A description of ASL features in writing☆

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HIGHLIGHTS

- Six categories of language transfer were identified in deaf adolescent writing.
- The most prevalent category was the use of lexical ASL features.
- The most common syntactical category was adjectives.
- Both lexical and syntactical ASL features responded similarly to instruction.

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ABSTRACT

Similar to second language students who embed features of their primary languages in the writing of their second languages, deaf and hard of hearing (d/hh) writers utilize features of American Sign Language (ASL) in their writing of English. The purpose of this study is to identify categories of language transfer, provide the prevalence of these transfer tendencies in the writings of 29 d/hh adolescents and describe whether language features are equally or differently responsive to instruction. Findings indicate six categories of language transfer in order of prevalence: unique glossing & substitution, adjectives, plurality & adverbs, topicalization, and conjunctions. ASL features, of both lexical and syntactical nature, appear to respond similarly to instruction.

1. A description of ASL features in writing

Second language (L2) students draw on their existing linguistic repertoires when attempting to convey meaning through written text. They use multiple strategies to make sense of morphological and syntactical structure variations, and while developing L2 language proficiency, they may embed L1 (primary language) features in L2 writing (Baker and Jones, 1998; Bhela, 1999; Hedgcock, 2012; Hinkel, 2002; Valdes, 2006). This phenomenon of incorporating grammatical features of one language into the other is known as language transfer (Paradis and Genesee, 1996). The basis of this phenomenon suggests that L2 writers may use an L1 to generate or communicate ideas prior to or during production of text (Woodall, 2002). Developing a sophisticated understanding of a L2 generally diminishes the language transfer occurrences, suggesting that as writers gain competence in their L2 and build linguistic awareness, there are fewer features of L1 in their writing (Baker and Jones, 1998).

In cases where a child is exposed to two languages before reaching fluency in one, the child is engaged in bilingual language acquisition whereby L1 and L2 are developing simultaneously at similar or dissimilar rates. For various reasons, the child may apply knowledge of one language to his/her productions in the other and vice versa (Hulk and Miller, 2000), leading to incidents of blending or cross-linguistic influence.

The occurrence of cross-linguistic influence, or language transfer as used in this paper, has been known to occur among deaf and hard of hearing (d/hh) writers, whereby structures of American Sign Language (ASL) are utilized in writing (Menéndez, 2010; Niederberger, 2008; Wolbers, 2010; Wolbers and Dostal, 2010). We can examine this phenomenon from a Universal Grammar perspective, where there is a finite set of parameters, or specific grammar rules, that differentiate languages syntactically (Pinker, 1995). Although many of the grammatical errors that d/hh children make are similar to those of hearing children during acquisition (which may reflect similar parameters across languages), ASL and English do have dissimilar parameters such as the position of WH questions (e.g., English: Where is the boy? ASL: BOY WHERE? or WHERE BOY WHERE?). Use of ASL during writing of English can happen, for example, if the student knows the ASL parameter setting but does not know the English one, and then he applies his ASL linguistic knowledge (Lillo-Martin, 1997). Errors of this nature would fall away (and parameters reset) once students are provided with further linguistic input or evidence (Lillo-Martin, 1993, 1997). While an examination of errors may allow us to identify language transfer when ASL and English have different parameter settings, it would not, however, lend itself to identifying the application of ASL linguistic knowledge when language parameters are similar (e.g., use of WH questions in the initial position).

The transfer of ASL to English in writing provides for a unique area of research and discussion since the manual and visual nature of ASL and the absence of a written form differentiates it from spoken languages. The purpose of this paper is three-fold: (1) to describe the types of ASL grammatical features that appear in the English writings of d/hh adolescents, (2) to provide the prevalence of language transfer types or categories, and (3) to describe whether categories (e.g., syntactically and morphologically related categories) are equally or differently responsive to instruction, specifically Strategic and Interactive Writing Instruction (SIWI).

1.1. ASL in English text

American Sign Language (ASL) constitutes a grammatically complex system and includes its own elements of language such as phonology, morphology and syntax (Stokoe, 1960). For example, the visual nature of ASL allows for the expression of more than one concept simultaneously or the use of space around the body to show relationships between objects. These features among others differentiate ASL in structure from English. As such, ASL and English are entirely different languages and "…it would be highly unusual for an ASL sentence ever to have exactly the same grammatical structure as an English sentence" (Liddell, 2003, p. 2). This makes it possible to identify some specific ASL features in English writing.

