MOUTHING: A DISCOURSE STRATEGY IN SPOKEN LANGUAGE-TO-SIGNED LANGUAGE INTERPRETATION

Julia Romanchuk-Weisenberg

Department of Linguistics
State University of New York at Stony Brook

1. Introduction

Mouthing is the voiceless visual representation of words on a signer's lips produced concurrently with manual signs.[1] Mouthing of a spoken language during signing is the result of language contact. It is prevalent among English-dominant bilingual users of American Sign Language (ASL) such as professional sign language interpreters. However, it is well documented in the literature that mouthing in deaf native signers is regularized, serving an adjectival and/or adverbial function in the sign language (Wilbur 2000, ASL; Vogt-Svendsen 1981, Norwegian Sign Language; Padden 1990, Italian Sign Language; Engberg-Pederson 1993, Danish Sign Language) and that these mouthing patterns do not correspond to the phonetics of the majority spoken language, but are more likely a grammaticalization of universal gestures (see Janzen & Shaffer 2002). Interpreters have the advantage of *simultaneity:* the two channels of expression are distinctly different: one, a visual-gestural channel, the other oral-aural.

1.1. Categories of Mouthing

There are two categories of mouthing: (1) phonetically-intact mouthing[2] and (2) partial mouthing.[3] The former is significant because it surfaces in bilingual speakers and is measured as the dependent variable in the current study. Examples of category (1) appear below:

---

[1] Mouthing has been observed in the discourse of many of the world's sign language users (Boyes-Braem 2001, Swiss German Sign Language; Schermer 1990 and Coerts 1992, Sign Language of the Netherlands, Ebbinghaus and Hessman 1996, German Sign Language; Wilbur & Peterson 1998[1], Wilbur 2000, Davis 1989, and Weisenberg 2003, American Sign Language (ASL) use by hearing bilinguals; Bridges & Metzger 1996 and Neidle et al 2000, ASL; Kourbetis & Hoffmeister 2002, Greek Sign Language; Detthow 2000, Swedish Sign Language use by hearing bilinguals; Quinto-Pozos 2004, Mexican Sign Language (LSM).

[2] Phonetically intact mouthing is indicated by brackets [ ].

[3] Partial mouthing is indicated by parentheses ( ).

Mouthing: *[silicon]*   n_   to_   el_
ASL gloss: fs-S-I-L-I-C-O-N CL:1 (rt) CL:B (lft) → ELEMENT
                                            [right
CL:CC → ('squares in rows') CL:1

Mouthing: *ne_   xt to]*   *[carbon]*
ASL gloss: (rt) CL:B (lft), fs-C-A-R-B-O-N
Spoken English text: *'Silicon is an element, it is a metalloid, and not coincidentally,
    it's right next to carbon.'*

                                    (+tech, -deaf, Subject JN) Weisenberg (2003)

Subject JN silently mouths the word 'silicon' on her lips while fingerspelling the
word (S-I-L-I-C-O-N). Fingerspelling, a manual representation of letters, appears
to be a wide-spread device among deaf signers resulting from language contact with
the surrounding spoken language community (see Sutton-Spence 1994). The subject
mouths 'right next to' while manually articulating the concept of 'element-adjacent
to-element'. The subject utilizes a classifier handshape (CL:1), remaining in the lo-
cus of the signing space where the element 'silicon' was previously indexed. The sub-
ject's other hand forms a different classifier handshape (CL:B) and moves horizon-
tally left, coming to rest at a locus that she identifies as 'carbon'. Complete mouthing
accompanied by fingerspelling of 'silicon' is expected since it is a newly introduced
term. Fingerspelled words begin to undergo lexicalization after approximately the
third production (Brentari & Padden 2001).

An example of category (2) mouthing appears below:

Mouthing: *silicon*   (n_   to_   el_)
ASL gloss: fs-S-I-L-I-C-O-N CL:1 (rt) CL:B (lft) -→ ELEMENT
                            right
CLCC → ('squares in rows') CL:1

Mouthing: *ne_   xt to*   *carbon*
ASL gloss: (rt) CL:B (lft), fs-C-A-R-B-O-N
Spoken English text: *'Silicon is an element, it is a metalloid, and not coincidentally,
    it's right next to carbon.'*

                                    (+tech, -deaf, Subject JN), Weisenberg (2003)

Subject JN silently mouths the initial consonant of 'next' while setting up the
signing space to reflect the locations of the elements using a classifier construction
(CL:1 (rt) CL:B (lft)). She uses a reduced form of mouthing, the first part of the pol-
ysyllabic word, when manually signing ELEMENT.

