

Linguistic functions of head movements in the context of speech

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Abstract

Speaker head movements pattern predictably and have semantic, discourse, and communicative functions. Some head movements convey propositional content, while others carry semantic meanings beyond affirmation and negation. Side-to-side shakes correlate with expressions of inclusivity and intensification. Lateral movements also co-occur with uncertain statements and lexical repairs. In narration, head movements serve to locate referents in abstract space. A change in head posture marks switches between direct and indirect discourse, and speaker head nods function as backchannel requests to which listeners are extraordinarily sensitive. These findings are based on the microanalysis of videotaped conversations between native speakers of American English. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

The head movements we make when we speak are not random. They mark the structure of the ongoing discourse and are used to regulate interaction. Previous research on spontaneous nonverbal movements in the context of speech has focused on manual gestures and gaze. Gesture researchers currently debate whether spontaneous gestures are primarily an indication of the speech production process (Butterworth, 1980; Butterworth and Beattie, 1978; Butterworth and Hadar, 1989; Krauss et al., 1996) or whether their primary purpose is communicative (Streeck, 1993, 1994; Kendon, 1994).

As is currently the case in regard to the study of manual gestures in the context of speech, researchers study head movements from two different, but not necessarily

conflicting perspectives: their role in speech production, and their communicative functions. This paper will present evidence from the microanalysis of dyadic conversations that head movements are both an integral part of language expression and function to regulate interaction. They pattern in predictable ways.

2. Previous research on head movements

The role of body movement in general in the speech production process was investigated in a 1931 experiment by Dobrogaev (reported in Kendon, 1980: 225). Subjects were asked to suppress all head and manual movements as well as facial expressions while speaking. No subject was completely successful, and the resultant speech lacked pitch variation and fluency. Lexical selection itself became difficult.

Birdwhistell conceived of body movement as being tied directly to linguistic structure (1970: 103). He postulated a hierarchical system of units of movement in which lower-level units combined to form higher-level units. He regarded isolable features of movement as kines that clustered in classes of kinemes (1970: 229). A kineme was a group of movements which informants regarded as the same and which held the same 'meaning' for interactants in American culture. Despite the fact the Birdwhistell sometimes used the terms kine and kineme interchangeably, he regarded the head nod as a distinct kinesic unit with a typical velocity range among Americans of 0.8 degrees to 3 degrees per 1/24 second over a spatial arc of 5 to 15 degrees (allowing for variation interpreted within an individual's overall pattern of movement). Head movements outside of these specifications belonged to different units. At the same time some head nods were considered stress kinemes. Birdwhistell believed that movement kines in general were culturally specific and that ultimately linguistic and kinesic forms are but alternate manifestations on different channels of more comprehensive communication units. In this framework, pointing gestures including the deictic use of the head came to be called kinesic pronominal markers because of their synchronization with pronominals such as 'I', 'that', 'here', and the like. Although Birdwhistell's system of parsing movement was not adopted by gesture researchers, much subsequent work has expanded on his early observations. It is now understood, for example, that deictic gestures are not limited to co-occurrence with pronominals in speech and that other types of gestures can use space indexically as well.

Several studies have focused on the relationship of movements of the head to the speech production process. Many are the work of Hadar and his colleagues who postulated motoric functions for head movements during speech. Hadar et al. (1983a) found that during speech the head moves almost constantly, while stillness tends to occur during pauses and while listening. Thus head movements correlate with speech in a manner paralleling the relationship of manual gestures to speech: that is, speakers tend to move their heads and limbs, while listeners tend to remain comparatively still. A correlation was found between head movements and verbal amplitude. Rapid head movements were accompanied by primary peaks of loudness, but the reverse relationship was only weakly implied.

When the head shifted its axis of movement, such a change was labelled a postural shift. A positive correlation between speed and amplitude of movement was found during such shifts. In previous research, postural shifts of the head were said to regulate turn-taking (Duncan, 1972), mark semantic and syntactic boundaries of concurrent speech (Kendon, 1972), and indicate encoding difficulties (Dittman, 1972). Hadar et al. (1984a) determined that postural shifts co-occurred most significantly between sentences or clauses and were associated with assuming or yielding a turn. They hypothesize that postural shifts may function “to coordinate the movements of the articulators by providing an ‘external’ reference” (1984a: 244). As one assumes the role of speaker, the muscle tension required to move the head acts to prime the inert articulators.

