

Doing mutual understanding. Calibrating with micro-sequences in face-to-face dialogue

Janet Bavelas^{*}, Jennifer Gerwing¹, Sara Healing

University of Victoria, Canada

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Abstract

“Mutual understanding” has both cognitive and social, interactive meanings. Interlocutors can *have* or *share* a (cognitive) mutual understanding. We propose they also *do* mutual understanding in an observable, reciprocal, three-step micro-process called *calibrating*. Following Mead (1934) and several subsequent authors, calibrating sequences require three steps: The speaker introduces new information, the addressee responds, and the speaker follows up with evidence that the addressee's response displayed sufficient understanding for current purposes. Without the third step, the addressee would not have evidence of mutual understanding. We developed a microanalysis for reliably identifying calibrating sequences, then applied it to a random sample of face-to-face getting-acquainted dialogues. The results confirmed our three hypotheses: (a) calibrating sequences were continuous throughout these dialogues; 97% of the 1232 utterances that introduced new information were followed by the second and third steps. (b) The micro-sequences were short, averaging 5 s each. (c) They were also efficient, with almost two-thirds of the utterances playing a role in more than one sequence. Several factors enhanced generalizability, including the unstructured and diverse content of getting-acquainted dialogues, random sampling, high inter-analyst agreement, and replication of an earlier study. Calibration can link cognitive theories of mutual understanding with observable social interaction. We also describe applications in practical settings.

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1. Introduction

In any dialogue, whether on mundane or consequential topics, interlocutors use their words and actions to convey their experiences, thoughts, opinions, and insights to each other. In order for the conversation to proceed, they must display their agreement on the meaning of their words and actions so that, over the course of a conversation, they accumulate mutual understanding and can presuppose more and more information. This article distinguishes between *having* mutual understanding as a cognitive state and *doing* mutual understanding as an interactive process.

Several authors have described meaning-making and mutual understanding between interlocutors as an interactive process. Linell (2009) said “Meanings are made in situated interaction and discourse. They are brought to life in situations” (p. 222). Svennevig (2009) proposed that meaning is found in the interactions between interlocutors, most

^{*} Corresponding author at: Department of Psychology, University of Victoria, P.O. Box 1700 STN CSC, Victoria, BC, Canada V8W 2Y2.
E-mail address: bavelas@uvic.ca (J. Bavelas).

¹ Jennifer Gerwing is now a senior researcher at the Health Services Research Unit, Akershus University Hospital, Oslo, Norway.

evidently in conversation. Garfinkel (1967) emphasized even more strongly that shared agreement on meaning was “[a] social method *The appropriate image of a common understanding is therefore an operation rather than a common intersection of overlapping sets*” (p. 30, italics original).

At least four quite different approaches to dialogue have also treated mutual understanding as something interlocutors do together: In conversation analysis, Schegloff (1992) adopted Garfinkel's (1967) approach to intersubjectivity and offered a succinct analogy: Two computers with identical contents do not have common or shared knowledge (p. 1297). In Clark's (1996) collaborative theory, “speakers and their addressees go beyond . . . autonomous actions and collaborate with each other moment by moment to try to ensure that what is said is also understood” (Schober and Clark, 1989, p. 211). In Garrod and Pickering's (2008, p. 8) theory of interactive alignment, “interlocutors (conversational partners) work together to establish a joint understanding of what they are talking about”. Even more radically, Roberts and Bavelas (1996, p. 138) proposed that “the meaning of an utterance depends on both the speaker and addressee; it exists only ‘in’ their interaction.”

1.1. A three-step process unit for mutual understanding

This article follows in the interactive tradition and focuses on the observable details by which interlocutors create, ensure, and display mutual understanding between themselves. We start with George Herbert Mead's (1934) social and behavioral definition of *meaning* as a three-step process. In his well-known “conversation of gestures” (in which “gesture” meant any communicative act, verbal or nonverbal), he proposed that

It is not necessary, in attempting to solve this problem [of the meaning of meaning], to have recourse to psychical states, for *the nature of meaning*, as we have seen, is found to be implicit in the structure of the social act, implicit in *the relations among its three basic individual components*; namely, in the triadic relation of a gesture of one individual, a response to that gesture by a second individual, and completion of the given social act initiated by the gesture of the first individual. (p. 81, italics added)

In contemporary terms, Mead's “three basic individual components” would be three successive utterances, as illustrated in the following two excerpts from a getting-acquainted conversation between undergraduates (see Appendix A).²

Example 1. Robin and Lisa had established that Robin was “in Music,” and Lisa asked her, “What do you play?”

- 14. Robin: (matter of factly) “*French Horn*”
- 15. Lisa: (quietly) “*Wow*” (widens eyes, lifts head up and back)
- 16. Robin, overlapping: (nods)

Robin introduced new information at 14, and Lisa's response suggested that she had understood. However, it was only Robin's follow-up nod at 16 (which might otherwise seem redundant) that gave Lisa evidence that her response was sufficient evidence of understanding. This sequence was 1.83 s. In the following sequence, shortly afterward, the new information was not as straightforward.

Example 2. Lisa (who was not a Music major) volunteered information about what she played:

- 21. Lisa: (looking down; voice almost apologetic) “*I used to play the sax*” (with a shoulder and facial shrug,³ then looks up at Robin and smiles)
- 22. Robin, overlapping: (smiles, short laugh)
- 23. Lisa, overlapping: (laughs, shrugs her shoulders, and rolls her eyes)

At 21, Lisa named the instrument that she herself had played and seemed to deprecate it. At 22, Robin's laughing conveyed that she understood not only the name of the instrument but also Lisa's self-mocking opinion of its status, perhaps compared to the French Horn. However, Robin could not know that her laugh and smile demonstrated sufficient understanding until Lisa followed up at 23 with her own laugh and an even more exaggerated shrug. They had displayed a mutual understanding of what playing the sax meant to Lisa in 3.16 s.

² Meaningful visible acts and voice qualities are in parentheses, and stressed words are in italics. The utterance numbers match the transcript in Appendix A.

³ A quick retraction of one corner of the mouth, typically with the same meaning as a shoulder shrug (Chovil, 1991).

1.2. Three-step sequences since Mead

Sinclair and Coulthard (1975) were probably the first to identify three-step sequences in their studies of teacher–student interactions. Specifically, the teacher asked a test question, the student answered, and the teacher provided feedback on the answer's accuracy.

More generally, Marková and Linell (Marková, 1990; Linell and Marková, 1993) proposed a ubiquitous “three-step process as a unit of analysis in dialogue” (Marková, 1990, p. 129), which is explicitly based on Mead (1934). Their description fits Examples 1 and 2, above, as well:

Mead's “conversation of gestures” amounts to saying that for ... A to have his or her act (or utterance) *a* communicated and mutually understood, it takes the interactants, A and B, at least three steps. First A makes an action (gesture, utterance) *a*, then B responds to A's action, usually through another action (gesture, utterance) *b*, and then A must show his or her reaction to B's response, again usually through another action (gesture, utterance) *a'*. Note that without the third step, while A has access to B's understanding [displayed in the second step], B has not yet received any reaction from A and hence cannot know whether *b* fits in with A's ideas; hence, no mutual ground has been established ... (Linell and Marková, 1993, p. 182)

See also Tsui (1985), Roberts and Bavelas (1996), and Arundale (2010) on the necessity of a third step.

Linell and Marková (1993) went on to point out that each utterance must have multiple roles in their triads. “Each contribution (turn, utterance) is characterized conceptually by three elements (cf. the three-step analysis): the relationship to prior contribution(s), the contribution itself (with its propositional and illocutionary content), and the relationship to the next contribution(s)” (p. 183). The following example (from Linell, 2009) illustrates these multiple, interlocking roles.

Example 3. From a criminal trial in a Swedish court:

1. Judge: “Okay, then I am going to ask you, John Gregersson, what is your stance with regard to this first act?”
2. Defendant: “It is true.”
3. Judge: “You admit it?”
4. Defendant: “Yes.” (p. 196)

The defendant's admission at #2, “It is true,” has an obvious role in relation to the previous utterance, as it answers the judge's question. It is also new information with propositional content and even illocutionary force. Finally, it is the topic of the judge's formulation in the next utterance.

Multiple roles for single utterances are in fact necessary for a three-step model to work. Heritage (1984) had anticipated the problem: If a separate third step were always required, it too would have to be confirmed and the interlocutors would be trapped in “an endless task of confirming and reconfirming their understandings of each other's actions” (p. 258). That is, each bit of new information would have to be followed by evidence of mutual understanding from both the addressee and the speaker before any more new information could be introduced:

Example 3a. Hypothetical version of Example 3:

- 1a. Judge: “Okay, then I am going to ask you, John Gregersson, what is your stance with regard to this first act?”
- 1b. Defendant: “I understand your question.”
- 1c. Judge: “I accept that you understand my question.”
- 2a. Defendant: “It is true that I committed the first act.”
- 2b, 2c, etc.

