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Navigating joint projects with dialogue

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Abstract

Dialogue has its origins in joint activities, which it serves to coordinate. Joint activities, in turn, usually emerge in hierarchically nested projects and subprojects. We propose that participants use dialogue to coordinate two kinds of transitions in these joint projects: vertical transitions, or entering and exiting joint projects; and horizontal transitions, or continuing within joint projects. The participants help signal these transitions with *project markers*, words such as *uh-huh*, *m-hm*, *yeah*, *okay*, or *all right*. These words have been studied mainly as signals of listener feedback (back-channel signals) or turn-taking devices (acknowledgment tokens). We present evidence from several types of well-defined tasks that they are also part of a system of contrasts specialized for navigating joint projects. *Uh-huh*, *m-hm* and *yeah* are used for horizontal transitions, and *okay* and *all right* for vertical transitions.

Keywords: Dialogue; Conversation; Joint activity; Discourse marker; Back-channel; Acknowledgment token; Okay

1. Introduction

Many features of dialogue arise as people interact with each other. One of these is turn-taking. People in conversation cannot all speak at once, so they have to manage who speaks when (Sacks, Schegloff, & Jefferson, 1974). The current speaker, for example, can select the next speaker by using a statement or question that requires an immediate response. When Anna asks Benoit, "Where's the skillet?" he is projected to answer the question in the next turn, say, "In the pantry," and the result is an *adjacency pair* (Schegloff & Sacks, 1973). Speakers can

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use adjacency pairs to project both longer turns and sequences of turns. Two other features of dialogue that emerge from people's interactions are feedback and repair. Benoit may produce *uh-huh* in the middle of Anna's turn to signal her to continue (Schegloff, 1982), or ask "Where's the what?" to initiate a repair (Schegloff, Jefferson, & Sacks, 1977). People use these and other techniques to *ground* what they say—to establish the mutual belief that the addressees have understood what the speaker said well enough for current purposes (Clark & Schaefer, 1989; Clark & Wilkes-Gibbs, 1986). There has been much research on how people manage dialogue *per se*.

But what do people use dialogue for? In the course of a day, people engage in joint activities that range from buying goods, working with colleagues, and attending classes to gossiping, planning parties, and making dinner. Joint activities take coordination, and people achieve much of that coordination through dialogue. When Anna and Benoit make dinner together, they must agree on what to eat, who is to prepare which dishes, set the table, serve the food, clear the dishes, and when to do each of these things. They reach these agreements largely through dialogue. If they had nothing else to talk about, their dialogue might consist entirely of these arrangements. There has also been much research on how people use language in carrying out joint activities—from calls to emergency assistance (Zimmerman, 1992) and home consultations by nurses (Heritage & Sefi, 1992) to operations in airport control rooms (Goodwin, 1996) and on ships (Hutchins, 1995).

Dialogues, therefore, divide into two planes of activity (Clark, 1996, 1999, in press). On one plane, people create dialogue *in service of* the basic joint activities they are engaged in—making dinner, dealing with the emergency, operating the ship. On a second plane, they manage the dialogue itself—deciding who speaks when, establishing that an utterance has been understood, etc. These two planes are not independent, for problems in the dialogue may have their source in the joint activity the dialogue is in service of, and vice versa. Still, in this view, basic joint activities are primary, and dialogue is created to manage them.

In this paper we consider how people navigate joint activities by means of words such as *okay*, *all right*, *uh-huh*, and *yeah* within both planes of activity. Most previous studies have investigated joint activities only one plane—dialogue management. And the joint activities they studied did not have a clear structure outside of the dialogue by which they were managed. Our tack here is to investigate joint activities that consist of well-defined projects and subprojects. We show that people initiate and complete certain joint projects with words like *okay* and *all right*, whereas they continue them with words like *uh-huh* and *yeah*. We begin with a characterization of joint activities.

2. Joint activities and joint projects

In cognitive science, activities by individuals—autonomous activities—have long been analyzed into hierarchies of projects and subprojects (von Cranach, Kalbermatten, Indermühle, & Gugler, 1982; Leont'ev, 1981; Miller, Galanter, & Pribram, 1960; Newell & Simon, 1972; Tschan, in press; Zacks, Tversky, & Iyer, 2001; von Cranach, Ochsenbein, & Valach, 1986). Anna's going to a film, for example, might be divided into three projects—traveling to the cinema, watching the film, and returning home—each of which divides into subprojects. Anna

doesn't plan the entire activity in detail. She might plan to travel by car, but on discovering her car doesn't work, she takes a bus; she might plan to see the whole film, but when she discovers she hates it, she leaves after a few minutes. Anna's plans are flexible and opportunistic.

Joint activities are no different, except for one feature: they must be planned and carried out by the participants *jointly*. Anna and Benoit's having dinner together, for example, might divide into preparation, eating, and clearing up, each of which divides into subprojects. To succeed, Anna and Benoit need to coordinate on each of the projects and subprojects. Anna may offer to prepare the broccoli, but because Benoit wants to do that, she agrees to prepare the potatoes. Joint activities are as flexible and opportunistic as autonomous activities, but to coordinate on the options, the participants must rely on communication (Clark, 1996).

The issue here is *project navigation*—how participants use dialogue to move through joint activities. If they navigate by dividing joint activities into projects and subprojects, and if they complete them one after the other, that should be reflected in the dialogue by which they accomplish this. There is much evidence that it is. Spontaneous dialogue generally emerges as hierarchical units, variously called *context spaces* (Reichman, 1978), *focus spaces* (Grosz & Sidner, 1986), or *topics* (Brown & Yule, 1983). Participants often signal their moves between these units by means of *discourse markers* (sometimes called *cue words* or *clue words*). In this approach, however, the hierarchical units tend to be viewed as parts of the dialogue. Our argument is that they are also products of the basic joint activities being carried out and reflect the hierarchical nature of those activities.

How, then, do people use dialogue to navigate joint projects? Here we focus on the system of words such as *okay*, *all right*, *uh-huh*, and *yeah* in their role as what we will call *project markers*—markers used for navigating joint projects. But first we discuss project navigation itself.

3. Navigating joint projects

Joint projects tend to emerge as a hierarchy of joint actions. Suppose Ed and John were to move two benches from one room to the next. The structure of their joint activity might emerge as follows:

Open A-project 1. Ed and John agree to move two benches
  Open B-project 1.1. Ed and John agree to move bench 1 first
    C-project 1.1.1. Ed agrees to take the left end, and John the right end
    C-project 1.1.2. Ed and John lift the bench together
    C-project 1.1.3. Ed and John put down the bench together
  Close B-project 1.1. Ed and John agree that they have finished moving bench 1
  Open B-project 1.2. Ed and John agree to move bench 2 next
    C-project 1.1.1. Ed agrees to take the left end, and John the right end
    C-project 1.1.2. Ed and John lift the bench together
    C-project 1.1.3. Ed and John put down the bench together
  Close B-project 1.2. Ed and John agree that they have finished moving bench 2
Close A-project 1. Ed and John agree that they have finished moving the two benches
Open A-project 2. Ed and John agree to go have a beer together

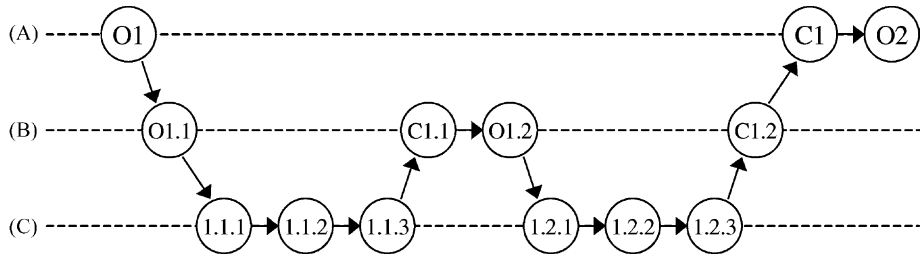

Fig. 1. Hierarchical and sequential structure of joint activity. A, B and C represent different hierarchical levels of joint projects. Transitions within and between levels are indicated by the arrows. "O1" means "open project 1," "O1.1" means "open project 1.1," "C1.1" means "close project 1.1" and so on.

This activity is represented graphically in Fig. 1.

Ed and John engage in two types of activities—*basic* actions and *coordinating* actions. They take the basic *physical* actions necessary for moving the benches (stepping to one end of the bench, lifting the bench, etc.). But they also take the communicative actions necessary for agreeing who is to do what when. Their first four turns might go as follows:

(1) Ed Would you help me move these two benches into the next room?
John Yes, I'd be happy to.
Ed Okay, let's move this bench first.
John Okay.

Ed and John use the first two turns to agree on joint project 1, the next two to agree on joint project 1.1, and so on.

Navigating hierarchies requires two kinds of transitions—*vertical* and *horizontal* transitions. Vertical transitions go *between* levels in the hierarchy, as the participants enter and exit joint projects or subprojects (e.g., A and B moving from 1.1 to 1.1.1). These are analogous to *push* and *pop* transitions in programming hierarchies (Grosz & Sidner, 1986). Horizontal transitions go between moves *within* a single level of a hierarchy—as the participants proceed through the moves at that level. As Ed and John's dialogue illustrates, both horizontal and vertical transitions are done sequentially, because dialogue is a linear medium. Still, the participants mark when a transition is horizontal and when it is vertical. Our proposal is that they use *project markers* in part to do this. Some of these markers are specialized for horizontal transitions, and others for vertical transitions.

