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Why American Sign Language Gloss Must Matter

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R ESPONDING TO AN ARTICLE by Grushkin on how deaf children best learn to read, published, along with the present article, in an *American Annals of the Deaf* special issue, the authors review American Sign Language gloss. Topics include how ASL gloss enables deaf children to learn to read in their own language and simultaneously experience a transition to written English, and what gloss looks like and how it underlines deaf children's learning and mastery of English literacy through ASL. Rebuttal of Grushkin's argument includes data describing a deaf child's engagement in reading aloud (entirely in ASL) with a gloss text, which occurred without the breakdown implied by Grushkin. The authors characterize Grushkin's argument that deaf children need to learn to read through a conventional ASL writing system as limiting, asserting that ASL gloss contributes more by providing a path for learning and mastering English literacy.

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Writing in the present issue of the *American Annals of the Deaf*, Grushkin appropriately observes that attention to writing down American Sign Language (ASL) for the purpose of instructing deaf children is much needed and timely. The reading difficulties that deaf children experience in learning to read English are well known and understandable due to the impact of hearing loss, especially for those children who have been profoundly deaf since birth or lost their hearing before the age of 2

years. Supports and strategies for helping deaf children learn and master English literacy (via English-based intervention systems and translation via ASL; Garate, 2012; Trezek, Wang, & Paul, 2010) are one option. However, a more clearly defined option is needed, especially given that, as Andrews, Leigh, and Weiner (2004) point out, the cohesion of reading theory is far from real in the field of deaf education. What educators and researchers may have overlooked is that while English is an issue in reading for deaf children (regardless of what supports and strategies are provided), the print itself can be the source of the problem for these children. It is our belief that a wrong language is being rep-

resented in print; the focus should not be on English print but on, for example, written ASL.

To this end, exploration of the area of signed language reading must occur. In this scenario, deaf children would have recovered their capacity for reading when it came to ASL as compared to English. According to the ASL proficiency measurement research (e.g., Enns & Herman, 2011; Maller, Singleton, Supalla, & Wix, 1999; see Singleton & Supalla, 2011, for a review of the topic), deaf children are known for being native signers. This is understandable given that ASL is a signed language, whereas English is not. Thus, deaf children who experience signed language reading are expected to be free of the complications associated with their disability. With the needed sensitivity of theory and practice for language modalities (i.e., signed vs. spoken languages), the concept of linguistic accessibility is highly relevant, for it offers a possible remedy for the reading difficulties that plague deaf children as a group (see Supalla & Cripps, 2008, for further discussion of the linguistic accessibility concept). Grushkin's focus on providing reasons and discussions in regard to what form an ASL writing system should take serves as an excellent starting point for the field of deaf education. Any consideration of the signed language–based approach to teaching reading would carry much potential for the curriculum, instruction, and assessment alignment.

However, the title of our response article, "Why American Sign Language Gloss Must Matter," suggests that something is missing in Grushkin's writing about the value of written ASL in the education of deaf children. To elaborate, ASL gloss is composed of a particular approach to teaching reading to deaf children that includes learning to read in their own language

while simultaneously transitioning to English literacy. ASL gloss can be seen as the "elusive" intermediary system for children who are competent in ASL and in need of undergoing the process of learning to read English. (See Goldin-Meadow & Mayberry, 2001, for discussion on the need for an intermediary system that maps ASL onto English literacy in order to produce better reading outcomes.) Although Grushkin acknowledges the intentions of ASL gloss with his brief discussion based on Supalla, Wix, and McKee (2001), he suggests pursuing the course of creating a conventional writing system for ASL, not something intermediary with English literacy in mind. Going back to the linguistic accessibility framework, English is not simply another language for consideration with deaf children. The status of English as a spoken language is a serious matter that Grushkin does not seem to understand or address. Although he makes reference to a theoretical paper published in 1998 (Singleton, Supalla, Litchfield, & Schley) to introduce the notion of modality-constrained bilingualism concerning ASL and English with deaf children, careful consideration of the relationship between ASL and English as two languages is lacking.

Adding to the urgent need for clarifications associated with ASL gloss, Grushkin criticizes the ASL glossing phenomenon as used in ASL instruction of thousands of hearing students who study the signed language as part of meeting their foreign/second-language requirement in American high schools, colleges, and universities. As reported by Supalla and Cripps (2011), glossing is a norm among ASL textbooks and student workbooks that have been published over the years (e.g., Baker-Shenk & Cokely, 1980; Humphries & Padden, 2004; Lentz, Mikos, & Smith, 1988, 2014; Madsen,

1982; Mikos, Smith, & Lentz, 2001; Smith, Lentz, & Mikos, 2008; Zinza, 2006). The value and benefits of ASL gloss merit attention in the form of research and scholarship. Grushkin sees glossing as problematic, not something to pursue. He is not alone in his disapproval of ASL gloss; multiple scholars share his opinion (e.g., Baker, van den Bogaerde, & Woll, 2008; Hoiting & Slobin, 2002; Hoza, 2011; Humphries & MacDougall, 2000; Lane, Hoffmeister, & Bahan, 1996; Neidle, Kegl, MacLaughlin, Bahan, & Lee, 2000; Slobin, 2008).