A similar motoric explanation is postulated for head movements following speech dysfluencies (Hadar et al., 1984b). Head movements after dysfluencies were found to be of greater amplitude and velocity than those preceding dysfluencies. (A dysfluency was defined as a pause in speech longer than 0.2 second.) Short pauses (less than 0.5 second in duration) are most often accompanied by rapid head movement and occurred within clause or sentence boundaries, while pauses longer than one second tend to occur between sentences and are accompanied by slower movements, postural shifts, or stillness. Hadar et al. support Dittmann and Llewellyn’s (1968) hypothesis that post-dysfluency prominence is a motor ‘spill-over’ of effort after a temporary glitch.

Hadar et al.’s explanations of head movements are basically physiological; however, the authors recognize that head movements may simultaneously coordinate speech production, mark structural boundaries, and regulate turn-taking.

The power of head movements to control interpersonal interaction even in the absence of speech was described by Adam Kendon in ‘Some functions of the face in a kissing round’ (1990). In this article Kendon details how a young woman on a park bench regulates the actions of her amorous partner solely by her head and facial movements. Patterns of head and facial behavior are shown to control and organize the interaction.

In other research, Kendon (1972) studied head movements in the context of speech of a single individual. Independently segmenting first the verbal channel and then the kinesic channel, Kendon notes that the unit boundaries of both tend to coincide. (Kendon observed the same in an earlier unpublished study cited in Kendon, 1972: 183.) For example, based solely on prosodic phenomena, Kendon defines a locution as a group of tone units bounded by distinct pauses with a marked increase in loudness in the beginning and a corresponding decrease finally. Kinesic locutions are stretches of body motion which share a distinctive movement or position. Kendon found that distinctive patterns of head movements correlated with verbal locutions. Typically, the head starts in one position and shifts to another by the end of a locution. For the first prosodic phrase of a locution the head often maintains the final position of the previous locution as a kind of kinesic cohesive device. During the second prosodic phrase the head position shifts and is held throughout the remainder of the locution.

Kendon notes that the particular patterns of movement vary according to the discourse function of the utterance. For example, the speaker’s head position during a parenthetical remark contrasted with that during statements that “move the substance of the discourse forward” (1972: 193). Thus Kendon was the first to observe that

some head movements are connected to the discourse structure of an utterance. The temporal alignment of manual gesture and head movement varies in Kendon's data. At times the onset of the manual gesture precedes the head movement and at other times the reverse (1972: 195).

In addition to their role in the speaking process, body movements also function interactively. The 'speech-preparatory' repositioning of the head before the start of talk can simultaneously signal the assumption of a turn or the intention to continue and as such is a part of conversational management. Listeners have also been observed to synchronize their head movements with the speech of the speaker. One subject in Kendon's (1970) research raised and lowered his head to match the rise and fall of the speaker's pitch.

Listener nods have been of particular interest to many other researchers. Dittmann and Llewellyn (1968) focused on the behavior of listeners only. They found that listeners tended to nod and vocalize at boundaries of the speaker's phonemic clauses. Two patterns were prominent: listeners nodded and vocalized before making a comment or asking a question; listeners nodded and vocalized in response to the speaker's direct questions and in response to the more perfunctory 'ya know'. Such discourse environments accounted for 70% of their data. The remaining 30% were considered "continuing signals of attention" (1968: 82).

Listener nods preceded their vocalizations by an average 175 milliseconds. Dittmann and Llewellyn hypothesize that this temporal alignment allows the listener to signal the start of a response without interrupting the speaker. Speaker movements were not part of the study, but the investigators note that "the speaker, too, may be putting out signals", although they postulate that such signals are primarily changes in gaze patterns (1968: 82).

From its inception, the term 'backchanneling' included the head nod as a prototypical example (Yngve, 1970). Backchannel signals were initially identified in Yngve's study of turn-taking and were conceptualized as vocal or gestural expressions of the listener that do not signal his desire or intention to assume the floor.

Following Yngve, Duncan (1972) regarded listener head nods as backchannels. Such nods were considered auditor initiated; that is, they were regarded as the listener's spontaneous expression when he or she desired to backchannel including those times when the listener wished to avoid assuming the role of speaker.