4. Project markers

Project markers have been investigated before under various labels. One of these is *back-channel response* (Yngve, 1970). In this view, dialogue divides into a *front channel*, the speech of the person who currently has the floor, and a *back channel*, the speech and other signals from those who don't currently have the floor. Back-channel responses aren't separate turns, but rather are located at junctures *within* the current speaker's turn (Duncan, 1974; Duncan & Niederehe, 1974). They include not only words like *uh-huh*, *yeah*, *m-hm*, but also utterance

completions, requests for clarification, nodding, smiling, and brief statements (Brunner, 1979; Duncan, 1974). Back-channels serve a range of functions: signaling the listener's "active participation" in the conversation, encouraging the speaker to continue, or expressing agreement, acceptance, or understanding (Oreström, 1983).

Project markers have also been analyzed as devices for regulating turns (Sacks et al., 1974), where they are often referred to as *acknowledgment tokens* (Jefferson, 1984). The idea is that different acknowledgment tokens have different functions. Words such as *uh-huh* and *m-hm* are often used as what Schegloff (1982) has called *continuers*. Addressees insert them between units *within* the speaker's turn to establish the just-produced unit as part of a series of units in a single turn—to signal the speaker to continue. Continuers contrast with *assessments* such as *oh wow* or *gosh* (Goodwin, 1986). Addressees use these to react to particulars of the speaker's current speech (e.g., expressing surprise or affiliation), so they tend to produce them *within units* within a turn. Speakers will even delay initiation of the next unit to keep from overlapping an assessment. Continuers like *uh-huh* and *m-hm* also contrast with words like *yeah* (Drummond & Hopper, 1993; Jefferson, 1984). Whereas continuers exhibit *passive recipiency* (the addressee is not seeking the floor), words like *yeah* exhibit *active recipiency*, or a readiness to take the floor. So continuers, assessments, and recipiency markers are three ways in which listeners influence the emerging turns of a conversation.

But how are these words used in joint activities more broadly? Many observations have come from informal conversation, such as gossip, where it is notoriously difficult to infer what people are trying to do (Tracy & Coupland, 1990). In talk for talk's sake, the goals of the talk are negotiated from one contribution to the next in what Sacks et al. (1974) call *local organization*. Our tack, instead, has been to study well-defined joint activities and examine where and how the participants use project markers in the process. If we know what participants are trying to do, it is easier to determine what they are using project markers for.

Also, previous research has often been too broad or too specific. In the back-channel tradition, different kinds of words, phrases, and non-verbal behaviors have often been lumped together. In conversation analysis, in contrast, project markers have often been studied in isolation or in pairs (e.g., *uh-huh* vs. *yeah*). We assume that project markers are related to each other *as specialized components of a system*. When speakers use a word, they use it in contrast to other words they could have used (Grice, 1975). Project markers are no exception. When speakers use, say, *uh-huh*, they are selecting it over others they could have used. Our goal is to consider project markers as a conventional system of contrasts—in particular, for marking horizontal and vertical transitions. The hypothesis is that the words previously studied as back-channel responses and acknowledgment tokens also mark horizontal and vertical transitions in navigating through joint projects.

4.1. Markers specialized for horizontal transitions

Project markers specialized for horizontal transitions serve to ground contributions within joint projects. They enable participants to proceed with the current joint project. We propose that *m-hm* and *uh-huh* and *yeah*, *yes* and *yep* all work as horizontal markers.

When partners use *uh-huh* and *m-hm* as continuers, as we noted, they display their understanding that the current speakers are continuing their turn, and they signal that they do not

intend to take the floor (Goodwin, 1986; Jefferson, 1984; Schegloff, 1982). That is, continuers are horizontal navigational tools that allow the current speakers to continue whatever action they were performing.

Yeah in its different forms (*yeah*, *yes* or *yep*) can be used in at least two ways. As noted earlier, *yeah* can also be used as an acknowledgment of understanding and, often, as a signal that the addressees are ready to take the floor. By doing so, addressees signal that they are ready to continue the joint project in course (e.g., by contributing to topic development). *Yes*, in contrast, is commonly used as an affirmative answer to a *yes-no* question. It is the second part of a question plus answer viewed as an adjacency pair (Schegloff & Sacks, 1973). An adjacency pair usually accomplishes a minimal joint project. Asking a question initiates that project, and answering the question displays the addressee's understanding of the question. If the speaker is satisfied, the partners are in a position to proceed. If not, the speaker may request further information. In either case, *yes* continues the joint project initiated by a question. In this sense, both *yes* and *yeah* function as tools for horizontal navigation.

In brief, *uh-huh* and *m-hm* allow the current speaker to continue, whereas the various forms of *yeah* can signal that the *addressee* intends to continue. These two equations, however, are not absolute, so it is important to determine exactly how they contrast.

4.2. Markers specialized for vertical transitions

There are many techniques for vertical transitions—for entry into and exit from subprojects. One technique can be illustrated with repairs or clarifications accomplished in side sequences, as here (London-Lund corpus, Svartvik & Quirk, 1980):

(2) A that wasn't the guy I met, was it—when we saw the building?—
B saw it where,—
A when I went over to Chetwynd Road,
B yes,

In turn 1, A asks a question that B cannot answer without further information. So, in turn 2, B initiates a side sequence, asking A for that information, which A provides in turn 3, completing the side sequence. Only then does B answer A's original question. Turns 2 and 3 are therefore an embedded joint project. B makes a vertical transition into it by asking a question where an answer would be appropriate (see Schegloff, 1972), and he makes the vertical transition out of it by returning to answer the original question.

Digressions are another kind of vertical transition. Participants temporarily suspend a joint project to initiate and complete another one, before returning to the original project (Clark, 1996). Entries into digressions are often marked with *by the way* or *incidentally*, and exits with *anyway* or *so* (Grosz & Sidner, 1986). These are *pre-turn markers* or *discourse markers* (Schiffrin, 1987), because they mark upcoming talk as an entry or an exit. Here is an example of an entry into a digression from the Switchboard corpus (Godfrey, Holliman, & McDaniel, 1992):

(3) A Um, I personally think to set a mark with the judicial system and we're talking about criminals,

B Uh-huh.
A criminal cases that they should bring back hangings on weekends,
B In public places.
A in public places. There is one state that does that, by the way.
B Really? What is that?
A I want to say Oklahoma, I saw something the other night about it.
B Um.
A They don't do them real often.
B Yeah.
A Which is obviously the death penalty.
B Yeah.
A Um, but I think [continues].

A and B are discussing weekend hangings. A suggests that they be reinstated, and mentions that there actually is a state, Oklahoma, where this is already the case. He uses *by the way* to enter the digression and *but* to exit from it.

What about *okay*? We examine the proposal that it is used primarily for vertical transitions into and out of extended joint projects. It often appears as a pre-turn marker for transitions *into* such projects, whereas it often appears alone for transitions out of such projects. It creates these transitions by marking the speaker's commitment to his or her role in a mutual agreement to an extended joint project. Let us expand on this hypothesis by looking at the functions attributed to *okay*. We suggest that all of these functions mark vertical transitions.

First, note that *okay* can be used as either an adjective or an interjection. It is used as an adjective in examples like "that's *okay*," and "but it may not be *okay* to everybody" (Svartvik & Quirk, 1980). Here it means, roughly, "acceptable." When *okay* is used as an interjection, it cannot be paraphrased as "something or someone is *okay*," and it is that use that we will focus on.

Okay as an interjection has been observed in a variety of contexts. First, it can be used as a *pre-closing device* in telephone conversations (Schegloff & Sacks, 1973). At some point in a telephone conversation, both parties indicate that they have nothing more to say, and that they are ready to initiate closing. Characteristically, the first party says *okay*, and the second party takes up the first with a second *okay*. In this way, they use *okay* in moving vertically from the body of the conversation into the closing section.

Okay can be used to return from a digression. In the following example from the Switchboard corpus, two people are discussing football players on the telephone.

(4) A Uh, but I like, uh, Reggie Roby.
B Reggie Roby, who does he play for?
A He, Miami.
B Okay.
A Uh, at times I like Kevin Butler on the Bears.

A is telling B which players he likes. B initiates a side sequence by asking a question. A answers the question and B indicates his satisfaction with A's answer by saying *okay*, whereupon A

continues. Note that this side sequence is also a question–answer adjacency pair. Beach (1993) describes this as a case of "third-turn receipt by current speaker." In terms of joint projects, it is a vertical transition.

Okay can also used as a link between different levels of discourse organization or parts of an encounter. It is used to *bracket* these parts (Goffman, 1981; Sinclair & Coulthard, 1975). People engaged in discussions often start and end their interactions using *okay* (Condon, 1986, 2001). They also use *okay* to link large phases in a decision-making process (Condon, 1986, 2001) or an institutional encounter (Antaki, Houtkoop-Steenstra, & Rapley, 2000; Merritt, 1984), or to mark completion of a longer turn at talk (Guthrie, 1997). And, as Hoyle (1994) has shown, boys playing the role of sportscasters describing a basketball game use *okay* to switch between levels of pretense—in moving from commentary to a pretend interview with a player, or the reverse.

We propose that all these uses of *okay* correspond to vertical transitions in a hierarchy. As a pre-closing device, *okay* is used in exiting the main body of conversation. In using *okay* to link larger segments of discourse or to move between levels, people are entering and exiting joint projects. So *okay* is a prime candidate for being a vertical navigation tool. In the literature on *okay*, *all right* is treated as approximately equivalent (Beach, 1993; Heflin, 1962; Louwerse & Mitchell, in press; Merritt, 1984), so we will examine whether *all right* is indeed used in the same way as *okay*.