One must remember that up to the latter part of the 20th century, ASL was written off as a human language (for its supposed lack of linguistic principles). Meier (2002) explains that two of the most notable linguists of the 20th century (Leonard Bloomfield and Edward Sapir) took an unfavorable position on signed languages. It was Dr. William C. Stokoe, an English professor at Gallaudet University, the venerable institution of higher education for deaf students, who had to teach himself linguistics and engage in research to prove that the understanding about human languages at the time was wrong (Maher, 1996). Thus, any misunderstanding about ASL gloss deserves a correction, which we endeavor to provide in the present article through our discussion of the implementation of ASL gloss in a charter school, as well as preliminary data showcasing how a deaf child performed when reading a gloss text. As a response to Grushkin, the present article will, we hope, generate a shift in attitude about alternatives to how ASL is represented in print.

Some Clarifications on ASL Gloss

To begin, Grushkin comments that the authors of the well-known, popular ASL curriculum Signing Naturally (Lentz et al., 1988, 2014; Mikos et al., 2001; Smith

et al., 2008) avoided using ASL gloss. This observation represents one critical part of his argument against the system. However, when one opens the instructor's edition of the curriculum, it becomes clear that gloss text is in use from the beginning to the end. The curriculum authors had words and sentences glossed to guide the instructors in modeling the language in front of students in the classroom. ASL gloss is clearly of value for these authors. They did avoid ASL gloss in the student workbook, however, but not because something is wrong with the system. The authors were committed to the idea of having students interact in ASL among themselves, with the instructor as the primary source for learning the language. Additionally, teaching grammar is not a priority of the Signing Naturally curriculum. It is thus understandable why ASL gloss reading is not part of the students' experience with the curriculum. Grushkin is correct in pointing out that illustrations (or photos) of ASL signs and sentences are used in the student workbook for study, and that this is not the same as written ASL in terms of quality. Yet his similarly negative outlook on ASL gloss is troubling and requires a closer look.

To understand the source of Grushkin's seemingly confused position on ASL gloss, it may be helpful to consider the gloss example he uses in his article. The format of the interlinear translation (between the two languages ASL and English) can create either a poorly conceived or ideal gloss sentence. To elaborate on this, below we provide the English sentence and Grushkin's own rendition in the gloss format:

I will go to the store, and afterward, I will come home and take a shower.

ME GO STORE, FINISH, COME HOME SHOWER. (p. 514)

With the gloss sentence, Grushkin correctly capitalizes various English words (in their root forms), but there are a few problems to discuss here. First, it is important to understand that a signer would point to himself for both *I* and *me*. Given that ASL does not distinguish between *I* and *me* in the pronominal form, Grushkin makes the decision that only one of the English pronouns can be used and be subject to glossing (i.e., *me* over *I*). One option would be to avoid English pronouns altogether and create something to represent ASL via the gloss text more faithfully. However, Grushkin's creation of a one-to-one word correspondence principle is too strict: It results in a gloss rendition that is both ungrammatical and incomplete. Grushkin uses these very terms to describe ASL gloss, but this choice of words can be attributed to his limited understanding of glossing.

According to the ASL gloss system put together in an Arizona charter school setting with deaf children in attendance (as reported by Supalla et al., 2001), the situation with ASL pronouns can be handled successfully. In this system, a signer not only points to himself for the first-person marking (for both *I* and *me*, as discussed earlier); he also points to a person in front of himself for the second-person marking (or *you*), and points to a location either on the left or right side in the signing space for the third-person marking (or *he*, *she*, *him*, and *her*). The ASL pronouns are written this way: IX=＿＿＿. IX is an abbreviation for the indexing as a term frequently used in the ASL linguistics literature. The blank is to be filled with 1, 2, or 3. Both *I* and *me* would be glossed as IX=1, *you* as IX=2, and *he*, *she*, *him*, and *her* as IX=3. One can see that there will be no confusion for readers when the ASL pronouns are written separately from English. Person marking underlines the use of

the ASL pronouns. This includes the opportunity for the readers to understand that ASL does not pursue case marking with its pronouns (or having a subject or object pronoun, as is found in English). The ASL pronouns are also gender-free (i.e., there is no *he* vs. *she*).

We will now shift to providing an understanding of how ASL gloss works, based on the Arizona charter school's system. Below, the reader will see Grushkin's gloss rendition, subject to editing. ME is replaced with IX=1. Please note that the ASL pronoun gloss is used in the sentence once, not twice as found in the English sentence (as the pronoun being used twice would appear redundant according to ASL):

Before editing:

ME GO STORE, FINISH, COME HOME SHOWER.

After editing:

IX=1 WILL GO>IX=3 STORE, <u>FINISH</u>, COME HOME TAKE-SHOWER. (p. 514)

The additional changes include the insertion of WILL. The English sentence has future tense in use, but its deletion in Grushkin's gloss rendition is drastic and not justified. That is, if the English sentence refers to something that will take place in the future and a signer has a way of expressing the same in ASL, WILL's insertion is appropriate. As discussed for the ASL pronouns, WILL is used only once in the ASL sentence, not twice as found with the English sentence.