In this paper I present the results of an experiment which show that sign lan-
guage interpreters adjust their rate of English mouthing depending on their audi-
ence, namely a non-deaf audience causes a higher rate of mouthing than a deaf au-
dience, and that in general, the perceived addressee has more of an effect on style
shift than the topic under translation. I will also argue that mouthing is a type of
borrowing and present some initial evidence that mouthing overlapped with signing
seems to undergo a three-stage process during a single interpreting episode. Because
a single sign-language interpreting event encapsulates the more lengthy process of a

sign's evolution, we can examine the role mouthing plays in the creation of neologisms.

1.2. Theories of Mouthing

There is widespread agreement that for both deaf natives and hearing bilinguals, mouthing appears to be systematic. Previous claims include that mouthing is (1) code-mixing employed to elucidate the translation (Davis 1989), (2) intrasentential code-mixing driven by discourse dominance (Weisenberg 2003), (3) a type of borrowing used to fill lexical gaps in the discourse (Boyes-Braem 2001), (4) a paralinguistic element whose appearance is influenced by the signer's motoric fluency or by spoken language-sign language syllable congruencies (Wilbur 1998).

Borrowings involve the insertion of single lexical items from a donor language that are filtered through the recipient language (Poplack & Meechan 1998). Insertions are typically (a) content words (b) morphologically integrated constituents, (c) selected elements (e.g., objects or complements) rather than adjuncts, (d) nested (i.e., the fragment preceding the insertion and the fragment following are grammatically related), (e) single constituents (Muysken 2000). It has been proposed that the matrix language determines the features of the inserted lexical item (Myers-Scotten 1993).

The English mouthing that sign language interpreters utilize is theorized to be a type of borrowing based on the fact that the borrowings are (a) content words (b) morphologically integrated constituents (c) selected elements (d) nested and (e) single constituents. Mouthing is coordinated with a manual ASL sign that has the same meaning (mouthing appears in bold):

*"For example, everybody **knows** that **water** is H_2O"*

(Subject JN, +tech, -deaf) Weisenberg (2003: 23).

1.3. Sign Language Interpreting

Sign language interpreters are highly concerned with their deaf consumers' level of comprehension, especially when organizing highly abstract English discourse into a more concrete visual-spatial mode. They often resort to borrowing directly from the dominant language. They determine whether they should insert mouthing or not depending on their audience. The interpreter's ability to successfully accomplish translation in general is also affected by factors such as the familiarity with the source text, a speaker's rate of speech, and the fact that speech is linear. Interpreters also pay attention to cohesion. Cohesion is defined as "a network of relations that permits the listener to comprehend the interpreted discourse and is an important component in spoken language interpreting" (Shlesinger 1995). By virtue of their work, sign language interpreters must be able to identify these links in the source language and reproduce them in the output language, or there is the potential for the audience to misunderstand the message as it was originally intended. Given these facts, an experiment was designed to test the effects of audience on sign language interpreters' rate of borrowings.

2. Experiment

It is known in the interpreting profession that a deaf consumer's cultural status is a deciding factor of target language output since the interpreter is ethically bound to represent the message in the "language preferred by the client" (Humphries & Alcorn 1999). However, it is unknown to what degree other non-audience factors of the interpreting task contribute to the choice to borrow and whether these factors outweigh the effects of the addressee. The null hypothesis is that the addressee should have no effect on the rate of an interpreter's mouthing. If this hypothesis is correct, one would expect to find the same rate of mouthing in a translation task where the interpreter perceives the audience to be *culturally-deaf*[4] (affiliated with deaf culture) and an equivalent task where the audience is perceived to be *non-culturally* deaf (affiliated with *hearing* culture). If anything, we could expect other non-audience factors to affect mouthing such as the topic of the translated material (Bell 1984).

2.1. Design

2.1.1. Participants

There were a total of four participants (one man, three women) who were recruited through printed advertisements and electronic mail. Subjects were asked to fill out a questionnaire to determine level of proficiency in ASL and English. All the interpreters were nationally certified by the RID, and had three or more years of experience as an employed interpreter. Three of the interpreters used ASL a minimum of thirty hours per week and socialized with deaf people on a monthly basis. Two of the participants had ten or more years of experience using ASL. All indicated English as their first language. None of the interpreters had family members who were deaf, indicating they were not native signers of ASL. All of the interpreters had experience interpreting in post-secondary setting. This fact is important since all stimulus material was at college level.

