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Using Online Grammar Lessons for Student Fluency in American Sign Language

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Thesis Submitted in Partial Fulfillment of the Requirements for the
Degree of Master of Arts in Education

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Using Online Grammar Lessons for Student Fluency in American Sign Language

Darby Campbell

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Abstract

American Sign Language (ASL) is offered as a foreign language at many universities across the United States. Most research on ASL acquisition focuses on Deaf and Hard of Hearing (DHH) children and first language (L1) acquisition. In this quantitative experimental study, a sample of undergraduate hearing students in intermediate ASL classes were given ASL grammar lessons that accompanied traditional language lessons. It was hypothesized that ASL students exposed to explicit written grammar lessons would show an increase in fluency. Participants were given a pre-test and post-test consisting of 20 English sentences and were asked to translate them into written ASL gloss. The treatment group was given one explicit ASL grammar lesson a week for a period of five weeks. Independent t-tests were run on the post-test results and no statistical differences occurred between the treatment and control groups. However, the treatment group improved at twice the rate of the control group which leads to a partial acceptance of the hypothesis. These results reinforce the need for further research on hearing ASL students given explicit ASL grammar instruction in language-only programs. These data will serve as a preliminary foundation for further research in the field of ASL acquisition in hearing students.

Keywords: American Sign Language (ASL), grammar, glossing, acquisition

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Using Online Grammar Lessons for Student Fluency in American Sign Language

Literature Review

Second language (L2) acquisition has a long history of research and from it can be drawn several conclusions: L2 acquisition can be related to fluency in the first language (L1), age of acquisition can impact fluency potential, principles of language processing can impact age of acquisition, and teaching methodologies can impact student acquisition (Cziko, 2004; Filipovic & Hawkins 2013; Juffs, 2011). It has been found that although learners develop language acquisition following similar patterns, learning and acquisition are not always impacted by teaching (Klapper & Rees, 2003). This is because the instruction of a foreign language in a classroom setting comes with several limitations (Cziko, 2004). These limiting factors include the psychological states of students, pedagogical approaches, the physical environment of the classroom, and the process of generalizing findings in language acquisition and applying them to visual languages (Cziko, 2004; Filipovic & Hawkins, 2013; Rosen, 2014). These limitations challenge American Sign Language (ASL) teachers to use current pedagogical approaches and the classroom environment to their advantage any way they can. This can include moving classroom furniture, providing more visual stimuli, and encouraging more physical activity in the classroom. These approaches may be effective but there are still limitations in the ASL classroom.

ASL class lectures, predominantly conducted in ASL, are limited in their ability to give students full immersion, exposure, and a wide variety of topics in which students can use the language (Buisson, 2007). This is compounded by both native and non-native language users teaching ASL classes using curriculum from a wide variety of pedagogical theories without formal instruction regarding pedagogical approaches for ASL or its grammar. Instruction of

formal ASL grammar is imperative to hearing L2 learners because of the high variability in sign

production (Hilger, Loucks, Quinto-Pozos, & Dye, 2015). This variability can be attributed to

many factors. Some of these factors include: regional dialects, educational history of the

instructor, and the instructor's frequency of interaction with the Deaf community among others.

Due to the variability in sign production, is it even more important to teach students formal ASL

grammar in language classes (Lucas, Bayley, & Valli, 2001). ASL has become widely popular

in secondary and post-secondary education as a foreign language option. However, it is rare for

students to receive formal education of grammar in language classes. This could be due to the

variety of writing systems for signed languages or the intent to teach grammar via in-class

immersion. Formal grammar lessons are important for students to reach full fluency which is

why ASL grammar lessons should be included in ASL language classes (Buisson, 2007).

ASL as a Foreign Language

ASL has been used for longer than its documented history with its origins beginning in

1750's France (Stokoe, 2005). ASL's recognition as a language in the late twentieth century

transitioned into language classes due to the Americans with Disabilities Act (Miller, 2008).

Since then, the popularity of ASL classes has increased (Quinto-Pozos, 2011). As of 2006, over

40 states recognize ASL as a foreign language and offer classes for credit at both the high school

and college levels (Miller, 2008). Because ASL is becoming an ever more popular foreign

language option, it is imperative that students are instructed in the formal grammar in an attempt

to preserve the language.

