Examining Interactions across Language Modalities: Deaf Children and Hearing Peers at School

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Deaf youth easily become communicatively isolated in public schools, where they are in a small minority among a majority of hearing peers and teachers. This article examines communicative strategies of deaf children in an American “mainstream” school setting to discover how they creatively manage their casual communicative interactions with hearing peers across multimodal communicative channels, visual and auditory. We argue that unshared sociolinguistic practices and hearing-oriented participation frameworks are crucial aspects of communicative failure in these settings. We also show that what look like “successful” conversational interactions between deaf and hearing children actually contain little real language and few of the complex communication skills vital to cognitive and social development. This study contributes to understanding the social production of communicative isolation of deaf students and implications of mainstream education for this minority group.

As has been well documented, Deaf youth easily become communicatively isolated in public schools, where they are in a small minority among a majority of hearing peers and teachers. Even within their minority group they are not able to communicate well because other deaf children may not have learned sign language or may have only minimal sign language skills. What has not been well documented are the details of this communicative isolation and how communicative interactions between deaf and hearing children who share classroom, lunchtime, and recess spaces are organized. How do interactions between deaf and hearing children fail, given the skills children demonstrate in navigating the complex participation frameworks demanded in school settings, and given the skills we know children have in acquiring new language forms? As has been previously noted, physical proximity is not a sufficient condition to promote interaction between deaf and hearing children (Arnold and Tremblay 1979; Levy-Shiff and Hoffman 1985). Autobiographical accounts by Deaf students attest to their problems interacting with hearing students (e.g., Foster 1988; Hurwitz 1979), and lack of interaction with peers can put children at risk developmentally (Antia 1994).
In this article we report on a study examining communicative interactions between deaf and hearing children in a "mainstream" school setting in order to discover how the deaf children creatively manage their spontaneous communicative interactions with hearing peers, using multimodal communicative channels, visual and auditory. The results of our study show not only the prevalence of instances where deaf students' initiations and contributions to conversations with hearing classmates fail and vice versa, but also the impoverished nature of communication (even when interactions are successful) between deaf and hearing students. This article identifies specific sociolinguistic strategies children use that lead to interactional failure, strategies that can be altered through educating hearing children about visual communication. As Lederberg, Rosenblatt, Vandell, and Chapin note, "Most deaf children interact with hearing children who frequently reject their social overtures" (1987:532, see also Lederberg, Ryan and Robbins 1986; Vandell and George 1981). By identifying specifics of communicative failure in these settings this study provides a basis for arguing for the creation of an environment in school settings in which deaf and hearing children can gain the tools to participate in more complex language interactions with each other.

We describe below how Deaf–hearing (D–H), Deaf–Deaf (D–D), and hearing–hearing (H–H) interactions in the groups we studied are different in a number of important ways. We focus on two aspects of communicative practice among the children that we feel are especially significant: (1) the organization of participation in a conversation, and (2) the use of symbolic resources in conversation. We first discuss some key differences between the D–D, H–H, and D–H conversational interactions we recorded in terms of the organization of participation in conversation, including aspects of how to be a coparticipant in an aural or visual conversation. We then discuss the use of symbolic means—language—in the context we studied, including how language is used to build extrasituational or imagined contexts. We believe that mainstreaming relies on an unexamined model in which cross-modal communication is assumed to be unproblematically achievable through the adaptation of deaf children to hearing communication strategies and hearing children to deaf students. In our corpus, however, conversations between children who are deaf and between children who are hearing are lacking in real communicative content. The lack of symbolic resources utilized in cross modal conversations points out the gravity of the situation for the small minority deaf children.

There are many challenges presented to teachers and administrators of elementary schools, and we met very inspiring and dedicated teachers and principals during our research. During classroom times deaf children are provided with interpreting and special tutoring. Our concern here is not with the classroom (cf. Erting 1994), but rather interactions between children in spontaneous school settings outside the classroom,
in order to better understand the communicative isolation from their peers that deaf students experience, and the role of habitual linguistic and sociolinguistic patterns in this process.

Background

Our research was conducted over five months in 1999-2000, and included observations and video recordings in a natural setting, as well as informal interviews with teachers and principals. We visited two schools in the Austin, Texas area, one school twice each week and another school once per week. Throughout the research process we were each aware of our positionalities vis-à-vis Deaf culture, sign language, and our relationships to mainstreaming. One of us (Mirus) is deaf and a native signer of ASL; he is fluent in English and attended mainstream schools as a deaf student. Our research assistant, Chris Moreland, also experienced mainstreaming as a deaf student, and although not a native signer, is fluent in both ASL and English. The other author (Keating) is a native English speaker and proficient in ASL. We believe the collaboration between deaf and hearing coauthors is ideal for a project closely investigating communication across deaf and hearing groups, with the goal of better understanding the mainstream experience for the deaf student in terms of communication failure. In addition to acting as ethnographers, Mirus and Moreland (both university students) were positioned by the elementary school teachers, principals, and students as highly valued role models of academic achievement as well as for their expertise in ASL communication and Deaf culture.