Utterances that function backward and forward and have multiple roles, such as in Example 3, solve this problem and are maximally efficient. Whether interlocutors demonstrate the skill and coordination necessary for such efficiency is an empirical question for the present research.

More recently, Svennevig (2009) also proposed that interlocutors continuously negotiate joint interpretations in a three-step process: After a remark by the speaker, the interlocutor's response displays his or her interpretation of this remark, and the original speaker either ratifies or rejects the interpretation. Like Linell and Marková (1993), Svennevig pointed out that each utterance serves several roles. As illustrated in Fig. 1, the second step of the cycle initiates a new cycle while being responsive to the first step. The third step often initiates its own cycle while being responsive to the second step and ultimately ratifying (or rejecting) the other person's response to the first step. The interlocutors are continuously engaged in all three steps of the process: “to provide something new to the conversation, to respond to the other's utterance, and to signal the acceptability of the other's interpretation of one's own previous contribution” (p. 83, translated by JG). Svennevig called his process *negotiation* and proposed that the process itself, particularly the third step, can do more than

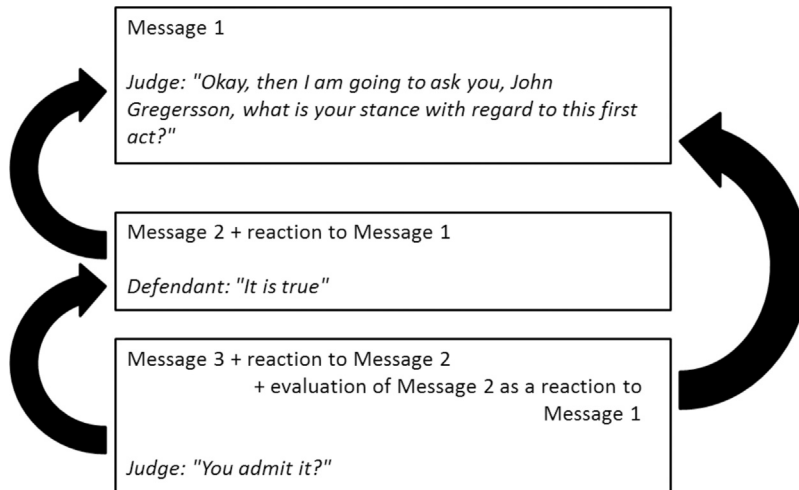


Fig. 1. Svennevig's (2009) illustration of the multiple roles of utterances in three-part cycles. (Adapted from p. 83; the messages are from Linell, 2009, p. 196.)

create a common understanding. It also creates the possibility of agreeing on an interpretation that may not be what the original speaker intended, with the decisive factor being not what the speaker originally intended but what the two interlocutors agree on during the second and third steps (p. 83, paraphrase of translation by JG).

Tolins and Fox Tree (2014) found direct evidence of the influence of the second step on the third, that is, of the addressee on the speaker. While the speakers were telling their addressees about a bad roommate experience, their addressees contributed back channels that were either generic (e.g., "Mhm") or specific (e.g., "Oh wow!"). The results showed that "After generic backchannels, [narrators] provide discourse-new events. After specific backchannels, they provide elaborative information on previously presented events" (p. 152). So the back channels did not conclude the sequence. Instead, speakers acted as if the backchannel had directed them to proceed in one way rather than another. Tolins and Fox Tree concluded, "More broadly, we suggest that a fully developed theory of backchannel communication includes not only their function as responses to speaker talk, but also their role in pushing unfolding speakers' talk along particular trajectories" (p. 163). This finding is consistent with Linell and Marková's (1993) and Svennevig's (2009) theories of utterances in three-step sequences that have more than one role.

1.3. Different sequence organizations

Several conversation analysts have reported three-step sequences and treated them as exceptions. For Peräkylä (2011) and Kevoe-Feldman and Robinson (2012), the third turns they observed were specific to particular situations. Heritage (1984, 2016) proposed that the *opportunity* for a third step was always available for repair – but used only if needed. In his words, the possibility of a third action was

a systematically given opportunity to repair any misunderstanding of the first action that may have been displayed in the second. Given the generic availability of this procedure, any second speaker may look to a third action to see whether this opportunity was taken and, *if it was not, conclude that [his or her second action] was adequate.* (1984, p. 258; italics added)

Schegloff (1992) took a similar position when he described the *possibility* of "repair after next turn" as "the last structurally provided defense of intersubjectivity in conversation" (p. 1295). That is, a third turn was an opportunity for ensuring intersubjectivity when it was threatened, but it would be waived if repair was not needed. Schegloff was even more explicit early in his 2007 treatise on sequence organization:

The discussion in the text which follows, and the numerous exemplars that are displayed there, are meant to ground the claim that the basic, minimal form of a sequence is *two* turns, and that sequences composed of more are expansions. . . . [In this view], it is the presence of additional turns in sequences longer than two turns which requires analytic accounting. (p. 22, italics original)

However, Schegloff (2007, p. 2) also implied a possible compromise. He distinguished between the general principle of *sequential organization*, which is “any kind of organization which concerns the relative positioning of utterances or actions” and the more specific term *sequence organization*, which refers to particular kinds of *sequential* organization for getting some activity accomplished. For example, turn taking or adjacency pairs are two specific sequence organizations. Recall that Marková (1990, p. 129) proposed “a three-step process as a unit of analysis in dialogue,” not “the unit of analysis in dialogue.” We therefore propose that our model is a specific *sequence* organization, that is, another kind of *sequential* organization for getting a different type of activity accomplished, namely, a micro-process of establishing mutual understanding.

A similar distinction applies to the work of Clark and his colleagues. Clark’s *grounding process* (Clark, 1996; Clark and Brennan, 1991; Clark and Schaefer, 1987, 1989; Clark and Wilkes-Gibbs, 1986; Schober and Clark, 1989) is also a social theory of how interlocutors accumulate mutual understanding. Speaker and addressee accomplish the criterion for mutual understanding in contributions with two phases: the speaker presents information, and the addressee accepts it. As with adjacency pairs, these *presentation* and *acceptance* phases often comprise several utterances while still remaining a two-step model. Thus the scale of grounding is larger than the scale of our proposed micro-sequences (e.g., Examples 1 and 2).

At one point, Clark and Schaefer (1987) drew on Clark and Wilkes-Gibbs (1986) to propose

a process of *mutual acceptance* [that] consists minimally of *three parts*:

- (a) A presents *u* [an utterance] for B to consider.
- (b) B accepts *u*.
- (c) A accepts that B accepts *u*.

During the presentation phase, A places her utterance *u* into consideration. During the acceptance phase, B needs to accept *u* in a unilateral acceptance. For *mutual* acceptance, however, A must accept that B has actually understood. *The acceptance phase includes both part b and part c.* (p. 20; emphasis added)

In short, mutual acceptance must be reciprocal. We can see a third step (part c) in virtually all of Clark and Schaefer’s (1987, 1989) examples, but it was always explicitly subsumed within the acceptance phase. Similarly, Clark and Brennan (1991, pp. 128–130) pointed out that contributions “may contain contributions embedded within both their presentation and acceptance phases.” Again, a three-step micro-process is a different sequence organization.⁴

Another distinguishing feature of the model proposed here is the inclusion of both speech and visible co-speech acts, which was not usual in the research of either conversation analysts or the Stanford Language Use Group at the time. Nodding, obviously, is a visible back-channel response, and Brunner (1979) showed that smiling can also serve the same function. More specific visible responses include eyebrows looking interested or puzzled (e.g., Ekman, 1979), wincing (Bavelas et al., 2000), and even mimicking gestures (Holler and Wilkin, 2011). Tsui (1985) suggested that third steps may be apparently missing in transcripts or audio recordings because they were often visible, not audible (e.g., Examples 1 and 2). In general, any of the three steps may include essential visible co-speech acts. For example, Bavelas et al. (2011) microanalyzed 552 nonredundant hand gestures (i.e., ones that introduced new information that was not in the accompanying words). Their results confirmed that the interlocutors demonstrated mutual understanding of these gestures in three-step sequences.

Visible co-speech acts contribute to another key feature of spontaneous face-to-face dialogues, its rapid reciprocity. Like audible minimal responses from the addressee (“mhm,” “yeah”), visible minimal responses often overlap with the speaker without being treated as interruptions (e.g., Goodwin, 1986). In Example 2, both the second and the third steps were overlapping visible co-speech acts, which accounts for the extreme brevity of the sequence. For all of these reasons, the appropriate test of the ubiquity of three-step calibrating sequences must use video recordings of face-to-face dialogue with both interlocutors on screen at all times (e.g., split-screen).

1.4. Testing the calibrating model

Our model operationalizes the theory of Marková and Linell (Marková, 1990; Linell and Marková, 1993). We propose that the interlocutors engage, utterance by utterance, in continuous three-step exchanges, which constitute the

⁴ Although we used *grounding* in earlier work (e.g., Roberts and Bavelas, 1996; Bavelas et al., 2011, 2012), *calibrating* is a more descriptive term for the micro-process and avoids confusion with Clark’s model.

micro-process of displaying and accumulating mutual understanding. That is, interlocutors constantly *calibrate* (i.e., “carefully assess, set, or adjust”; OED online) their understanding of new information. Just as two individuals can calibrate their watches by assessing any differences, adjusting if necessary, and agreeing on a common setting, the interlocutors can assess any difference in their understanding of new information, adjust if necessary, and agree on a mutual understanding.