Duncan proposed a turn-taking framework in which the speaker gives turn-yielding signals to the listener who then has an opportunity to assume the turn – or to backchannel, if he does not wish to do so. Five of the six turn-yielding signals were vocal such as decreasing pitch or loudness, and the remaining signal was nonverbal: the cessation of manual gesturing. Thus, speaker head movements were not among Duncan's turn-yielding signals. He did note, however, lateral movements of the head toward or away from the listener that he considered alternate manifestations of the eye-gaze pattern identified by Kendon (1967).¹

¹ Kendon (1967) reported that a speaker tends to be [-gaze] as he begins an utterance, perhaps for cognitive reasons, that is, to generate or organize thought. However, the speaker becomes [+gaze] at the utterance's end as he yields the floor.

Maynard (1987) studied head nods which occurred during dyadic conversations among twelve native speakers of Japanese. Although the most frequent type of head nod was that made by Japanese listeners as backchannels, a high percentage of nods during conversation are performed by Japanese speakers. Speaker nods function variously to mark a clause boundary or end of a turn, to fill a turn-transition phase, and to signal emphasis or affirmation. Speakers were often observed to nod before they assumed their turns as well. Thus Japanese speakers use nods semantically, syntactically and interactionally.

Maynard observed that, in general, Americans nod much less frequently during conversations. The Japanese nod on average every 5.75 seconds, while Americans conversing with each other average one nod every 22.5 seconds. Beyond comparing frequency, however, Maynard did not analyze the context of occurrence of nods in conversations among Americans.

Of particular interest is the fact that except for nods that affirmed or emphasized (Maynard determined the latter based on co-occurrence with verbal stress), Japanese speakers did not nod within an utterance for interactional purposes. Japanese speaker nods occur either on the last syllable of speech or during (potential) turn-transition pauses. As will be discussed in this paper, American speakers display a significant difference in this respect.

The present study presents evidence that the head movements of native speakers of American English carry semantic meanings beyond the familiar up-and-down nods for affirmation and side-to-side sweeps for negation. Head movements function as modality markers for uncertainty, and they also signal discourse structure by introducing direct quotes. In narration, they can have a deictic function, and lexical repairs are kinesically marked. Interactionally speaker head nods function as backchannel requests.

3. Database

Two dyads (male-male, female-female) of native speakers of American English were filmed in a television studio. In each dyad the subjects were friends and between the ages of 24 and 37. They were asked to converse about the topics of their choice for roughly an hour. Neither gestures nor movements were mentioned. Before the filming the subjects understood only that they were participating in linguistic research. After the taping, the exact nature of the research was explained and each subject signed a consent form. All four subjects gestured manually and nonmanually, and their manual movements included propositional and beat gestures in addition to self-adaptors such as touching their hair and object-adaptors such as adjusting clothing. Speakers moved their heads with great frequency, and this analysis details recurring patterns of movement that have been identified to date.

Three cameras recorded each conversation. Two cameras closely framed the upper bodies of each participant allowing clear observation of small head and facial movements. The third camera was placed at a distance of approximately eight feet to

capture the full bodies of both subjects. A timecode was simultaneously generated on each tape. Using a time code, it is possible to coordinate the head and manual movements of a subject with the head and manual movements of his interlocutor down to 1/30 second. The analysis is done using a Sharp VC-A5630 VCR machine on which the muting device has been disconnected so that sound is heard as the film is advanced frame by frame. Using such equipment, the manual and nonmanual movements can be matched to the syllable or silence co-occurring on a specific video frame. This is done by advancing the tape and pausing it on the frame before the target frame. The first syllable heard after releasing the pause button is that on the frame in question.

4. Semantics of head movements

American culture like many others uses up-and-down movements which will be referred to as nods for affirmation. Side-to-side sweeps, called shakes are used to signal negation. These movements signal precisely these meanings in the absence of speech, and they are, therefore, considered emblems in American culture. An emblem is a gesture with a conventionalized form and a well understood meaning in a particular culture that is equally well understood in the absence of speech (Efron, 1941; Ekman and Friesen, 1969). There are, however, head movements that predictably pattern with certain concepts. They have gone largely unnoticed, however, because they co-occur with speech.

Inclusivity. One such pattern is the lateral sweep that co-occurs with concepts of inclusivity such as the words 'everyone' and 'everything'. Johnson (1987) suggests that language is grounded in the body. Our bodily experience of a collection of things taking up more than one point in space is the likely basis for the lateral sweep.

Birdwhistell (1966: 185) labeled such sweeps pluralization markers since in his data lateral sweeps of the hand, arm, and/or head co-occurred with plural pronominal forms such as 'we' or 'them', and phrases such as 'all of them'. The broader concept of inclusivity is needed, however, to include lateral sweeps co-occurring with lexical items such as 'whole' which are not regarded as plural forms. Three examples follow.