The findings in this article are based on a close analysis of 20 hours of videotaped interactions between deaf and hearing second and third graders during lunch and recess at one school (plus observations of kindergarteners), and ten hours of observation of interactions (kindergarten, third, fourth, fifth grades) during lunch and recess at another Austin area school. The large corpus of videotapes was edited into a smaller corpus for analysis, allowing for better comparison of both similar and dissimilar contexts of interaction and particular communicative strategies. Interactions were transcribed for further analysis using methods conventional in linguistic anthropology, including conversation analysis, as well as linguistic analysis at the phrase and morpheme level. We chose the schools by consulting with Deaf education teachers. We had no prior acquaintance with any of the students, teachers, or administrators.

Here, we discuss four children at one school. As is common in the Deaf community, the deaf children have a variety of backgrounds, hearing capabilities, and language abilities. The wide range of language skills among Deaf people is due to the fact that most Deaf children are born to hearing parents (the case for all the children discussed in the present study), who do not know sign language and cannot provide their children with the visual language input research shows deaf children
most benefit by and need for building language skills (including English skills). By the time many deaf children of hearing parents are ready to attend elementary school, they are often already far behind their age-mates, and in spite of special programs provided by the schools, many never catch up. The deaf children in this study represent a wide variety of ethnic backgrounds (African American, Hispanic, white), and are of middle-class and working-class backgrounds.

Communication, although complex, is a central part of people's everyday lives. Ideas, events, and relationships are all represented through language and these representations become subject to negotiation in daily interactions between people. Interactions with others and the environment are important sites for the development of cognitive processes (Vygotsky 1978). Through language particular realities and social relationships are constructed, including social hierarchies, categories of race and class, relations of authority, identities, and gender. Speakers together construct contexts that have a history and that organize activities, expectations, practice, participant structures, and interpretations (see, e.g., Duranti and Goodwin 1991). In interactions, members of a society learn to treat each other as aware of and hence accountable for certain actions and understandings of what is appropriate behavior in particular contexts (Garfinkel 1967). Thus, everyday casual or mundane talk is a place to investigate how language is used to build relationships across individuals, time, and space through language—in this case, in the elementary school setting. The important developmental activities embedded within conversations can be difficult to achieve across linguistic and cultural boundaries.

Differences between Deaf and hearing cultures and experience (see, e.g., Padden 1980; Padden and Markowicz 1975), and differences in pragmatic strategies between sign and spoken languages, are illustrated by remarks made by sign language interpreters. They describe how, when they are interpreting between deaf and hearing people, they must manage not only the language but "the pragmatics of [the] scene" (Roy 1992:57). This is a process whereby "the interpreter aids the minority [Deaf] speaker in behaving in ways acceptable to the larger society and in understanding how such scenes should play out" (Roy 1992:57). This quote reminds us that not only are sign and voice different modalities, but they represent different bases of power and authority in American and other societies. Deaf children in our study exhibit more skill in accommodating to hearing children's linguistic and sociolinguistic strategies than the reverse. However, while the deaf children are skilled at marshalling a variety of resources to communicate with hearing peers, hearing children interpret Deaf children's participation in the hearing world not as extraskillful, but as not fully competent. And hearing children do not exploit their own visual resources to advantage.
The Organization of Participation in Conversation

Conversations do not happen "naturally" but are complex, highly structured events that require mutual monitoring and cooperation across participants. Language users must produce a message that can be understood and listeners must be active in order to respond and provide feedback at key stages. This cooperation cannot be taken for granted (Gumperz 1997). A signer's production of appropriately timed receptive behavior—for example, acknowledgement tokens, backchannel cues, and other signs interactants make to show that they are attentive and appreciative of the contributions of language producers—are very important. Language producers orient to whether others in the interaction are attentive (see, e.g., C. Goodwin 1979). Conversation also includes many signals that provide information about stance, attitude, and other social information and these signals vary across languages and groups (Goodwin and Goodwin 1990; Heath 1986; Kendon 1990; for specifics about American Sign Language, see Klima and Bellugi 1991). Conversationalists must manage turn-taking, interruptions, overlaps, simultaneous starts, trouble spots and side conversations (see, e.g., Sacks et al. 1974), as well as the spatial configuration of participants. Rules for eye gaze differ cross-linguistically, including between spoken and signed conversations. Relationships between linguistic form and context are also crucial in the success of conversational interactions.