More formally, *calibrating* in a spontaneous face-to-face dialogue is a *rapid, observable process of continuous three-step micro-sequences through which the interlocutors indicate a mutual understanding of new information that is sufficient for current purposes*. The three steps of calibrating are

- A. The speaker initiates the sequence by presenting new information (the *A-initiation*).
- B. The addressee responds in a way that implies or demonstrates understanding (the *B-response*).
- C. The speaker follows up in a way that implies or demonstrates that the addressee’s response was sufficient for current purposes (the *C-follow up*).

Examples 1 and 2 also show that calibrating sequences are fast, often overlapping, and include both audible and visible responses. Upon completion of all three steps, the interlocutors have calibrated the new information.

Three hypotheses follow from this model of calibration:

1. The three-step sequences will be continuous throughout dialogues, that is, virtually all new information will initiate a three-step sequence. Bavelas et al. (2011) found that 92% of new information followed the predicted three steps. Therefore, our data should show 8% or fewer incomplete sequences.
2. These sequences will be rapid. Based on previous observations, they should be completed in 10 s or less. That is, longer chunks of new information will be calibrated in shorter installments.
3. To be both continuous and rapid, the sequences have to be efficient, with individual utterances more likely to have two or three roles rather than a single one (Linell and Marková, 1993; Svennevig, 2009).

Note that experiments such as those that support alignment or collaboration (e.g., Pickering and Garrod, 2014; Clark, 1992, 1996) show effects that are consistent with our model but cannot provide direct evidence of a specific intervening process. Fortunately, because the calibrating process is observable, it is possible to develop a reliable analysis that documents three-step micro-sequences in order to test our prediction in a random sample of dialogues.

We chose getting-acquainted conversations because they maximized generalizability in several ways: (a) Getting acquainted with a new person is a familiar and typical dialogue in everyday life. (b) The process of getting acquainted has been studied both in data from the lab (e.g., Maynard and Zimmerman, 1984) and in conversations in other settings (e.g., Svennevig, 1999). (c) In contrast to the usual referential communication tasks, the range of possible topics is open. (d) There is no fixed format, and the interlocutors move freely between being speaker and addressee. Thus, these dialogues presented heterogeneous patterns of interaction that also resembled a common dialogue outside the lab.

2. Data

2.1. The sample

We have a video archive of face-to-face dialogues between volunteer undergraduates at the University of Victoria in a variety of previous experiments. Five of these experiments met our criteria of (a) beginning with a getting-acquainted conversation between participants who were meeting for the first time and (b) having been recorded in high-quality, split-screen video, with both interlocutors on camera at all times: Bavelas et al. (2000, 2008, 2011, 2014b); Chovil (1989; published in Chovil, 1991). The five experiments, which were conducted by different experimenters over a period of 25 years, yielded 72 getting-acquainted conversations. We drew a stratified random sample of 25% of the dyads in each experiment. The resulting sample was 19 dyads (8 female–female, 4 male–male, and 7 mixed gender). These dialogues supplied a total of 53 min, 15 s of dialogue with an average duration of 2 min 48 s each.

2.2. Equipment

Over the time covered by the source experiments, the cameras, recording, and special effects equipment in the Psychology Department’s Human Interaction Lab at the University of Victoria changed; see details in each of the articles cited above. The four camera configurations used are shown in Fig. 2.



Fig. 2. Camera configurations in the various data sets. In each dialogue, the interlocutors sat across from each other (note: two studies used configuration B).

Any analogue recordings were digitized with Pinnacle Studio Plus version 11 (www.pinnaclesys.com). The analysis software was ELAN (<http://tla.mpi.nl/tools/tla-tools/elan/>) from the Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands. ELAN is multimedia annotation software for viewing video from frame-by-frame to double time and for annotating it on multiple layers (i.e., tiers) that remain tightly synchronized with the video (e.g., [Wittenburg et al., 2006](#)).

3. Analysis

3.1. The inductive phase

Our research group has developed a research method, *microanalysis of face-to-face dialogue*, for the moment-by-moment analysis of multi-modal data and has applied it in dozens of projects (e.g., [Bavelas et al., 2016](#)). One key feature of this method is that it usually begins with an inductive phase, that is, deriving a new analysis from the particulars of data. The resulting formal analysis can then be tested in a deductive phase, as illustrated in this article.

The immediate roots of the calibration project were in work with clinical colleagues interested in co-construction (e.g., [Bavelas et al., 2014a](#)), which provided many examples of three-step sequences in psychotherapy interviews. These observations and preliminary definitions suggested that it was worth developing a comprehensive, systematic, and formal analysis to test for the ubiquity of three steps in a wider range of data. (The analysis by [Bavelas et al., 2011](#), was encouraging although its purpose was limited to sequences that began with the use of a non-redundant gesture within a specific experimental task.)

JG and SH developed, applied, and tested the analysis in this article. The first step was to draw the stratified random sample described in Section 2.1 and to set these dialogues aside for the later formal analysis. Then, we were free to use any of the remaining dialogues from the five studies as developmental data. This inductive phase was an iterative process – proposing and defining key elements (e.g., new information, B-responses, C-follow ups), then testing and refining these definitions against more data.

The biggest challenge was how to recognize what was (and was not) new information. It quickly became clear that evaluating each utterance as an isolated, unique set of words was not workable; some grouping was necessary. Grammatical features (e.g., declarative, noun phrase) were untenable because they would isolate an utterance from its immediate context. Speech acts, direct or indirect, were also unsuitable because they focus on the speaker's intention and presume the perlocutionary effect on the addressee. Neither approach helped to decide whether an utterance did or did not introduce new information. Instead, we created an intermediate (and previously completely unforeseen) step, namely, deciding on an utterance's *interactive function*, that is, what was this utterance doing at this point in the dialogue – what did it respond to and what did it project? Our initial attempts generated five or six interactive functions, but more dialogues revealed utterances that did not fit this limited set and led to additional functions. Finally, a set of 15 interactive functions worked for any dialogues drawn from the developmental data.

A major advantage of interactive functions was that they were based on predicting whether the utterance *should*, *could*, or was *unlikely* to initiate a calibrating sequence; see Section 3.4, below. Using a similar inductive process, we defined B-responses and C-follow ups. This trial-and-error process ultimately resulted in a systematic procedure for making all of the necessary decisions, articulated and illustrated in a 60-page manual that includes operational definitions, decision criteria, a 22-tier ELAN system (see Fig. 3), and a set of 11 procedural decision trees (all available from any of the authors).