2.1.2. Materials

Four lecture monologues were produced in English by three speakers (two females, one male) who were all teachers with experience at the post-secondary level. Two of the speakers were ESL teachers. One was a chemistry instructor. Their voices were recorded in a sound proof room of a phonetics laboratory. Speakers did not read from a prepared text, but rather were asked to speak extemporaneously on a familiar topic. Two of the speakers were instructed to lecture on a technical topic from their discipline, the third individual — a dramatic life event.

There were a total of four hypothetical interpreting lectures labeled A, B, C, and D. The deaf audience and the lecture topic were independent variables (see Fig-

---

[4] The term *culturally-deaf* refers to individuals who consider themselves members of a cultural and linguistic minority with its own set of norms and values that differ from the majority, *non-deaf* culture.

ure 1). Context A and B were considered more technical, the former — a Chemistry lecture on principles of electron affinity, the latter — a talk on computer architecture. Technical lectures are represented in Figure 1 as **Tech 1**. Context C and D were less technical, the first — instruction in applying for an educational grant, the second — tips on planning a wedding. A non-technical lecture is represented in Figure 1 as **non 0.**

In context A and C, the deaf client refers to himself as *hard-of-hearing,* this is represented in Figure 1 as **non 0**. In context B and D, the interpreter is working with a client who is second-generation deaf, with deaf children, and a graduate of a deaf-only school. His cultural identity is Deaf, represented in Figure 1 as **Deaf 1.**

	Lecture	
	non 0	**Tech 1**
non 0	00	01
Deaf 1	10	11

Consumer

Figure 1

2.1.3. Procedure

Subjects were asked to fill out a questionnaire (see appendix) and read a card that depicted a hypothetical interpreting assignment. Context cards were given in random order. Each provided the name, age, cultural and linguistic background of the audience, and the setting and topic. Sign language interpreters regularly obtain this information when contracting for an assignment (Frishberg 1990). The participants were instructed to listen to a recorded excerpt of a spoken English lecture on audiocassette and interpret the source language (English) into target language (ASL) based on the information about each audience. Their signing was recorded digitally with a Canon Optura 200 and streamed into a Macintosh program called iMovie for analysis.

2.2. Analysis

Each audio-taped lecture was transcribed in English. The subject's signed output was analyzed frame by frame. The following measurements were taken: the total signs realized by each subject for a baseline (Figure 2) and the total number of mouthings per subject in each lecture (Figure 3). The dependent variable was the total number of English mouthings per subject.

		LECTURE			
		Non deaf + non technical (00)	**Non deaf + technical (01)**	**Deaf + non technical (10)**	**Deaf + technical (11)**
Subject	GG	695	685	628	677
	JN	593	542	620	479
	CC	831	695	780	588
	MP	725	666	715	595

Figure 2

Total signs realized per subject

		LECTURE			
		Non deaf + non technical (00)	**Non deaf + technical (01)**	**Deaf + non technical (10)**	**Deaf + technical (11)**
Subject	GG	179	388	344	225
	JN	87	154	114	129
	CC	76	122	478	67
	MP	276	274	236	137

Figure 3

Total mouthing per lecture

2.3. General results

Results indicate that the audience makes a difference in the rate of mouthing. Sign language interpreters produce more mouthing to a non-deaf audience than to a deaf audience, based on an analysis of variance (ANOVA), $F_{(1,3)} = 11.11$, $p < .05$. These results are congruent with other studies of audience design (Bell 1984, Clark & Muphy 1981, Metzing & Brennan 2003, Lockridge & Brennan 2002). The audience has more of an effect on an interpreter's mouthing than the topic of the material under translation. On average one sign was produced in translation of every two English words heard. There was a higher percent of mouthed content words than function words.[5] This result reflects findings from studies on spoken language mixing (see Poplack & Meechan 1998). Nouns were mouthed more frequently than other categories across all four contexts.[6] There were cases where mouthing served the grammatical function of distinguishing homonyms. Finally, recurrent terminology was represented by the interpreters with a sign+mouthing combination, ex-

---

[5] For example, *determiners*: (00 = 0%; 01 = 4%; 10 = 3%; 11 = 2%); *prepositions*: (00 = 15%; 01 = 10%; 10 = 6%; 11 = 7%); *conjunctions:* (00 = 10%; 01 = 7%; 10 = 3%; 11 = 3%) in comparison to *nouns:* (00 = 39%; 01 = 26%; 10 = 26%; 11 = 21%) or *adjectives:* (00 = 39%; 01 = 26%; 10 = 26%; 11 = 18%).