A key difference between H-H, D-D, and D-H conversations in the lunchroom is the organization of the conversations in terms of participation. Typically the deaf children interact minimally with hearing peers during lunch, resulting in a low frequency of conversational interactions. In one 15-minute segment, for example, Lori, a third grader, did not initiate or participate in a single interaction with the children sitting around her. At recess, however, she often signed with one of the authors, Mirus, for periods of 10 or 15 minutes. She also sometimes signed with Jay, the other deaf student in her grade, at lunch. A second-grade deaf girl, Zelda, also typically sat alone for long periods watching children at another table or in the lunch line, while the hearing children around her conversed with each other.

Sign and speech communication have very different ways of organizing participant roles, gaining addressees' attention, initiating participation, or signaling a bid for a turn at talk in an ongoing conversation. We discuss below the following aspects of participation in conversation between deaf and hearing children that we believe contribute to interactional failure: turn taking and eye gaze patterns, the organization of participants, and participants' orientation to utterance or turn organization.

Turn-Taking and Eye Gaze

Turn-taking strategies in visual language are quite different from those in spoken interactions (Baker 1977; Mather 1994). A Deaf person
cannot initiate signing until the addressee’s gaze is directed toward the Deaf person. This makes eye gaze a powerful turn regulator (Mather 1994:627). As Mather and Carroll note, “with Deaf students awareness cannot be taken for granted. It must be requested by the speaker, and, in effect, assented to by the audience” (1990:9). Those who are not aware of or are not skilled in eye gaze rules will experience difficulty in having “smooth” exchanges and turn-taking will be affected (Mather 1994:627). Triadic and multiparty interactions in sign language require even more coordination of eye gaze. The hearing children in our study understand how to get deaf children’s eye gaze by tapping the deaf child’s shoulder or handwaving (initiating an interaction with a deaf child necessitates using a visual or tactile communication). In addition, they have discovered that the use of vocatives recruits other hearing children as coparticipants in physically or visually getting a deaf child’s attention and securing their eye gaze. Deaf children also use vocatives to attract the visual attention of hearing children and to initiate conversations. Once initial attention is secured, however, a successful interaction and one with the complex language content common to children of these ages is not achieved between the deaf and hearing children we observed. The hearing children do not understand important aspects of eye gaze in maintaining visual conversations.

There is more to eye gaze than merely looking at a signer. As Ramsey and Padden (1998) describe in their study of signed classroom discussions, “attending to signed discussions involves coordination of a set of actions that result in, but entail more than, looking in the right direction at the right time. Duration and direction of eye gaze are cued by small features of interaction such as the eye gaze and movements of others, and by patterns of discursive markers that indicate ends of utterances as well as transitions” from one speech genre to another (1998:13). Signers repeatedly scan their environment for visual information. These skills are crucial to competent interaction in the visual mode. In hearing conversation joint attention can be maintained even if eye gaze is not (and many of the same speaker exchange cues noted above for sign language in spoken language are realized prosodically). One study of twins of Deaf parents found significant differences in the bilingual twins’ use of eye gaze when speaking English versus when signing (Richmond-Welty and Siple 1999). When using sign, eye contact was almost always secured, with English only a third of the time. Hearing children have been socialized into patterns of conversation that do not require the same attention to eye gaze as sign language conversation.

The following excerpt is an example of how eye gaze differences and differences in participant organization can affect the success of conversations. A deaf second grader tries to engage a hearing child’s participation in interaction. The initial attempt is redone five times and yet fails to result in an engagement. Zelda, the deaf child, makes her opening move to initiate a dyadic interaction with a hearing girl by tapping her shoulder.
Zelda has imitated a breath-holding maneuver introduced by Gail, a hearing girl, and Zelda wants to elicit Hilda’s participation in a dyadic interaction built around this breath-holding. Hilda, meanwhile, is listening to a hearing conversation across the table from her. After ignoring Zelda’s first shoulder tap, at the second one Hilda glances briefly at Zelda, but quickly turns her attention back to the hearing conversation across the table. Although this move would not necessarily terminate a hearing–hearing interaction, because Zelda could comment to Hilda’s back or Zelda could choose to remain a peripheral participant in the focused hearing interaction, it terminates an interaction dependent on visual communication and eye gaze. Another hearing girl who first started making the breath-holding face is in fact able to join the hearing conversation (she drops her hands from her face and later is engaged as a participant in their interaction). After six tries to engage Hilda, Zelda gives up. The girl who started the breath-holding, Gail, starts the maneuver again while Zelda resumes her communicatively isolated state and begins watching children at the table behind her.

Example 1. Hilda, hearing, is sitting between Gail, who is hearing, and Zelda, who is deaf. Zelda’s actions and Zelda’s attempts are in boldface type to make it easier to see the interactional moves.