There are three remaining corrections to Grushkin's gloss rendition. One is marking GO with the verb agreement rule of ASL. The citation form of GO has its movement moving from the signer outward, which is neutral. With the store being a destination or an ob-

ject, a signer is expected to inflect the verb so that it moves leftward or rightward to the store's location in the signing space. The verb is thus written as GO>IX=3. Recall that the third-person pronoun in ASL is glossed as IX=3, and it involves pointing to the location of a third person at the left or right side of the signer. For the common grammatical use of signing space, GO should include IX=3 through affixation. With the morphological markings known for ASL being absent in his rendition, Grushkin made the claim that ASL gloss is incomplete by nature, which is not a fair treatment of the system or the concept of glossing.

As discussed for the verb agreement marking, the Arizona charter school's gloss system has a way of incorporating the ASL conditional rule as well. For example, in Grushkin's gloss rendition, FINISH must be underlined. This writing convention corresponds to the facial behavior that a signer incorporates by raising his eyebrows when signing FINISH. This grammatical marker indicates that when one finishes with going to the store, he will come home and take a shower. The signer thus relies on his face to express the necessary syntactic information. With ASL gloss, the use of underline captures the ASL sentence's conditional characterization of the events.

Finally, Grushkin's gloss SHOWER is changed to TAKE-SHOWER. Given that the English sentence includes "taking a shower" (not "showering"), it needs to be accepted as two words for one word in ASL. The use of the hyphen to connect the two words *take* and *shower* informs readers that one word expressed in one language may require more than one word in another language. One well-known example in ASL of having one sign for a two-word term is *give up*, which is easily glossed as GIVE-UP. These examples suggest that Grushkin's one-to-one word corre-

spondence principle between ASL and English would have trouble coping with the complex relationship between the languages. Because of the Arizona charter school's embrace of ASL gloss, the outcome is understandably different as educators and researchers (at the University of Arizona) were committed to making the system work. In the end, ASL gloss comes with an elaborate set of conventions. Although the Signing Naturally curriculum's gloss system was initially seen as a model, it was not necessarily intended to be an efficient system friendly to children and adults alike. This explains why the newer ASL gloss system is subject to discussion here.

It is important to emphasize that Grushkin does correctly gloss some features. The fact that he deletes the use of articles (i.e., *a* and *the*) in his gloss rendition falls in line with how ASL works as a language. In the area of semantics, Grushkin's use of a different gloss FINISH for *afterward* (as used in the English sentence) is correct. FINISH addresses the concept of finishing the task of going to the store. The closest lexical concept to *afterward* that ASL has is FROM-NOW-ON, which is not the same in meaning.

Use of ASL Gloss With Deaf Children

At this point in the present article, it is clear that ASL gloss has merit for exploration for use in the field of deaf education. This includes Grushkin's acknowledgment that deaf children have the disability of hearing loss, which affects their potential to learn and master the reading skills of English. This suggests that something needs to be put together to help these children cope with learning to read in that language. Grushkin's proposal that whole language and the use of a conventional writing system for ASL would take care of English literacy is

not sufficient. Hearing the language (i.e., English and the development of spoken-language knowledge) continues to be the critical point of departure for learning to read (in English). The bilingual education expert Jim Cummins (2000) made it clear that hearing children who learn to read in Spanish as a first language would need to repeat the process with English as a second language, for example. For ASL gloss, the question is: What is special about this system?

It is necessary to first look at the field of ASL instruction where glossing is widespread. The particular experiences ASL instructors and students have had with ASL gloss demand attention. There is something transparent about the intermediary writing system in question, which has implications for the education of deaf children (to be discussed shortly). Because capitalized English words are used, the gloss text demonstrates a high level of readability. In comparison, a hearing student who studies a foreign language, for example, French, experiences a more difficult text, as it includes the use of Roman letters with words spelled differently from English.

In any case, ASL instructors who use the Signing Naturally curriculum are known for teaching themselves how to read gloss text by studying the conventions and then being able to read in gloss in a very short time. In addition, with other ASL curricula in which students have the opportunity to read ASL gloss, they experience comprehension rather easily. It is important to stress that the best potential for successful reading comprehension with the gloss text occurs when students know more about ASL. This includes instructors explaining the different conventions (with ASL grammar being taught at the same time), which helps with the process. Yet the reading transparency reported for ASL gloss

should not be overlooked and must be seen as scientifically interesting.

Deaf children typically do not know any English and have not developed reading skills when they enter kindergarten, yet they are poised to benefit from ASL gloss. This starts with considering that English literacy is inaccessible to deaf children and that their experiences with reading may not have been pleasant. With English text normally introduced to deaf children in school as their only source for learning to read, Hoffmeister and Caldwell-Harris (2014) describe these students' reading experience as "bewildering." One must realize that deaf children encountering English text do not rely on what is called *spoken-language knowledge*. They are disabled in terms of thinking in and processing English or any spoken language (although the situation for ASL is different, of course). The English text winds up being strange and inconsistent with how they sign, for example.