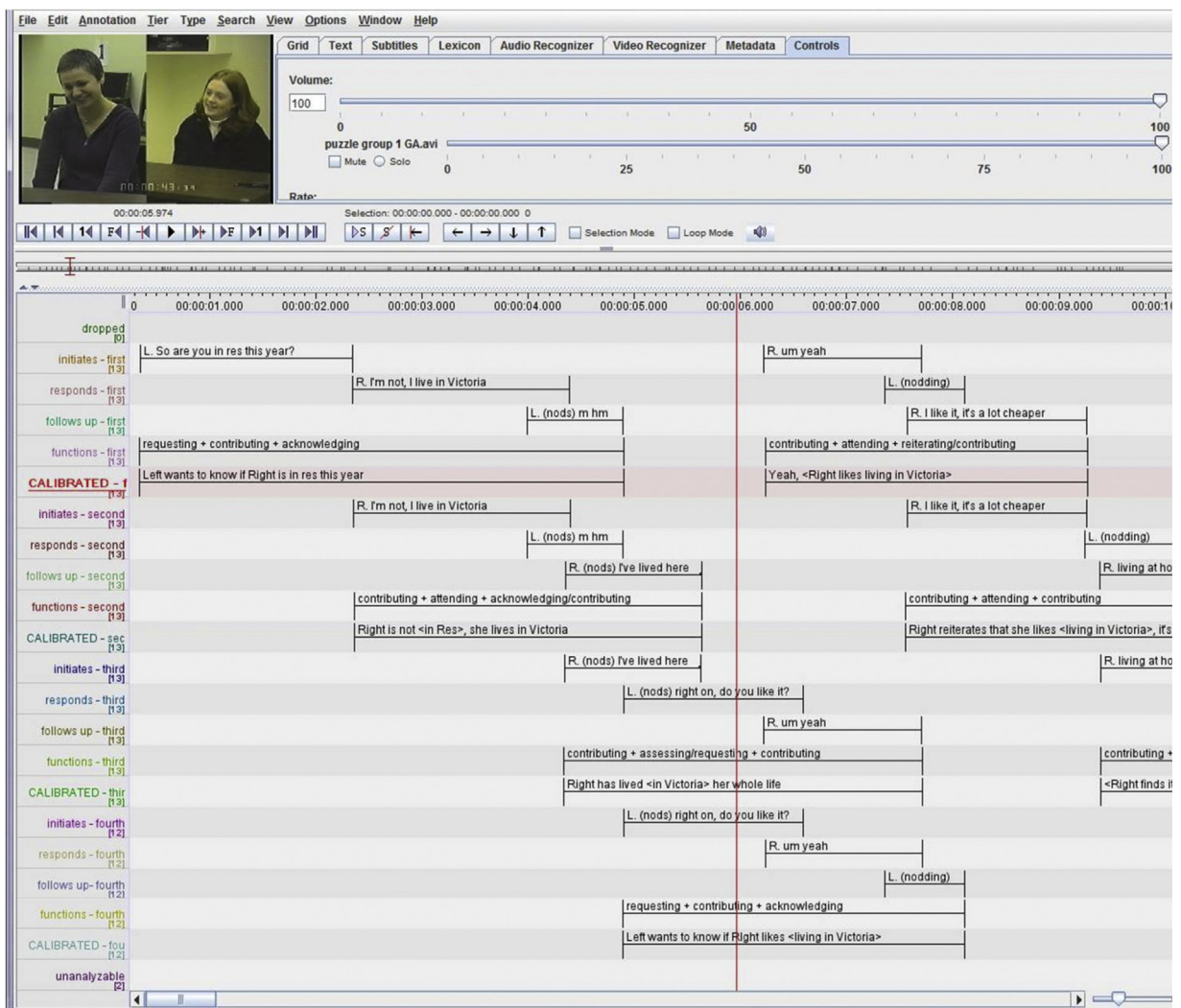


Fig. 3. ELAN analysis format with 22 tiers, showing lines 1–8 of Appendix A.

The test of our analysis system was whether it would also fit the data in the stratified random sample, which had been excluded from its development. This final step of *cross-validation* (e.g., Bavelas et al., 2016, p. 141) provides a test of the analysis system and of our hypotheses using data that was comparable but entirely new. These are the analysis and results reported in this article.

3.2. Overview of the formal analysis procedure

The goals of the analysis were (a) to identify new information when it entered the dialogue and (b) to establish whether that new information was calibrated in the hypothesized three steps. Achieving these goals required several systematic intermediate steps; see Fig. 4 for a schematic representation. The analysts proceeded incrementally through these steps, first identifying the starting and ending points of an utterance, then specifying its interactive function, which in turn determined whether it was likely to convey new information. If it did, the next steps determined whether it was calibrated in a three-step sequence. These four main decisions are explicated briefly in Sections 3.3–3.7.

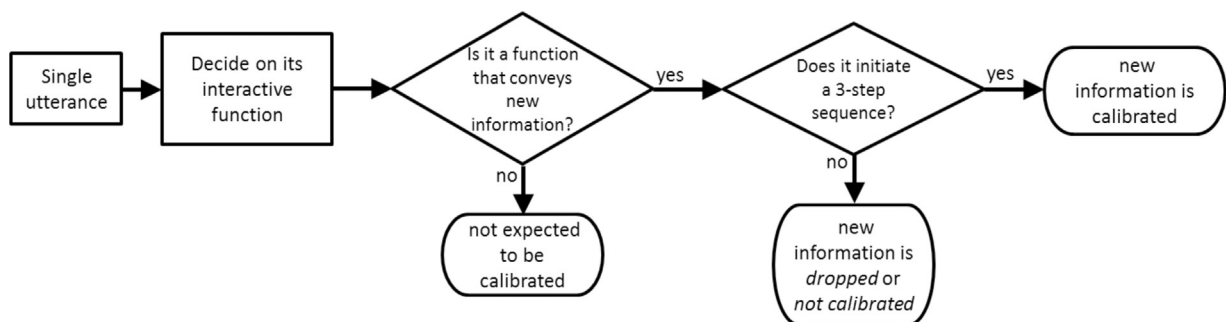


Fig. 4. Schematic representation of the steps of analysis.

3.3. Identifying a single utterance.

An *utterance* included audible actions (speech, prosody) integrated with what interlocutors were conveying in concurrent co-speech acts (i.e., facial gestures, hand gestures, gaze). An utterance could also be solely visible (e.g., a nod, smile, or raised eyebrows) and could range from a quick nod or a single word to one or more sentences. The end of an utterance was determined by the actions of both individuals: A speaker's utterance ended either when the speaker paused and looked at the addressee, creating a gaze window to elicit a response (Bavelas et al., 2002) or when the addressee said or did something that could be construed as communicative (e.g., a formulation, "M-hm," or a nod).

Example 4. Lisa has just asked whether Robin likes living in Victoria (off campus) rather than in a University Residence. (Note that, throughout this dialogue, each successive utterance overlapped the end of the previous utterance).

8. Robin: "I like it, it's (nodding) *a lot cheaper*"

9. Lisa: (nodding, eyes widened)

10. Robin: "living at *home* (slight nodding), so"

11. Lisa: (nods, soft voice, then looking down) "Oh for *sure*"

12. Robin: "it's nice" (.6 s pause while looking away, then back) "Um I'm, and I'm in *Music*"

By our definition of utterance, what Robin said in lines 8, 10, and 12 ("It's *a lot cheaper* living at *home*, so it's nice") was three separate utterances, divided by minimal responses from Lisa. In contrast, at line 12, Robin paused but looked away from Lisa, who did not respond during the pause. Thus neither the speaker's actions nor those of the addressee fulfilled our criteria for dividing this into two utterances. (Subsequent analysis would take into account that this utterance had two different functions.)

3.4. Identifying an utterance's interactive function

Analysts grouped utterances by their *interactive function*, that is, by what the utterance was doing at this point in the unfolding dialogue, especially in relation to the preceding utterance. An utterance such as “You live in town?” could be an informal request for information. However, if this utterance was a response to “I live in town,” its function would be *formulating* what the other person had said. Some utterances are entirely context dependent: When “yeah” was preceded by a question that it answered, its function was *contributing new information* (e.g., Appendix A, lines 5 and 6). If “yeah” was preceded by a formulation, its function was *confirming* what was just said.

Note that our calibration model is predictive, not descriptive. That is, it predicts what would follow an utterance, specifically, some evidence that the addressee has understood and that the speaker has deemed the addressee's evidence to be sufficient. Therefore, what followed an utterance could not influence the analysts' decision about that utterance's interactive function. For example, “Where do you live?” would be *requesting new information* regardless of whether the addressee ended up providing the information. Finally, it was possible for a single utterance to have more than one function. In Example 4, line 12, “It's nice. Um, I'm, and I'm in *Music*” began by Robin *reiterating* (paraphrasing) topical content she had conveyed earlier (“It's nice”) and then *contributing new information* (“I'm in *Music*”).

Tables 1–3 provide definitions and examples of the 15 interactive functions. These tables also group interactive functions by their second, equally important purpose, which was to determine the likelihood that an utterance conveyed new information, as described in the next section.

Table 1

Six utterance functions that conveyed new information and SHOULD therefore initiate a 3-step calibration sequence.

Utterance function	Operational definition	Examples
CONTRIBUTING new topical content	An utterance that functions to present topical content that is new to this particular conversation (i.e., presenting facts, opinion, or descriptions; characterizing, specifying, elaborating).	<ul style="list-style-type: none"> • I'm from Kelowna • I'm going into commerce • I'm just in first year, I don't know (furrows brow) any what I am doing
REQUESTING new topical content	An utterance that functions to invite new topical content that has not yet come up in the conversation.	<ul style="list-style-type: none"> • Where are you from? • What year are you- are you in first year? • How was that?
PROPOSING something	An utterance that functions to manage the conversation at a meta-level, above the level of topical content (e.g., to start the conversation, end the conversation, shift topics, end current topic, change speakers). PROPOSING can be a familiar discourse shift marker such as “anyways” or “so, yeah”, often left hanging prosodically.	<ul style="list-style-type: none"> • Do you think we're done? • Should we move on? • But... anyways... (often an implicit way to shift the topic) • You wanna go first?
ALERTING that repair is needed	An utterance that functions to signal that there is some trouble in hearing or understanding. There are two different occasions for alerting: Alerting that <i>I did not hear (or understand) you</i> . The person who is alerting indicates that he or she needs to hear the utterance again or needs a rephrased version because it was not understandable in its current form. Alerting that <i>you did not understand me</i> . In this case, the person doing the alerting is saying that he or she has been misunderstood and will usually repeat or rephrase his or her contribution so that the other person will understand.	<ul style="list-style-type: none"> • Pardon? • Sorry?
RE-INTRODUCING information	An utterance that functions to invite confirmation that this information was previously calibrated. It initiates a topic shift to the information being re-introduced.	After calibrating on the fact that the boyfriend of one of the participant's lives in Kelowna, they talk about other things. Then later, the other participant says “And your boyfriend lives in Kelowna right now?” as an introduction to suggesting which university she thinks her interlocutor could consider applying to.
SCRIPTING initiating a script	An utterance that functions as an invitation to start a conversational routine or script without inviting or contributing new topical content. These should have a predictable or stereotypical response.	<ul style="list-style-type: none"> • How's it goin' (predictable response = some variant of “fine”) • Nice to meet you (predictable response = some variant of “you, too”)

Table 2

Five utterance functions that do not convey new information and are UNLIKELY to initiate calibration sequences.

