre figure? [*made of three figures?*]

S2: esatto [*exactly*]

S1: **okay**

Linguistic forms

- ▶ Lexical/non-lexical one-word expressions:
yes, mm, uh-uh, okay, perfect, alright, etc...

Dutch? Maltese? Papuan languages? Specific expressions in varieties of English?

Nonverbal → Head movements, gaze direction, facial expressions...

Language- and culture-specific forms?

Turn-taking & Entrainment

- ▶ Turn-holding vs turn-yielding cues (Gravano & Hirschberg 2011)
- ▶ “Backchannel-inviting” cues (Gravano & Hirschberg 2009, 2011; Levitan et al. 2011)
- ▶ Linguistic/visual cue types optional and speaker-dependent
- Do speakers adapt these strategies to each other during interaction, and how?

Turn taking & Entrainment (coordination)

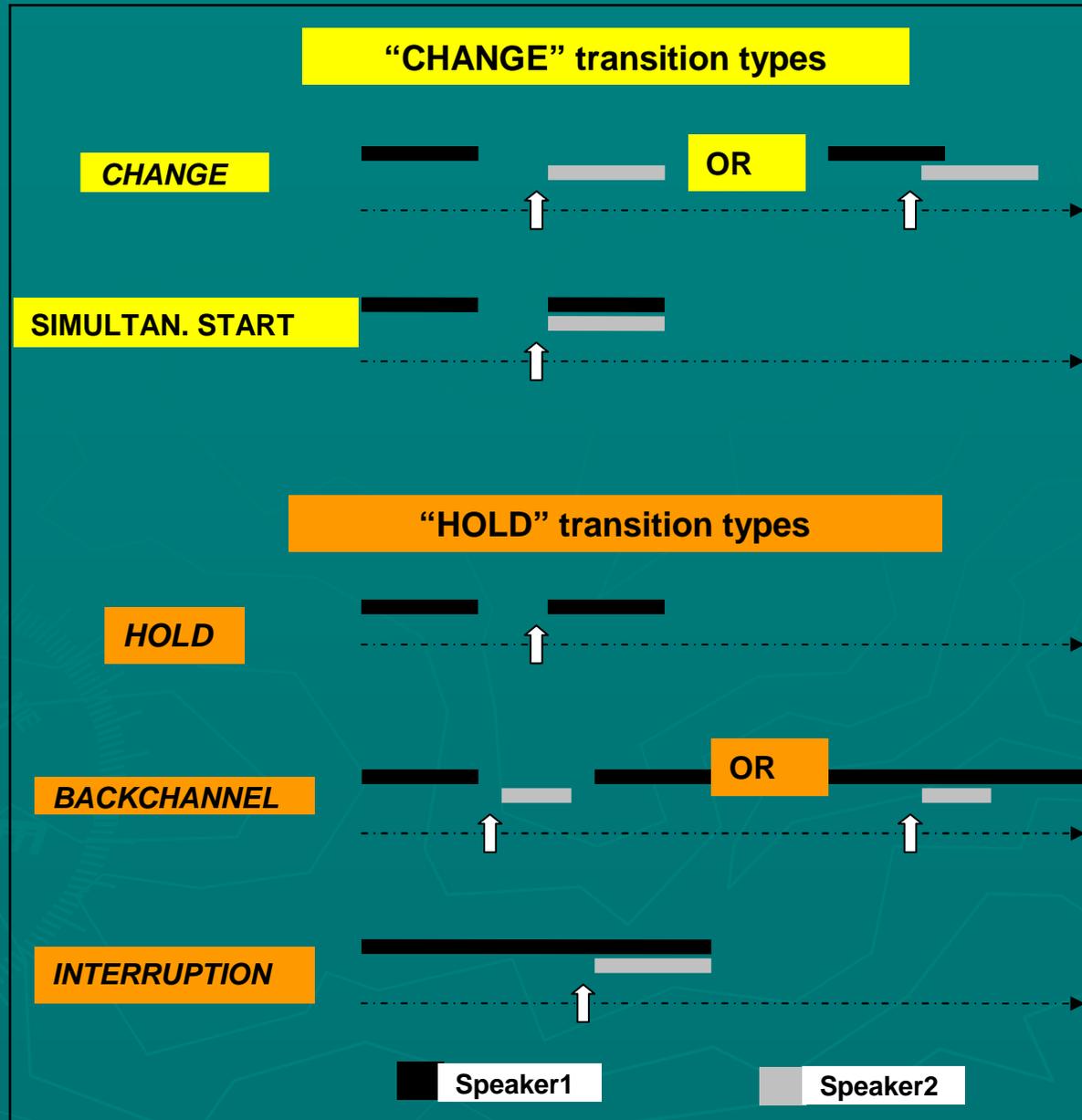
- ▶ Overlappings & interruptions: do they decrease as interaction goes on?
- ▶ Smooth turn changes: do they increase as interaction goes on?