This is where the Arizona charter school set its course to create a process starting with what deaf children know linguistically, which is ASL, and moving to English literacy. ASL gloss serves as the critical "missing link" in the realization of a reading instruction program that works around deafness and is consistent with reading theory in general. The question, then, is this: What exactly did the charter school see in ASL gloss? The answer lies in the reversal of the beneficial effect of ASL gloss from English-to-ASL as reported for ASL instructors and students to ASL-to-English with deaf children. For the ASL-to-English transition, the charter school took advantage of the fact that deaf children know sight words (in English, due to exposure to print in the environment during early childhood). Sight words are a way in which to begin to teach reading ASL gloss. The fact that the gloss text includes English lexicon provides the gateway to English literacy (as it does for ASL instructors and students with ASL literacy). Equally important is the gloss text's consistency with ASL's morphosyntactic structure, which allows deaf children to read it word for word. This results in the gloss text being accessible and in tune with the signed language knowledge that deaf children possess.

With hundreds of children's literature books and basal readers glossed from kindergarten through third grade, the Arizona charter school had the important understanding that deaf children must have a way of identifying English words that are unfamiliar in a given gloss book. The sight words these children bring to school are few in number. For this reason, the school created a form of bilingual dictionary called the "Resource Book." The Resource Book allows deaf children to look up and identify unknown English gloss by reading the ASL word equivalent. Thousands of English glosses were paired with their ASL word equivalents written in a system called the "ASL-phabet." This system is made up of 32 graphemes, which represent the three phonological parameters of handshape, location, and movement (which underline the formation of all signs). Each sign must be written with the handshape information that it possesses, then followed with its location and, finally, movement. Up to 8 graphemes may be necessary to write a word in ASL. For example, the sign WORK requires the use of two hands; thus, two handshape graphemes are written. By comparison, TELL includes only one hand and thus one handshape in writing. (See Supalla, McKee, & Cripps, 2014, for more information on the ASL-phabet.)

To serve as a demonstration, the edited gloss sentence from the preceding section is shown along with all of its words listed in the Resource Book as follows:

IX=1 WILL GO>IX=3 store, <u>FINISH</u>, COME HOME TAKE-SHOWER.

COME	⎮ ⎮ ϶ ⅃ ⅃ ≋
FINISH	⋇ ⋇ ϶ ≋
GO	⎮ ⎮ ϶ ⅃ ≋
HOME	⋇₁ɔ ⌇ ⋇₁〜 ⌇
STORE	⋇₁⋇₁ ϶ ≋ и
TAKE-SHOWER	⋇₁ ≋ и 〜
WILL	∏ɔ ⅃ ≋

Now let's look at how a deaf child reads the gloss sentence and uses the Resource Book. Suppose that the child reads the sentence all the way until HOME, a word he does not know. This is where the child will need to use the Resource Book to locate the English word (based on the English alphabetic order) and read the ASL equivalent printed next to it: ⋇₁ɔ ⌇ ⋇₁〜 ⌇. In order to do this cross-linguistic word recognition task successfully, deaf children at the Arizona charter school had to learn the signed language–based alphabetic principle so that they could read the ASL words. This led to the children's ability to decode written signs based on their knowledge in signed language phonology and phonetics, for example.

Please note the reading example as discussed is a simpler example. Should a gloss word have two or more ASL equivalents, such as RIGHT referring to (a) someone being right, (b) having a right, and (c) turning right, the Resource Book will include three different written signs in a list next to the English gloss. A deaf child who did not know the gloss RIGHT would need to read all three signs. Knowing the context of the gloss sentence being read would help this child narrow the choices down to the right sign equivalent and then identify the meaning of the English word and proceed with

reading the rest of the gloss text. The design of the Resource Book also includes another component in which written signs are organized (in the ASL-phabet's own order) with English equivalents next to them. During a writing task (with ASL gloss), deaf children are expected to use this part of the Resource Book to locate the sign they know, learn what the English equivalent is, and copy it through writing.

For deaf children's transition to English literacy, the development of a large English vocabulary base through regular use of the Resource Book must be seen as a key benefit associated with ASL gloss. Deaf children find the regular English text readable, with words being the same as in the gloss text. The lexical transfer from ASL gloss to the regular text is automatic. The reported transparency of gloss text for deaf kindergarteners extends to English print. Going back to the gloss sentence example and the identification of HOME, should the child read anything in English with the word *home* in use, it would be recognizable and understandable to him. With both reading and writing tasks occurring, deaf children can learn one sight word after the other with English throughout their elementary school years.

The last aspect of ASL gloss, called *comparative analysis*, is what completes the transition to English literacy for deaf children. In the classroom, a teacher leads comparative analysis activities based on a sentence-by-sentence comparison of gloss and regular texts. This occurs with the understanding that the gloss text has already been read by the deaf children. With TAKE-SHOWER, as used in the gloss sentence example, children will see that a hyphen is removed in the English version, and that the letter *a* is inserted. This is where the teacher provides an English-language lesson by explaining the indefinite article in English and that the English version is now a phrase (and no longer a word as found in ASL).

The teacher is also expected to go through other features of the English sentence example with deaf children. What is different from the gloss text includes the form of English pronouns that account for case marking (i.e., *I* being the subject and *me* the object). Deaf children will also learn about the definite article used in the sentence (*the*) in the beginning of the English sentence and its difference from the indefinite article (*a*) as used in the later part of the sentence. The use of *afterward* in the English sentence will be studied as something specific to English. It is important to note that ASL has the sign AND, but it is used rarely, only with certain sentence structures. Finally, deaf children will have the opportunity to understand that the English sentence requires the use of *I will* twice, while this is not the case for ASL.