The pedagogical approaches toward the teaching of introductory ASL fall into two main

categories (a) the focus on conversational use of the language; and, (b) the integration of both the

vocabulary and explicit grammar lessons (Buisson, 2007; Miller, 2008; Rosen, 2010). The

importance of explicit grammar lessons is apparent in any language; however, it is most

beneficial for intermediate students due to their previous language exposure. To teach explicit

grammar lessons with the goal of student comprehension and application, a basic understanding

of the language is mandatory because without it students often rely on dictionaries in order to

sequence ASL signs in English order (Quinto-Pozos, 2011); without a basic understanding,

students would be unable to apply the theoretical concepts they learn from grammatical structure

to their use of the language.

      The grammatical structure of foreign languages is integrated into the curriculum, but

whether it is taught implicitly or explicitly is the decision of the department, individual

instructor, or institution. For ASL, this approach is related to the theoretical perspectives present

in the curriculum (Rosen, 2010). According to Rosen (2010), the current ASL curricula are

reflective of three different perspectives: behavioral, linguistic, and communicative. Behavioral

curriculum emphasizes imitation and recitation of vocabulary and linguistic curriculum focuses

on the linguistic rules for conversation. Communicative curriculum, however, focuses on the

ability of students to have conversations in ASL through vocabulary instruction and teacher

demonstration of language use. However, the variance of language use per individual instructor

is a potential hindrance in grammatical acquisition of ASL because of regional variations in

signs, the educational history of the instructor, and whether ASL is their first or second language

(Lucas, et al., 2001). The variations in ASL use and instructional curricula are why it is

important to give formal explicit ASL grammar lessons in language classes in order to maintain

the integrity of the language (Stokoe, 1980). This formal grammar instruction is imperative

especially for hearing learners of ASL due to the potential for L1 interference. It has been

documented that the learner's L1 fluency level can impact L2 acquisition, but it was also found

that the L1 could interfere with L2 acquisition (Filipovic & Hawkins, 2013). L1 impact on L2

can influence reading, writing, and speaking the language, but an L1's interference on L2

changes the way the syntax of the language is used.

L1 interference can occur due to the student's desire to communicate in the target

language with limited vocabulary (Filipovic & Hawkins, 2013). During the introductory level of

ASL, students are exposed to the manual alphabet and basic signs for communication. They do

not acquire vocabulary in a wide enough variety of topics for formal grammar lessons to be

effective. Language instruction generally occurs in the grammar of the target language but is not

accompanied by formal grammar lessons due to the information being too complex for

introductory learners. If grammar lessons are not given until the advanced levels of language

classes, then students are more likely to experience L1 interference, thus becoming less effective

(Filipovic & Hawkins, 2013). This is why intermediate ASL students are the ideal population

for formal ASL grammar lessons.

ASL grammar. Signed languages are as varied as the countries from which their users

live and so are the methods for documenting them in a written form (Hopkins, 2008). ASL is

classified as one of the hardest languages to learn due to linguistic complexity; similarly, many

students are shocked to find that the signed language has little-to-nothing in common with the

dominant spoken language (DSL; Hopkins, 2008). The visual nature of ASL is also a challenge

related to teaching formal grammar. Due to the visual nature of signed languages and the

community that uses them, there has been no writing system that has been generally accepted by

native language users (Hopkins, 2008). However, there is a long history of researchers and

educators using written systems to document signed languages.

Due to the difficult nature of the acquisition of ASL, it is key that the formal structure of the language be taught to students in tandem with vocabulary (Miller, 2008). Many students do not realize the difficulties involved with acquisition of ASL because many language-only programs place the emphasis on learning vocabulary and expressing concepts in English order with the aid of both online and physical dictionaries and language workbooks (Quinto-Pozos, 2011). Although supplemental ASL dictionaries are beneficial for students who have difficulties remembering the vocabulary that is taught or are curious to acquire more vocabulary, many of these dictionaries do not provide conceptually correct equivalents. It is almost impossible to develop a true culturally and conceptually appropriate dictionary because alphabetical sequencing of ASL signs is a near impossible feat (Fajardo, Vigo, & Salmeron, 2009). This is also impacted by the variation of ASL lexicon by city, state, or continental region which also impacts the ability for the language to be written in a standardized way.