Speaking about President Nixon's support of the space program, Subject C said:

- (1) And he loved the whole concept of heroes²

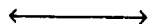


Head moves from left to right.

Subject B mentions the futility of dealing with a large corporation's personnel department in the following excerpt:

² ←→ indicates duration of lateral head movements. Italics describe the movement.

- (2) The worse department to call is the Human Resource Department, because everybody calls them.



*Exaggerated head sweep from left to right.*³

In a discussion about meditation, Speaker D says the following:

- (3) And that made me put the whole situation in perspective.



Quick head movement to the right.

It is not the case that every expression of inclusivity is accompanied by head movement, much the same as manual gestures do not accompany all verbalizations. However, when head movements do co-occur, a lateral pattern has been observed.

Intensification. Head shakes also convey intensification. Lateral movements of the head often co-occur with lexical choices such as 'very', 'a lot', 'great', 'really', 'exactly', and the like. Goodwin (1980, 1987) interprets these lateral shakes as appreciation of something 'out of the ordinary'. Because of their tendency to co-occur with evaluative utterances such as 'It was so good', such shakes are considered prototypical assessment markers (Goodwin and Goodwin, 1987). Noting that evaluations routinely include verbal intensifiers, Schegloff (1987) referred to the synchronized movements as intensifiers, and it is his label that is used here because it reflects the proposed origin of such movements. One hypothesis regarding the link between lateral movements and verbal intensifiers is that the lateral movement is related to negation and, therefore, carries the meaning of 'unbelievable' in such cases (David McNeill, personal communication.) A different but not incompatible explanation can be framed in terms of the bodily experience of inclusivity discussed above. To intensify is to add more of something, thus increasing it in energy, volume, or number. More of something is conceptualized as taking up more space, at least metaphorically, so in this way the concept of intensification is related to the concept of inclusivity. Examples of lateral head movements for intensification from all four subjects follow:

- (4) Subject A: a. I did a lot of units here.



b. Yeah exactly.



Subject B: c. It's a wonderful experience.



³ Here it should be explained that although gestures co-occur with semantically related speech, the preparation phase of a gesture often precedes affiliated speech; that is, the hand(s) will move into position for the stroke of the gesture – the most robust part – preceding the words that are co-expressive with the gesture. (See McNeill's (1992) temporal and semantic synchrony rules.) Thus it comes as no surprise that the beginning of a head movement may co-occur with the syllable preceding the conceptually affiliated verbal segment.

- d. Oh, that was a great job.
 ←————→
- Subject C: e. And she was saying how she knew a lot of people
 who were very positive.
 ←————→
- f. Ah, what a nice man.
 ←————→
- Subject D: g. I had had such a great day. (repetition in original)
 ←————→
- h. She's totally she's so cool.
 ←————→

None contains a negative, yet all examples co-occur with lateral movements. The concept of intensification is conveyed in words such as 'great', 'totally', 'very', and the like. Subject A's response (4b), 'Yeah, exactly', lends strong support to the hypothesis in that here lateral head movements follow an explicit verbal affirmation.

The patterns of lateral head movements accompanying verbalizations expressing inclusivity and intensification suggest that head movements signal semantic information beyond affirmation and negation.⁴

Uncertainty. Affirmative statements are often marked verbally as uncertain by 'I guess', 'I think', 'whatever', 'whoever', and similar expressions. They are kinesically marked as well by lateral shakes whose trajectories may be quite contained. In such cases, the subject is not negating the statement but rather acknowledging another possibility or missing piece of information. Examples follow from three of the four subjects in the study. An expression of uncertainty by the fourth subject coincided with a negative clause so although there were simultaneous, lateral movements, such movements could not be attributed solely to uncertainty in that utterance.

- (5) a. Subject A:
 you throw it in some bucket or something
 ←————→
 to take home and cook and eat
 and stuff like that?
- b. Subject C:
 and the reason being was cause uh
 Miss J?
 ←
 whoever that ya know we were talking about
 —————→

⁴ So widespread are lateral shakes for assessment/intensification and inclusivity that they are used also by native signers in American Sign Language (ASL). A Deaf sign linguist repeatedly moved her head laterally as she signed 'WOW SHOW-UP MANY' (English translation: Wow! Many showed up.) This example is of particular interest since it is clear evidence of gesture co-occurring with ASL signs (McClave, in preparation).