During this entire experience, deaf children will be learning about how ASL works (through looking closely at the gloss version) to appreciate the similarities and differences between it and English. The simple text as found at the kindergarten level (in both gloss and English versions) will allow deaf children to work on a small number of grammatical features. As time goes by, with the scaffolding of more grammatical features to learn and those that are learned subject to review (through the increasingly complex texts being read), these children will see grammatical patterns being repeatedly employed in various books in English that they read on their own. The result of following an ASL-to-English reading instruction procedure includes the establishment of English-language knowledge along with the transfer of reading skills from ASL for deaf children (such as reading left to right, paying attention to what is read, and knowing what is involved with reading comprehension). According to Supalla and Blackburn (2003), around the time of fourth grade, ASL gloss will cease to be used with deaf children who demonstrate reading fluency through assessment. (More on how reading abilities are measured for deaf children is provided in the next section of the present article.) The ideal situation includes their shift to the process of reading to learn and continue using ASL with all reading materials in English.

Gloss Text Subject to Oral Reading

While the value and rationale of ASL gloss may both be strong, a brief description of how a deaf child reads with it is still important, especially because the concept of signed language reading is new. Looking closely at how a child reads a gloss text means venturing beyond the scope of Grushkin's article. The data-based description of signed language reading we discuss below serves as a different step toward the goal of understanding what constitutes "best practice" in teaching reading to deaf children. Although ASL gloss is embraced in the field of ASL instruction, only one known study on its use has been published. The results were positive, according to the researcher, Buisson (2007), who found that ASL students who had the opportunity to learn the language with ASL gloss performed better (with ASL) than without ASL gloss. For deaf children, signed language reading is a wide-open and uncharted territory.

To facilitate the description of a signed language reading example, it is necessary to review what is involved in oral reading. Oral reading is typically done from kindergarten through third grade, a time when children focus on the process of learning to read. Rasinski (2003) made a list of benefits associated with oral reading:

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1. connecting spoken to written language
2. building readers' confidence
3. strengthening readers' decoding skills
4. fostering readers' fluency
5. boosting readers' comprehension
6. allowing teachers to view their students' reading process

The benefits of oral reading for deaf children with ASL gloss are substantial. These children experience a connection of *signed* to written language, thanks to the matching of signing and print. Their confidence as readers increases when they are provided with the experience of reading based on the language they know, ASL. Since these children can sign word for word, it is easy for the teacher to see if they are reading with accuracy, for example. The teacher can also monitor whether these children use the Resource Book any time they encounter unfamiliar English words in print. This allows the teacher to see how the children fare with reading the ASL equivalents written in the ASL-phabet. The teacher's guidance on reading written signs will strengthen the deaf child's decoding skills. The same holds true for modeling how to best read a gloss text with a wide range of conventions in use. One way or another, these children's reading comprehension will be boosted. Fluency will ultimately develop, with practice opportunities provided along with the teacher's coaching efforts. The development of English literacy for deaf children is contingent on the features of oral reading being implemented through ASL gloss along with the perusal of comparative analysis and the teaching of English-language lessons on a regular basis.

In terms of measuring oral reading, the running records (or miscue analysis) are one well-known way of examining how well a child reads orally from any text. With hearing children, the running records are most helpful in providing evidence on how well they are directing their knowledge of letters, sounds, and words to understanding the message in the text (Clay, 2000). To conduct running records, a teacher listens to a child's oral reading and follows a script of the passage, tallying the words being read successfully. Errors are marked when the child skips a word or fails to decode a word. The assessor knows the total number of words in the English passage, and this results in a computation based on the number of errors that produces a percentage. Should the child obtain an accuracy rate higher than 98% in running records, that child would be considered an independent reader and would not need the teacher's assistance. Thus, the text would be considered "easy." If a child read the text (and decoded words) at grade level with an accuracy rate in the range of 90%–95%, that child would be considered to be reading at an instructional level and would need the teacher's assistance. If the accuracy rate were below 90%, the child would likely be faltering as a reader and reading at the frustration level. In other words, the text would be too difficult for the child (Gillet & Temple, 2000; Leslie & Caldwell, 2001).

The opportunity to measure deaf children's oral reading with ASL gloss was provided at the Arizona charter school, as it had accepted the challenge of using the running records. The obstacle that had to be overcome was how to count words in a gloss text. Teachers at the charter school complained that the "English way" of counting the words in ASL seemed to always lead to a much smaller number and caused the computations to be "off" and unrepresentative of how deaf children perform with reading. The dilemma of ASL sentences having a small number of words is not surprising when one looks at the research of Klima and Bellugi (1979). They did a study comparing the rate of speaking and signing and confirmed that a signer would consistently use fewer signs in a sentence to convey the equivalent meaning in English. On average, individual signs require twice as much time for production as spoken words. At the same time, ASL is described as having a rich and multilayered morphology (in the form of inflections, classifiers, etc.) and the use of nonmanual signals (such as raised eyebrows for marking a sentence conditional) that compensate for the longer time it takes to sign words and the smaller number of signs per sentences as compared to English. The question is, then: What should be done with the running records to adjust for this?