Written ASL Systems

Although there is no standard writing system for ASL, several writing systems have been developed primarily by researchers in order to study the language. These writing systems are generally categorized as either adapted systems or influenced creation systems (Hopkins, 2008). Adapted systems typically use alphabetic systems to show movements and visual features whereas influenced creation systems use graphics or iconic markers. The first of these written systems was presented by Stokoe (2005) who described signs by their location in relationship to the signer's body, the handshapes of the signs, and whether or not the signs make physical contact with the body. Each category had corresponding symbols relating to the various locations of the body, shape of the hands, and movements made during sign pronunciation (Hopkins, 2008; Stokoe, 2005; Valli, Lucas, Mulrooney, & Villanueva, 2011). The most

common approach used for writing ASL, commonly referred to as glossing, is taken from the

DSL and attempts a translation into ASL structure using English words to represent the concepts

expressed by ASL signs (Hopkins, 2008). Other approaches include line drawings (i.e., drawn

pictures of a person signing) and transcription systems such as signwriting. Line drawing

approaches are more common in educational textbooks for the purposes of teaching vocabulary,

but for the purposes of research and analysis it is more common to see glossing used (Hopkins,

2008).

        ASL grammar/glossing instruction. ASL grammar is generally taught informally

within ASL classes through language exposure; whereas glossing is formally taught in ASL

linguistics classes that are offered separate from language classes. Glossing utilizes English

words used to represent ASL signs, (i.e., tag-words), written completely in capital letters with

facial expressions written above. Understanding that this is not a standardized format, it is

commonly accepted and documented in the leading ASL linguistics text, *Linguistics of American*

Sign Language (Valli et al., 2011). This text focuses on the relationship between morphology

and phonology in English, and phonetic and morphemic structures in ASL (Valli et al., 2011).

Thus, the use of the non-standardized approach of glossing to teach more complex features of

ASL structure is most effective. Although glossing is commonly used amongst ASL researchers

and educators, there are some issues with its use.

        The first issue is that there is no word-for-word translation between ASL and American

English (Hopkins, 2008). Secondly, the more complex the written system or notation system is

then the higher the likelihood of it being too difficult for students to grasp, thus decreasing the

chance of L2 syntactic structure transfer (Filipovic & Hawkins, 2013). Although it is not heavily

depended on in most language classes, the presence of written gloss is important for hearing

students to learn as it is likely to have a direct impact on language fluency and comprehension
(Buisson, 2007).

Hearing students who grew up using a spoken language who then go on to learn a signed
language are a unique group of second language learners. This is because they need to learn a
new way to express language (Hilger et al., 2015). These L2 students are accustomed to orally
articulating language then change to a manual articulation system. This transition from
oral/aural language to manual language can cause frustration in students, especially when their
exposure is limited to vocabulary and basic conversational language without explanation of the
variance of grammar between their native language and the target language (Hilger et al., 2015).

There is a lack of research surrounding foreign language acquisition in adult language
learners of ASL, despite ASL becoming a foreign language in high demand (Miller, 2008;
Quinto-Pozos, 2011; Rosen, 2014). Due to many limitations in research, specifically the lack of
empirical research, the understanding of ASL L2 acquisition is extremely narrow (Filipovic &
Hawkins, 2013). However, in an attempt to increase research in this area, Rosen, Turtletaub,
Delouise and Drake (2015) suggest that ASL teachers become ASL researchers. Specifically,
they theorize that this will make findings much more generalizable to the target population and
will help teachers effectively relate research to real life practice.

Purpose

The ultimate goal of foreign language education is student fluency and that comes with
an understanding of grammar (Prinz & Strong, 1998). Although ASL grammar is taught
implicitly in most language classes, it is imperative for student fluency that grammar be taught
explicitly. This is because ASL students often rely on signed dictionaries for vocabulary recall
which leads to students signing ASL signs in English word order. The L1 interference of

English in adult learners of ASL can be minimized through explicit instruction of ASL grammar using the written method of glossing as defined by Hopkins (2008). Using a written method of instruction for ASL grammar allows hearing learners continued exposure to the DSL and educates them about the grammatical structure of ASL thus limiting L1 interference. Previous research has focused on students in introductory level classes but their lack of knowledge in ASL does not make them the prime population for ASL grammar instruction. If explicit grammar instruction were to occur in the advanced level courses, then the students would have more L1 interference. Therefore, the intermediate level students are the prime population as they have some working knowledge of ASL and limited L1 interference.