Utterance function	Operational definition	Examples
ATTENDING to the other person	A minimal response with no semantic link to what the speaker just said. It functions simply to imply that the addressee is paying attention to the speaker.	<ul style="list-style-type: none"> • M-hm • U-huh • (Nodding)
ASSESSING what the other person said	A minimal response with a semantic or interpretive link to what the speaker just said. It functions to show the addressee's reaction to the information the speaker just contributed. Note that if the brief response repeats any of the words of the speaker, it should be considered FORMULATING instead.	<ul style="list-style-type: none"> • Really? • Cool! • (laughing)
CONFIRMING what was just said	An utterance that functions to affirm or verify that what was just said is acceptable; it occurs when the previous speaker appears to be seeking confirmation (e.g., using a questioning pitch). CONFIRMING often follows ASSESSING, FORMULATING, RE-INTRODUCING information.	<p>Rose confirms Beth's formulation in line 4</p> <ol style="list-style-type: none"> 1 Beth: Are you doing a Psychology major? 2 Rose: I'm thinking about it 3 Beth: You're thinking about it 4 Rose: (nods) <p>Beth confirms Rose's formulation in line 4</p> <ol style="list-style-type: none"> 1 Rose: Did you live in- do you live in res? 2 Beth: Ah no, ah yeah- I'm from Victoria 3 Rose: So you live at home still? 4 Beth: yup
LINKING	A conjunction at the beginning of a C-follow-up that functions (a) to implicitly accept the B-response by building on the previous A-initiation or B-response and (b) to show that the content in the C-follow-up is to be interpreted within the context of the content presented in the A- Initiation.	<ul style="list-style-type: none"> • And • So • But • Or • Otherwise
ACKNOWLEDGING that the B-response was acceptable	A brief utterance in the C-follow-up position that functions only to show explicitly that the other person's B-response was acceptable; it contributes no new topical content. Acknowledging only happens in C-follow-ups. Some of the typical forms are the same as attending or assessing; they differ based on their position in a calibration sequence.	<ul style="list-style-type: none"> • Yeah • Ok • (smile) • (laughing) • (nodding)

3.5. Identifying when an utterance introduced new information

The interactive function of an utterance was the intermediate step that determined the likelihood that an utterance should, could, or was unlikely to initiate a calibration sequence. Table 1 shows six interactive functions that *should* convey new information. Speakers could introduce new topical content by *contributing* new topical content to the conversation (e.g., facts, opinions, descriptions) or *requesting* new topical content from the other person. Speakers could also convey new information at the level of managing the conversation by *proposing* that the dyad do something new (e.g., start the conversation or change the topic), *alerting* the other person that there had been a problem with hearing or understanding, *reintroducing* information that had been calibrated earlier in the conversation (as a way to shift the conversation back to that topic), or initiating a conventional *script* (e.g., greeting, exchanging names). We hypothesized that each utterance serving one of these six interactive functions should initiate a calibration sequence.

Table 2 shows five functions that were *unlikely* to introduce new information. These were all forms of minimal responses that functioned as B-responses or C-follow-ups: *attending*, *assessing*, *confirming*, *linking*, and *acknowledging*. Although utterances with these functions were arguably informative to the other interlocutor (e.g., an addressee's nod could inform the speaker that the addressee had understood and the speaker could continue), these were not new information in our model. They served the calibration process but did not themselves require calibration.

Finally, Table 3 shows four interactive functions that fell between these two clear groups because they *could* (sometimes) convey new information. For example, when *formulating* what the other person said, speakers often simply repeated it or rephrased it slightly, which would not convey anything new. However, speakers might transform the original content enough that the utterance could be conveying something new. Similarly, when speakers were *reiterating* what

Table 3

Four utterance functions that COULD convey new information.

Utterance function	Operational definition	Examples
FORMULATING what the other person said	An utterance that functions to provide a display of what the addressee has understood by furnishing the gist of the previous contribution.	Beth formulates Rose at line 3 1 Beth: Are you doing a Psychology major? 2 Rose: I'm thinking about it 3 Beth: You're thinking about it Rose formulates Beth at line 3 1 Rose: Did you live in- do you live in res? 2 Beth: Ah no, ah yeah- I'm from Victoria 3 Rose: So you live at home still?
REITERATING what one said earlier	An utterance that functions to emphasize or repeat content that the same person already contributed earlier.	Beth reiterates herself at line 3 1 Beth: It's a bad idea! (shaking head) 2 Rose: and I don't know (laughing) 3 Beth: Don't do it! (smiling)
ACCEPTING the proposal	An utterance that functions to indicate agreement to manage the conversation as proposed.	Beth accepts Rose's proposal at line 2 1 Rose: Well you can go first if you want 2 Beth: OK
FOLLOWING the script	An utterance that functions to follow along with the script the other person initiated by providing the predicted response. Note that if the speaker provides an unexpected response (e.g., replying to "how's it goin'" with the answer "terrible, actually!"), the utterance function should be CONTRIBUTING new topical content instead of following the script.	Beth follows Rose's script at line 2 1 Rose: How's it goin'? 2 Beth: Good Rose follows Beth's script at line 2 1 Beth: Nice to meet you (holds out hand) 2 Rose: Nice to meet you, too (shakes hand)

they had said earlier, they could repeat or rephrase only slightly, or they could change their original contribution enough that the content could be considered new information. *Following the script* or *accepting the proposal* was ordinarily routine, but either could also introduce new possibilities. The analysts always checked whether interlocutors completed calibration sequences after utterances with these four functions. Although incomplete calibration sequences after *should* functions counted against our hypothesis, incomplete sequences after *could* functions did not.

In either case, in order to establish whether the new information (which we are calling an *A-initiation*) was calibrated, the two successive utterances had to fulfill the criteria of a B-response, then a C-follow-up.

3.6. B-responses

After an A-initiation, the analysts looked for a B-response. For the next utterance to be a B-response, it had to be from the other person and it had to imply or display an understanding of the A-initiation by being semantically compatible with it.

Example 5. A-initiation requesting new topical content followed by B-response contributing new topical content.

1. Lisa: (smiling broadly) "So are you in *Rez* [university residences] this year?"
2. Robin: (also smiling) "I'm not, I live in *Victoria*"

Example 6. A-initiation contributing new topical content followed by B-response assessing what the other person said. Lisa had asked "How long have you been doing that [playing the French horn]?"

18. Robin: "Uh" (looks away with thinking face) "*five years*, something like that"
19. Lisa: (smiles) "that's *awesome*"

If the other person did not respond, the new information in the potential A-initiation would be considered *dropped*. For example, interlocutors might resolve simultaneous speech by ignoring one of the utterances, which would therefore be dropped. Or if the next utterance did not fit the criteria for a B-response, the A-initiation was also dropped, and analysis started over with the next utterance.

3.7. C-follow-ups

Finally, for the new information in the A-initiation to be calibrated, the B-response had to lead to a C-follow-up. C-follow-ups had to come from the original speaker and had to show the results of the speaker's evaluation of the other person's B-response, indicating that he or she deemed the addressee's response as sufficient evidence that the addressee had understood the new information in the A-initiation. There were several ways the speaker could indicate or imply the addressee's B-response was sufficient:

First, if the interactive function of the utterance was *acknowledging*, *confirming*, or *linking*, it was automatically a C-follow-up because that was the only role it could fulfill in that position. In the following example, in line 50, Robin used an initial "and" to link her continuation to her A-initiation at line 48, which presupposed that Lisa had understood line 48.

Example 7. Lisa asked Robin how she got into the sport of curling.

48. Robin: "My *mum* did it. So I *watched* her one time and--when I was like *nine*"

49. Lisa: (very quietly) "Yeah"

50. Robin: "And I said "(shaking head, higher pitch)" 'Oh I *wanna* do that'"

In some cases, the speaker had included a link earlier, at the end of the A-initiation, and a completion of the link in the third step was also a C-follow-up; in Example 4 above, Robin's utterance at line 10 ended in "so," which she completed at line 12.

Second, if the utterance used either a *deictic reference* or *elliptical clause* for the new information in the A-initiation, this utterance was a C-follow-up because these forms require and therefore presuppose mutual understanding of information that had been calibrated earlier. In [Geluikens' \(1991\)](#) term, the information was *recoverable*.

Example 8. Deictic reference in C-follow-up. Lisa asked Robin if she was living in Rez this year.

2. Robin: (smiling) "I'm not, I live *in Victoria*."

3. Lisa: (nods) "M-hm"

4. Robin: (nods) "I've *lived here* my whole life."

In line 4, Robin replaced "in Victoria" with "here," thereby presupposing that Lisa had understood sufficiently. The same is true for ellipsis, as in line 29, below:

Example 9. Elliptical response as C-follow-up.