It was a master's thesis by a graduate student at the University of Arizona (under the supervision of the lead author of the present article, Samuel Supalla) who solved the seemingly big problem of how to make the running records work for deaf children. A published reading inventory with English passages increasing in complexity over grade levels was first subject to glossing. The next task was to come up with a word count formula for ASL that ensured a parallel between gloss passages and their originals in the English reading inventory. It was through the necessary alignment of the ASL word count formula that the total number of words did increase. In addition, each gloss passage shared the same spot of ordering with the English version. The thesis author, Michelle Nersesian (2002), devised a formula for use with the running records (with ASL and ASL gloss). Serving as one example, a classifier predicate in ASL has the appearance of a single sign, but not according to Ners-

esian's word count formula. In Figure 1, the illustration shows a classifier predicate example of the English equivalent *jumped out of the bed*. It is followed by written ASL gloss.

Before discussing how [∩-BED V-JUMP>OUT] is counted, it is important to understand how this classifier predicate is written. There are two ASL-phabet letters in use (i.e., ∩ and V). The ASL gloss conventions developed at the Arizona charter school allows borrowing of these letters from the ASL-phabet. Each letter originally represents a phoneme in ASL, and now functions as a morpheme here. To illustrate this, ∩ refers to the flat palm of a handshape, which is appropriate for the flat surface as found on a bed. V refers to the "V" handshape that is appropriate for the "legs" or a person. The parentheses in use indicate that two classifier handshapes are at play. The English glosses BED, JUMP, and OUT are what a deaf child needs to identify as conventional signs (and the child can use the Resource Book to identify their meaning through ASL).

The counting of [∩-BED V-JUMP>OUT] will be three, according to Nersesian's formula. BED, JUMP, and OUT are subject to counting as "tokens" in one gloss word. The ASL word count formula established in her master's thesis does not limit itself to the handling the classifier predicates, as it includes some morphosyntactic markings for counting as well. The original attempt to count English glosses was clearly not sufficient. One must also realize that the contribution of ASL gloss to the study by Nersesian (2002) cannot be underestimated. Imagine how one tries to decide on the counting of tokens with classifier predicates when there is no gloss writing to rely on. Most importantly, when Nersesian's formula was tried at the charter school, the teachers found the running records to be working for them.

Figure 1
The classifier predicate example 'jumping out of bed' subject to glossing.
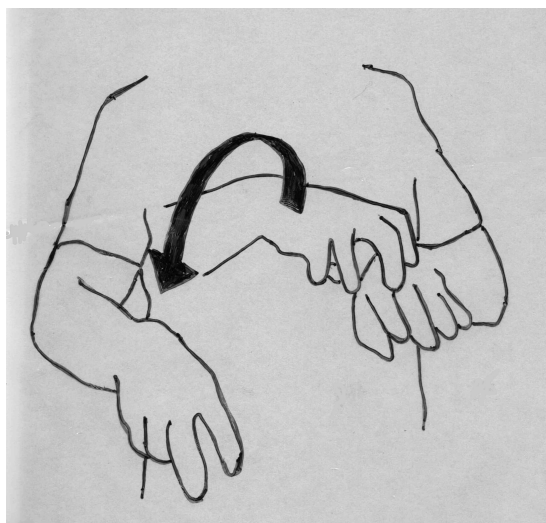
[R-BED J-JUMP>OUT]

They intuitively knew where the children stood with reading, and welcomed the support provided by the results of the running records.

Here one will now see that the improved running records with a young deaf child reading a gloss passage are visibly consistent with what the charter school's teachers felt about the assessment. The child in question was a girl (age 9 years) who had been profoundly deaf since birth and grew up in a signing household with deaf parents. This student attended the Arizona charter school (as a third grader) and was ranked as proficient on the American Sign Language Proficiency Assessment (Maller et al., 1999). A third-grade English passage titled "The Trip to the Zoo," from the Qualitative Reading Inventory–3 (Leslie & Caldwell, 2001), was subject to interlinear translation leading to the creation of a gloss version. The child was instructed to read and sign the gloss text from the beginning to the end. The Resource Book was made available for her use when needed. For the purpose of the present article, only the first three sentences are subject to discussion in regard to her oral reading performance. The excerpt of the English passage and its gloss version follow:

English:
The day was bright and sunny. Carlos and Maria jumped out of the bed and dressed in a hurry. They didn't want to be late for school today.

ASL gloss:
THAT DAY BRIGHT SUNNY. fs-CARLOS BOY NAME AND fs-MARIA GIRL NAME [∩-BED V-JUMP>OUT] BED DRESS IN-A-HURRY. IX=3# NOT-WANT LATE FOR SCHOOL TODAY.