An example of ASL features existing in English text comes from the Deaf Way II Anthology (Vol II) (Stremlau, 2002), which is a literary collection of works by d/hh writers. This collection includes a poem, entitled "Salt in the Basement: An American Sign Language Reverie in English", written by Willy Conley. The author of this poem, who is fluent in ASL and English, purposefully transliterated ASL features into text. A few excerpts are provided for clarification.

me little, almost high wash–wash machine
down basement, me have blue car
drive drive round round

happen summer
me inside blue car
drive round round
basement

me drive every corner
drive drive drive

then BOOM! Me crash (Conley, 2002, p. 184)

In this brief excerpt, the author includes several phrases that have specific ASL features. "Wash–wash machine" is an example of substitution for "washing machine", to which the sign for "wash" is repeated two, maybe three times, depending on the context. "Drive drive round round" would likely be signed using classifiers to describe the object, location and movement of the car. Based on one perspective, this statement could be translated to English as, "Driving in a circular motion". "Happen summer" in the second section is an example of how "happen" functions as a conjunction in ASL (Fischer and Lillo-Martin, 1990). The poem provides an example of how ASL grammatical features have been used in written English to illustrate visual concepts in text.

More examples of purposeful use of ASL features in English writing come from Children of Deaf Adults (CODAs). Bishop and Hicks (2005) examined the written email conversations between CODAs who used a purposeful blending of ASL and English, referred to as "CODA-talk" (p.196). The analysis identified ASL characteristics in their writing and visual descriptions of ASL signs. They found, for example, that 146 of the 275 lines used unique ASL glossing, a notation method to translate individual signs into text (Valli et al., 2011). One example of ASL gloss in Bishop and Hicks (2005) is "not my taste". The English translation could be "not my preference". There were also English features that were commonly dropped. Of the 275 lines analyzed, the most common features were dropped subjects (69) (e.g., "Hope lots of room on plane"), dropped copulas (62) (e.g., "That nice"), and dropped determiners (59) (e.g., "That point"). Dropped subjects in English could be explained because the "subject is understood through context" (Bishop and Hicks, 2005, p. 205). While not as frequent, objects were also dropped, which may reflect aspects of ASL whereby persons indicate the space where objects were previously placed through pointing or directing verbs (Liddell, 2003). Additionally, elements of visual representations in ASL such as space, facial expression, and body language may not be literally translated into English and result in these drops. While the above examples come from purposeful adult writing rather than unintentional instances of language transfer, they do provide a beginning illustration of how ASL features may present in English writing.

1.2. Trends among developing d/hh writers

It is possible that ASL transfer may contribute in part to common writing trends among developing d/hh writers. Some trends identified in the literature involve text that is typically shorter, less complex, and sentences that are comprised of repetitions of basic grammatical patterns (Marschark et al., 2002, 1994; Mayer, 2010; Singleton et al., 2004; Spencer et al., 2003). New topics are introduced without producing fully developed ideas, and content-oriented vocabulary is employed over functional words (Singleton et al., 2004; Wilbur, 2000). English grammatical features containing little semantic value are particularly difficult for d/hh persons who are unable to acquire them acoustically (Fabbretti et al., 1998). And, additional words are added out of context, necessary words are not considered, and there are substitutions of text or phrases (Paul, 1998). Writing characteristics among d/hh such as simplified sentences, grammatical errors or non-standard usages have persisted over time (Mayer, 2010).

Persons draw on their linguistic repertoires to convey meaning through written text, and d/hh students vary considerably in their linguistic knowledge of ASL and English. While approximately 95% of deaf children are born to hearing parents and are exposed to spoken English as their first language (Mitchell and Karchmer, 2004), many do not have the auditory capabilities to fully access that language for development. Lengthier written texts, to some

extent, have been correlated with more advanced oral skills among those who have significant auditory access to English (Spencer et al., 2003). Similarly, growth in writing length and complexity has been related to growth in expressive/receptive ASL among d/hh (Dostal and Wolbers, 2014). We propose that students with ASL knowledge draw on ASL linguistic features when they encounter challenges conveying meaning through English text.

It is possible to illustrate these concepts using the independent writing of d/hh students who vary in ASL and English proficiencies. Nover and Andrews' (1999) Star Schools Project Report includes teachers' reflections on implementing ASL/English bilingual methodology for d/hh students and examples of d/hh writing.

I not know much about Earth. I have no feel about Earth, but I finish learn about Earth. People need care for home. People need respect. People nice to Earth. Animals can live long if animals eat healthy food, drink clean water and breathe clean air. Animals live Free. Each help people and animal live. Each is very pretty because blue water, colors many different. Earth need nicely. Earth not need mess. (99).

Sentences are simple, ideas are not fully developed, and some content across the sentences is repetitious (e.g., Earth). While this particular sample is not representative of all d/hh students in the report, the syntactical structures used by this deaf elementary student are illustrative of the linguistic phenomenon of topic. Consistent with Singleton et al. (2004), the content words are strong, much more than functional words. For example, in these statements, "People need respect. People nice to Earth.", the meaning of these two sentences is comprehensible, yet functional words (e.g., infinitives, determiner) are missing. There is also inclusion of ASL gloss such as the statement "finish learn". In ASL, "finish" is a way to show past tense (Valli et al., 2011) and is provided before the verb "learn". Once established, tense is not repeated throughout a narrative. Another example of ASL structure found in this written artifact is "colors many different". This is a linguistic element of ASL to which the topic or noun is conveyed before the details (Valli et al., 2011). In this example, the details are "many different". In English, a possible translation would be "There were many different colors", whereby "many different" precedes the noun.