(Nenkova et al. 2008, Gravano and Hirschberg 2011, Levitan et al. 2011)

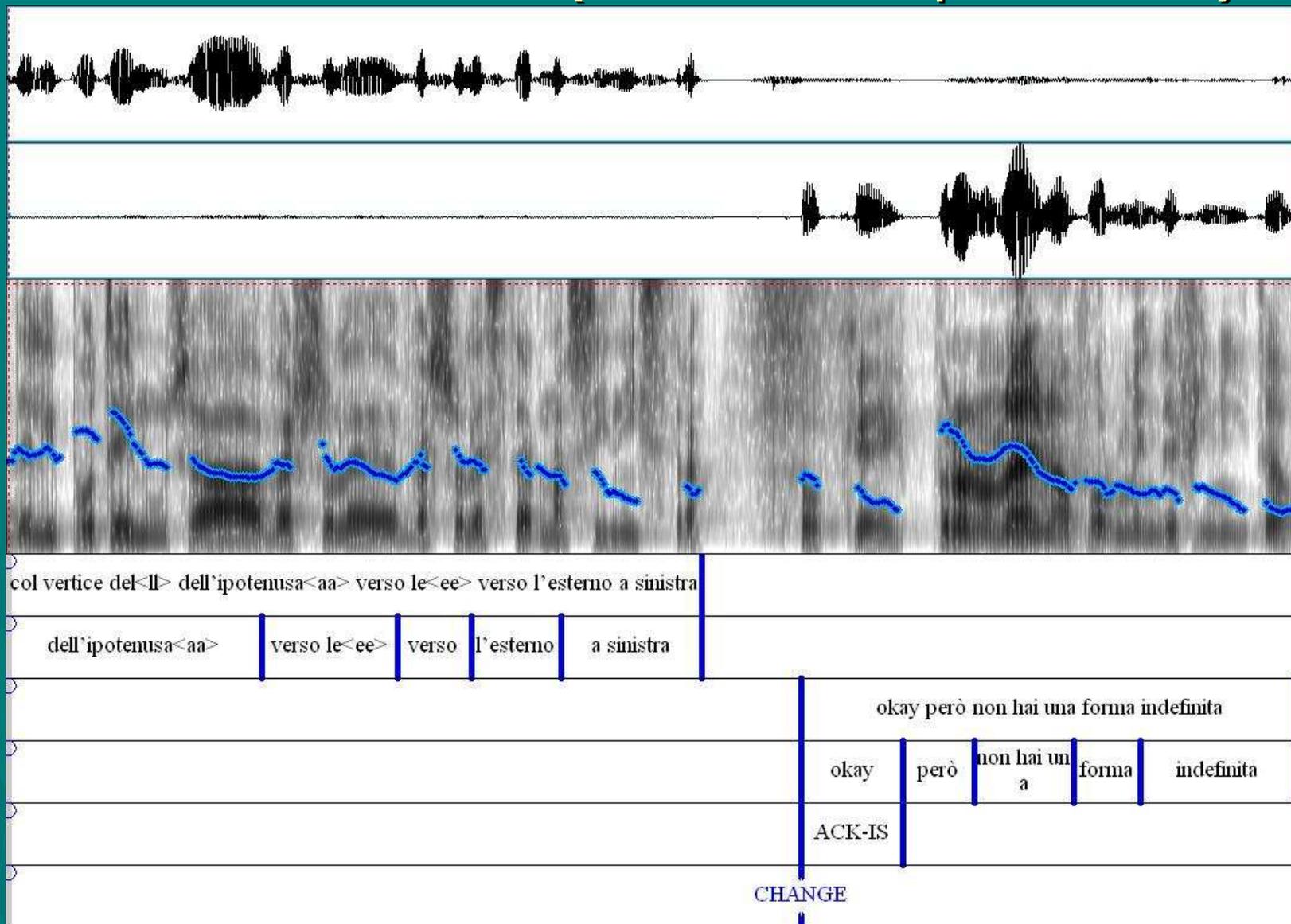
Turns and T-transitions Annotation

- ▶ Transition Relevant Places (TRP) = possible completion points of Turn Constructional Units (Sacks et al. 1974) → either HOLD or CHANGE
- ▶ **IPU** (Inter Pausal Unit) = operational definition of TCU:
 - Koiso et al 1998, Caspers 2003 = S's speech bounded by pauses >100ms (>50 ms in Gravano & Hirschberg 2011)
- ▶ **Turns**: maximal sequence of IPUs from one single speaker

T-transition types (reproduced from Caspers, 2003)



Praat annotation (Italian example slide 6)



Bibliography

- Allwood, J., Nivre, J., Ahlsen, E. (1993). On the semantics and pragmatics of linguistic feedback. *Journal of Semantics* 9(1), 1-30.
- Caspers, J. (2003). Local speech melody as a limiting factor in the turn-taking system in Dutch. *Journal of Phonetics* 31, 251-276.
- Clark, H. H. and Brennan, S. E. (1991). Grounding in communication. In: Resnick L. B., Levine, J. and Teasley, S. D. (eds.), *Perspectives on socially shared cognition*, pp.127-149, Am. Psychol. Assoc.
- Gardner, R. (2001). *When listeners talk*. J. Benjamins Pub.
- Gravano, A., Hirschberg, J. (2009). Backchannel-inviting cues in task-oriented dialogue. In: *Interspeech 2009*, pp.1019-1022.
- Gravano, A., Hirschberg, J. (2011). Turn-taking in task-oriented dialogues. *Computer, Speech and Language* 25, 601-634.