1. **Gail:** laughs, starts a breath-holding maneuver by holding her nose and blowing into her cheeks, with her hands covering her mouth.
2. Continues for several seconds. Makes eye contact with Zelda.
3. **Zelda:** responds to eye contact by immediately imitating G by placing her hands over her mouth and swelling her cheeks.
4. Taps another hearing girl, sitting beside her, H, on shoulder (first attempt)
5. Z acts as if she will burst from holding her breath, moving her head up and down.
6. **Hilda:** doesn’t respond, but continues as listener participant in a conversation with hearing boys across the table
7. **Z:** taps H on shoulder again (second attempt)
8. blows her breath into her cheeks with her hand over her mouth
9. **H:** looks at Z, watches her for a second,
10. looks away, with no response or change in expression
11. **Z:** places hands over mouth and repeats the gesture
12. **H:** ducks her head and smiles a half-smile, but doesn’t look at Z
13. **Z:** taps H on the shoulder again (fourth attempt)
14. **H:** looks at Z with a briefly impatient expression with brows raised
15. **Z:** continues covering her mouth and swelling her cheeks
16. **H:** looks away
17. **Z:** taps H again (fifth attempt)
Zelda’s persistence in the face of rejection is quite striking, although all the children in the lunchroom seem to orient to difficulties in securing the attention of the others because of the noise and complex participation frames of the lunchroom, and they can be quite persistent. It is easier, however, to deny visual attention than to deny aural attention (Holzrichter 2000:11).

Zelda gets the attention of her intended addressee, Hilda, but her hearing addressee does not interpret her own gazing back as meaningful in the same way—that is, agreement to a longer span of attention and a recipient role in an interaction. In sociolinguistic terms, Zelda did not receive the type of receptor’s eye gaze from her target addressee (Hilda) that she repeatedly sought and that is necessary to sustain a visual interaction.

Orientation to Turn and Utterance Organization

A second example of the difficulties of managing participation roles in D–H conversations is one in which lack of orientation to the organization of a signed utterance or turn leads to lack of coordinated eye gaze and interactional failure. In this case eye gaze and participation in a conversation are accepted by the hearing addressee but are withdrawn at a crucial communicative point, before the signer’s communication is complete or understandable. A common structure in ASL is referred to as topic–comment structure, where the topic is introduced first, followed by a comment. English uses topic–comment structure in proverbs; for example, “a stitch in time (topic) saves nine (comment).” In the following example, a deaf child (Yolanda) sits beside a hearing girl and both are eating. Yolanda taps the hearing girl (Holly) on the shoulder. Holly turns and gazes at Yolanda’s face. Yolanda then points at her own plate. Holly then gazes at Yolanda’s plate, but then turns away without again gazing at Yolanda. The comment Yolanda has attempted to introduce, concerning the food on her plate, cannot be expressed (this would be something like: THIS FOOD (topic), YOU WANT SOME (comment)? or THIS FOOD (topic) TASTES FUNNY (comment). 

Example 2. Yolanda, deaf, and Holly, hearing.

1 Yolanda: taps H; leans toward H
2 Holly: looks at Y, establishes eye contact
The budding conversation ends with only the first part, "this food" being produced. In this case a failure to understand or orient to the shape of a signed utterance leads to conversational failure.

**The Organization of Participants**

While conversational interactions between hearing children (H–H) most often involve more than two children, deaf–hearing (D–H) and deaf–deaf (D–D) interactions are most often dyadic. We observed that when dyadic interactions occur among hearing children they are relatively short, and a dyadic interaction often builds quickly to a multiparty interaction involving as many as six children. However, if a third (hearing) student joins a dyadic deaf–hearing interaction, the deaf participant often drops out, as the interaction becomes less visually oriented. Dyadic interactions are the most frequent type of participant structure between the deaf children, no doubt influenced by the fact that each grade we studied had only two deaf children. In the multiparty hearing conversations in the lunchroom, hearing children can participate as bystanders or overhearers, but the inability of deaf students to participate in the role of bystanders or overhearers in hearing children’s talk limits their opportunities for making contributions to ongoing conversational activities because they cannot know when it is appropriate to begin a turn at talk as well as important knowledge about context. Long, rectangle tables do not favor multiparty visual communication (in the cafeteria of the Texas School for the Deaf the tables are round, orienting to visual participation structures and allowing for optimal management of eye gaze).

We have discussed some representative examples from our corpus of how deaf–hearing interactions can fail to be initiated or sustained. Even when interactions are successfully built, however, they are lacking in real communicative content, as we discuss below.