In what follows, we examine a range of project markers, including *m-hm*, *uh-huh*, *yeah*, *okay*, and *all right*, as they are used in different kinds of well-defined joint projects. We use these data in turn as evidence for the reality of horizontal and vertical transition markers and, in particular, for the idea that language use emerges from the structure of joint activity.

5. Sources of evidence

We base our proposal on eight corpora of spontaneous dialogues, totaling about 3.5 million words, from several types of conversation and two languages. We analyzed the first four in detail:

- *U.S.-Tangram corpus*: Conversations from 18 pairs of Stanford University students as one of them, the director, got a partner, the matcher, to arrange 12 Tangram figures in a particular order.
- *Swiss-Tangram corpus* (from Bangerter & Smolenski, 2000): Conversations from 19 pairs of University of Basel students (Swiss German speakers). They also worked together to arrange 8 Tangram figures in a particular order.
- *Lego corpus* (from Clark & Krych, in press): Conversations from 16 pairs of Stanford University students as one of them, the director, got a partner, the builder, to build a particular model out of Lego blocks.
- *Trains corpus* (from Gross, Allen, & Traum, 1993): Sixteen conversations between eight pseudo-pairs of people, eight students from the University of Rochester who each talked to a ninth student playing the role of a computer system.

Table 1
Corpora characteristics

Corpus	Task	Language	Word count
U.S.-Tangram	Ordering pictures	U.S. English	36,675
Swiss-Tangram	Ordering pictures	Swiss German	21,554
Lego	Building Lego models	U.S. English	50,627
Trains	Logistical planning	U.S. English	11,841
London-Lund	Informal talk	British English	170,000
Switchboard	Telephone discussion of topics	U.S. English	2,959,024
Directory Enquiries	Calls to operator	British English	65,087
Map Task	Describing routes on map	British English	146,855

In addition, we included four corpora for which we report rates of *okay*, *yeah*, and *uh-huh*:

- *London-Lund corpus* (from Svartvik & Quirk, 1980): Fifty surreptitiously recorded face-to-face conversations, recorded between 1961 and 1976 among British adults, mainly academics, in two- to six-person settings.
- *Switchboard* (Godfrey et al., 1992): Spontaneous telephone conversation between Texas Instruments employees speaking American English about pre-assigned topics.
- *Directory Enquiries* (Barnard, 1974): Customers calling "directory enquiries" in Cambridge, England, for information about telephone numbers.
- *Map Task* (Anderson et al., 1991): One hundred and twenty-eight dialogues between 64 students of the University of Glasgow, Scotland, describing routes on a map.

Table 1 gives an overview of the eight corpora, including number of words in each corpus.

We worked from transcripts of these corpora. The U.S.-Tangram, Lego, and Trains corpora were transcribed in English, but included fillers (*uh*, *um*), major pauses, markings of overlapping speech (the onset of which we indicate with an asterisk), and word fragments. The Swiss-Tangram corpus was transcribed in German with similar markings. When we cite utterances from this corpus, we will present them in German, with an English translation on the following line. We assume that words like *m-hm* and *ja* (*yes*) are understandable to the reader and do not translate them. The London-Lund corpus was also coded for intonation and length of pauses (see Svartvik & Quirk, 1980), though we made use of only the wording. All examples we present are taken from real discourse unless otherwise specified.

Our analyses focused mainly on four classes of project markers: (1) *M-hm* and *uh-huh*. We assume that *uh-huh* comes in two variants, one with lips open (*uh-huh*) and another with lips closed (*m-hm*). In what follows we will use *m-hm* and *uh-huh* interchangeably—even though we assume they contrast in some way. (2) *Yeah*, *yes*, and *yep*. Although these are semantically and phonologically related, they are clearly not interchangeable (but see Louwerse & Mitchell, in press). We will use *yeah* to refer to this whole class unless otherwise indicated. (3) *Okay*, *kay*, *m-kay*, and *okey-dokey*, were collectively considered variants of *okay*. Most *okay*s in this corpus are interjections, not adjectives (e.g., "I'm okay"). (For the disputed etymology of *okay*, see Condon, 1986; Heflin, 1962.) And (4) *All right* and *All righty*. Speakers can pronounce most of these items in a variety of different ways, some of which modulate

precisely how they are being used (Hockey, 1993; Kowtko, 1996). None of our corpora (except the London-Lund corpus) mark intonation, so in this paper we were unable to take it into account.

Inter-rater agreement was assessed for all coding procedures relying on coder interpretation. This mainly involved classifying utterances preceding a given project marker into different categories as shown in the results we will present in Tables 3, 5 and 6 and in Section 6.3. About 10% of the data in each corpus was coded by two different coders. Agreement (Cohen's kappa) was high: 0.87 for the U.S.-Tangram corpus (Table 3), 0.85 for the Swiss-Tangram corpus (Section 6.3), 0.83 for the Lego corpus (Table 5), and 0.79 for the Trains corpus (Table 6).

All the chi-square statistics we report are significant at $p < .001$ unless otherwise specified.

6. Tangram matching task

To study project markers in well-defined joint projects, we turned first to two matching tasks in which pairs of people made matching arrangements of two sets of Tangram figures. The director D, whom we will refer to as female, and the matcher M, whom we will refer to as male, were each given a set of cards with Tangram figures on them. D's job was to get M to arrange his cards in the same order as D's. They could talk as much as they liked, but they couldn't see each other or each other's cards. They were asked to complete the task speedily but accurately. After they finished each arrangement, the cards were shuffled, and they repeated the task on a new trial. They completed trials 1–6 with one set of cards, and trials 7–12 with another set.

The U.S. and Swiss experiments differed in several ways. First, there were 12 cards in a set in the U.S. procedure, and 8 in the Swiss one. The U.S. participants arranged the Tangrams on computer monitors while talking over headsets, whereas the Swiss participants arranged the Tangrams printed on cardboard while talking without headsets. The U.S. participants spoke American English, and the Swiss participants, Swiss German or German. To make the U.S. and Swiss samples more comparable, we used only 18 of the original 30 pairs in the U.S. experiment, selecting those with the most intelligible recordings.

Table 2 shows the occurrence (per 1,000 words) of six types of project markers in the two corpora. *Okay* was used in both corpora, but about five times as often in the U.S. corpus as

Table 2
Occurrences per 1,000 words (and standard deviations) of six types of project markers in two matching task corpora

Project marker	U.S.-Tangram	Swiss-Tangram
Okay	57.5*** (23.8)	11.2 (6.3)
M-hm	12* (11.7)	22.1 (15)
Ja	–	77.5 (22.4)
Yeah	28 (19.1)	–
All right	2.1 (2.7)	–
Got it	5.9 (5.4)	–

* $p < .05$.
*** $p < .001$.

in the Swiss one, $t(35) = 8.2$, $p < .001$. One reason for the difference may be that *okay* is a foreign word in German; as we will document, *okay* is also used somewhat differently than in English. In contrast, *m-hm* was used almost twice as often in the Swiss corpus as in the U.S. one, $t(35) = 2.3$, $p = .03$.

The matching task reflected in these two corpora emerges in a hierarchy of joint projects defined by the task goals and subgoals. The levels of joint projects are these:

A. The overall task divides into 12 trials; we will call these *A-projects*. We investigated A-project navigation by analyzing how pairs initiated and ended trials.
B. Each trial divides into the identification of 8 or 12 Tangram figures; we will call these *B-projects*. We investigated these by analyzing how pairs ended descriptions of each figure before moving onto the next one.
C. Each identification involves discussing features of the right Tangram figure; we will call these *C-projects*. We investigated these by analyzing question–answer sequences about features, especially in the Swiss-Tangram corpus (Section 6.3).

Okay, *uh-huh*, *yeah*, and the other project markers should arise at characteristic places in this hierarchy of joint projects.

6.1. Navigating A-projects

The two partners regularly used *okay* and *all right* to mark entries into and exits from A-projects (trials). Typically, D would say *okay* as a preface, or pre-turn, for her description of the first Tangram figure ("Okay, the first one is . . . "), and M would use *okay* to signal his completion of the entire arrangement ("Okay."). Numeric analyses follow.

In the U.S.-Tangram corpus, *okay* or *all right* was the first word in 74% of trials, and the last word in 45%. D produced 91.3% of trial-initiating *okay*s and *all right*s. This is significantly higher than the overall percentage of *okay* and *all right* spoken by D (26%), $\chi^2(1, N = 2,017) = 402.9$. M produced 89% of trial-ending *okay*s and *all right*s, which is significantly higher than an overall rate of 74%, $\chi^2(1, N = 2,017) = 11.7$. The number of pairs beginning or ending a trial with *okay* or *all right* did not vary from trial 1 to trial 12 (beginning: $\chi^2(11, N = 161) = 5.9$, *ns*, ending: $\chi^2(11, N = 98) = 4.6$, *ns*). Overall, navigation on A-projects accounted for 12% of all occurrences of *okay* and 28% of all occurrences of *all right* in this corpus.