Singleton et al. (2004) conducted a study on the quality of written text based on ASL proficiency. Although not the focus of that research, ASL features could be identified in associated writing samples produced by d/hh elementary students with various levels of ASL and English proficiencies. For example, "Who win turtle" could be an example of an ASL rhetorical question whereby the sentence is structured with a question and response, and "Turtle puzzle" could be described as topicalization whereby the topic precedes the details. Bailes (2001) also included some writing samples from d/hh writers in the primary grades that illustrate ASL features in English text. One student wrote "invented sled dog". In this phrase, the determiner is omitted and the subject is dropped. Additionally, the compound construction, "sled dog", whereby "dog" acts as a descriptor, is flipped compared to the English phrasing of "dog sled". The two different syntactical structures have the same meaning but are expressed differently in ASL and English.

In prior literature, it is possible to locate intentional uses of ASL in English writing such as those in ASL literary collections and in CODA email conversations. It is also possible to observe unintentional application of ASL linguistic features in the samples of d/hh developing writers. In this research, we examine the natural occurrences of language transfer that exist in d/hh adolescent writing. We describe the various kinds of ASL features and the prevalence of those features found in writing. We then investigate whether lexical and syntactical features of ASL respond similarly to instruction that aims to heighten metalinguistic awareness and promote L2 implicit competence.

1.3. Strategic and Interactive Writing Instruction

Strategic and Interactive Writing Instruction (SIWI) is an instructional approach to teaching d/hh students to write for a variety of purposes and audiences. There are three main driving principles of SIWI. First, SIWI draws on 20 years of evidence-based research with strategy instruction in writing (Englert et al., 1991; Graham, 2006), whereby the strategies or processes of expert writers are explicitly taught to novice writers who do not yet evidence usage of the strategies independently. It may be that students, for example, benefit from explicit instruction on ways to plan for writing. While students engage in practice, they rely on procedural facilitators that prompt them to engage in planning behaviors until the actions become routine.

Secondly, SIWI builds on a substantial foundation of research in interactive writing (Englert and Dunsmore, 2002; Englert et al., 2006; Mariage, 2001; Wolbers, 2008a). During collaborative writing, teachers, and sometimes peer students, model, think-aloud and scaffold students with the writing process and with the use of more advanced writing skills. Over time, the teacher steps back and transfers more responsibility to students when engaged in shared or independent writing activity.

Lastly, SIWI has instructional components that respond to the unique language needs of d/hh individuals. Informed by second language acquisition research, SIWI incorporates explicit language teaching meant to build students' metalinguistic knowledge of ASL and English, and also provides opportunities for developing implicit competence of L2 (Ellis et al., 2009; Krashen, 1994). For students who use ASL to communicate but do not yet effectively code-switch to English when engaged in writing, teachers may use a *two-surface* or a *two-zone approach* to handle language expressions during guided writing. That is, one surface or zone is where the group co-constructs the English text and another surface or zone is where ASL ideas are represented. Expressions that are close approximations of English and only require minor revisions to be grammatically accurate may be added to the English board. Expressions that are more like ASL in form are identified by the group and held on the ASL board or in the zone (known as the ASL holding zone or language zone) to give explicit attention to the ASL grammatical features. Teachers may use various strategies to capture or emphasize the ASL expression (e.g., ASL gloss, pictures, drawing, video, role playing, restating ASL expressions, gesture) in the zone. Then, the teacher will then guide the class in translation, moving the idea from ASL to English, and subsequently adding to the English text. During this process, participants build their metalinguistic knowledge or their understandings of the grammars of ASL and English through explicit teachings of the languages.

Teachers also implement frequent rereadings of the English text to aid development of implicit competence in English. It is important that students have an opportunity to acquire English implicitly, for there are many aspects of English that cannot be explicitly taught. Often these are the intangibles that native English speakers claim "just sound right or wrong". While rereading the text is important to the revision process, it is also a way d/hh students come to know how English looks, feels and sounds, similar to a native user. Students reread the text using *print-based sign*, which is not a way of naturally communicating but a nuanced and complex method of signing with text support. It calls for students to pay attention to the exact written English (in all its complexity) and express the corresponding meaning through a manual mode. While reading, the teacher uses one hand to point to the words or chunks of the printed text and her other hand to guide the students in a conceptually accurate rereading. Students may prefer to also voice or move their mouths to replicate the words they are reading. Since the text during collaborative writing is generated by

Table 1
Participant information.