27. Lisa: "I'm in *second year*" (1.1 s pause while looking down) "Um" (looks up) "I lived in Rez *this year* but now I'm in an apartment"

28. Robin: (nods)

29. Lisa: "with a *roommate*" (shrugs with cute face)

Third, if the function was *reiterating* or *formulating*, it was a C-follow-up as long as the rephrasing implied that the B-response had displayed understanding of the A-initiation. In Example 2, at line 23, Lisa reiterated her shrug from line 21 as part of showing that Robin's laugh had displayed sufficient understanding.

Fourth, in other instances, the C-follow-ups were connected through their relation to the B-response, for example, answering a question:

Example 10. In the second part of the utterance at line 12, Robin introduced a new topic:

12. Robin: "...Um I'm, and I'm in *Music*"

13. Lisa: (widens eyes, leans forward) "Oh, what d'you *play* here?"

14. Robin: "*French horn*"

Lisa's question obviously showed that she understood Robin was "in Music." Therefore, answering the question showed Lisa that her understanding was correct. The same principle applies to accepting a proposal or following a script.

Finally, a C-follow-up could be an utterance that, although lacking any of the above features, presupposed and clearly built on the A-initiation by contributing new information that inherently required understanding of the A-initiation. For example, lines 45–47 in the following sequence:

Example 11. They were talking about one of Robin's main sports, curling, to which the deictics in lines 43 and 45 are referring:

43. Lisa: (still smiling) “Yeah but you should be *proud* it's the *Canadian* thing”
 44. Robin: (laughs and smiles, then, drawn out) “*Yeah*”
 45. Lisa: (looking down, not smiling) “Well *that* and *hockey* I suppose”
 46. Robin: “*Yeah*” (shaking head) “I don't play hockey though” (slight smile)
 47. Lisa: “*How* did you get into *curling*?”

At line 45, Lisa said that curling and hockey were the Canadian thing. They had already established that Robin was a curler, so when Robin eliminated hockey, Lisa's question about curling followed logically.

If there was no C-follow-up meeting one of the above criteria, the A-initiation was *not calibrated*.

3.8. Recording the calibrated information

When the potential A-initiation did result in a full three-step sequence, then the interlocutors had provided each other with evidence of their mutual understanding. The information presented in the A-initiation could now be annotated on a separate tier, using the speaker's exact words; see column 4 in [Appendix A](#).

Example 12. Robin had asked whether Lisa does any sports.

33. Lisa: (slowly) “*Um, I swim, I run*”
 34. Robin: (several nods)
 35. Lisa: (very quietly) “but other than that not really, I *roller blade*”
 36. Robin: (nods) “That's cool”
 37. Lisa: (nods) “You?”

In lines 33–35, the new information they calibrated was “Lisa swims and she runs.” The analysts used the speaker's exact words to note what was calibrated. However, when the speaker used deictic expressions or elliptical clauses, these had to be disambiguated by replacing them with what was recoverable in previous utterances, marking the replacement with angle brackets. For example, in line 35, Lisa used a deictic expression (“that”) to refer to swimming and running. She also used an elliptical clause (“not really”) to refer to whether she plays sports, which had been calibrated earlier. So for lines 35–37, the information that was calibrated was “Other than <running and swimming> Lisa does not really <play sports> She roller blades.”

3.9. Identifying the next A-initiation

Recall that, as [Linell and Marková \(1993\)](#) and [Svennevig \(2009\)](#) proposed, an utterance could serve more than one role in an overlapping sequence. Often, a B-response or C-follow-up conveyed new information, becoming an A-initiation in the next sequence; see examples in [Table 4](#). Therefore, analysis proceeded incrementally, with B-responses and C-follow-ups re-examined for whether they also initiated their own calibration sequences.

Table 4
 Example of utterances with multiple roles in successive calibrating sequences.

Utterances ^a	Roles in each sequence					Number of roles
	Sequence 1	Sequence 2	Sequence 3	Sequence 4	Sequence 5	
1 Lisa: (smiling broadly) “So are you in <i>Rez</i> this year?”	Initiating					1
2 Robin: (also smiling) “I'm not, I live in <i>Victoria</i> ”	Responding	Initiating				2
3 Lisa: (nods) “m-hm”	Following up	Responding				2
4 Robin: (nods) “I've <i>lived here</i> my whole life”		Following up	Initiating			2
5 Lisa: “Right on, do you <i>like</i> it?”			Responding	Initiating		2
6 Robin: “um <i>yeah</i> ”			Following up	Responding	Initiating	3
7 Lisa: (nodding)				Following up	Responding	2
8 Robin: I like it, it's (nodding) <i>a lot cheaper</i>					Following up	1

^a Lines 1–8 in [Appendix A](#).

3.10. Inter-analyst agreement

The two analysts had to make three essential decisions: (a) where each utterance started and stopped, (b) whether each utterance contained new information, and (c) whether the utterances containing new information were calibrated, not calibrated, or dropped. Some of these required one or more intermediate decisions; any disagreements on those would be reflected in the final decision.

We assessed agreement utterance by utterance (not, for example, by correlating analysts' total number of utterances, of new information, or of calibrated sequences for a dyad). The reliability sample was a random 10% of the total number of minutes in 19 dyads (53 min, 15 s), therefore, 5 min, 20 s of dialogues, chosen as follows: To ensure that no dyad represented a disproportionate amount of the reliability sample, a first random procedure selected 13 dyads from which a 30 s excerpt would be drawn. Then a second random procedure ensured that these 30 s excerpts came from all phases of the dialogues (i.e., beginning, middle, and end). The analysts worked independently on these excerpts with the following inter-analyst agreement: 94% for deciding whether an utterance contained new information, 89% for deciding whether the new information might be divided into two or more utterances, and 98% for deciding whether new information was ultimately calibrated.

4. Results and discussion

The data set yielded 2205 utterances in 53 min, 15 s of dialogue, an average of 116 utterances per dialogue (range = 54–176 utterances). Ten utterances were not analyzable (nine because they were inaudible and one because the experimenter had entered the room during the utterance). In addition, 67 utterances were analyzable but did not fit the criteria to be either an A-initiation, B-response, or C-follow up; see details in section 4.3, below. Of the remaining 2128 utterances, 1269 introduced new information.

4.1. Primary hypotheses

The results strongly supported our first hypothesis that the three-step sequences would be continuous throughout dialogues. Of the 1269 utterances that conveyed new information, 97% (1232) were completed with three-step calibration sequences. Only 3% (37) of utterances conveying new information resulted in incomplete sequences. Of these, 23 were dropped because the addressee made no B-response, and 14 were not calibrated because the original speaker did not provide a C-follow-up.

Because of the singular importance of C-follow-ups to our first hypothesis, it is useful to look more closely at the kinds of utterances that qualified and their frequencies. That is, what constituted acceptable evidence from the speaker that the addressee's B-response had shown an understanding of the speaker's A-initiation that was sufficient for current purposes? As described in detail in the Method section, the utterances that served as C-follow-ups could vary in explicitness and the nature of their connection to the B-response while still meeting the criterion. Table 5 shows the frequency and characteristics or functions of utterances accepted as evidence of the third step.

We also followed up on Tsui's (1985) suggestion that some previous researchers might have missed the ubiquity of third steps by using audio recordings or transcripts of face-to-face dialogues, thereby omitting visible utterances that could be functioning as acknowledgements. Our data confirmed this possibility: There were 468 C-follow-ups with an acknowledging function; for 370 of these, acknowledging was the sole function of the utterance (e.g., a "yeah" or nod alone, not followed by contributing new information). Of these 370 utterances that were the only evidence of the third step, 111 (30%) were visible (e.g., a nod, head shake, shrug, smiling) and *not* accompanied by speech. Without the visible action, there would appear to be no third step.

The second hypothesis, that the calibrating sequences would be rapid, 10 s or less, was also strongly supported: mean duration = 5.0 s (SD = 2.7 s), median = 4.4 s, mode = 6.2 s, range = 1.3–23.3 s. (As these figures suggest, the distribution of durations was positively skewed ($G1 = 2.03$.) Thus, the interlocutors introduced and calibrated new information at a mean rate of 23.61 sequences per minute (SD = 4.18 s); range = 14.38–30.15 s.

The third hypothesis was that calibration sequences would be efficient, with individual utterances more likely to have two or three roles rather than a single role. As predicted, the sequences were often overlapping, with 62% of utterances serving more than one role in contiguous sequences (50% served two roles, 12% served all three roles). These results support the proposals of Linell and Marková (1993, p. 183) and Svennevig (2009).

Table 5
Utterances in the C-follow-up step that completed a calibrating sequence.