- Interspeech 2012 Satellite Workshop on Feedback Behaviours in Dialogue, Proceedings downloadable at <http://www.cs.utep.edu/feedback/proceedings.html>
- Jefferson, G. (1983). Notes on systematic deployment of the acknowledgment tokens "yeah" and "mm hm", TILL, Tilburg University, The Netherlands.
- Jurafsky, D., Shriberg E., Fox, B., and Curl, T. (1998). Lexical, Prosodic, and Syntactic Cues for Dialogue Acts. In: *ACL/COLING Workshop on Discourse Relations and Discourse Markers*, pp.114-120.
- Koiso, H., Horiuchi, Y., Tutiya, S., Ichikawa, A., Den, Y. (1998). An analysis of turn-taking and backchannels based on prosodic and syntactic features in Japanese Map Task dialogs. *Language and Speech* 41, 295-321.
- Levitan, R., Gravano, A., Hirschberg, J. (2011). Entrainment in speech preceding backchannels. In: *Proc. of the 49th Annual Meeting of the ACL*, pp.113-117.
- Nenkova, A., Gravano, A., Hirschberg, J. (2008). High frequency word entrainment in spoken dialogue. In: *Proceedings of the 46th Annual Meeting of the Association for Computational Linguistics on Human Language Technologies*, pp.169-172.
- Sacks, H., Schegloff, E.A., and Jefferson, G. (1974). A simplest systematics for the organization of turn-taking for conversation. *Language*, 50(4), 696-735.
- Schegloff, E. (1982). Discourse as an interactional achievement: some uses of 'hu huh' and other things that come between sentences. In: Tannen, D. (ed.), *Analyzing discourse: text and talk*, pp.71-93. Georgetown Univ. Press, Washington.