N = 29	Mean	SE	Min	Max
Age (years, months)	13.2	1.1	11.8	14.9
Unaided hearing	88 dB	21 dB	21 dB	113 dB
Aided hearing	35 dB	18 dB	17 dB	98 dB[**]
SAT-HI reading comp (grade level)	2.7	1.1	1.3	6.1

[**] 2 students did not use amplification.

the students based on their own ideas but also scaffolded by the teacher to a slightly more complex grammatical state, the English is comprehensible and meaningful input slightly above students' current levels of independence.

SIWI has been implemented with students who have mild to severe hearing losses and who use various communication methodologies such as ASL, speech, English-based sign, or a mixture of these. Prior SIWI research has led to improved expressive ASL as well as written English outcomes at the word, sentence, and discourse levels (Dostal and Wolbers, 2014; Wolbers, 2008a,b, 2010; Wolbers et al., 2012). The data provided in this paper have also been analyzed quantitatively and published elsewhere (Wolbers et al., 2013). Findings from the quantitative analysis suggest that students provided with SIWI make statistically significant reductions in their use of ASL in writing over one academic year of instruction. At the same time, while ASL features in writing substantially reduced, they were not eliminated, and there was considerably less impact on ASL features during the second half of the year compared to the first. These findings may point to some ASL grammatical features being more immediately responsive to instruction than others. To better understand the ASL language transfer phenomenon as well as inform future pedagogical practices, we engage in qualitative analyses of the data focused on identifying and tracking specific features over time. More specifically, the foci of the current study is three-fold–(1) to identify categories of language transfer, (2) to provide the prevalence of the transfer tendencies in the writings of 29 d/hh adolescents, and (3) to describe whether categories are equally or differently responsive to instruction.

2. Method

Students in this study were provided with 2–3 h of weekly SIWI instruction over one academic year. Students were introduced to four different kinds of writing—personal narrative, narrative, expository, and persuasive. Writing samples for each genre were collected at pre-, mid-, and post-academic year. For this study, researchers used personal narrative samples (N = 87), as no additional categories of language transfer were observed when expanding the sample to include other types of writing. The teacher read a personal narrative prompt to students (using the students' preferred method of communication) and also gave the prompt to the students to read. Students were asked to write about a previous experience like a visit to some place special, something they did over the summer, or something that happened to them. They were given unlimited time for writing. If students requested help, the teacher did not assist but rather told them to do the best they could.

2.1. Participants

The teacher participant is a language arts instructor who is hearing and in her 4th year of teaching. She has a BS in Educational Interpreting, a MS in education, and a rating of Advanced Plus to Superior Plus on the Sign Language Proficiency Interview (Caccamise and Samar, 2009) which indicates near native like production and fluency. The teacher started learning about SIWI one year prior to the start of the study. She began reading SIWI

literature and other associated research to familiarize herself with the instructional approaches and undergirding theories. During this time, the first author periodically supported development of the teacher's classroom practice in a variety of ways (e.g., modeling lessons in the classroom, sharing SIWI video footage with the teacher, observing the teacher and providing feedback, responding to questions or helping her to problem solve). During the year of the study, the teacher's use of SIWI was observed at least once each quarter and rated using a SIWI fidelity instrument. The instrument includes 28 actionable principles measured on a 4-point rubric scale, 4 as strongly agree and 1 as strongly disagree that the item was implemented. The teacher implemented SIWI with high fidelity, with average totals consistently between 3.809 and 4.0 points.

There were a total of 29 d/hh students in grades 6–8 at a southeastern residential school for the deaf. See Table 1 for demographic data by age, hearing loss and reading level. Students varied in their dominant method of communication (e.g., speech, ASL, English-based sign, or delayed in both ASL and English) and varied in the amount of exposure to ASL they received after school hours, from deaf adults at the school, and during conversations with other students. During SIWI lessons, the teacher mainly spoke and signed simultaneously (known as Sim-Com). She frequently integrated ASL into lessons by using videotaped expressions or the students' expressions of ASL to explicitly draw comparisons and distinctions between ASL and English. She would also frequently sign expressions in both ASL and Sim-Com (back to back) in order to meet the needs of all of her various students. Of the 29 students, 22 used ASL features in their writing.[1] Six of these students were considered proficient ASL users, and six were considered proficient users of English-based sign, Sim-com or sign supported speech. Students were considered proficient if they could fluidly express many to most ideas/concepts through the indicated communication method. The ten remaining students were observed to have difficulty expressing many to most ideas/concepts in both ASL and English. These determinations were based on the teacher and the researchers' judgments of students' communication method and communication skills, as there were no standardized assessment instruments for this purpose at the time of the study. Even though the amount of ASL input varied among students, they all were receiving some degree of exposure and, in this regard, could be considered developing bilinguals, albeit with varied levels of proficiencies in ASL and English.