Nature of connection	Function or form	Frequency	Sub-totals	Percentage
Explicit	Acknowledging	468		
	Linking	126		
	Confirming	76		
	Link projected in A-initiation	22		
	Total of explicit functions		692	56%
Marked as calibrated information	Elliptical clause	138		
	Deictic reference	123		
	Total marked as calibrated		261	21%
Linked by function	Answering a question	105		
	Reiterating	33		
	Formulating	32		
	Accepting	8		
	Following	3		
	Total linked by function		181	15%
Implicit	Content builds on A-initiation	95	95	7.8%
	Other	3	3	0.2%
Totals		1232	1232	100%

Note: See Method section for definitions and examples.

4.2. Accumulation of calibrated information

Recall that when entering the information that had been calibrated in each sequence, the analysts differentiated between the newly presented information and the previously calibrated information that was necessary for understanding it (e.g., in the right-hand column of [Appendix A](#)). This method led to a post hoc discovery of how constantly the interlocutors were building on and therefore accumulating calibrated information. The two calibrating sequences in lines 1–4 of [Appendix A](#) illustrate how quickly information was accumulating.

[Table 6](#) illustrates how, in an extended sequence on one topic, calibrated information could accumulate rapidly, in cryptic but dense exchanges. The speech from the transcript is presented in Example 13 to illustrate the density of the exchange. (Note that visible actions are omitted in Example 13 below but included in [Table 6](#).)

Table 6
Accumulation of calibrated information.

Sequence and speaker	Utterances	What was calibrated ^a
1 Reese	Do you live at <i>home</i> ?	
2 Lynn	(looks aside quickly, then brows up) <i>Right now?</i>	
3 Reese	(fast) <i>Yeah.</i>	1–3: Reese is asking if Lynn lives at home
4 Lynn	(fast) <i>No.</i> (single head shake)	2–4: Lynn is asking if Reese means <living at home> right now
5 Reese	(quietly, very fast) You <i>live</i> ?	3–5: Yeah <Reese is asking if Lynn lives at home right now>
6 Lynn	With my <i>sister</i> (slight nod)	4–6: No <Lynn doesn't live at home right now>
7 Reese	<i>Oh</i> (tilts head up and nods).	5–7: Reese is asking <where> Lynn lives
8 Lynn	(short nod, looks down) <i>Basement suite</i>	6–8: Lynn <lives> with her sister
9 Reese	(softly, slight nod) Cool	
10 Lynn	It's <i>fun</i> .	8–10: Lynn <lives with her sister in a> basement suite
11 Reese	Is your sister <i>older</i> or younger?	
12 Lynn	Ah, younger.	10–12: Lynn finds that <living with her sister in a basement suite> is fun

^a Previously calibrated information is in angle brackets.

Example 13. Speech used in a dense exchange.

1. Reese: “Do you live at home?”
2. Lynn: “Right now?”
3. Reese: “Yeah”
4. Lynn: “No”
5. Reese: “You live?”
6. Lynn: “With my sister”
7. Reese: “Oh”
8. Lynn: “Basement suite”
9. Reese: “Cool”
10. Lynn: “It’s fun”
11. Reese: “Is your sister older or younger?”
12. Lynn: “Ah, younger”

They calibrated each piece of new information, moment by moment. Moreover, they branched out into different but related topics even though, with two exceptions, their utterances were only two or three words long.

Two-thirds of utterances that contributed new information were incorporating and building on the previously calibrated information that was accumulating. That is, on average, 64% of A-initiations included either deictic or elliptical references to recoverable information. These results may reveal a micro-aspect of discourse cohesion, that is, how the interlocutors folded information that was now mutually presupposed into new information with both deictic references and elliptical clauses.

It is noteworthy that the dialogues varied widely in the percentage of deictic and elliptical references, from 47% to 81%. Our subjective impression was that the getting-acquainted conversations in which the interlocutors “hit it off” and appeared to develop rapport quickly seemed to be ones accumulating more shared information, and the awkward conversations were accumulating less. However, this was only an informal observation that hinted at a possible measure of rapport and would have to be tested rigorously.

4.3. Bridging sequences

A second post hoc finding came from closer examination of the 67 (out of 2205) utterances that could not serve a role in calibration sequences because they neither introduced new information, responded to new information, or followed up on an addressee’s response. These anomalous utterances consisted of series of alternating minimal responses, which the interlocutors simply tossed back and forth, as in the following example.

Example 14. They had established that Rosa was originally from Mexico and Luke was from Victoria.

1. Luke: (finishing laughing, still smiling) “Where in Mexico are you from?”
2. Rosa: “Um” (looks away, then back) “Guadalajara”
3. Luke: (nodding) “Oh, okay, yeah” (smiles)
4. Rosa, overlapping: (nodding) “Yeah” (smiles)
5. Luke, overlapping: (nodding and smiling; very softly) “Oh, nice”
6. Rosa: (.7 s pause, then nodding and smiling) “Yep”
7. Luke, overlapping: (nodding and smiling) “Cool”
8. Rosa: “What Psyc class are you taking?” (while looking away, then back)

The utterances in lines 3 and 4 had roles in calibration sequences 1–3 and 2–4. However, due to their limited function, these two minimal responses could not initiate new calibration sequences, nor could the utterances at lines 5, 6, or 7. The next calibration sequence did not begin until line 8 (“What Psyc class are you taking?”). We characterized the series in lines 5–7 (“Oh, nice”, “Yep”, “Cool”) as a *bridging sequence* between calibration sequences. Bridging sequences started with a minimal response that had no role in the preceding calibrating sequence and could not function as an A-initiation. They could consist of a single utterance or several in succession, as in the example. Thirteen dyads used bridging utterances at some point; six used none.

About two-thirds of the bridging utterances occurred at topic shifts in the conversation, as shown in Example 14, so they may signal or function as a transition to a new topic. As with the differences in accumulating information, this observation would have to be tested formally, perhaps in a broader study of topic changes. Both of these post hoc observations demonstrate the potential of this method of analysis for revealing phenomena in dialogue that might otherwise remain unnoticed.

4.4. Support for the *should/could* distinction

A key analysis decision was whether an utterance was new information. Few would disagree about the functions that were usually minimal responses and therefore deemed *unlikely* to introduce new information. The analysis system divided the other functions into those that *should* versus *could* introduce new information, and the results supported these guidelines. Of the 1175 utterances serving functions that *should* introduce information new to the dialogue 1138 (97%) did so by initiating completed calibration sequences. In contrast, there were only 127 utterances serving functions that *could* convey new information. The interlocutors treated 94 (74%) of these utterances as new information by completing a calibration sequence initiated by them. The differences between *should* and *could* in both overall frequency and completed sequences supports our a priori decision that some functions were much more likely than others to introduce new information.

5. Conclusions and implications

The results strongly support the proposals of Mead (1934), Marková and Linell (Marková, 1990; Linell and Marková, 1993) and Svennevig (2009) as well as Tsui (1985), Roberts and Bavelas (1996), Arundale (2010), Bavelas et al. (2011), and Bavelas et al. (2012), all of whom have proposed that mutual understanding is a moment-by-moment, interactive, three-step process that interlocutors accomplish together. The present analysis provides a means for observing this process systematically and comprehensively in both theoretical and applied studies.

5.1. Combining cognitive and social processes

We began this article with those who have proposed that mutual understanding is something that interlocutors *have* and *do*. Clark (1996) proposed that, because language use is both cognitive and social, it “cannot be understood from either perspective alone: The study of language use must be both a cognitive and a social science” (pp. 24–25). Therefore, studies that include both kinds of data would be quite informative. For example, typical referential communication tasks measure whether the interlocutors independently demonstrate that they have a mutual understanding. How they achieve this goal is also observable. A calibration analysis would reveal directly the process by which interlocutors indicate to each other that they are establishing sufficient understanding to proceed toward that goal. Another example would be cognitive models such as Christiansen and Chater (2016). They proposed that “Language is fleeting. As we hear a sentence unfold, we rapidly lose our memory for preceding material. Speakers, too, soon lose track of the details of what they have just said” (p. 1). This proposal could be tested by directly observing the accumulation of mutually understood information as the dialogue unfolds.

5.2. Variations in task and format

The getting-acquainted conversations studied here were symmetrical, with both interlocutors contributing to the dialogues more or less equally. In contrast, personal narratives such as close-call (Bavelas et al., 2000) or bad roommate stories (Tolins and Fox Tree, 2014) create asymmetrical interactions with an assigned speaker and addressee, which may create a different calibrating pattern. Also, face-to-face dialogues afford the maximum of audible and visible responses as well as the highest level of reciprocity, which are both lacking to different degrees in mediated dialogues, such as phone, texting, or other computer-mediated communication (CMC) formats. Phillips (2007) showed that CMC formats that permit overlapping and rapid feedback are more efficient, accurate, and cohesive than formats that do not. Presumably the ability to calibrate is implicated in these differences. Sampling mediated dialogues from our archive could address how or whether the interlocutors adjust to these constraints and with what effects. The results would have implications not only for the design of CMC formats but also for the design of realistic and effective embodied agents.