6 d. Subject B:

.....
 And then they'll say, 'Yes, I do.'
right neutral
up & down

And then they'll say – *head and gaze right*
 'Yes, I do' – *head moves left and nods*
gaze at listener

e. Subject C:

and he seemed to have a really kind of a cool rapport
 with him,

.....
 ya know, like, ya know, 'Hey, Leland! How ya doin'?'
neutral right neutral

ya know, like – *head and gaze at listener*

ya know, 'Hey, Leland!' – *head and gaze to right and down as if looking at a child*
 '-land! How ya doin'?' – *head and gaze at listener*

f. Subject C:

.....
 And he said, 'Ya know, I used to build those ...'
right left neutral

And he – *head right, eyes closed*

said – *left movement begins, gaze at listener*

'ya' – *left movement continues, gaze at listener*

'know, I used to build those' – *head and gaze at listener*

g. Subject D:

She goes, 'Ain't she though? She's just so cool.'
neutral right tilt then head bobs

She – *head neutral, eyes close*

goes – *head right, eyes closed*

'Ain't' – *head tilts right, eyes closed*

'she though? She's just so cool' – *eyes either closed or squinting, head bobbing in different directions*

h. Subject D:

.....
 'n he goes, 'Yeah, you're right.'
right neutral

'n he goes – *eyes close and then head right*

'Yeah' – *eyes closed, head neutral*

'you're right' – *head and gaze at listener*

Expression of mental images of characters. Subject C's head movements in example 6e. mark not only the change from indirect to direct discourse; her head angle also reflects a difference in height between the characters in her narrative. At this point in her story she has been speaking about an adult co-worker who is especially good with children, and about a particular child, Leland, for whom she is responsible at her job. As she quotes the adult greeting the child by name 'Hey, Leland!', she moves her head both right and downward iconically conveying the information that

the co-worker is taller than Leland. Such head postures convey differences in height or status and are not uncommon in narration. They are evidence that spontaneous head movements reflect mental imagery. This insight is based on Liddell's (1990) research on American Sign Language in which he noted that certain ASL verbs inflect for height; that is, certain verbs are directed to a specific area of the interlocutor's body. For example, the sign GIVE is directed toward the recipient's chest. Should the recipient be a child, an adult will then lower the sign and his or her head to accommodate the difference in height. This is done even if the child is not physically present but is only part of a narrative. Liddell presents such changes as evidence that the signer has a mental image of the recipient at the moment of signing. Analogously, spontaneous head movements reflecting a difference in height between an adult and a child are evidence of mental imagery among hearing non-signers as well. Thus, both native speakers of English and native users of ASL use head position to convey propositional content.⁶

Deixis and referential use of space. Research on manual gestures has shown that narrators identify particular spots in abstract space in front of the body with particular characters in their narrative (McNeill, 1992). An initial gesture associated with a particular character will be made in a certain space. Subsequent gestures associated with the character will be made in the same space. These are spontaneous gestures performed unwittingly by speakers during narration. The head is also used deictically to locate a referent in space and to orient to the referent subsequently.

The following excerpt is from Subject A's description of a trip to Central America. The excerpt is given first without nonverbal notation; then the deictic head movement and deictic manual gesture are noted for the relevant segment.

- (7) Subject A: I arrived
 made friends even in the airport waiting for luggage
 and then walking around and not knowing where to
 find something
 I would ask (pause)
 so I'm gonna ask this one lady
 ...
 I would ask (pause)
 head: *neutral left*
 so I'm gonna ask this one lady
 head: *left*
 hand: *left – preparation for deictic gesture 'this one lady'*

⁶ I am using the term 'propositional' in regard to gesture (following McNeill, 1985) to distinguish gestures that convey meaning from those whose primary function is rhythmic. In the example under discussion, the speaker lowered her head when quoting the adult addressing the child to show the difference in their heights. The extension of the term 'propositional' to gesture seems apt insofar as the speaker conveyed the information by a head movement and never referred to their heights in speech. Speakers are choosing, albeit usually below the level of conscious recall, how to express meaning on the verbal and gestural channels. As Lyons (1977: 38) notes, "... most messages of the kind we would describe as factual are ... channel-free: they could be transmitted along one of various alternative channels, and might be sent simultaneously along several, or partly along one and partly along another".