In the Swiss-Tangram corpus, *okay* was the first word in 10% of trials and the last word spoken to the other partner in 43% of trials. D produced 96% of trial-initiating *okay*s, significantly higher than an overall rate of 28%, $\chi^2(1, N = 244) = 56.1$. M produced 87% of the trial-ending *okay*s, which was significantly higher than an overall rate of 72%, $\chi^2(1, N = 244) = 16$. Navigation on A-projects accounted for 49% of all occurrences of *okay* in the Swiss-Tangram corpus, and that is significantly higher than in the U.S. corpus, $\chi^2(1, N = 2,262) = 222.2$. The number of pairs using *okay* to either begin or end a trial did not vary over the 12 trials, $\chi^2(11, N = 107) = 3.9$, *ns*.

So, in the matching task, D is tacitly responsible for initiating A-projects, and M for closing them. This division of labor, in both the U.S. and Swiss corpora, is evidence for the joint projects account. The layout of the task determines the responsibility of each partner: D knows the right

order, and M determines when they are done. Their use of *okay* and *all right* is determined by what they are trying to accomplish and not merely for the sake of turn-taking.

6.2. Navigating B- and C-projects in the U.S.-Tangram corpus

Within trials, D and M also collaborated to match each of the 8 or 12 cards, or B-projects. Matching cards is difficult in the first trials, but becomes easier as D and M develop conventions for naming each card (Brennan & Clark, 1996; Clark & Wilkes-Gibbs, 1986; Krauss & Weinheimer, 1966). On trial 1, D and M must propose, confirm, and accept or reject descriptions of each Tangram figure, and that takes time and effort. These actions get them into C-projects, as in the following example:

(5) D And then the next one looks like there's a diamond on top and something on the bottom that looks like a square with a triangle put on top of it and the diamond is really small on top. So it looks like almost like a lamp or something with like a diamond on top.
M okay is the is the bottom um like a perfect square.
D yeah it's ( ) perfect square with like something that looks like a triangle overlapping it on top.
M okay.
D okay and then the third [proceeds to describe next card].

M acknowledges D's first description with *okay* (in turn 2), but then immediately asks about another feature of the figure ("is the is the bottom um like a perfect square"), which initiates a side sequence (a C-project). D confirms the feature, and M returns to the B-project level, again with *okay* (in turn 4). That allows D to close that particular B-project (with *okay* again) as a preface to initiating the next one. *Okay* is used by D and M to locate themselves in levels of a project hierarchy and to move from one level to the next.

D and M's perspective on B- and C-projects, however, changes in the course of the task. As Example 5 illustrates, placing a card (a B-project) is an extended task at first, because D and M have to propose, confirm, and accept or reject descriptions of each Tangram figure by discussing features (C-projects). But as D and M develop conventions for referring to the figures (like "the lamp"), they no longer need C-projects and are able to place each card (B-projects) with one-word descriptions. The result is a change in perspective: in later trials, they should view each card placement (B-project), not as an *extended* joint project, but simply as a *continuation* of the overall trial (A-project). They need *okay* to initiate and complete extended joint projects, but all they need is *uh-huh* to continue within the overall trial.[1]

There is good evidence for such a change in perspective. First, *okay* decreased over the six trials. Fig. 2 shows the number of cards whose description ended with *okay* over the six trials with new figures (we combined trials 1 and 7, 2 and 8, and so on). (Coding reliability, assessed on the basis of double-coding of 244 card descriptions, or 10% of all cases, was high, Cohen's kappa $= 0.87$.) When the Tangram figures were brand new (trials 1 and 7) their descriptions ended with *okay* 65% of the time. By the last trial (trials 6 and 12), the percentage had dropped to 31%, linear trend, $b = -0.8$, $t(10) = -4.6$, $p < .001$. Second, *uh-huh* increased over trials (see Fig. 1). For brand new cards, descriptions ended with *uh-huh* only 5% of the time; by the

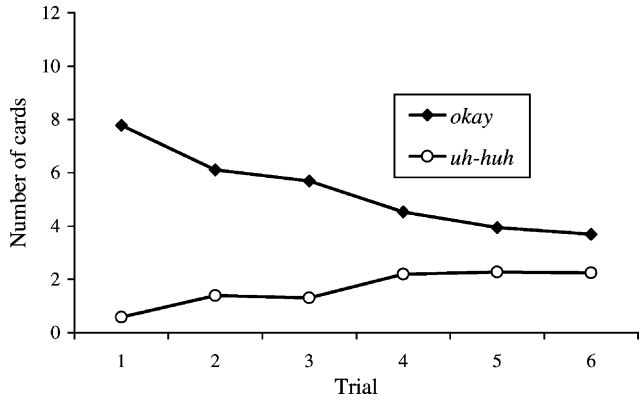

Fig. 2. Number of card descriptions ended by *okay* and *uh-huh* in the U.S.-Tangram corpus.

end of the last trial, the percentage had increased to 19%, linear trend, $b = 0.3$, $t(10) = 3$, $p = .004$. That is, *okay* decreased over trials, and *uh-huh* increased, as D and M streamlined their B-projects by eliminating their subprojects (C-projects). Here is evidence that *okay* is used for navigating into and out of extended joint projects and not simply for continuing on to the next minimal joint project.

Let us now look at how different markers were used within trials. Table 3 shows the moves that immediately preceded each type of marker in percent of total occurrences of that marker. We distinguished between *descriptions* ("so it looks like almost like a lamp or something with like a diamond on top"), *questions* ("is the is the bottom um like a perfect square"), *answers* ("yeah it's like a perfect square"), *suspended speech* ("the next one looks like um okay he's leaning over"), and *other project markers* ("okay got it").

The seven types of project markers were used very differently. *Uh-huh*, *yep*, and *yes* have specialized uses: *uh-huh* and *yep* were used primarily to acknowledge descriptions, whereas *yes* was used primarily to answer questions and not to acknowledge descriptions. In contrast, *yeah* has a variety of uses—from acknowledging descriptions to answering questions and following up suspended speech and other project markers. This is all the more surprising because *yeah*, *yes*, and *yep* are semantically and phonologically related. *Okay* and *all right* are different from

Table 3
Predecessors of seven types of project marker in the U.S.-Tangram corpus (%)

	Okay	*Uh-huh*	*All right*	*Yeah*	*Yes*	*Yep*	*Got it*
Description	50.9	88.9	42.9	26.8	8.3	78.9	33.3
Question	0.9	5.5	1.8	32.7	72.2	3.3	0.5
Answer	11.6	0.7	3.6	2.9	1.4	0.4	5.7
Suspended talk	7.8	0.7	10.7	9.5	8.3	7.4	3.6
Other project marker	12.2	1.7	19.6	15.5	4.2	4.5	36.5
Other	16.6	2.4	21.4	12.6	5.6	5.4	20.3
Total	100	100	100	100	100	100	100

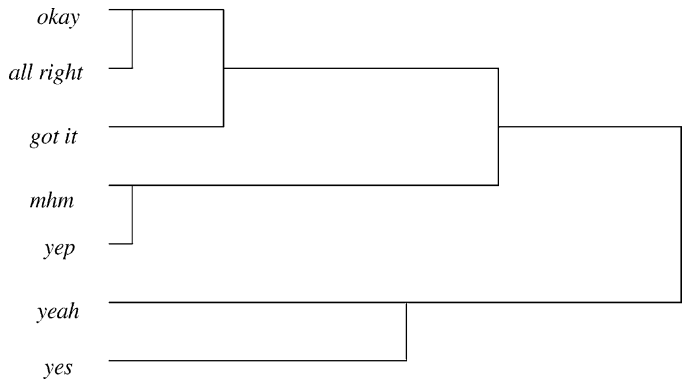

Fig. 3. Cluster analysis of project marker use (similarity of context profiles) in the U.S.-Tangram corpus.

uh-huh, yep, yes, and *yeah*. They were used for acknowledging descriptions and following up other project markers, but almost never for answering questions. In addition, *okay* was often used for acknowledging answers. *Got it* was used primarily to acknowledge descriptions and to follow up other project markers (*okay* in particular).

To look at similarities among the seven project markers, we performed a hierarchical cluster analysis on the data in Table 3 (using the average linkage between groups method with phi-square measures of dissimilarity). The results are shown in Fig. 3. *Okay* and *all right* were joined early as highly similar, and so were *uh-huh* and *yep*. Then *got it* was joined with the *okay-all right* cluster, and finally *yeah* and *yes* were joined. The picture looks the same with another clustering method (average linkage within groups) except that *yeah* was added on to the *okay-all right-got it* cluster, and *yes* was joined with all other clusters much later. The *okay*, *all right* and *got it* cluster is a class of vertical navigational devices, whereas *uh-huh* and *yep* are horizontal devices. *Yes* seems to be specialized for answering questions affirmatively, and *yeah* has a number of uses, all of them corresponding to horizontal transitions.

6.3. Navigating B- and C-projects in the Swiss-Tangram corpus

Swiss German speakers used *okay* somewhat differently from American English speakers. They used it less often, and when they did, over half the time it was for starting and ending trials (A-projects). But how do they use project markers to coordinate their actions on the individual cards (B-projects)?

M-hm and *ja* were often used in a similar fashion—for example, to acknowledge descriptions—though they still contrasted in use. Consider this example:

(6) D das sechs ist der mit dem Kelch.
six is the one with the cup.
M mmm-hm ja.
D das sieben ist . . . [proceeds to describe next card].
seven is . . . .