2.2. Procedures & analysis

Three researchers blind reviewed the pre-, mid- and post-writing samples (N = 87) to identify specific ASL features. Two researchers were hearing and fluent L2 users of ASL, and one researcher was a deaf, native user of ASL. The researchers first segmented each of the writing samples into T-units and then marked

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[1] The seven students who did not use ASL features in their writing were observed to be either highly proficient bilinguals in ASL and English, or highly proficient users of speech or sign supported speech.

Table 2
ASL features identified in the literature.

Valli et al. (2011)	Bishop and Hicks (2005)
[**]Topic/comment	Irregular inflections (S-V agreement)
Tenses	Dropped subjects
[**]Adjectives/Adverbs	Dropped copula
Pronouns	Dropped determiners
[**]Conjunctions	Dropped auxiliaries and modals
Interjections	Dropped prepositions
Pluralization	Dropped infinitives
[**]Rhetorical questions	Dropped objects
WH questions	[**]Unique glossing & novel lexicon
Negation	
[**]Substitution	

Note.
[**] influenced categories in current research.

any t-unit with ASL features embedded (see example in the Appendix). A t-unit is an independent clause and any subordinate clauses that cannot stand on their own (Hunt, 1965). For example, "the boy ate spaghetti" and "the boy ate" are examples of t-units while "ate spaghetti" is not. Only those instances of clearly identifiable ASL features in writing were marked, rather than simply any non-English expression or dropped English, even though prior literature of d/hh adult writing demonstrates how drops may represent a writer's application of ASL. Because drops may also be related to developing proficiency in English, these were not coded as applications of ASL knowledge. The research team came to full consensus on all occurrences of ASL features identified in writing.

The identified instances of ASL were then organized into categories by type of ASL feature. The categories in this study were derived in part from those used in Bishop and Hicks (2005) to describe the application of ASL knowledge in the written emails of CODAs, and also influenced by the linguistic descriptions of ASL grammatical features provided in Valli et al. (2011).

Table 2 demonstrates ways in which the literature influenced our descriptions of the ASL features found in student samples. Examples of selected categories (those with asterisks) are provided in Table 3 (Section 3).

Twenty-five percent of the ASL occurrences were categorized by the three researchers for type of ASL feature, and inter-rater reliability was calculated at 94.7%. Discrepancies were resolved among research members, and the agreed upon categories were used in the analysis. Once the various types of ASL expressions occurring in d/hh student writing were identified and categorized, we tallied total frequency counts by category and by category for pre-, mid-, and post-academic year to examine both prevalence and different features' responses to instruction.

3. Results

3.1. Focus area 1: Identification of categories of language transfer

Nearly all cases of ASL transfer identified in the student samples could be organized into six different categories: unique glossing & substitution, plurality & adverbs, adjectives, topicalization, conjunctions and rhetorical questions. A description and an example of each category is provided in Table 3. Besides unique glossing & substitution, the categories are all representative of ASL syntactical features. If an identified ASL feature did not fit the description of any of the six categories and did not occur more than once to substantiate its own category, it was labeled as "other".

3.2. Focus area 2: Prevalence of various ASL features in English writing

Of the samples collected from 29 students, 7 students did not exhibit any ASL occurrences in pre, mid, or post-academic
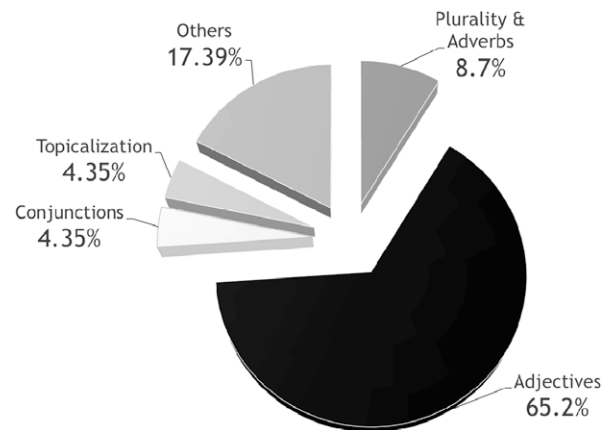
Figure 1. Percentages of ASL syntactical structures identified in pre-academic year writing samples.

year samples. Twenty two students embedded ASL features in their writing. The majority of writing samples approximated a paragraph in length (less than 20 t-units) and contained about 1 ASL feature each.[2] There were a total of 86 ASL occurrences identified in the writing samples, 39 of those occurred at the beginning of the year (45.3%). Unique glossing & substitution accounted for nearly half of the occurrences in pre-academic year writing samples at 41.0%. All other categories were? related to syntactical aspects of ASL, and together represented 59.0% of the ASL occurrences at the beginning of the year. Of the syntax-related categories, adjectives occurred most frequently (65.2%), and then plurality and adverbs (8.7%), topicalization (4.4%), and conjunctions (4.4%) (Fig. 1). Additional syntactical structures included in "other" accounted for 17.4% of the ASL features. Rhetorical questions, while absent in pre-academic year samples, were identified at the end of the year (i.e., 4 instances in 2 samples).