I – head and gaze at listener
 would – head neutral, eyes closed
 ask (pause) so I'm gonna – head and gaze left
 ask (second) – deictic manual gesture begins to move left, head and gaze still left
 this – apex of manual gesture

Subject A turns his head and gaze left as he says 'ask (pause) so I'm gonna'. This precedes the first verbal mention of the woman, but already the head movement locates her to the speaker's left in abstract space. A deictic manual gesture directed toward the same abstract space on the left co-occurs with the last part of the utterance. The manual gesture begins on 'ask' in 'ask this one lady' and reaches its apex on 'this'. The head movement precedes the manual gesture by over one second; thus the head is the first indication that the concept of the lady has already taken shape in the mind. It was the first external manifestation of the internal thought process and was used to locate the referent in abstract space.

It should be emphasized at this point that all of gesture research is based on the premise that body movements during speech are not random. Propositional gestures are produced at points of high communicative dynamism; that is, when the emerging utterance expresses information new to the pre-existing context (McNeill, 1992). A propositional gesture is motivated by specific thoughts and is specific in its form to the new thought. Evidence for this is that gestures always correspond to or complement semantically their conceptual affiliates in speech. For this reason, Subject A's orientation to the left in advance of the manual deictic is not interpreted as Subject A's general thought that something interesting but as yet unclear to him is about to happen on the left, although communicatively it may have that function for the listener.

Speaking in another segment about his foreign travels, Subject A reports that the local residents advised him not to go to a certain neighborhood. He quoted the residents in his narrative saying, 'Oh, don't walk through this neighborhood. It's so dangerous'. As he started the direct quote, he simultaneously started a deictic gesture to his left on 'Oh'. His left arm reached its full extension on the word 'through'.

- (8) [Oh, don't walk through] this neighborhood. It's so dangerous.⁷
deictic manual gesture locates neighborhood to the left.

The speaker thus locates the bad neighborhood to his left in abstract space. During the next twenty-three seconds, the hearer asks a question and the speaker reveals that he went to the neighborhood despite the warnings. The speaker reporting his thoughts at the time says:

- (9) So it's like, 'Oh, I [can e]scape from this'.
 left deictic manual gesture to left.
 (head)

⁷ Square brackets indicate duration of gestural stroke.

- (11) (Only those gestures under discussion are indicated.)
1. A: Here people are (pause) are very interested in (pause)
 2. the lineage or descendency of somebody
 3. B: yeah
 4. A: it's not like well what are you
 5. in other countries sometimes if somebody says for example
 6. well, I'm Colombian
 7. they don't say
 8. well, I'm um
 9. [Asian] Colombian
 - R
 - (1)
 - (1) *Right hand moves forward in 5-handshape, palm toward center and fingers pointing away from the body.*
 10. or I'm [American Co]lombian
 - F
 - (2)
 - (2) *right and left hands move forward together. Left fingers hold right pinkie.*
 11. or [Italian Co]lombian
 - F
 - (3)
 - (3) *right hand moves forward in 5-handshape, palm toward center and fingers pointing away from the body.*
 12. B: um hum
 13. A: it's not
 - (very subtle lateral head shakes)
 14. [Colombi]an!
 - L F
 - (4)
 - (4) *right and left hands move forward in 5-handshapes. Right palm is oriented upward. Left palm is oriented toward listener.*
 15. B: um hum

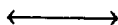
Subject A's head moved right as he uttered the stressed syllable of 'Asian', and forward on the stressed syllable of 'American'. It then moves back momentarily (19/30 second) and begins to move forward again on a glottal stop before the stressed syllable of 'Italian'. Very subtle lateral shakes co-occur with 'it's not'. Before the final exclamation, 'Colombian!', he moves his head right. On the precise frame that he begins to vocalize 'Colombian', his head starts to swing left and then forward. The four movements of the head were paralleled by forward manual gestures with the right or both hands. On the final 'Colombian', he holds both hands out to his sides in what is later in this paper called an 'elicitation gesture'; that is, the palms are upward and in this case the left palm is oriented toward the listener. The important point here is that each item in the list has its own head and hand movements which are distinct, separate movements. The final inclusive concept of 'Colombian' which is understood at this point in the context to emphasize the inclusion of all of Colombia's ethnic groups, co-occurs with a marked lateral movement

preceding the forward movement of both head and body. Here we see in rapid succession a lateral sweep for inclusivity and a forward movement for an item in a list.