Methods

Research Question

Does the teaching of written ASL grammar via glossing help hearing university students in the intermediate level of language courses improve their signed ASL structure when taught concurrently with vocabulary?

Hypothesis

Based on Buisson's (2007) research, I hypothesize that intermediate ASL students who receive both written ASL grammar lessons via glossing and signed vocabulary lessons will improve their understanding of ASL structure and will thus improve their ability to produce fluent ASL.

Research Design

The study was a five-week experimental quantitative study with a nonequivalent group pre-test-post-test design. There was one control group ($n = 22$) and one treatment group ($n = 15$) who had similar demographics and were also representative of the university's population. The

study involved one independent variable and two conditions – the treatment group and the

control group. The study focused on the acquisition of ASL grammar through online glossing

lessons and its effect on student comprehension of ASL structure. Participants were given the

instructions in written English because the acquisition of an L2 is shown to be linked to fluency

in the L1 (Buisson, 2007; Prinz & Strong, 1998; Rosen, 2014).

Independent variable. The independent variable for this study was online grammar and

glossing lessons. These lessons were provided through an online classroom portal to the

treatment group in written English once a week for six weeks. Lessons were given solely

through the online portal to replicate Buisson's (2007) study but with intermediate students and

lessons given during class time.

Dependent variable. The dependent variable was the students' signed use of ASL

structure based on the work of Buisson (2007) and his findings that students' use of ASL

improved after grammar and glossing lessons. Students had a pre-test and post-test that

evaluated their ability to use ASL structure without prior lessons. The pre-test and post-test

asked students to translate a list of 20 sentences developed by the school's ASL department that

reflect the information students learned in the introductory level of ASL accompanied by a

recorded video of participants signing the sentence translations.

Setting & Participants

This research was conducted at a California State University (CSU) in an intermediate

level ASL class. According to the CSU Office of the Chancellor's website (TCSU; 2017), this

university houses over 7,600 students, 33% of which are from the neighboring counties, and

serves primarily underserved and low-income student populations. Over half of the student

population is first-generation college students and over 70% are receiving financial aid.

According to TCSU's website, the student population is primarily between the ages of 18-24

(83%), female (63%), and comprised of students from over 20 states and international transfer

students. The groups included in this study were selected at random. During the term, there

were four intermediate sections being offered; two instructors were assigned two sections each

randomly by the Department Chair. The two groups assigned to the researcher were then

randomly designated as the treatment group and control group respectively. The participants

were selected using a convenience sample of the courses the researcher was assigned to teach. It

was decided through random selection that the section with the lower section number would be

the treatment group and the larger section number would be the control group.

Treatment group. This section of the intermediate level course was taught by the

researcher two days a week in the early afternoon for an hour and fifty minutes each session.

The sample size was 15 with two participants having taken this course previously and failed to

complete it with a passing grade. The registered participants in this section totaled 21, but two

did not complete the pre-test and four did not complete the post-test and were thus excluded from

the analysis. The students that repeated the course were included in the results as their previous

instruction involved no formal grammar or glossing lessons. For demographic information, see

Table 1, Table 2, and Table 3.

Control group. This section of the intermediate level course was taught by the

researcher two days a week in the late afternoon for an hour and fifty minutes each session. The

sample size was 22. There was one student who was retaking this course; however, they were

included in the study as their previous instruction involved no formal grammar or glossing

lessons. The size of the group registered for this section was 35, but 10 participants did not

complete the pre-test and three did not complete the post-test and were thus excluded from the

results. For demographic information see Table 1, Table 2, and Table 3.