Please note the child reads only the ASL gloss text. The names of Carlos and Maria start with fs- to indicate that they are fingerspelled. The gloss IN-A-HURRY is similar to what was discussed earlier with TAKE-SHOWER and GIVE-UP. Please note that the gloss conventions were subject to modifications since the time of this assessment with the running records. The English phrase "in a

hurry" is now glossed as IN-HURRY, not IN-A-HURRY. NOT-WANT serves as another example of this type of glossing. Finally, the use of the # symbol after the third-person pronoun IX=3 indicates its pluralization. Instead of pointing to a single location on the left or right of the signing space, IX=3# involves a pointing that sweeps across the signing space (as if one were pointing to a group of people, not just one person).

As shown in Table 1, the running records format indicates the child's oral reading performance. Gloss text that is signed successfully is marked with a check. With the first word, the child did a self-correction (i.e., SC) when she signed incorrectly, and ultimately signed THAT. No penalty was assessed for this reading behavior. The child was able to complete the first sentence with no apparent difficulty. With the second sentence, the child's oral reading performance has a few interesting features to consider. The child fingerspelled the two proper names correctly, but she skipped the word NAME twice, which in both in-

stances was marked as an error (i.e., E). In ASL, it is important to sign NAME when introducing someone's name. Fingerspelling the person's name without signing NAME is incorrect. The child read the more complex classifier predicate with no difficulty, which is encouraging. However, she made another self-correction when she skipped BED and signed DRESS prematurely. She quickly realized that an error had been made and went back in the sentence to sign BED and then DRESS. While the child did not recognize the last word IN-A-HURRY, she did use the Resource Book and looked up and read the ASL equivalent, ‖ ‖ ꓱꙆи. The convention "RB" is used to mark successful English word identification. More specifically, the child read the written sign and started to sound it out in ASL and came up with the sign. The child produced the last sentence in the oral reading task perfectly, as she used the pluralized form of the third person pronoun IX=3.

The use of Nersesian's formula for counting tokens in ASL gloss shows

that the child performed at 91%, which is at the instructional level, with an error rate of 1:11.5. The child could be described as capable of reading, but she was not an independent or fluent reader. As shown by the running records, the child needed continued teacher's assistance in oral reading at an age-appropriate level of the gloss reading materials. The fact that the child identified a vast majority of the English glosses can be seen as a positive result of her previous reading experiences, especially with the regular use of the Resource Book. It should be recalled that whenever the child used the Resource Book, she was reading the ASL equivalent of the gloss. While this is only one example of the child being successful with reading the ASL equivalent to IN-A-HURRY, it is easy to imagine that she had an adequate amount of word-decoding skills. The identification of the child's reading level as instructional indicates that more work in developing reading skills was needed. The key area of reading improvement for the child lay in her

Table 1
Deaf Student's Reading Performance using Running Records

	SC	√	√	√		
1.	THAT	DAY	BRIGHT	SUNNY.		

	√		√	E	√	√	√
2.	fs-CARLOS		BOY	NAME	AND	fs-MARIA	GIRL

E		√	√	√ SC	√	√	RB
NAME		[Ո-BED V-JUMP>OUT]	∧	BED	DRESS	IN-A-HURRY.	
			DRESS				

	√		√	√	√	√	√
3.	IX=3#		NOT-WANT	LATE	FOR	SCHOOL	TODAY.

Key to Conventions for Coding	Student Data
√ = correct response	23 running words
E = error	2 E, 1 RB, 2 SC
RB = used The Resource Book	Accuracy: 91% (75%)
SC = self-correction	Error rate: 1:11.5 (1:4)

paying attention to what was read. For example, she seemed inclined to read too fast, which caused her to skip NAME twice and BED once.

Closing Remarks on Teaching Reading to Deaf Children

As evidenced by the preliminary oral reading example with ASL gloss, deaf children have a strong potential to experience a variety of reading development features and have their reading abilities measured. The child discussed above was cognitively engaged in reading the gloss text, which appeared to be authentic and normal (with no confusion or any indication of incompleteness associated with the gloss text that may have affected the child's reading experience). This included a form of inner speech in the child's head as she read the gloss text, according to the language that she knew (i.e., ASL). The phenomenon of signed language reading as described is not strictly theoretical, but practical as well.

The remaining question is: Why don't educators working with deaf children pursue ASL gloss similarly to what has been reported in the field of ASL instruction? One answer is historical. The field of ASL instruction is a recent phenomenon, while the field of deaf education is old, tracing back to the early nineteenth century. The field of ASL instruction had its start with a "clean slate" with the notion that ASL is a language and people are interested in learning it. Deaf education is more complex, as it is part of a large educational establishment that caters to children who can hear. One can say that in theory and practice, reading is treated as synonymous with spoken language out of convenience, which is both erroneous and antiquated in terms of what is understood about human languages. If ASL possesses linguistic principles (as linguists and researchers

have demonstrated over the last few decades), then reading in the signed language is a real possibility. To accept this, deaf education would have to undergo some changes, something that is inherently difficult to do.

By all accounts, Grushkin must be commended for challenging the dominance of spoken- language reading. (See also Cripps & Supalla, 2012, for further discussion of the power of spoken language and its effects on the education process.) It is important to note that many educators have recognized ASL as a full-fledged human language. Signing is widely encouraged in schools and programs serving deaf students as well as for those integrated into regular public schools. In integrated settings, the provision of signed language interpreting services is a testimony to society's acceptance of an alternative modality to language (i.e., signed and ASL). However, the persistent problem for the education of deaf children lies in how ASL has been confined to use "through the air." Adding to this dilemma is how the linguistic accessibility concept has not been seriously addressed, with the exception of the Arizona charter school discussed in the present article. The educational system will need to start thinking about signed language reading and ASL gloss, as deaf children's reading difficulties are well known, and must be addressed in the present era of pursuing best practices and accountability.