**Use of Symbolic Resources in Conversation**

Deaf–hearing interactions between the students in our study are more limited in complexity of language use and use of extrasituational context than those interactions between the same hearing children and their hearing peers, and the same deaf children and other deaf children or with the research team. There is only a limited amount of language used in deaf–hearing interactions.
The Limits of Shared Linguistic Resources

One of the most successful and sustained types of interaction between D-H in this age group is nonlinguistic: physical play or reciprocal touching, for example, clapping hands, arm wrestling, tickling, or play kicking under the table. This is similar to what Antia observed in studies of how to increase "positive" interaction between "hearing impaired" children and their hearing peers. Intervention strategies were "primarily effective in increasing nonlinguistic interaction" (1994:282-283). When co-participation between deaf and hearing students consists of physical play with one partner, the body orientation is maximally optimal for the deaf student. Eye gaze, hands, and arms are the principle points of interaction. In order to "play," the hearing child must be visually attentive. Participants can learn the rules of the interaction by mimicry as they play. In addition to having little if any complex language content, however, these multiturn interactions ultimately fail, too, because they are considered inappropriate in the lunchroom, and become a site for disciplinary action by the adult supervisor. Sometimes the hearing children anticipate and perform the disciplinary action themselves, which ends the physical play. The children are regularly told by adult supervisors to keep their hands "to themselves" in the lunchroom. They are encouraged to adopt a hearing style of verbal conversation as the prime activity other than eating.

The deaf children use a surprisingly limited number of signs or gestures when communicating to their hearing peers although they (the deaf children) have some skill with and are learning sign language. In the following example (also an example of physical play) between a deaf boy (Jay) and a hearing boy (Hal), only one sign is used, the numeral ONE, which is accompanied by Jay’s voicing of the word "one." As is typical of signs in D-H interactions in our corpus, one sign constitutes the entire utterance, not understandable outside the current context.

Example 3. A deaf boy, Jay, and a hearing boy, Hal, playfight. Both are grappling with each other’s hands. Hal is trying to grab Jay with a hand, and Jay is trying to hold him off by holding Hal’s wrist with his hand.

1 **Jay:** pretends to scream in fear
2 **Hal:** starts to raise his other hand
3 **J:** shakes his head; says "no." Raises his index finger and says "one."
   (Establishing or reestablishing the rule: "use one hand.")
4 **H:** Changes his playing hand, formerly a clawshape, into a 1-handshape (copying J)
5 The two continue struggling in play.

In voicing "no" and "one," Jay accommodates to Hal’s language modality. Hearing peers also use voice to communicate with deaf children. However, only 25 percent of spoken language is understandable for
most deaf people through lip reading (Culhane and Mothersell 1979). One of the consequences of deaf-to-hearing accommodation (from sign to voice, and the use of signs and gestures that are known to the hearing children) is that hearing children (as well as deaf children) have few models of sign language in their environment.

The signs we recorded include only a small number: the verbs EAT, WAIT, STOP, LOVE, affirmatives/negatives NO, YES, the pronouns I, YOU, SHE/HE/IT. Some of the hearing children use sign phrases they have learned, for example, “SHE LOVES YOU,” and some mixtures of sign and gesture (e.g., HE YOU crazy-gesture “he says you’re crazy” or YOU crazy-gesture). The children also compose utterances consisting entirely of gestures (e.g., gesturing “come-here”). Other conventionalized gestures include: pointing, shoulder shrug, head nod, head shake, and hands as a block in front of the body. Some hearing students in some grades use fingerspelled words to deaf students (but infrequently).

A Lack of Complexity in Types of Talk

Another way deaf–hearing conversations lack symbolic complexity is in terms of genre. Typically, children’s conversational activities in these age groups involve complex speech genres. Goodwin’s (1990) study, for example, shows how children are involved in learning and performing complex speech patterns, including argumentation. Children regularly initiate and respond to efforts of other children to initiate conflict, and these disputative interactions build language skills. Children “promote extended debate” (Goodwin 1990:158) by, for example, recycling positions or stances and by providing justifications for those positions and then countering those justifications. However, there is none of this kind of extended debate in the deaf–hearing interactions we recorded and observed.

In the following excerpt, for example, a hearing girl (Gabriella) attempts to instigate a dispute in a three-way conversation between herself, a hearing boy (Bill) and a deaf boy (Jay). Gabriella taps on the shoulder of the deaf boy to get his attention, points to the hearing boy, then to the deaf boy and uses the conventionalized American gesture for “crazy” (circular motion of the finger beside the head). This was interpreted by Mirus as “He thinks you’re crazy.” The hearing girl repeats this proposition twice, but, although the deaf boy establishes eye contact (line 4) and although Gabriella repeats her reporting of the insult three times, Jay does not respond and resumes playing on his own.