6. Cognitive processing

Lexical repairs. Occasionally, a speaker utters a word or words that she immediately rejects as inappropriate and then repairs. The repairs under study are those that seem to result from the speaker's difficulty with lexical retrieval or memory rather than repairs whose function is primarily interactive (Goodwin and Goodwin, 1987). The repair is typically preceded or accompanied by head movements the most common of which are lateral shakes, often small lateral tremors, as in this example from Subject D:

(12) Subject D: And then last night at work at at dinner



The lateral movements in repairs are related conceivably to the lateral shakes that express polarity in interactional sequences. Goodwin (1980: 316) and Schegloff (1987: 105–106) have noted that speakers shake their heads with affirmative utterances if they contrast with the immediately preceding utterances of an interlocutor. With lexical repairs the contrast is intrapersonal rather than interpersonal, and the movement is reminiscent of erasing or wiping something away.

It should be mentioned that some of the head movements discussed so far are subtle and quick becoming prominent only when viewed in slow motion. Indeed, if this were not the case, we would have become aware of their patterning long before now.

7. Interactive functions of head movements

Backchanneling requests. Backchanneling is a hearer signal such as 'yeah', 'um hum', or a nod that indicates that the hearer is taking note of what the speaker is saying. Linguists have long recognized that *hearer* nods are nonverbal backchannels. Many instances of backchanneling were assumed to be internally motivated; i.e., the listener backchanneled when he or she felt like it. Microanalysis of *speaker* head movements in relation to listener head movements reveals that what were heretofore presumed to be spontaneous, internally motivated, listener responses are actually responses to the speaker's nonverbal requests for feedback. These requests are in the form of up-and-down nods, and listeners recognize and respond to such requests in a fraction of a second.

For example, in a conversation about vacation travel, Subject B is telling Subject A that his travel agent booked him a flight on Carnival Airlines.

(13) 1. B: and supposedly what she told me⁹
you go through Carnival

⁹ xxx = subject A's head nods; XXX = subject B's head nods.

2. A: um humxxx
 3. B: airlines?
 |
 4. A: xxxxxxxx
 um hum
 5. B: which is (pause)
 xxxxxx
 (manual gesture: arms open up to the sides with palms directed
 toward Subject A)
 |
 6. A: xxx|x don't know.
 7. B: the ship.
 xxxxxx
 (manual gesture repeated)
 |
 8. A: Oh okay.
 xxxxx

Subject B's head remains motionless until he says 'which is' in line 5. He starts to nod as he starts the manual gesture of extending his hands. McNeill (1992: 149) and Bavelas et al. (1992) have characterized such manual gestures as requests for a response. In this context then it is sensible to conclude that the head nods also may encourage a listener response. Subject A starts to nod his head 4/5 of a second after Subject B's nods start. Since the speaker utters an incomplete relative clause in line 5 with no propositional content whatsoever, Speaker A's nods in line 6 do not signal agreement with an utterance. In the context of an unfinished clause listeners often nod to signal that they know what the speaker means even though he or she has left the utterance syntactically incomplete. Here, however, Speaker A explicitly states that he doesn't know on line 6. The listener's nods appear to function interactively as backchannel responses which have been elicited by the speaker's manual and non-manual movements.

We note similar nonverbal backchannel prompts in our second example; this one from the female dyad. Subject C is telling Subject D about her experience working with children.

- (14) 1. C: [I was tough on the] kids (pause)¹⁰
 xxxxxxxxxxxxxxxx
elicitation gesture *****
 2. like Faith was
 xxxxxxxxxxxxxxxx

 3. ya know I mean [if they weren't cleaning] up
 xxxxxxxxxxxxxxxx
 ***** *superimposed beat* ***

¹⁰ xxx = subject C's head nods; xxx = subject C's exaggerated head nods; xxx = subject D's head nods; | = stroke of the manual gesture; ***, = manual gesture is held

- 4. I didn't go over and say
head left head up and left tilt

- 5. '[Ex]cuse me. Please clean up.'
head down and left
possible manual deictic toward right
- 6. I'd [be like Faith
 xxxxxxxxxxxxxx
superimposed beat on repeated elicitation gesture
- 7. I'd [say 'Time] [to clean] up.' (pause)
 xxxxxxxxxxxxxxxxxxxxxxxxxxxx
*superimposed beats ****
- 8. ya kn[ow 'now'] (pause)
 xxxxxxxxxxxxxxxxxxxx
 super.beat**
- 9. [D: xx um hum