[6] Mouthing of *nouns*: (00 = 39%; 01 = 26%; 10 = 26%; 11 = 21%).

hibiting a pattern of mouthing reduction while preserving the manual sign over the course of the experimental context.

2.3.1. Mouthing functions

The experiment provided a means to examine potential functions of mouthing. Interpreters utilize borrowing to avoid a homonym in ASL that could lead to miscomprehension. Avoidance of homonyms through lip movements has been discussed in other signed languages.[7] The following is an example of homonym avoidance. In context (-tech, -deaf) the speaker refers to a specific application form that must be *downloaded*. Subjects GG, CC and MP co-articulate the manual sign with mouthing:

(1) '***I downloaded** the RFP, which is the **request for proposals**, like I said earlier, and I read through it.*   (Subject GG)

(2) '***I downloaded** the RFP, which is the **request for proposals**, like I said earlier, and I read through it.*   (Subject CC)

(3) '***I downloaded** the RFP, which is the **request for proposals**, like I said earlier, and I read through it.*   (Subject MP)

<div align="right">(Weisenberg 2003: 25)</div>

The interpreter is obliged to add mouthing to avoid potential homonyms for the chosen classifier (either MATERIALS-FLOWING-DOWN or PULL-DOWN) because of the introduction of the technical term *RFP* for which there is no equivalent manual sign in ASL.

The data also provided examples of cohesion. The interpreter utilizes mouthing to emphasize that a previously introduced concept is now contrasted.[8]

1. *English: 'two metals can not form a relationship in which they share electrons, but two nonmetals can… bonds in which atoms share electrons are called covalent bonds.*
ASL: mean 2 people lose lose meet share can't. set-up connect can't. not share, not give.
M: **share**
ASL: But happen, not-metal can.
M: **but**   **can**
<div align="right">Subject CC, Context [+technical, -deaf]</div>

The interpreter mouths 'but' while using the manual sign BUT and manually produces CAN while silently pronouncing 'can'.

2. *English: 'two metals can not form a relationship in which they share electrons, but two nonmetals can… bonds in which atoms share electrons are called covalent bonds.*

---

[7] The claims made here can extend outside the interpreting environment and seem to support previous analyses of bilingual data from deaf native signers (Boyes-Braem 2001 and Ebbinghaus & Hessman 1996).

[8] ASL = American Sign Language; M= mouthing.

ASL: understand metal metal connect can't. but not-metal can. Give-back-forth
     share-each-other.
M: **can**
     share
ASL: Fs-but fs-atoms share E connect name fs-covalent-bonds.
M: **called**
                                   Subject JN, Context [+technical, -deaf]

2.3.2. *Mouthing metamorphosis*

One result of the experiment was the discovery of a pattern of mouthing reduc-
tion. At least two contexts contained technical terminology that was repeated. Of-
ten there was no manual equivalent in ASL and therefore subjects had to translate
these terms by overlapping mouthing and a manual sign with approximate meaning.
Once the interpreter had expressed the mouthing+sign combination a few times, the
mouthing was reduced or removed completely.

3. English: *So what happened was Robbie decided that he was gonna transfer to another univer-*
   sity and he chose Rochester Institute of Technology…so I was pretty happy to see him go there.
   ASL: fs-Robbie decide transfer other university where-ret? Rochester…I…T [abbreviation]
   M: Robbie decide transfer   institute of technology

   fs-RIT. happy see-him go Rochester fs-RIT **[no mouthing]**
   happy to see him go
                                   Subject GG: Context: [-technical, +deaf]

4. English: *…which is an old saying and really refers, in this case, to electrons…*
   ASL: old quote really this fs-case quote refer to fs-electrons "E" [synonym established]
   M**:   old   really refer this case to   electrons**   [no mouthing]
                                   Subject GG: Context: [+technical, -deaf]

5. English: "*…which is an old saying and really refers, in this case, to electrons…*"
   ASL: old story since know really point fs-electrons E [synonym established]
   M: **saying   really   electrons electrons**

Later in the same context the interpreter produced *electrons* with reduced mouthing:

6. English: *…so atoms tend to come together, if you want to use the analogy of hu-*
   man relationships…
   ASL: so "E" connect same human connect
   M: **so e—t—n** [mouthing reduced] **come together**

Further into the same context, the interpreter continued to use reduced mouth-
ing for *electron.*

7. English: "*…Clorox would do a good job of causing any material to lose its*
   electrons…"
   ASL: fs-clorox cause thing lose lose lose E. will lose its E
   M: **cause**   **e—t—n** [mouthing reduced]
                                   Subject JN: Context: [+technical, -deaf]

2.3.3. Mouthing reduction

Just as the Drosophila fly is the workhorse for genetics research due to its gene mapping potential in a short life cycle, so too can a single sign-language interpreting event replicate the more lengthy process of a sign evolution in a much shorter *life cycle.* As more technical terms have been introduced to ASL, users of the language have been forced to create new signs, incorporating core-language synonyms with English initialization, English mouthing, and/or fingerspelling (Padden 2001). Interpreters however are actually engaging in mini-evolutions on a daily basis. The process of mouthing reduction in the creation of neologisms is diagrammed in Figure 4.
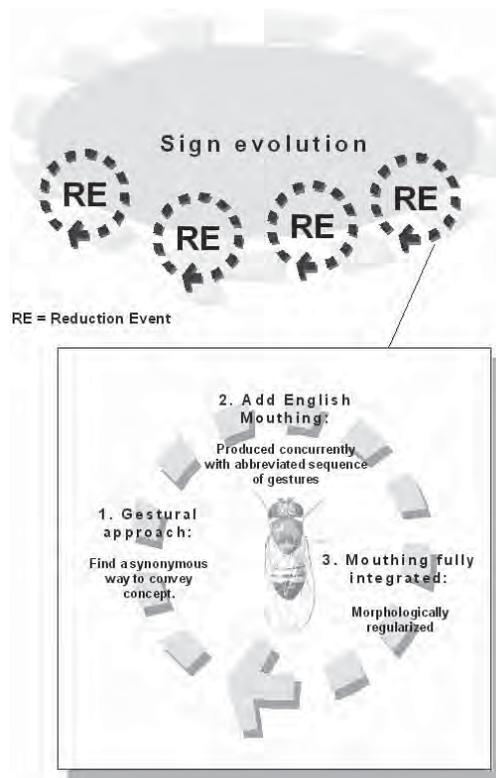
Figure 4

When an interpreter encounters a new term for which there is no equivalent in ASL, (s)he will first mentally search for a gestural synonym, or sequence of synonymous gestures in ASL and *test* this choice on the audience (Step 1). At some point further along in the interpretation, the interpreter will generally shorten the sequence and overlap it with English equivalent mouthing (Step 2). Later it is common to see the mouthing become more integrated with the sequence. This is evidenced by a reduction in the lip and overall jaw movement to usually just match the initial sounds

of the original English word being interpreted (Step 3). If at some point in the discourse the interpreter receives audience feedback that the concept is in fact clearly understood, the interpreter may even elect to drop the English mouthing all together.

The evidence of mouthing reduction in the current experiment points to a larger theory that mouthing undergoes a three-stage process which occurs naturally in the evolution of American Sign Language, and is replicated by interpreters in the reduction event. The entire process is referred to as a Reduction Event (RE) because the natural process of language is to convey one's message more efficiently and interpreting mimics that process.

3. Explanation and conclusion

We know that in the absence of the aural-oral channel, language will come through a visual-gestural one (Sandler in press). We also know that the very nature of sign language and spoken language allows for the two to be produced simultaneously. Speech is linearized while gesture is more holistic. It is apparent that speech and gesture can convey different information. While speech can label and classify an object, a deictic gesture may localize it: *The chair goes right there.* For bilingual signers, the opposite is occurring. The lips can show what the hands cannot. Mouthing gestures can supplement the signing. Furthermore, unique to the sign language interpreting profession is that language borrowing is the means by which interpreters fulfill the requirements of their service. They are expected to use the language preferred by the consumer. Interpreter borrowing is different from that of spoken language bilinguals by virtue of the fact that in an interpreting situation, (1) the interlocutors may or may not be bilingual and (2) the audience makes no decision about when and where to borrow. In contrast, these decisions fall to the interpreter based on their application of an *audience screen*.