<table>
<thead>
<tr>
<th></th>
<th>Gabriella:</th>
<th></th>
<th>Jay:</th>
<th></th>
<th>G:</th>
<th>J:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>waves to J; points at B</td>
<td></td>
<td>moves his shoulders as if startled; continues playing with research microphone</td>
<td></td>
<td>laughs; taps J on shoulder</td>
<td>establishes eye contact with G</td>
</tr>
</tbody>
</table>
We notice a high proportion of directives in the deaf–hearing interactions. Initiating speech acts are often directives, for example, “watch” “look,” communicated as pointing to a particular location or person or event. These directives can be responded to physically (e.g., through an action of looking), and no language is required. Research on hearing mothers of deaf children notes that they are more directive than hearing mothers of hearing children or deaf mothers of deaf children, and a high percentage of directives are also common in interactions with children of lower communicative competence (Holzrichter 2000:8).

One striking aspect of the lack of complexity of deaf–hearing interactions in our group of children is the absence of any contexts for language outside the immediate present. Research shows that children typically move between real and imaginary events in language (see, e.g., Goodwin 1990:168), for example, in their creation of narratives. Narratives often integrate multiple communicative modes and can contain dramatic reenactments (Ochs and Capps 1996:20). Narratives are recognized as an important means of making sense of and socializing attitudes toward experience. They create continuity between past, present, and imagined worlds (Ochs and Capps 1996), as well as identities (Ochs 1993). Narratives of personal experience mediate past events (see, e.g., Labov and Waletsky 1968; Polanyi 1989). They attribute significance to particular individual actions and events according to their effect on a larger whole (Polkinghorne 1988) or schema, and storytelling can be a “theory-building activity” (Ochs, Taylor, Rudolph, and Smith 1992). As humans, we can only participate in certain events through the world created by language. When deaf and hearing children converse in the lunchroom with each other, however, they situate their conversations only within the present time and space, using objects and people in the immediate context. These conversations, lacking as they are in linguistic content, are highly dependent on building meaning through pointing and situating the body and utterance within a current visual scene. Hockett links the idea of language with the ability to “talk about things that are remote in space or time (or both) from where the talking goes on”
According to this definition, these deaf and hearing children do not use language to each other. There is no reporting between deaf and hearing children of their thoughts, feelings, perceptions, and memories and reconstructions of past events.

In contrast to D–H interactions, H–H and D–D interactions in the lunchroom often contain narratives. Among the hearing children in the lunchroom, story recipients critique narratives, and “truth” or “lying” emerge as a way of distinguishing between particular constructions of hearing children’s reality and of constructing authority. In the example below, hearing children negotiate the reality of an overturned car suddenly righting itself and continuing down the road.

Example 5. Hearing children’s narrative (square brackets indicate overlap, italics indicates emphasis, question mark indicates unclear utterance, hyphen indicates cutoff).

1 Alice: my friend said that (1.0 second pause) um (1.0 second pause) that their car flipped over and they were still driving (1.0 second pause)
2 Bob: ahh dun
3 A: flipped flipped over and flipped back over done that
4 B: gross
5 A: (? unclear utterance)
6 Chris: (? unclear utterance overlapped with A)
7 A: but the car was driving it just flipped over and then they kept on driving
8 B: that’s so-
9 A: that’s what she told me and I know that’s not true. I don’t know (? unclear)
10 B: if you got a car like this driving it’s driving like this and then it flipped over
11 A: and wuh she said her friend said they were still driving
12 C: (? overlapped speech with A unclear)
13 A: that’s what she said and said I’m not going to believe you because she- see the other time she said that her Mom had died. And her Mom is still alive (? unclear) and her Mom’s alive and none of that’s true (1.0 second pause)
14 C: and who takes care of her
15 A: I know that’s what I said

The children collaboratively construct a particular stance to this narrative within a narrative, and are active and critical coparticipants in a truth-versus-reality negotiation, and they use language in this process. Example 6 is a D–D signed narrative. The addressee of the story, Yolanda, shows great interest and appreciation and watches Zelda closely through a long sequence. Zelda constructs a different context in time and space than the lunchroom and she shares it with Yolanda. Although
this is a fairly monologic performance, Yolanda shows her interest and engagement by continually laughing, smiling and nodding. The story is told mostly in ASL classifier handshapes. With classifiers, signers can visually create a physical category (e.g., person, vehicle, object) and then move this entity through space and activities.

**Example 6.** Deaf children’s narrative.

1. Zelda: **SEESAW. HIT-ONE-SIDE-OF-SEESAW, PERSON-FLIES-UPWARD-SCREAMING** (scream is shown on Z’s face) *This is what happened. Two children were sitting on a seesaw. One kid came down hard on the seesaw. The other flew up screaming.*

2. Yolanda: laughs

3. Z: (?)unclear **PERSON-SPINS-AND-SPINS-AT-PEAK-OF-FLIGHT, PERSON-LAUNCHED-FROM-SEESAW, FLIES, FALLS, LANDS-ON-GROUND-ABRUPTLY.** *The one who flew up spun around in the air really high. That person sprang up from the seesaw, flew through the air, fell, and landed on the ground hard.*

Yolanda exhibits steady eye contact and shows her understanding of this surprising chain of events through Zelda’s turns. After one class took an ice skating field trip, Mirus and Moreland were told several stories in sign by the deaf children about events on the ice, including the deaf children’s perspective toward and attitude about the events and their relationship to other events.