5.3. Dialogues in applied settings

Many applied settings, such as medical or psychotherapeutic practice, involve high stakes in terms of the potentially life-altering consequences of whether interlocutors have established mutual understanding. It is possible to target specific topics in these dialogues for intensive calibration analysis. For example, Gerwing and Indseth (2016) analyzed simulated but unscripted medical emergency calls between non-native-Norwegian speaking callers and native-Norwegian speaking operators. Specifically, they analyzed three-step sequences initiated when a caller provided potentially incomprehensible information, then the operator responded, and the caller followed up. The results showed that callers indeed followed up systematically; for example, after operators signaled trouble understanding, callers repeated information 100% of the

time, and after operators responded minimally, callers provided new information 90.4% of the time. An analysis of specific calibration sequences in actual calls could replicate and extend this work. This finding echoes Tolins and Fox Tree's (2014) findings on how the second step influences the third step.

Nishimura et al. (2013) conducted a systematic review of methods for ensuring understanding in informed consent. Studies that used “extended discussion” with a health care professional were not only significantly more effective than the basic consent form but also had the biggest effect. In contrast, a variety of multimedia approaches were not significantly better at ensuring understanding than a basic consent form. Analysis of those “extended discussions” versus multimedia presentations might show that the difference is the ability to calibrate understanding.

A calibration analysis could also focus on the fate of selected types of new information rather than the comprehensive analysis conducted here. For example, Healing (2013) distinguished between two kinds of information that patients contributed in oncology consultations: *bio-medical information* and *patient-centered information* (which is idiosyncratic information about the effects of the disease or treatment on this individual patient's life, concerns, and priorities). A calibration analysis could target and track the fate of the patient-centered information in the consultation: Was it subsequently calibrated or dropped?

Peräkylä (2011) is among researchers who “have explored the linkages and discontinuities between the practitioners' clinical theories... and the actual interactional practices” (pp. 313–314). (See also Korman et al., 2013; Smock Jordan et al., 2013). These linkages are the focus of psychotherapy approaches that assume therapeutic dialogues are co-constructed, that is, woven from the contributions of a therapist and a client. However, theories of co-construction (e.g., Gergen, 1985, 2009) are extremely abstract, with little connection to observable events in dialogue. Analysis of mutual understanding as a three-step, interactive process (Bavelas et al., 2012, 2014a) could provide a missing link, as Marková and Linell (1996, p. 357) and Svennevig (2009) proposed.

In summary, these results support previous three-step theories of dialogue, are relevant to other theories of mutual understanding, and offer future research directions as well as practical applications.

Appendix A. The calibration of new utterances in a dialogue

Utterance (<i>new information in boldface; stressed words in italics</i>)	Information that is now calibrated <angle brackets explicate ellipsis or deictic reference>
1 L (smiling broadly) So are you in Rez this year?	
2 R (also smiling) I'm not, I live <i>in Victoria</i>	
3 L (nods) M-hm	1–3: Lisa is asking whether Robin is in Rez [i.e., living on campus] this year
4 R (nods) I've <i>lived here</i> my whole life	2–4: Robin is not<in Rez>, she lives in Victoria
5 L Right on, do you like it?	
6 R <i>Um. Yeah</i>	4–6: Robin has lived<in Victoria> her whole life
7 L (nodding)	5–7: Lisa is asking whether Robin likes<living in Victoria>
8 R I like it, it's (nodding) <i>a lot cheaper</i>	6–8: Yeah <Robin likes living in Victoria>
9 L (nodding, eyes widened)	
10 R living at home (slight nodding), so	8–10: Robin reiterates that she likes <living in Victoria> it's a lot cheaper
11 L (nods, soft voice, then looking down) Oh for <i>sure</i>	
12 R it's nice , (.6 s pause while looking away, then back) Um I'm, and I'm <i>in Music</i>	10–12: <Robin finds it a lot cheaper> living at home so
13 L (widens eyes, leans forward) Oh, what d'you play here?	
14 R French Horn	12–14: <living at home> is nice and Robin is in Music
15 L (quietly) <i>Wow</i> (widens eyes, lifts head up and back)	13–15: Lisa is asking what <musical instrument> Robin plays <in the music program>
16 R (nods)	14–16: Robin<plays> the French Horn
17 L How long have you been doing that?	
18 R Uh (looks away with thinking face) five years, something like that	
19 L (smiles) that's <i>awesome</i>	17–19: Lisa is asking how long Robin has been <playing the French Horn>.
20 R (laughs)	18–20: Robin <has been playing the French Horn for> something like five years.
21 L (looking down, voice almost apologetic) I used to play the sax (shoulder and facial shrug, then looks up and smiles)	
22 R (smiles, short laugh)	
23 L (laughs, shrugs shoulders, and rolls eyes)	21–23: Lisa used to play the sax

Appendix A (Continued)

Utterance (new information in boldface; stressed words in italics)	Information that is now calibrated <angle brackets explicate ellipsis or deictic reference>
24 R What do you do?	
25 L Um (looks up with brief thinking face), I'm actually a psych major.	
26 R (quick nod)	24–26: Robin is asking what Lisa does
27 L I'm in second year (1.1 s pause while looking down) <i>Um</i> (looks up) I lived in Rez this year but now I'm in an apartment	25–27: Lisa is actually a psych major
28 R (nods)	
29 L with a roommate (shrugs with cute face)	27–29: Lisa is in second year, she lived in Res this year but now she's in an apartment
30 R (nods, then inaudible speech)	
31 L (quietly) Yep	29–31: <Lisa is in second year, she lived in Res this year but now she's in an apartment> with a roommate
32 R <i>Um, do y'do any sports?</i> (smiles, raises eyebrows)	
33 L (slowly) Um, I swim, I run	
34 R (several nods)	32–34: Robin is asking if Lisa does any sports
35 L (very quietly) but other than that not really, I roller blade	33–35: Lisa swims and she runs
36 R (nods) That's cool	
37 L (nods) You?	35–37: Other than <running and swimming> Robin does not really <play sports> she roller blades
38 R yeah I golf and curl those are my main	
39 L (nod includes upper body; voice louder, smiles) <i>Really?</i>	37–39: Lisa is asking <whether Robin does any sports>
40 R (nods) my main sports (smiles)	38–40: Yeah <Robin plays sports> she golfs and curls, those are her main-
41 L (still smiling) I've never met a curler before (laughs)	
42 R (smiling and laughing, then:) Not many people have	40–42: <Golfing and curling are> Robin's main sports
43 L (still smiling) Yeah but you should be proud it's the Canadian thing	41–43: Lisa has never met a curler before
44 R (laughs and smiles, then, drawn out:) <i>Yeah</i>	42–44: In Robin's opinion, not many people have <met someone who curls>
45 L (looking down, not smiling) Well that and hockey I suppose	43–45: In Lisa's opinion, Robin should be proud, <curling> is the Canadian thing
46 R Yeah (shaking head) I don't play hockey though (slight smile)	
47 L How did you get into curling?	45–47: In Lisa's opinion, <curling> and hockey <are the Canadian things>
48 R My mum did it so I watched her one time and--when I was like nine	46–48: Robin agrees <that curling and hockey are the Canadian things>; she doesn't play hockey though.
49 L (very quietly) Yeah	47–49: Lisa is asking how Robin got into curling.
50 R And I said (shaking head, higher pitch) "Oh I wanna do that"	48–50: Robin <got into curling because her> mum did <curling>, so she watched her one time when she was like nine.

This excerpt = 1 min, 10 s of a dialogue that was 2 min, 10 s long.

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Janet Beavin Bavelas (Ph.D., Psychology, Stanford) has spent her academic career at the University of Victoria, where she is currently an active Emeritus Professor of Psychology. Bavelas and her research team use experiments and other methods to investigate the unique features of face-to-face dialogue, specifically, the integration of words and co-speech acts (hand and facial gestures, gaze) and the moment-by-moment collaboration between speakers and addressees. More recently, the team have been applying this method and their findings to dialogues outside the lab, in psychotherapy, medicine, parent-infant interaction, and computer-mediated interaction. (<http://web.uvic.ca/psyc/bavelas/>).

Jennifer Gerwing (Ph.D., Psychology, University of Victoria, Canada) uses microanalysis in both lab experiments and applied settings. Her experiments and publications focus primarily on the effects of face-to-face dialogue on hand and facial gestures, especially in relation to speech. She applies microanalysis in hospital settings, including her present position as a senior researcher at the Health Services Research Unit at Akershus University Hospital in Oslo, Norway. She has also studied interactional coordination, both in home videos of triplets (one of whom was later diagnosed with autism) and also in emergency medical dialogues on the telephone.

Sara Healing (B.A., honors., M.Sc., Psychology, University of Victoria, Canada). Her honors thesis (published as Healing and Bavelas, 2011) was an experiment on the effects of two different lines of questioning. For her M.Sc. thesis, she developed a microanalysis that identified the unique information that individual patients can contribute to oncology consultations. She has collaborated in 19 studies, including both basic research in lab experiments and applications of microanalysis in various applied settings, especially medical and psychotherapy dialogues. Her publications include experiments on hand and facial gestures, bad-news delivery in healthcare, and review chapters and articles.