Table 1

Demographics of Participants

	Treatment	Control
Caucasian/White	35%	47%
Hispanic/Latino	25%	20.60%
African/African Amer.	20%	14.70%
Asian/Pacific Islander	10%	5.88%
Mixed/Biracial	10%	5.88%
Native American	0%	5.88%

Note. Amer. = American

Table 2

Gender of Participants

	Treatment	Control
Female	55%	61.70%
Male	45%	35.30%
Gender Fluid	0%	3%

Table 3

Grade Level of Participants

	Treatment	Control
5th Year Senior	15%	13%
Senior	0%	13%
Junior	40%	5%
Sophomore	45%	32%
Freshman	0%	0%

Measures

The measures were a pre-test (see Appendix A) and post-test (see Appendix B) developed by external reviewers who are proficient in ASL and the grammatical rules of the language. It consisted of 20 sentences of varying lengths and types, written translations created by the participants, and a signed video of participants signing the translated sentences. Both the control and treatment groups were given this pre-test in class during the third week of the term. This gave students an opportunity to readjust to seeing and using ASL after a break between semesters. The content in the pre-test sentences included various concepts learned in the introductory level of ASL and concepts taught in the first three weeks of class (e.g., introductions, basic questions, discussions about family, and variations of the English word 'Have'). The post-test sentences included concepts learned during the intermediate level (e.g., classifiers; describing people, clothing, and textures, and features of a neighborhood).

Utilizing Buisson's (2007) research, the treatment group was given weekly lessons that were hosted on the campus's online classroom portal. These lessons were in written English, scaffolded weekly, and concluded with a formative multiple choice assessment consisting of five to ten questions with immediate feedback as it has been found that immediate feedback is more beneficial for student comprehension (El Saadawi et al., 2010). Each week, students had the opportunity to apply the structure lessons they learned by translating English to ASL grammar in gloss. During the sixth week, both the treatment and control groups were given a post-test consisting of 20 English sentences developed by the university's ASL instructors reflecting the information the participants learned during the term. Participants also created a video of themselves signing these sentences along with a submission of their written gloss. The videos

were evaluated by the university's ASL instructors to ensure accuracy in comparison to the submitted written gloss.

Validity. According to Buisson's (2007) experiment, online glossing lessons improved student knowledge and fluent use of ASL. In order to ensure internal validity, the questions of the written portion were evaluated by several deaf and hearing instructors who are knowledgeable about ASL glossing and grammar. The ASL department at the university, including the researcher, reviewed the signed portion of the post-test in order to ensure its relatedness to the developed structure lessons. External reliability will be strengthened if the treatment group shows improvements when compared to the control group. As the students received lessons from the most commonly used language and linguistic texts, if clear differences were present, then it can be said that intermediate students benefit from both formal language classes and formal structure lessons.

Reliability. Buisson's (2007) research was used as the structural foundation for online grammar and glossing lessons. The content of the weekly lessons was taken from Valli and colleagues' (2011) linguistic categories and rules. The structure and grading of the pre-test, post-test, and weekly assignments was developed by the school's ASL department. Two of the researcher's colleagues evaluated the assignments before they were given to the group and were also given access to the online classroom portals to ensure that the treatment group was given the intervention and the control group did not.

Intervention

The intervention occurred over five-weeks; the pre-test and introductory lesson were given the first week, followed by one lesson given weekly for the next four weeks, and the post-test occurring the following week. The intervention consisted of online grammar and translation

lessons focusing on ASL grammar categories as outlined by Valli and colleagues (2011) and

glossing as defined by Hopkins (2008). Each week the lessons focused on a different aspect of

ASL grammar and how to appropriately gloss it. There were five lessons in total including an

introductory lesson about parts of speech in English and their ASL equivalents. The intervention

was implemented during the last hour of the last class session each week. The decision to utilize

an online format for glossing lessons came from Buisson's (2007) research on online glossing

lessons.

Procedures

Using the work of Buisson (2007) as a guide, both groups had a pre-test, the treatment

group had five weeks of intervention, and then both groups had a post-test. The length of time

for the intervention was chosen based on Buisson's (2007) work and the structure of the term in

which the research occurred. During the intervention weeks, the treatment group received

structure lessons while the control group did not. These lessons were hosted on the school's

online classroom portal to ensure accessibility. Participants completed these weekly assignments

in the school's language lab during the last weekly class session. The ASL language lab at the

university has twenty-five desks; there were 21 registered students in the treatment group and 34

in the control group. Thus, some control group students needed to complete the assignment

during class time but not at a desktop computer. Instructions for the intervention were given via

written English text at the beginning of each lesson. Data from the pre-test and post-test was

used to determine internal validity.