M acknowledges D's description in turn 2 with an extended *mmm-hm* to indicate that he is searching for the right figure. But he says *ja* when he is ready to go on. Or consider this example:

(7) D Christus. die *Tänzerin.
*Christ. the *dancer.*
M *wart wart wart Christus ja.
**wait wait wait Christ yeah.*

This excerpt is from a later trial, by which time the pair has names for each card. D is describing the cards so quickly that M signals her to slow down by repeating the name of the last card he has placed, and by then saying *ja* for D to continue. M uses *ja* to display readiness to move to the next card (the next B-project).

Ja therefore signals a more definitive closure than *m-hm*. *M-hm* was often used to acknowledge a contribution as preliminary, as a continuation of the *current* B-project, as in this example:

(8) D ja? Dann die 6 Karte ist ähm sieht man auch von vorne.
yeah? then the sixth card is um you see it from the front.
M m-hm.
D Hat ähm wie so die Arme nach oben und ähm.
has um like arms upwards and um.

In the following example, D challenges M's use of *m-hm* as inappropriate:

(9) D und die Arme gehen hinauf.
and the arms are raised.
M m-hm.
D ja?
M ja.
D ja und das vier ist [proceeds to describe].
yeah and four is.

M uses *m-hm* to acknowledge a card description, but D is not sure whether this means that he can continue with the next card, so he *asks* for a *ja* and M gives it.

The corpus usage bears out these contrasts among *m-hm*, *ja*, and *okay*. D and M used 79% of their *m-hm*s to acknowledge descriptions, compared with 67% of their *ja*s, $\chi^2(1, N = 2,045) = 23.4$. They used only 22% of the *okay*s this way. In contrast, they used 12% of their *ja*s to answer questions, compared with only 3% of their *m-hm*s, $\chi^2(1, N = 2,045) = 33.9$, and 2% of their *okay*s. To compare *m-hm* and *ja*, we looked at whether D went on to describe the next card after M produced *m-hm* or *ja* following a description. We looked at freestanding occurrences (where *m-hm* or *ja* was the only word of a speaker's turn) from trials 1 and 7, since these are when cards are new and more complex descriptions are necessary. D moved to the next card 69% of the time after *ja* and 57% of the time after *m-hm*. This was not a reliable difference, $\chi^2(1, N = 136) = 1.7$, *ns*. Between trials 1 and 6, and between 7 and 12, however, the number of pairs using *m-hm* declined by about half, whereas the number of groups using *ja* did not (Fig. 4). As the Tangram figures became familiar and could be named, D and M preferred to use *ja* over *m-hm* to signal their readiness to move to the next card.

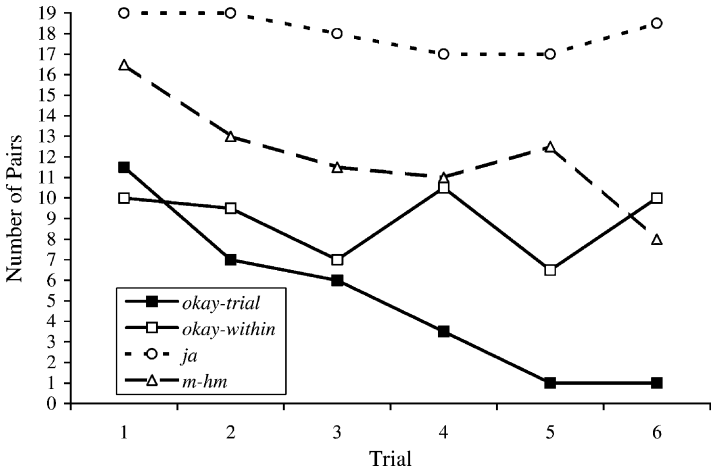

Fig. 4. Number of pairs using *okay* to start and end trials, *okay* within trials, *m-hm* and *ja* in the Swiss-Tangram corpus.

The use of *okay* decreased within trials in the Swiss corpus (Fig. 4), just as it did in the U.S. corpus. As partners went on, they streamlined their Tangram descriptions (B-projects) and turned them into continuations of the full trials (their A-projects). When *okay* was used within trials, it was used mainly for closing impromptu side sequences (e.g., question–answer pairs about card features; these are in fact C-projects). We compared a sub-sample of 52 freestanding *okay*s (i.e., they were the only word in a turn) with a matching sub-sample of freestanding *m-hm*s and *ja*s from the same trials. Partners used 61% of these *okay*s to close such side sequences, compared with 12% for *m-hm* and *ja* together, $\chi^2(1, N = 143) = 37.2$. The descriptions they closed with *okay* were an average of 4.6 utterances long, and that is almost twice as long as those they closed with *m-hm* (2.6 utterances long) or *ja* (2.4 utterances long), $F(2, 99) = 14.4$, $p < .001$. So when pairs used *okay* within trials they tended to use it when they had encountered problems in identifying cards, which resulted in questioning and longer descriptions. With these problems, they had a greater need to mark the closure of a description, and for this they used *okay*.

7. Building Lego models

For another well-defined joint project, we chose a building task in which one person described for another how to build a model from Lego blocks (Clark & Krych, in press). A director D, whom we will refer to as female, was given an abstract sculpture, or prototype, of six to eight Lego blocks and was instructed to tell a builder B, whom we will refer to as male, how to build an exact copy, or model, from individual Lego blocks. Each pair of participants completed 10 models from 10 prototypes. In a *visible* condition, D could see the model as B built it; in a *hidden* condition, she could not. We analyzed 16 pairs, 8 from each condition. Pairs produced an average of 4,531 words in the hidden condition and 1,798 in the visible condition, $t(14) = 5.23$, $p < .001$.

Table 4
Occurrence per 1,000 words (and standard deviation) of four types of project markers in hidden and visible conditions of the Lego corpus

Project marker	Hidden	Visible
Okay	42.8 (7.6)	49 (33.8)
Uh-huh	10.3 (8.1)	6.9 (5.6)
Yeah, yes, yep	16.2 (4.0)	33.3 (17.2)
All right	8.5 (12.8)	5 (7.1)

We analyzed *okay*, *uh-huh*, *all right*, and *yeah* (including *yes* and *yep*). Table 4 shows the occurrence per 1,000 words for these four types of words. *Yeah* was used twice as often in the visible condition as in the hidden condition, $t(14) = 2.76$, $p = .015$; otherwise, there were no differences between the two conditions.

The Lego task, like the matching tasks, emerges as a hierarchy of joint projects reflecting its goals and subgoals. We defined the three main levels of this hierarchy as follows:

A. The overall task divides into 10 model constructions. These are A-projects.
B. Each model divides into 6–8 *placement cycles*, as defined by the placement of a single block. These are B-projects.
C. Participants often divided each placement cycle into three main parts. (1) Identifying the next block to be placed ("take a red two by four"). We will refer to these as *take* sequences. (2) Determining an approximate location ("put it on the blue"). We will call these *put* sequences. (3) Specifying its final location ("so that it faces towards you"). We will call these *so* sequences. *Take*, *put*, and *so* sequences are all C-projects.

7.1. Navigating A-projects

The participants often entered and exited the 160 A-projects using *okay* or *all right*. They initiated 75% of them with either *okay* (84 trials) or *all right* (36 trials). And they closed 61% of them by using *okay* (77 trials) or *all right* (20 trials) among themselves before calling in the experimenter to check on the correctness of their models. Directors produced 98% of project-initiating *okay*s and *all right*s, which is significantly higher than their overall rate of 39%, $\chi^2(1, N = 2,516) = 178.6$. Directors also produced 65% of the project-ending *okay*s and *all right*s in the visible condition and 45% in the hidden condition. The first percentage did not differ from their overall rate of 65%, $\chi^2(1, N = 684) = 0.03$, *ns*, but the second was greater than their overall rate of 30%, $\chi^2(1, N = 1,831) = 6.39$, $p = .012$.

So the division of labor was slightly different in the building and matching tasks. In the building task, directors initiated most of the trials (using *okay* and *all right*), as in the matching task, but builders did not do the same for trial endings. The difference may reflect a difference in tasks. It was immediately evident to matchers in the matching tasks when the trial was finished. But builders in the Lego task couldn't know when the model was complete, so it was up to the director to signal the end of the trial.

7.2. Navigating B- and C-projects

Placement cycles (B-projects) typically consist of three kinds of contributions—*take*, *put*, and *so* sequences (C-projects). Consider this example of a placement cycle (hidden condition):

(10) D Okay. Um let's see. So we need a yellow two by two. Okay and that's going to fit on the right side of the blue block.
B M-hm.
D So that half of it oh yeah on one row of the right side of the blue block.
B Okay *so half of it's pointing to the right.
D *So half of it is pointing off to the right. Yeah.
B Got it.

D first initiates a *take* sequence, telling B how to identify the next block ("so we need a yellow two by two"). She then initiates a *put* sequence, telling him approximately where to put the block ("that's going to fit on the right side of the blue block"). She finishes with a *so* sequence, telling him precisely where to put the block ("so that half of it . . . "). When D and B accomplished the *put* and *so* sequences in a single exchange, we treated the exchange as a *so* sequence. Note the project markers that punctuate each contribution in this example (i.e., each C-project). D initiates both her *take* and *put* instructions with *okay*s (turn 1). B accepts the preliminary *put* instruction with *m-hm* (turn 2), on the understanding that more specific information is to come, but she acknowledges the final piece of information (turn 3) with *okay*. D and B confirm the positioning with a question–answer sequence, acknowledged with *got it* (turn 6).