Mouthing is a form of borrowing that can be used by sign language interpreters in translation from spoken English to American Sign Language. The factor that conditions the use of mouthing is the audience. In this case whether a consumer of the interpreting service is perceived to be culturally-deaf (+deaf) or not-culturally-deaf (–deaf). This factor is statistically more significant than the actual difficulty of the English material being translated. There were cases where the interpreters were trying to avoid potential homonyms by incorporating mouthing over the manual sign. There were also examples of mouthing for cohesion purposes.

The interpreting situation provides a unique look at sign change in general because interpreters are thrust into that sign-spoken language contact situation on a daily basis, and must often create approximates for concepts that do not exist in ASL. Thus using the drosophila analogy, interpreters accelerate what normally occurs over a longer period of exposure to other languages like English. It was speculated that mouthing follows a specific reduction process, though further development of this theory is beyond the scope of the present study.

Not only does this study confirm what is a commonly held notion in audience design, that people are adjusting their language in reaction to people, but also opens

up an inquiry to the use of the interpreting context as a means of examining neologisms and language variability.

References

Bell, A., 1984, «*Language* style as audience design», *Language in Society* 13, 145-204.

Boyes-Braem, P., 2001, «Functions of the mouthing component». In Diane Brentari (ed.). *Foreign Vocabulary in Signed Languages*, Mahwah, NJ: Lawrence Erlbaum Associates.

Brentari, D. & Padden, C., 2001, «Native and foreign vocabulary in American Sign Language: A lexicon with multiple origins». In ed. D. Brentari, *Foreign Vocabulary in Sign Languages*, Mahwah, NJ: Lawrence Erlbaum, 87-119.

Bridges, B. & M. Metzger, 1996, *Deaf Tend Yours: Non-Manual Signals in ASL*. Silver Spring, MD: Calliope Press.

Clark, H. H. & T. B. Carlson, 1981, «Context for comprehension». In J. Long & A. Baddeley (eds.), *Attention and performance IX*. Hillsdale, NJ: Lawrence Erlbaum, pp. 313-330.

Coerts J., 1992, *Nonmanual grammatical markers. An analysis of interrogatives, negations, and topicalisations in the sign language of the Netherlands*. Amsterdam: University of Amsterdam.

Davis, J., 1989, «Distinguishing language contact phenomenon in ASL interpretation». *Sociolinguistics of Deaf Community*, San Diego: Academic Press, 85-102.

Detthow, A., 2000, «Transliteration between Spoken Swedish and Swedish Signs». In ed. M. Metzger, *Bilingualism and Identity in Deaf Communities*, Washington, D. C.: Gallaudet University Press, 79-92.

Ebbinghaus, H. & J. Hessman, 1996, «Signs and Words: Accounting for spoken language elements in German Sign Language», *International Review of Sign Linguistics* 1, 23-56.

Engberg-Pederson, E., 1993, *Space in Danish Sign Language: The meaning and morphosyntactic use of space in a visual language*. Hamburg: Signum-Verlag.

Frisberg, N., 1990, *Interpreting: An introduction*. Maryland: RID Publications.

Humphries, J. & Alcorn, R., 1999, *So You Want To Be An Interpreter?* Austin, TX: H & H Publishing.

Janzen, T. & B. Shaffer, 2002, «Gesture as the substrate in the process of ASL grammaticization». In: Meier, R. P. et al. (eds.), *Modality and structure in signed and spoken languages*. Cambridge: Cambridge University Press, 199-223.

Kourbetis, Vassilis & Hoffmeister, R. J., 2002, «Name Signs in Greek Sign Language», *American Annals of the Deaf*, July 2002.

Lockridge, C. & Brennan, S., 2002, «Addresses' needs influence speakers' early syntactic choices», *Psychonomic Bulletin & Review* 9(3), 550-557.

Metzing, C. & Brennan, S., 2003, «When conceptual pacts are broken: Partner-specific effectson the comprehension of referring expressions», *Journal of Memory and Language* 49, 201-213.

Muysken, P., 2000, *Bilingual Speech: A Typology of Codemixing*. Cambridge, MA: Cambridge University Press.

Myers-Scotten, C., 1993, *Duelling languages: Grammatical structure in code-mixing*. Oxford: Clarendon Press.

Neidle, C., Bahan, B., Kegl, J., MacLaughlin, D. & Lee, R. G., 2000, *The Syntax of American Sign Language.* Cambridge, MA: MIT Press.