3.3. Focus area 3: Description of categories' responsiveness to instruction

By comparing percentages of ASL categories over time, it is possible to describe ASL features as equally or differently responsive to instruction. Percentages were calculated based on the total number of ASL occurrences ($N = 86$) in student writing during the year. Over time, a similar declining trend (Fig. 2) was identified within both ASL syntax categories (total, pre: 26.7%, mid: 16.3%, and post: 12.8%) and unique glossing & substitution (pre: 18.6%, mid: 16.3%, and post: 9.3%). Both decreased by approximately 50% during one academic year of SIWI instruction, and thus were similarly responsive to instruction. In Table 4, the percentages of each syntactical structure at pre-, mid-, and post-academic year are additionally listed. Whereas four of the syntax categories (adjectives, conjunctions, plurality & adverbs, and other) follow the pattern of the larger syntax category, two syntactical features did not decrease over time. Topicalization slightly increased from pre (1.2%) to mid (7.0%) and then decreased at post (3.5%). As mentioned earlier, rhetorical questions were not indicated at pre or mid, but slightly increased to 4.6% at post.

Overall, categories of unique glossing and syntactical features seemed to respond similarly to instruction over one academic year. Occurrences in both categories were cut in half, even while text length grew considerably (i.e., number of t-units in writing doubled). An example of a pre- and post-academic year writing sample can be viewed in Appendix A.

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[2] There were three samples that contained more ASL features than usual (e.g., 5 or 8 features); however, these writing samples were also lengthy multi-paragraph pieces.

Table 3
Types of ASL features in writing.

Category	Definition	Example
Unique Glossing & Substitution (UG/S)	Insertion of signed utterance in text (typically one gloss).	**Touch** Florida **finish** ● unique glossing **"Touch finish"** is translated as **"visited"** in English Grew up together **since** 11 years ● substitution **"since"** is used in place of **"for"**
Plurality & Adverbs (IV)	Reduplication or emphasis to represent pluralization of nouns or temporal frequency of verbs.	**house house** all over ● plurality (many houses) and use of space **sit sit** long time ● verb inflected through temporal frequency (recurring/continuous)
Adjectives (ADJ)	Noun precedes descriptor. This is similar to topicalization but on word level (i.e., typically adjacent words).	She lives in a **house blue** **Colors many different** (Nover and Andrews, 1999) I grew up **age 1** then I feel better **Morning 1:00**
Topicalization (TC)	Broad ideas precede details on sentence level. This code is similar to adjectives (noun-descriptor). The difference is the overall idea in the sentence precedes details.	I want **kind car is Jeep Liberty** **Homework I detest**
Conjunctions (CONJ)	ASL gloss that joins or "glues" together two ideas. Non manual markers accompanying the conjunction are characterized as raised eyebrows, head tilt, with a pause before starting the second idea.	All can go **understand** only children. ● Translated as "but" in English, Common conjunctions are **"but", "understand", "happen", "wrong"** (Fischer and Lillo-Martin, 1990)
Rhetorical Questions (RH)	Not a true question. Statement includes a response.	I bought shoes **why** old shoes don't fit anymore **When I have flu? Last Thursday**

Table 4
Percentages of unique glossing & substitution and syntax at pre, mid, and post-academic year.

ASL features	Pre	Mid	Post
Total ($N = 86$)	45.3%	32.5%	22.1%
Unique Glossing & Substitution (UG/S)	18.6%	16.3%	9.3%
Syntax	26.7%	16.3%	12.8%
Adjectives (ADJ)	17.4%	8.1%	4.7%
Plurality & Adverbs (IV)	2.3%	0%	0%
Topicalization (TC)	1.2%	7.0%	3.5%
Conjunctions (CONJ)	1.2%	0%	0%
Rhetorical Questions (RH)	0%	0%	4.6%
Other	4.7%	1.2%	0%
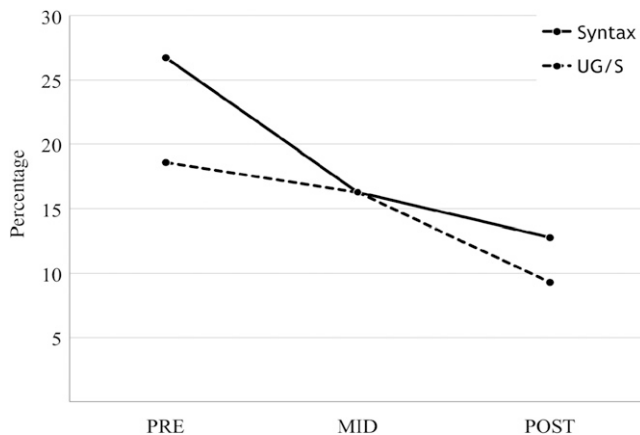
Figure 2. Percentages of ASL syntax and unique glossing & substitution (UG/S) at pre-, mid-, post-academic year.