The data in Table 5 support this picture of the typical uses of *uh-huh*, *okay*, *all right*, and *yeah* within trials. These items were used to ground *take*, *put* and *so* sequences in placement cycles, in side sequences (answering questions and acknowledging answers), following other project markers, and following suspensions of speech. Indeed, they were used in the building task much as they were in the matching task. *Okay* was used in the widest variety of ways—in placement cycles, to acknowledge answers, and after other project markers. *Uh-huh*, in contrast, was used in a very specific way: three times out of four in placement cycles, and also to answer questions. Over half the time, *all right* followed other project markers. Finally *yeah* (and *yes* and *yup*) were used in answer to questions, in placement cycles, and in following up other project markers (to a lesser degree than *okay* and *all right*).

Placement cycles (B-projects) are joint projects undertaken to identify and place one Lego block of the model. In these cycles, 60% of occurrences of *okay* were used to acknowledge *so* sequences, compared with 20% of occurrences of *uh-huh*, $\chi^2(1, N = 1, 297) = 170$. So *okay* was used mainly to close these cycles, and *uh-huh*, to continue within them.

As in the U.S. matching task, *yeah*, *yes*, and *yep* contrasted in use. *Yeah* was the most frequent, occurring 940 times, compared with 40 for *yep* and 46 for *yes*. *Yep* and *yes* were used more often for answering yes/no questions: *Yeah* was the answer to a question 45% of the time, *yep* 57% of the time, and *yes* 69% of the time, $\chi^2(2, N = 1, 026) = 12.4$, $p = .002$.

Table 5
What precedes *okay*, *uh-huh*, *all right*, and *yeah* in the Lego corpus (%)

	Okay	*Uh-huh*	*All right*	*Yeah*
Placement cycles				
Take	10.5	38.6	6.5	2.4
Put	7.2	23.1	2.5	2.4
So	26.9	16.1	13.3	15.7
Subtotal	44.6	77.8	22.3	20.5
Side sequences				
Question	1	11.6	1.8	47
Answer	20	1.4	6.8	5.3
Subtotal	21	13	8.6	52.3
Other project markers				
Okay	7.8	1.8	33.5	5.4
Uh-huh	1.4	0.2	5.8	0.4
Yeah	5.3	0.8	4.3	4.2
All right	1.2	0	1.4	0.1
Other[a]	3.2	0.4	7.2	1.1
Subtotal	18.9	3.2	52.2	11.2
Other				
Suspensions	4.5	0	4	8.5
Other[b]	11	6	13	7.6
Total	100	100	100	100

[a] Includes *that's it*, *got it*, *oh*, and *right*.
[b] Including unintelligible speech, laughter, self-talk, verbatim repeats, etc.

7.3. Differences between visible and hidden conditions

The placement cycles (B-projects) elicited much less talk from the builder in the visible condition than in the hidden condition (Clark & Krych, in press). Here is an example of a complete placement cycle in the visible condition:

(11) D Okay. Now get a uh eight piece green. And join the two so it's all symmetric. Yeah right in the center.

Whereas D speaks, B says nothing in response. The reason is clear. B is able to tell D what he understands by exhibiting a block or by showing where he would put it (Clark & Krych, in press). He has no need to acknowledge the *take*, *put* and *so* instructions explicitly.

Here is an idealized model, or *schema*, for a placement cycle for the hidden condition:

(12) D okay, take a blue two by four,
B uh-huh [takes block],
D put it on the red,
B uh-huh [gets ready to attach block at a location],

D so that it's hanging over towards you by two.
B okay [attaches block at the location],
D okay, now take a [proceeds to describe next block].

For comparison, here is a schema for a placement cycle in the visible condition:

(13) D okay, take a blue two by four,
B [exhibits block to D],
D put it on the red,
B [poises block for D at a location],
D so that, like that *yeah,
B *[attaches block at the location],
D Okay, now take a [proceeds to describe next block].

These schemas suggest several differences between the two conditions. First, in the hidden condition, there should be a higher proportion of *uh-huh*s within placement cycles (see 12), since matchers need to acknowledge *take* and *put* instructions explicitly. Indeed, there were: in the hidden condition, 80% of *uh-huh*s were used in placement cycles, compared with 70% in the visible condition, $\chi^2(2, N = 498) = 4.3$, $p = .038$. There should also be more *uh-huh*s by builders in the hidden condition than in the visible condition, and this, too, was the case, 94% versus 77%, $\chi^2(2, N = 498) = 26$. Finally, there should be a higher proportion of *okay*s used in placement cycles in the hidden condition, where completing the C-projects takes more time and effort, and there were, 50% versus 29%, $\chi^2(2, N = 2,040) = 74.8$.

In the visible condition, in contrast, there should be a higher proportion of *yeah*s used in placement cycles. This is because directors can see when a block is correctly poised and immediately signal this to builders with *yeah* (see 11 and 13). This was the case, 36% versus 9%, $\chi^2(2, N = 1,019) = 115.7$. There should also be a higher proportion of *okay*s following other project markers (especially *yeah*), because after directors have confirmed correct placement, they can see for themselves when they can proceed to the next block; in the hidden condition, this move is made by builders. This was also the case, 29% versus 15%, $\chi^2(2, N = 2,040) = 46.8$. Finally, there should be more *okay*s and *yeah*s spoken by directors in the visible condition than in the hidden condition. And there were: *okay*, 63% versus 20%, $\chi^2(2, N = 2,040) = 327.8$; *yeah*, 98% versus 73%, $\chi^2(2, N = 1,019) = 114.9$. All these differences support the schemas in Examples 12 and 13 as models of typical placement cycle talk in the hidden and visible conditions. They show how adding one more element to common ground transforms the structure of joint projects in placing blocks; this, in turn, is strong support for the hierarchical account of joint projects.

8. Planning tasks

For another well-defined joint project, we chose the Trains task, which calls for logistical planning. One participant, the manager (M, we will refer to managers as female) was responsible for assigning cargo (such as bananas or oranges) to trains, scheduling shipments (such as sending a boxcar of bananas from Avon to Corning via Dansville), and manufacturing things (such as orange juice from a shipment of oranges) in a simple world of four towns, warehouses,

and a factory linked by railway lines, boxcars, tanker cars, and engines. The second participant, the system (S, we will refer to the system as male) was actually a person who played the role of an artificial planning assistant, supplying information, evaluating plans, and so on (Gross et al., 1993). The corpus consists of eight system-manager pairs. Each pair solved two problems, an easy practice problem and a harder problem where an initially successful plan had to be modified. The role of the system was played each time by the same person.

The Trains task is less well-defined than the matching and building tasks. It is defined by an overall goal indicated in the instructions for each problem, for example: "The time is now midnight. Ship a boxcar of oranges to Bath by 8 a.m." Let us call these A-projects. But there were no standard sub-goals, so it was up to the participants to analyze the problem into B- and C-projects.

As in the matching and building tasks, *okay* and *all right* were used to enter and exit A-projects. Managers initiated 75% of the 16 trials with either *okay* (7 trials) or *all right* (5 trials). Similarly, 56% of the trials were ended with *okay* (six by the manager, three by the system). In three further cases (another 19% for a total of 75%) *okay* arose among the last words of the trial (e.g., "*okay* so we're done with that"). Within A-projects, there were 395 cases of *okay* (33.4 per 1,000 words), 143 cases of *right* (12.1 per 1,000 words), 77 cases of *yeah*, *yes*, or *yup* (6.5 per 1,000 words), 33 cases of *all right* (2.8 per 1,000 words), and only 16 cases of *m-hm* (1.4 per 1,000 words). How were these project markers used?

Table 6 shows what preceded project markers in A-projects. We distinguished between questions, answers, other project markers, suspensions of talk, and four types of statements: *orientation* (factual statements about states of affairs in the world, e.g., "so it's now 2 a.m.," "that would take 6 h"); *planning* (e.g., "engine E1 is gonna take the boxcar from Danville"); *evaluation* (assessing whether a plan meets the objectives, e.g., "which is plenty of time"); and *instructions and decisions* (e.g., "I have to ship a boxcar of oranges to Bath by 8 a.m.," "let's schedule that"). Orientation, planning, evaluation, and instructions/decisions are what we will call *task functions*; they deal directly with designing a plan to solve the problem at hand. Here is an example of some of these functions:

(14) M . . . and there's a tanker at . . . Corning. [4 s] okay can ya- can we hook up the tanker with the engine and the boxcar in when we're getting the w-oranges from the warehouse (QUESTION).

Table 6
Predecessors of project markers in the Trains corpus (%)

	Okay	*M-hm*	*All right*	*Right*	*Yeah*
OPEI[a]	38.2	68.7	28.6	55.9	27.6
Question	4	0	3.6	12.6	28.9
Answer	11.3	25	14.3	0.7	1.3
Other project markers	13.2	0	10.7	11.2	6.6
Suspension of talk	23.6	6.3	42.8	5.6	32.9
Other	9.7	0	0	14	2.6
Total	100	100	100	100	100

[a] Orientation, planning, evaluating, or instruction/decision, combined.

S yes yes that's no problem (ANSWER).
M okay so we'll do that (DECISION).
S okay.
M so then we'll . . . we'll be in a position to load the orange juice into the tanker car . . . and send that off (ORIENTATION).
S okay.
M so that sounds like a good temporary plan (EVALUATION).

As shown in Table 6, *okay* and *all right* were most often preceded by task function utterances and by suspended talk. They were also used in a third-turn position (acknowledging answers) and after other project markers. These patterns are very similar to those observed in the matching and building tasks. *Right* was used mainly to acknowledge task function utterances, but also to answer questions and following other project markers. *Yeah* was used in acknowledging task functions, answering questions, and resuming speech after a suspension.