Padden, C., 1990, «Rethinking fingerspelling», *Signpost* 4, 2-5.

Poplack, S. & Meechan, M., 1998, «How languages fit together in code-mixing», *International Journal of Bilingualism* 2(2), 127-138.

Quinto-Pozos, D., 2004, *Linguistic interference in a contact situation: Examples from ASL and LSM,* University of Illinois at Urbana-Champaign, Theoretical Issues in Sign Language Research 8 Conference; Barcelona, Spain, September 30-October 2, 2004.

Sandler, W. (in press), «Sign Language: An Overview». *Encyclopedia of Language and Linguistics.* Second Edition.

Schermer, T., 1990, *In search of a language: Influences from spoken Dutch on Sign Language of the Netherlands.* Delft: Eburon.

Shlesinger, M., 1995, «Shifts in cohesion in simultaneous interpreting», *The Translator* 1(2), 193-214.

Sutton-Spence, R., 1994, *The role of the manual alphabet and fingerspelling in British Sign Language.* Doctoral Dissertation, University of Bristol.

Vogt-Svendsen, 1981, «Mouth position and mouth movement in Norwegian Sign Language», *Sign Language Studies* 33, 363-396.

Weisenberg, J., 2003, «Simultaneous codemixing in American Sign Language interpretation». Unpublished qualifying paper, State University of New York at Stony Brook, New York.

Wilbur, R. & Peterson, L., 1998, «Modality interactions of speech and signing in simultaneous communication», *Journal of Speech, Language, and Hearing Research.* 41, 200-212.

—, 2000, «Phonological and prosodic layering of nonmanuals in American Sign Language». In K. Emmorey & H. Lane (eds.), *The Signs of Language Revisited: An anthology to honor Ursula Bellugi & Edward Klima,* Mahwah, NJ: Lawrence Erlbaum Associates, 215-244.

Appendix

Context A

Client name: Joseph Miller.

Age: 18.

Setting: Undergraduate Chemistry course at Columbia University. Day 10 of a fourteen-week session.

Topic: *"Neither a Borrower Nor a Lender Be": Electron Affinity*
The speaker is male, the instructor for this course. He is providing a brief overview of electron lending, borrowing, and sharing among the elements.

Background of

Your client: Joseph refers to himself as 'hard-of-hearing' and is considering having implant surgery. He prefers to voice for himself in class. He is the only deaf person in his family. He was mainstreamed K-12, and is now in his first year at Columbia University in New York. He hopes to work as a chemist for a pharmaceutical company.

Context B

Client name: Alice Ronin.

Age: 33.

Setting: Computer Training Center in Garden City. Day 2 of a ten-week course called "Computer Basics".

Topic: *"Why Computers Can't Write Jokes"*
The speaker is male, the instructor for this course. He will be explaining the chemical differences between the makeup of a computer's central processing unit (CPU) and the human brain.

Background of

Your client: Alice refers to herself as Deaf. Both her husband, daughter, and mother are deaf. This is her first class after taking a three year leave to be a full-time mother. She is a graduate of The American School for the Deaf, and has 12 undergraduate credits from Gallaudet University.

Context C

Client name: Bill Bartone.

Age: 28.

Setting: Undergraduate "Foundations of Education" course (required for teacher certification). Day 20 of a fourteen week session.

Topic: *"Understanding the Grant Application Process"*
The speaker is female, the instructor for this course. She is sharing with the class details of how she applied for a federal grant for her youth incarcerated literacy program.

Background of

Your client: Bill refers to himself as 'hard-of-hearing', the son of hearing parents, both of whom are teachers in a public school system. Bill was mainstreamed K-12, graduated NTID, and is now enrolled at Queens College. Like his parents, he hopes to be a high school math teacher, and does not see his hearing impairment as an obstacle to that goal.

Context D

Client name: Carol Federman.

Age: 50.

Setting: Adult Continuing Education (CE) evening class at local high school. Day one of the four week session.

Topic: *"Planning a Wedding"*
The speaker is female, the instructor for this course. She is sharing with the class the details of planning her wedding, which took place in Rochester, NY.

Background of

Your client: Carol is third generation Deaf. She lives in New York. She is the mother of two deaf children, and a grandmother of three. She was very active in the National Fraternal Society of the Deaf (NFSD), a former board member. She is a graduate of New York School for the Deaf, White Plains. She is taking this CE course to assist her daughter, who will be getting married next year.