4. Discussion

Through this study, we were able to identify and describe the various ways that students use ASL in their English writing. Nearly all occurrences of ASL transfer could be identified as unique glossing & substitution or one of five syntactical categories: plurality & adverbs, adjectives, topicalization, conjunctions and rhetorical questions. The categories of ASL features that were identified along with their descriptions, as provided in this paper, suggest that the writers in this sample could benefit from developing greater metalinguistic knowledge in specified areas and being exposed to more linguistic input. The students drew on their ASL linguistic knowledge when attempting to convey meaning in English, and this occurrence may be related to other populations who use their L1 more often when compensating for deficits in L2 understanding (Woodall, 2002). With greater linguistic input, the syntactic parameters should reset accordingly (Lillo-Martin, 1997). The kind of language analysis undertaken in this study may be helpful to educators of the d/hh who similarly witness instances of language transfer in their students' writing. Comparable to how we, as educators, analyze our students' independent writing to describe present levels of performance and set next objectives (Tindal and Hasbrouck, 1991), we can also engage in a process of examining the writing for the presence of ASL features. Once features are identified, we can begin to understand the nature of ASL transfer in the writing of our students, and respond with explicit instruction of ASL and English language forms or increased exposure to the forms in meaningful communication. Similarly, teacher training programs may find it purposeful to heighten their teacher trainees' awareness of grammatical knowledge of ASL and English, especially with those forms they are more likely to encounter.

Another focus of the current study was to describe the prevalence of various ASL features in d/hh adolescent writing. In the pre-academic year writing samples, language transfer was identified most frequently as unique glossing & substitution, more than any of the ASL syntactical categories (i.e., plurality & adverbs, adjectives, topicalization, conjunctions and rhetorical questions). Unique glossing & substitution was often the result of including ASL specific lexicon in English. The expressions are appropriate and acceptable in ASL but sound awkward and are sometimes

grammatically incorrect when utilized in the same way in English expressions. A few examples (with the unique word/s italicized) include "I was born *full* deaf", "Justin say that *invent*", "Later she got pregnant again and *borned* Hunter", "She fell *herself*". Because these occurrences happened at the word level, they were perhaps the least intrusive examples of language transfer in the students' writing, and the reader may not necessarily need to be a user of ASL to understand the expression. Other ASL features included in writing samples that were more syntactical in nature such as, "college I all day sit", may be considered more intrusive and difficult to understand without knowledge of the ASL grammar element, topicalization. With topicalization, the topic of an idea is conveyed prior to providing details, and therefore "college" is the topic whereas "I all day sit" is the description about this topic. ASL syntactical structures such as these could be perceived incorrectly as "poor grammar" rather than language transfer; yet, these occurrences were less prevalent in student writing. It should be additionally noted that the total number of ASL features occurring in writing was relatively low—an average of 1.3 per pre-academic year sample. With the majority happening at the word level rather than the phrasal level, it is unlikely that ASL transfer greatly inhibits the students' abilities to communicate meaning in English text.

The prevalence of various categories of ASL features in writing also indicate how some features happen regularly and others happen quite infrequently. This finding allows for explicit language instruction to be ordered from higher to lesser priority. For example, ADJ was the most frequent syntactical occurrence—happening more than three times the amount of each of the other syntactical features. Examples include "shoes Nike", "I was age 5 or 4", "break school" and "school middle". The teacher in this study made ADJ one focus of instruction and decreased the occurrences from 17.4% at the beginning of the year to 4.7% at the end of the year.

The teacher first provided explicit instruction on the use of adjectives in ASL and English and then proceeded to guided writing, whereby she engaged students in applying this knowledge when co-constructing authentic text together. She constructed visual scaffolds that helped students distinguish between ways of expressing adjectives in ASL and English. For example, she placed a list of example phrases (e.g., "blue car", "13 years old" on a corkboard along with manipulatives (e.g., a blue shape and a car picture) which could be moved to different sides of the board by the students when they were talking about ASL (e.g., "car blue") and English (e.g., "blue car"). The teacher prompted students to use the visual scaffold during guided writing until they became more independent in their understanding of how to express the concepts in each language.

The last focus of this study was to describe whether ASL categories were equally or differently responsive to instruction. Presented elsewhere (Wolbers et al., 2013), quantitative analyses of the data show that there was a statistically significant reduction of ASL features over time, but they were not eliminated from students' writing, and there was considerably less impact on ASL features during the second half of the year compared to the first. These findings raised questions as to whether some ASL grammatical features (i.e., lexical versus syntactical) were more immediately responsive to instruction than others. We find that over one year of SIWI, both categories of unique glossing & substitution and ASL syntax decreased in the writings of d/hh adolescents by approximately 50%. It seems that ASL features, both at the word and phrase/sentence level, responded to instruction similarly. It may be suggested that with more instructional time and greater proficiency in ASL and English, students will likely show success with eliminating all categories of ASL transfer that present themselves as English errors.