Participants often played out plans verbally, as in the following example, where each step in a plan is acknowledged by the partner.

(15) S okay so E2 goes to Corning then on to Bath and gets a boxcar (PLANNING).
M m-hm.
S then on to Avon load bananas (PLANNING).
M m-hm.
S and then go back to Corning we get to Corning at 3 (PLANNING).
M fantastic that solves the problem (EVALUATION).

As Example 15 illustrates, *m-hm* was preceded by one of the task functions (orientation, planning, evaluation, or instruction) in 11 cases; in 8 of these cases (73%), talk continued with the same function after it. For *okay*, this only happened 41% of the time. This difference is marginally significant, $\chi^2(1, N = 79) = 3.8$, $p = .051$. So when *m-hm* was used at all, it was as a continuer within a B-project, whereas *okay* tended to be used in switches from one B-project to the next.

In thinking about what to do next, speakers sometimes fell silent. When they resumed speaking, they often used *okay* to end their own and their partner's silences (see 14, turn 1). The transcripts mark pauses in speaking and silences longer than a second. Of the 241 silences over 1 s, *okay* was used to resume speech 18% of the time. *Okay* was thus the single most frequent word used to resume speaking after a second or more of silence. Other frequent words were fillers (*uh* and *um*) and discourse markers, including *and*, *so*, and occasionally *well* and *all right* (see Table 7). Of course, *okay* also occurred more often overall than the other words, so its rate of use for resuming talk (11% of all *okay* occurrences) was comparable to that of *um* (13%), and *well* (12%).

9. Dialogues and types of tasks

Dialogues differ in the occurrence of *okay*, *uh-huh*, and *yeah*. If *okay* is used for initiating and completing well-defined tasks, it should be prevalent in those tasks, but rare in conversations devoted mainly to gossip and news. *Uh-huh* and *yeah* should be useful in both.

Table 7
Words often used to resume talk after silences of more than 1 s

	Okay	*And*	*Um*	*So*	*Well*	*Uh*	*All right*
Number of cases	43	29	20	13	7	6	5
Percentage of silences	17.8	12	8.3	5.4	2.9	2.5	2.1
Percentage of total cases	10.9	7.8	13.4	5	12.5	3.6	15.2
Length of silence (s)	2.2	2.3	1.8	2.8	3.4	2.4	3.2

To examine this possibility, we compared the rates of occurrence of *okay*, *uh-huh* (including *m-hm*), and *yeah* (including *yes* and *yep*) for the seven English language corpora from Table 1. The results are shown in Fig. 5. We grouped the seven corpora by dialect (American vs. British English) and ordered them roughly by how well-defined the task was. By *well-defined*, we mean that the task could be hierarchically decomposed into a clear set of subtasks.

The first four corpora are American English. (1) The best defined tasks are reflected in the U.S.-Tangram and Lego corpora. These consisted of simple actions (ordering pictures and building Lego models) that were executed repeatedly over trials. (2) Next comes the Trains corpus, which reflects a more complex but clearly defined task. (3) The least defined tasks is reflected in the Switchboard corpus, where people were asked to talk about a specific topic—say, clothing in the work place—but were otherwise unconstrained. The last three corpora are British English. (1) The best defined task of these is the Edinburgh Map Task. It had a clear goal and a number of sub-goals, although it included several maps, and each route could be decomposed in several ways. (2) The Directory Enquiry calls were less well-defined. People called the operator for information about telephone numbers or addresses. Although this constrained what they did or did not talk about, there were many ways of organizing this information. (3) Finally, the London-Lund corpus consisted mostly of exchanging news and gossip.

Fig. 5 shows that *Okay* is clearly used more often in dialogues that reflect well-defined tasks. For American English speakers, it was most frequent in the U.S.-Tangram (55 occurrences per

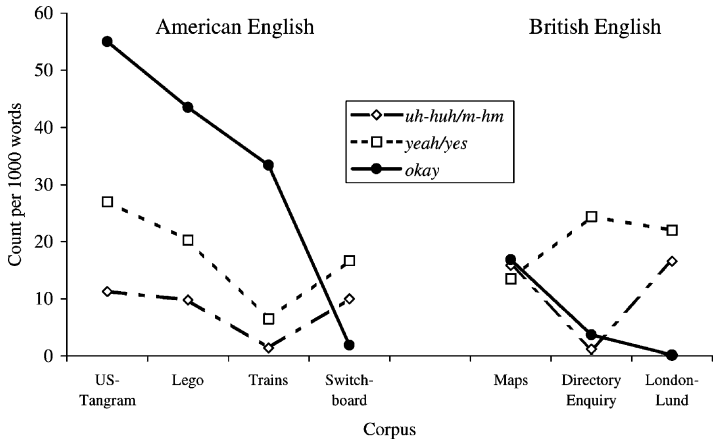

Fig. 5. Production rates per 1,000 words of *okay*, *uh-huh*, and *yeah* for American and British English corpora.

1,000) and Lego corpora (43.5 per 1,000). It was used about 20 times as often there as in the Switchboard corpus. It was so frequent in the U.S.-Tangram corpus (55 times per 1,000 words) that it ranked among the most common words, with *the, and,* and *so* occurring 92.1, 19.3, and 5.2 times per 1,000 words. In the Trains corpus, *okay* occurred 33.4 times per 1,000 compared with *and*, *uh/um*, and *so* at 31.2, 26.9, and 21.8 times per 1,000 words. For the British English speakers, *okay* occurred five times as often in the Map Task corpus as in the Directory Enquiry corpus and 80 times as often as in the London-Lund corpus. So both British and American speakers use *okay* more often in task settings than in informal conversation. In contrast, *uh-huh* and *yeah* did not show any systematic relationship to the type of task involved.

10. Discussion

Our findings suggest that people mark their progress through, or navigate, joint projects in part by means of words we have called project markers. In the tasks we have studied, English speakers used one type of marker (e.g., *okay* and *all right*) for vertical transitions, and another type (e.g., *uh-huh* and *yeah*) for horizontal transitions. German speakers made the same contrasts. Indeed, they used *okay* with roughly the same meaning that it has in English, except that they used it for higher-level transitions than the English speakers did. *Okay* or equivalent expressions exist in other languages as well (Maschler, 2002; Miracle, 1989).

These findings raise three issues. In what way do project markers constitute a system? How do people conceptualize joint actions with the use of project markers? And where else should we find project markers?

10.1. A conventional system of contrasts

Project markers, we assume, belong to a conventional system of contrasts for marking location and progress in joint activities. The ones we have examined fall into three main groups: (1) acknowledgment tokens (*yes*, *yeah*, *yep*, *uh-huh*, and *m-hm*); (2) agreement tokens (e.g., *right*); and (3) consent tokens (*okay* and *all right*). There are also what Goodwin (1986) has called assessments (e.g., *terrific* and *oh no!*), but they didn't occur in our tasks. All of these words can be used as second parts in adjacency pairs. We will argue that their functions as project markers derive from their role as second parts of such two-part serial actions: to produce a project marker is to take up a first part, which may be explicit or merely entailed. The three classes of markers differ in what they take up and how.

Words such as *yes*, *yeah*, *yep*, *uh-huh*, and *m-hm* can all be used as affirmative answers to yes-no questions, as in 16 and 17 (from the Switchboard corpus):

(16) Alice	So do you have any credit cards?
Bill	Yes, I do.
(17) Charles	Should we have been there?
Dan	Uh-huh.

These words divide into at least two subgroups: the full forms *yes* and *yeah*; and the reduced forms *uh-huh* and *m-hm*. According to examples from the Switchboard corpus, Bill could have

replied to Alice, “Yes, I do,” “Yeah, I do,” and even “Yep, I do,” but not “Uh-huh, I do” or “M-hm, I do.” Intuitively, these forms also range in strength of assent. *Yes* seems more forceful or decisive than *yeah* or *yep*; and *uh-huh* seems stronger than *m-hm*. Many of these differences are reflected in Fig. 3.

Yes, *yeah*, *yep*, *uh-huh*, and *m-hm* also appear as second-parts to statements, as in the following example (from the Switchboard corpus):

(18) A He, matter of fact he was here today. It was the first really warm weather we’ve had.
B Uh-huh.

In 18, *uh-huh* is used to acknowledge A’s statements as having been understood. These are what are called acknowledgment tokens. We suggest that *yes*, *yeah*, *yep*, *uh-huh*, and *m-hm* carry the same contrasts when used as acknowledgment tokens as when used as answers to yes-no questions (e.g., 16 and 17).

Right, in contrast, is used to assert agreement with a claim, as in this example (from the Switchboard corpus):

(19) A You know, so you can’t, the only way that you can do it is through a modem.
B Right.

In using right, B is agreeing with A’s claim. B’s “Right” is roughly elliptical for “That’s right.” *Right* is not the same as *yeah*. In the Switchboard corpus, *yeah* was sometimes accompanied by *right*, or *that’s right*, either before or after, as in (20):

(20) A Better than just sitting in jail all day not doing anything.
B Yeah. Right.

Okay and *all right* also occur as second parts of adjacency pairs, and when they do, they are used to *give consent to joint arrangements*, as in these examples:

(21) (from Beach, 1993, Example 6).
Camilla Can I borrow your car?
Betty When?
Camilla This afternoon.
Betty Okay.