As pointed out in the present article, Grushkin has a number of weaknesses in his understanding about signed language reading when it comes to how deaf children best learn and master English literacy. Yes, ASL and English are two languages under consideration, but only one is accessible, while the other is not. This clarification is crucial for explaining why ASL gloss had to enter the picture, as promoted at the Arizona charter school. Different components and tools of this program have been strategically put together to ensure that deaf children experience signed language reading with a systematic transition to English literacy. As shown in Figure 2a, the proposal by Grushkin to have a conventional writing system for ASL covers the oral-to-print process with a first language, or L1, but not with English as a second language, or L2. Deaf children continue to experience restrictions

Figure 2a
Some limitations of Grushkin's proposal in accessing English literacy.

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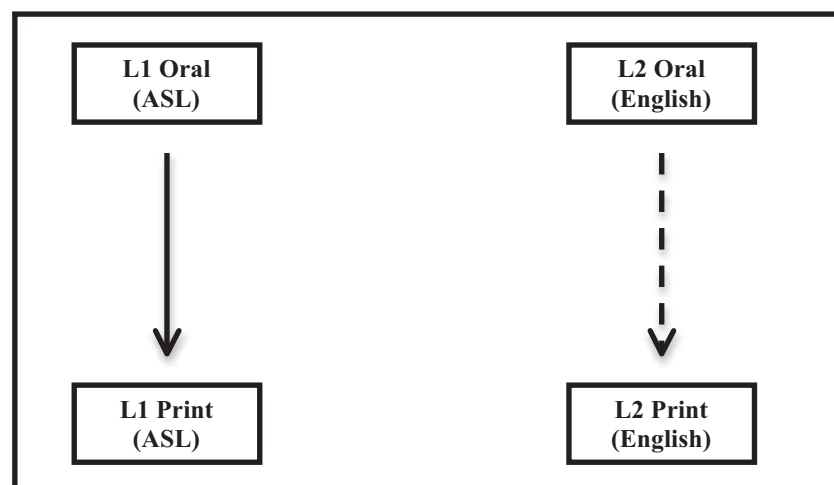
Figure 2b
The alternative proposal using ASL for teaching English literacy.
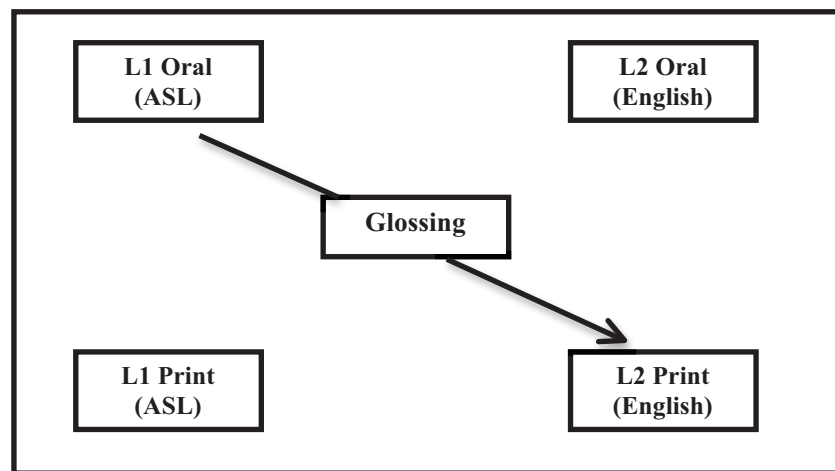
related to the English reading process (as indicated by the fragmented arrow in the figure). The ASL gloss set-up, on the other hand, addresses both languages, ASL and English. Children who use it rely on glossing for learning and mastering English literacy through ASL, as shown in Figure 2b.

Finally, the issue of ASL proficiency has become more important than at any other time in the history of deaf education, as it underlines the efficacy of ASL gloss. Up to now, deaf children have not been required to know ASL, and thus signed language proficiency has varied among deaf children (see, e.g., Lederberg, Schick, & Spencer, 2013). The status of ASL as a signed language requires that the educational establishment take a hard look at what language really means to deaf children (including how the linguistic structure must be different from English) so that it achieves the critical element of learnability and ease of use (see Supalla & McKee, 2002, for further discussion of this topic). As discussed by Cripps, Cooper, Supalla, and Evitts (2015), the field of speech and language pathology, which has a strong influence on deaf education, will need to expand its

scope to include signed language or ASL for the reason of linguistic accessibility. The notion of deaf children needing to become proficient in ASL due to their disability is a paradigm shift that requires attention in research and scholarship.

ASL gloss is innovative and is sensitive to the issue of how deaf children best learn English literacy. As described in the present article, ASL gloss is elaborate enough to provide deaf children with the ability to learn to read, which is the ultimate cognitive achievement of human beings.

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