While the substantial decline in the amount of occurrences in both of these categories would suggest that d/hh students

had increased their metalinguistic awareness and implicit English competence during the year, ASL features were not fully eliminated from their writing. This is likely a reflection of students' levels of ASL and English proficiencies and the need for additional linguistic input and development. We also suggest that had the teacher been aware of all the various types of ASL features identified in her students' writing at the beginning of the year, she may have been able to provide even more purposeful and explicit language instruction in the specified areas.

There were two ASL features that did rise slightly in students' writing over time—topicalization (i.e., pre 1.2%, mid 7%, and post 3.5%) and rhetorical questions (i.e., pre 0%, mid 0%, and post 4.6%). The percentages were very small compared to the other ASL categories, but did show a different pattern over time. This may have happened as a result of students writing more text and including more complex language (c.f., Wolbers et al., 2012) at the end of the year compared to the beginning. Rhetorical questions, in particular, are a way of adding more adverbial or adjectival phrases (e.g., *when* I have flu last Thursday; *when* I arrive at home what I do? I did play a game) or a way of conjoining clauses (I bought shoes *why* old shoes don't fit anymore). Students rely on their ASL linguistic knowledge until they have the tools in English to relay such complex constructions.

Another explanation for the unexpected but small rise in these ASL features could be related to students' growing use of expressive ASL (c.f., Dostal and Wolbers, 2014) and the sequence of ASL features acquired, which could likely have an impact on how much students expressed in their writing and in what way. Total word count more than doubled from pre- to post-writing samples for typically low-achieving students (c.f., Wolbers et al., 2012), and thus we were likely to see a greater occurrence of ASL features in the pieces of text written by these students. The majority of instances of topicalization (e.g., "Pug I love pet".) came from students who struggled to convey their ideas clearly through expressive language. The teacher explained that in class she would often try to clarify confused written expressions by guiding the students to order who/what first and then what happened. She remarked that she saw growth in their ability to use topic-comment ASL structure in their language by the end of the year but were still confused about how that translated to English. It could then be the case that students became more aware of the ASL features as a result of metalinguistic knowledge building in class, and perhaps as a result of their growing expressive ASL.

4.1. Limitations & future directions

In the current research, we reviewed the writings of 29 d/hh adolescents to determine the types of ASL features that exist in their writing. We were able to identify six different ways that students use ASL in their writing of English. While we did provide an initial description and discussion of this phenomenon that occurs among d/hh students, we do not claim the findings to be fully comprehensive of all possible ASL features in writing. Subsequent studies might draw from a larger group of d/hh students as well as incorporate ASL proficiency assessment data (see Singleton et al., 2004; van Beijsterveldt and van Hell, 2012). When using a homogeneous sample of proficient ASL users, it may be feasible to include dropped English in the analyses to further illustrate how writers apply ASL linguistic knowledge to writing. Subsequently, an analysis of language from a homogeneous sample of language delayed d/hh students who have not been exposed to ASL (and therefore would not have ASL linguistic knowledge to draw on) may result in an ability to more clearly distinguish language errors associated with accessing Universal Grammar from those of language transfer (c.f. Berent, 2009).

Lastly, it should be emphasized that the aim of the current paper was to identify and provide the prevalence of ASL features in English writing, and to describe whether features are equally or differently responsive to instruction. We do not provide a comparison group for the last analysis and acknowledge that trends in the prevalence of features over time may have been affected by other variables in addition to instruction. Future studies might compare the writings of students from classroom environments where there is not explicit instruction of ASL and English (control group) with the writings of students from environments where code-switching is used purposefully by the teacher as an instructional strategy (Andrews and Rusher, 2010) to guide students in translation and moving between ASL and English (experimental group).

Appendix. Pre- and post-academic year writing samples by T-unit

Student 1 (pre-academic year writing sample):

(1) T My friend and **I wert to Called Timeout**. *[ASL feature—UG/S]*
(2) T Then I wert to My friend and Went to My friend's house.
(3) T And last I Wert back House last friday.

Student 1 (post-academic year writing sample):
Title: Zach and about Myself.

(1) T I went to Zack's house.
(2) T I have fun at Zack's house.
(3) T Zack and I laugh about Family Guy that said "It butter Jelly Time".
(4) T I was act like It Peaunt butter Jelly Time.
(5) T I was eat Pizza rolls and, corn, and cornberad.
(6) T Then after dinner I help to clean up in kicthen.
(7) T Trew and I went Trew's house before in 2008.
(8) T I was laugh.
(9) T I was sad right now, Because every body hate me
(10) Tall teacher not love and caring of me
(11) T I not any friend
(12) T I was along Because all teacher and stundets hate me.
(13) T I not my mom and grandma long time about 3 years.
(14) T Everyone hate me
(15) T I have 0 friends.

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