(22) (From Merritt, 1984, Example 3).
Customer C’n I have two packs of Vantage Green?
Server Okay. [turns to get].

(23) Daughter I want to stay at Sarah’s house tonight.
Mother Okay.

In 21, Camilla requests a concrete action from Betty, and Betty uses *okay* to give her consent to that arrangement. The same goes for 22. In 23 (an invented example), the daughter seeks permission to stay at a friend’s house, and the mother uses *okay* to give her consent to that arrangement—to give her daughter permission. In these examples, *okay* means, roughly, “I give my consent to the joint arrangement at issue.”

Speakers, therefore, make different commitments with acknowledgment tokens, agreement tokens, and consent tokens:

1. *Acknowledgment tokens*: The objects that get acknowledged are *presentations*. When partners acknowledge a presentation, they claim to have received it well enough for current purposes. In 18, A says, "It was the first really warm weather we've had," and B says he has received it with "Uh-huh." In context, speakers often implicate further that they have understood and even accepted what has been presented—at least well enough to continue.
2. *Agreement tokens*: The objects that get agreed with are *positions*. When people agree with a position (as with *right*), they are aligning themselves with that position. In 19, A states that "the only way that you can do it is through a modem," and B aligns himself with A's position with "right." "Right" here is short for "you're right" or "that's right."
3. *Consent tokens*: The objects that partners give consent to are *joint arrangements*. By joint arrangement, we mean a projected undertaking that requires the partner's approval. When partners give consent to a joint arrangement, they are approving the projected undertaking. In 21, the projected undertaking was Camilla's borrowing of Betty's car, which required Betty's approval. Betty gave her approval by responding "Okay."

Partners make stronger and stronger commitments, therefore, as they go from acknowledgments to agreements to consents. With acknowledgment tokens, they are committed to the receipt of a presentation—although in context they may implicate understanding or acceptance as well. With agreement tokens, they are committed to agreeing with a position (which implies they have understood the position, too). And with consent tokens, they are committed to being part of the projected undertaking (which also implies they have understood). To see these contrasts, suppose A says, "I'd like to see Jones in that job." If B responds "Uh-huh," he is claiming to have received and, by implication, understood A's statement. If he responds "Right," he is also aligning himself with A's desire to see Jones in that job. If he responds "Okay," he presupposes that A is proposing an undertaking that requires B's approval (say, A and B are trying to hire someone), and he is giving that approval. That is, B's choice of *uh-huh*, *right*, or *okay* does two things (see Clark, 1996, Chapter 7). It displays his construal of A's contribution (as a presentation, position taken, or projected undertaking). And it acknowledges, claims agreement with, or gives consent to A's contribution (construed as a presentation, position, or undertaking).

Second-parts are sometimes produced without explicit first-parts. When speakers produce such second-parts, they presuppose the missing first-parts and implicate their current relevance. Consider a sign at the entrance of a building, "Thank you for not smoking." Its logic is this: You, the customer, promise not to smoke in the building, and the management thanks you for that promise. You have made no explicit promise, of course, but in accepting the thanks, you accept the management's presupposition that you have. That is, accepting a second-part ("Thank you for not smoking") entails accepting the unspoken first-part of the pair for which it is a second ("I promise not to smoke").

Project markers, we suggest, work by the same logic: to use an acknowledgment, agreement, or consent token is to accept the first-part of the pair for which it is a second, whether the first-part is explicit or not. Take *uh-huh* used as a continuer. It entails that there is a first part for which

it is a second. The first part depends on the context, but it might be, for example, "Do you understand me so far?" *Yeah* differs from *uh-huh* in whether the first-part implies completion of the speaker's contribution. Instead of "Do you understand me so far?" *yeah* presupposes "Have you understood me?" The transitions embodied in the two parts with acknowledgment tokens are horizontal transitions.

Okay works this way too, but the first part for which it is a second is a joint arrangement that requires consent. Consider a builder who has just completed a Lego model and says "Okay." He presupposes a first-part that reads, roughly, "Let's regard the Lego model as complete," and his *okay* gives his consent to the arrangement. Or consider a customer in the Directory Enquiry corpus who says "Okay" when the operator couldn't find a telephone number. The customer presupposes a first-part that reads, roughly, "Let's regard our search for the telephone number as complete," and his *okay* gives that consent (Merritt, 1984). Or consider the director in the Lego task who asks "Okay?" to which the builder replies "Okay." The first *okay* is used to ask, "Shall we regard this model as complete?" and the second gives the consent. In this way, *okay* marks a transition out of the current joint project—a vertical transition up.

Pre-turn *okay*s work much the same way. When the director in the Lego task initiates a trial by saying, "Okay, now find a two-by-four block," the initial *okay* is again a second-part of an implicit two-part sequence. Using it presupposes a projected joint action, and the tacit first-part, "Let's do the project we have jointly arranged." In saying *okay*, the director makes his consent explicit and then begins. It is in this way that he frames that utterance as the first move in that joint project. If instead of *okay* he had used *well* or *so*—two other common pre-turn markers—he would given it an alternative framing (Condon, 2001). So pre-turn *okay*s mark a transition into the first move of the next joint project—a vertical transition down.

Giving consent to an overall joint undertaking does not eliminate the need for further coordination. Once Ed and John have consented to move two benches (Fig. 1), they still must coordinate on moving each bench. Using *okay* at major transitions displays the speaker's consent to component joint projects and renewed consent to the overall joint undertaking—whether that is moving two benches, placing a series of cards, picking up a friend, or having a beer together.

An important issue we did not investigate is prosody. Intonation, for example, can be used to modulate the meaning of project markers (see Bolinger, 1989), as in the following invented example:

(23) Betty	Can I ask you a personal question?
Camilla	Okay [fall-rise intonation].

Here, Betty is asking Camilla if she can ask her a question (a pre-question, Schegloff, 1980). Camilla, in producing *okay* with a fall-rise intonation, gives Betty her provisional consent. But by making the consent provisional, she reserves the right not to answer Betty's question if she considers it too personal. Intonation is used to modulate the meaning of other acknowledgment, agreement, and consent tokens, too (see, e.g., Hockey, 1993; Kowtko, 1996; Oreström, 1983), though so far it isn't clear how these aid navigation through joint projects. Prosody is known to be used in regulating turn-taking (e.g., Beattie, Cutler, & Pearson, 1982), so it is surely used in marking transitions into, out of, and through joint projects.

10.2. Conceptualizing joint actions

People appear to differ in their use of project markers. In the matching task, we found that participants used *okay* less and less often over trials, switching to *uh-huh* as they became more familiar with the Tangram figures. But some participants continued to use *okay* without switching to *uh-huh*. Did *okay* and *uh-huh* have a different meaning for these two classes of participants, or did the two classes have a different conceptualization of the task? If one class of participants was treating *okay* and *uh-huh* as interchangeable, that would count against our view of project markers.

We suggest that different uses of project markers reflect differences in how people conceptualize the actions they are performing. People do indeed differ in how they describe actions. The same behavior can be identified as turning a doorknob, opening a door, or leaving a room (Goldman, 1970; Vallacher & Wegner, 1989). Indeed, observers who are asked to segment ongoing activity tend to agree with each other on higher-level actions and to disagree more at lower levels (Newtson, 1973; von Cranach et al., 1982; Zacks et al., 2001). Likewise, in our tasks, most pairs used *okay* to enter and exit (higher-level) A-projects. They were less consistent mainly at the lower levels (B- and C-projects). At these levels, they could conceptualize a next joint project either as a minor continuation of the current one, which required an acknowledgment, or as a major new joint arrangement, which required consent. Some participants construed them as minor, and others construed them as major.

10.3. Implications and applications

Our results underscore the need to analyze dialogue as the way people carry out basic joint activities. Although this point is not new, it has often remained implicit in research on dialogue. It was by treating project markers as reflections of these activities that we were able to characterize them as we did—to show that they are used for more than turn-taking, affinitive, or emotional functions.

Project markers should be useful, therefore, in creating or analyzing dialogue used for other joint activities. Intelligent conversational agents (e.g., Cassell, Sullivan, Prevost, & Churchill, 2000), for example, need to be able to monitor the joint projects they are taking part in and use project markers to help navigate them. That applies, for example, to conversational agents serving as tutors in artificial tutoring systems (Brandle & Evens, 1997; Fox, 1993; Tsukahara & Ward, 2001). Tutoring consists of such joint projects as problem solving, question answering, and explaining with examples (Graesser, Person, & Magliano, 1995), and according to some evidence, expert tutors are skillful in using project markers to navigate them. When tutees give a partial answer to a question, for example, expert tutors may say *yes* with a rising intonation to signal that the answer so far is correct, but incomplete. In saying *yes*, they also signal the continuation of the joint project of answering the question. They would use *okay* to signal that the problem is complete, and that they are moving on. Artificial tutoring systems, to be effective, must track the joint projects created and use the appropriate project markers. The analysis of project markers should also be useful in other pedagogical activities, such as classroom discourse (see Sinclair & Coulthard, 1975).

In this paper, then, we have assembled evidence that words like *uh-huh*, *yeah*, *okay*, and *all right* are used as project markers, as a system of words for navigating joint projects. The existence of such a system is, in turn, strong evidence that dialogue emerges from joint activities that the markers are used to navigate (Clark, 1996, 1999). Dialogue serves to coordinate joint activities and, therefore, derives much of its structure from those activities. It is shaped, in particular, by the commitments people make in agreeing to engage in joint projects.

Note

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