In this segment Subject C's hands form an elicitation gesture, return to rest, and then repeat the gesture. Her hands are both in 5-handshapes in neutral space in front of the sides of her body. The left palm is pointed upward while the right palm is oriented toward the listener. Every group of head nods is accompanied by the gesture which suggests that they may have a similar function. In lines 3, 6, 7 and 8, the speaker performs what are known as superimposed beats; that is, while her hands hold the elicitation gesture, they move up and down. McNeill (1992: 171) postulates that superimposed beats function to keep the content of the gesture still in play in the discourse, and Bavelas et al. (1992: 472) consider beats to be interactive gestures. This supports the following interpretation. Subject C encourages input from her listener through the use of an elicitation gesture together with head nods. When she does not succeed, first she superimposes beats on the elicitation gesture in lines 3 and 6. Still failing to get a response, she then exaggerates the nods in line 7. Subject D backchannels finally with ever so slight nods. Subject C's second set of superimposed beat and exaggerated nod (co-occurring with 'now' in line 8) elicits another listener backchannel. This time a faint 'um hum'.

In the preceding two examples speaker nods co-occurred with an interactive manual gesture, that is, a gesture whose form characteristically requests a listener response (Bavelas et al., 1992; McNeill, 1992). The co-occurrence of this specific manual gesture and speaker head nods suggests that they may have the same function. To pursue this further, do speaker head nods, in the absence of an interactive manual gesture, elicit listener input?

In Example 15, Subject B is describing a former job as an orderly in a hospital and the day a young motorcyclist who had been hit by a truck was rushed in.

- (15) 1. B.
 One of the worst experiences I had there¹¹

¹¹ = subject A's gaze; ... = subject B's gaze; xxx = subject A's head nods; xxx = subject B's head nods; <—> = lateral head movements; [] = stroke of the manual gesture.

18.

 as they were working on this guy
 xx
 x
19.

 A: um hum
20.

 B: so they had a neurologist doing this and (pause)
 xxx
21.

 and an orthopedic surgeon doing that
 xxxxxx
22.

 and you had a
 xxxxxxxxxxxx
23.
 ya had different types of uh doctors and
 xxxxxxxxxxxx
24.
 what I needed to do was uh
25.
 to clean it and uh (pause)
 ←→
26.
 it was real bad [(pause)]
 ←→
preparation for conduit gesture begins on 'real'
stroke of conduit gesture during the pause
gesture is held until after the listener's backchannel
27.
 what had happened was
28.

 he started choking
 xxxxx
- 29:

 A: um hum
 xxxxxxxxxxxx
 xxxxxxxx

During a fairly lengthy turn, the speaker moves his head only four times. He shakes his head while saying 'truck' in line 7, and again while saying 'it was real bad', line 26. These lateral movements seem to signal intensification as in the exam-

Subject D's nods seem to be showing submission ('Okay ... Dr. Watson. No problem'.) and adding emphasis ('thinking animosity'). These additional functions of nods are the focus of ongoing research, but it is significant that even nods with varying hypothesized cognitive functions seem to elicit listener backchannels.

This interpretation of speaker nods is based on observations of the listener. In my data the listeners interpret speaker nods as requests for input. Such nods, like manual gestures, are ordinarily beneath the level of conscious recall. Such gestures clearly function interactively.

8. Conclusion

Many head movements co-occurring with speech are patterned. They have been shown to have semantic, discourse, and interactive functions. Lateral movements of the speaker's head correlate with verbalizations expressing inclusivity, intensification, and uncertainty. Speakers predictably change the position of their heads at the beginning of direct quotes, and for alternatives or items in a list. In narration head orientation functions to locate a referent in abstract space. Because such deictic head movements precede verbalization itself, they cannot be nonverbal translations of speech. Thus, like manual gestures such movements are manifestations of core concepts that are expressed both nonverbally and verbally (McNeill, 1992). Some speaker head nods have been shown to have an interactive function in triggering backchannels. Listeners are extraordinarily sensitive to such signals and respond within a second.

It is likely that some of the head movements discussed here are culturally specific, such as the nods functioning as backchannel requests, while others are possibly universal such as the deictic use of the head to locate referents in abstract space. Cross-cultural studies are needed. The research reported here is ongoing. Undoubtedly, additional linguistic functions of head movements will be seen as more data are microanalyzed. The expression 'You have a head for language' takes on new meaning.

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