Deaf–hearing interactions themselves were sometimes subject to re-narrativizing, as a *hearing–hearing* interaction or *deaf–deaf* interaction, for example, when a hearing girl turned away from a deaf boy to tell another hearing girl what she had just told him and what he had told her in response (“I told him if he took my cookie I’d hit him”). Jay had feigned a grab at her cookie and she had hit at the air in his direction, then turned away from Jay to tell this to the girl sitting on her other side. Similarly, one deaf boy narrated in sign to Mirus an interaction that had just happened between himself and a hearing girl. However, the deaf children and hearing children were not active in telling stories or negotiating different versions of reality with each other across modalities, and a striking feature of deaf–hearing interactions in our corpus is the absence of retellings and an absence of contexts outside the immediate scene as resources for organizing experience, identity, emotions, self-versus-society, and other relationships.

As Zelda showed in her story to Yolanda (Example 6), retelling or constructing alternate times and places can be readily and easily achieved visually through ASL, including through classifier handshapes, where the fingers of one hand can represent a person and of the other hand a horse, and through pantomime one can enact character roles and actions. New actors can be created and enter the scene and perform actions that are quite separate from the narrator. ASL stories are often characterized...
by extensive dramatization or pantomime. In cross-modal interactions in our corpus, however, these resources are surprisingly not used. This has implications for the minority deaf children, who have far fewer opportunities to participate in complex symbolic interactions with other children. If they are the only deaf children in their grade, they have almost no opportunities.

We did record Jay utilizing pantomime to link several events together for a hearing coparticipant. He enacted eating something, becoming disturbed (shaking), hitting himself on the back of the head (the food coming up?), and recovering. This was in the context of tasting a pickle that came with the cafeteria lunch. His hearing coparticipant laughed. Jay also frequently enacted playing an imaginary guitar to himself. Zelda, during an extended sequence, fed the hearing girl sitting beside her spoonfuls of food. This could be interpreted as an imaginary context in which Zelda is the mother, although the terms mother or baby were not employed, and the role-playing was not made clear through language. These types of enactments show that there is enormous potential for communication through visual means, but they are undeveloped, rely on the present context, there is no linking of the current context to past or future, and the significance of and attitudes toward particular symbolic actions is not established or negotiated interactionally or intersubjectively.

Without complex linguistic interactions with their hearing peers, the deaf children are nonparticipants in many of the developmental activities that are taking place through language. Children's social agendas are important factors in communicative interactions. Children at these ages are developing an increasing awareness of themselves and their peers; working to define themselves as competent members of their social group (Beaumont 1999); doing important "social work" (Dyson 1993), including establishing identities, forming affiliations, and gaining a sense of agency (Corsaro 1985; Erting 1988; Goodwin 1990); and they are negotiating status relationships. In spite of spending large amounts of time together, the children in our study showed only a limited range of communication strategies across modalities.

Summary

Deaf–hearing interactions are notably different from deaf–deaf interactions and hearing–hearing interactions in our corpus in the following ways:

- Deaf children spent relatively long periods of time as nonparticipants in interaction, while hearing children were continually engaged in lengthy and complex verbal interactions. Being deaf in a hearing environment meant having little or no access to the role of peripheral participant.
Deaf–hearing interactions in the lunchroom were typically dyadic, but this was not the typical lunchroom interaction type, which was multiparty.

Deaf–hearing interactions had a shorter number of turns, and turns of shorter duration than D–D or H–H interactions.

Trouble in communication between deaf and hearing children was related not only to different abilities to either see or hear (i.e. understand) the other’s language, but to interactional or sociolinguistic practices specific to each modality. Factors particular to communicating across these two modalities influence these children’s lack of successful interactions with each other. Eye gaze, visual monitoring, scanning, turn-taking, and listening behavior are resources used differently in the two modalities (see, e.g., Bahan and Supalla 1995).

Deaf–hearing interactions in our corpus did not involve events outside the current context; that is, there was an absence of past or future contexts built through language. Signs or speech productions were anchored in the immediate world of the lunchroom. This means that there was an absence of many features of reality-building through language that are crucial in social, cultural, and cognitive development.

The immediate context of the lunchroom contained many models of hearing–hearing interaction and very few, and very limited, models of deaf–deaf interaction. There were few signs used in deaf–hearing interactions.

Most efforts were expended in the direction of deaf-to-hearing practice. This was in spite of the fact that only about 25 percent of speech is visible on the lips.

The hearing children in our corpus, though visually competent, were extremely dependent on their hearing for structuring interactions (initiating, sustaining, producing listener behavior, etc.), and collaboratively producing meaningful utterances. They had not yet exploited the potentials for creating meaning by using the visual modality.

The idea of "mainstream" education is built on the notion of equal "access" and distributing educational resources in a particular way, despite diversity in student abilities and backgrounds. It is also based on the idea that children who were previously educated in separate facilities (e.g., deaf children) would benefit from the opportunity to participate in nonseparate environments. These assumptions need to be revised in order to provide the best possible environment for deaf students to fulfill their potential, to have the opportunity to share experiences and worldviews with peers and thus participate in peer learning. If schools are assuming that deaf students are learning through interacting with hearing peers and we can demonstrate that these interactions are notable for their lack of real language, instead consisting of a few gestures
and a very limited number of signs, the idea that deaf students are benefiting from exposure to hearing children needs to be revised. One possible revision would be to allow deaf children to associate more closely with other deaf children during those activities where conversation is the focal activity. For example, unlike lunchtime, where conversation is a main activity, recess is a context favoring visual skills where both deaf and hearing children can interact. The linguistic "symbolic play" that children engage in conversationally at lunchtime, however (word games, fantasy, narratives), leaves deaf children isolated because of the poor visual communication skills of the hearing children and the deaf children's own accommodation to the hearing children's limited visual resources (i.e., limiting their own visual communication repertoire). Another revision would be to provide the hearing children with an opportunity to learn sign language.

Because the majority of deaf children grow up in hearing families (e.g., the four students discussed here), they have ample opportunity to learn about the hearing world and to interact with hearing people. It is worth noting that what most deaf children lack is not engagement with the hearing world, but engagement with competent peer visual language producers. Although the deaf students in the present study were physically assimilated in mainstream schools, they were not linguistically assimilated. A different standard thus existed between their extremely limited opportunities to build identities, solve problems, and experience other children's perspectives through language and the comparatively rich opportunities of the hearing children.

We suggest that just as deaf children are expected to develop skills for accommodating to hearing children, hearing children in classes with deaf children should be expected to develop comparable skills for interacting with deaf students in order to enrich peer interactions and enable the deaf students to have equal access to all learning opportunities. As we have shown, even what look like "successful" interactions between deaf and hearing peers actually contain little real language and none of the complex peer communication skills vital to the cognitive and social development of deaf students.

This study demonstrates that unshared sociolinguistic practices and hearing-oriented participation frameworks are crucial aspects of communicative failure between hearing and deaf children in mainstream elementary school settings. We have closely analyzed everyday cross-modal communication patterns between hearing and deaf children in order to better understand and begin to address the communicative isolation of deaf students from their peers. The study also contributes to a better understanding of implications of mainstream education for this minority group in terms of communicative and social development.
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Notes

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1. It is customary to capitalize the word Deaf when referring to the Deaf community, in order to emphasize that Deaf individuals are members of a distinct culture, rather than defined through hearing ability. Following Ramsey and Padden (1998), we will use small "deaf" because we are talking about deaf children with hearing parents, who are not yet culturally Deaf.

2. Before 1975 "handicapped" children were often segregated and kept out of regular public education systems. The EAHCA (1975 Education for All Handicapped Children Act) requires that states "to the maximum extent appropriate" educate handicapped children with children "who are not handicapped" (20 U.S.C. 1412[5]) (1982). Deaf children often receive individual help from an "itinerant" teacher who visits several schools, or from interpreters, and attend special classes at certain points during the day.

3. We do not mean to suggest that people who are deaf or hearing form a monolithic group; rather, as mentioned above there are wide variations in hearing loss and language resources even among the small group of Deaf children we are studying. At the same time, these students share similar isolation experiences in spontaneous settings.

4. All names used are pseudonyms.

5. This represents hours of training to learn skills using their "weaker or less developed abilities (i.e., hearing and speech, and a manual code of English), rather than being encouraged to use more natural strengths in acquiring a visual/spatial language, ASL." (Nover 1995:115).

6. In transcribing sign language, it is conventional to represent signs with capitalized letters. This reminds the reader that the glosses into spoken language are only approximations of the meaning conveyed through visual means.

7. In an interesting study by Vandell et al. (1982), however, hearing children who received an "intervention" in which they were given information about deafness and communication techniques interacted less with deaf children than hearing children who did not receive the intervention.

8. If we take the Peircean categorization of signs into icons, indices, and symbols, we would say that deaf–hearing interactions were largely dependent on the first two categories and much less on symbols, although there were some conventionalized gestures and signs used. Indexical meanings presume more meaning than is carried by the talk—causing interactants to use context to interpret meanings.
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