Fidelity. In order to maintain fidelity, two of the researcher's colleagues had complete

access to the online classroom portals of both the control and treatment groups to ensure that the

treatment group was receiving the treatment and the control group was not. They also had access

to the pre-test, weekly assignments, and post-test via the online portals to ensure that nothing

was changed or manually overridden in the online grade book. They also were the external

reviewers for the measure, the implementation of it, and how it was graded. Thus, the study has

100% fidelity to the intervention.

Ethical Considerations

For this study beneficence was high as the benefits of participating – the potential for

higher fluency in ASL – far outweighed the risks (McMillan, 2016). Participants in this research

were not aware that they were participating in a study as that could have impacted the likelihood

of their participation and increased the chance of skewed results. The names of the participants

remained confidential and their student identification numbers were used as identifiers instead.

Many students were taking a minimum of nine units, thus no time outside of the structured class

time was required for participation. As the research was conducted at the beginning of the

semester, there was a likelihood that motivation to attend class and complete the activities was

low and absences high. This also increased the likelihood for students to utilize the tutoring

services offered through the campus. In order to prevent the potential for skewed data from

students attending tutoring, the tutors were explicitly told to not help the treatment group

participants with the intervention lessons. They were told that the treatment group was being

given extra practice with ASL structure and were being encouraged to do the work on their own,

specifically in class. Even though most participants lived on campus, there was a group of

participants who needed to drive to campus. There was a likelihood that unforeseen

circumstances may prevent commuter students from coming to campus to physically participate.

For those students who were unable to physically attend the course during intervention days, the

lessons were available through their online classroom portal for completion during the four days

following the last class session of the week. If they missed the pre-test or post-test, then they

were excluded from the final data.

      Validity threats. There are two intermediate courses that served as the treatment and

control groups. Students in these classes are usually friends with one another increasing the

likelihood that the control group could have realized they were not provided with an ongoing

assignment. If this had occurred, then the control group would have been told that the treatment

group needed to improve their signing structure and were being provided with these assignments.

This interaction may have decreased the likelihood of lesson completion by participants in the

treatment group and thus skewed the results of the post-test. Also, researcher bias may have

influenced the amount of time in class that was spent discussing ASL structure and rules as ASL

linguistics is one of the researchers' passions. In order to circumvent this, the researcher

provided an online forum in both the treatment and control groups' online classroom portals so

that all participants could voice their questions outside of class time.

Data Analysis

      All data were entered into the Statistical Package for the Social Sciences® (SPSS®) for

Windows, version 24.0.0 (SPSS, 2016). No names or identifying information was included in

the data analysis. Before analyses were conducted all data were cleaned to ensure no outliers

were present (Dimitrov, 2012). After cleaning the data, the final sample size was 15 participants

for the treatment group and 22 participants for the control group. Independent (control and

treatment groups) and paired (pre-test and post-test) sample t-tests were conducted to determine

the significant difference in scores on the department developed glossing evaluation. Further,

before interpreting the analytical output, Levene's Homogeneity of Variance was examined to

see if the assumption of equivalence had been violated (Levene, 1960). If Levene's

Homogeneity of Variance was not violated (i.e., the variances were equal across groups), data will be interpreted for the assumption of equivalence; however, if the variances were not equal across groups the corrected output will be used for interpretation.

Results

Two independent samples t-tests were conducted on the whole sample (n = 39) for both the pre and post assessment scores. Results for the pre-test were: Levene's Homogeneity of Variance was not violated (p > .05), meaning the variance between groups was not statistically different and no correction was needed, and the t-test showed non-significant differences between the mean scores on the pre-tests between the two groups $t(37)$ = -.47, p > .05. This means that the treatment and control groups were statistically similar on the pre-test establishing a valid foundation for the intervention to begin (see Table 4). Results for the post-test were: Levene's Homogeneity of Variance was not violated (p > .05), meaning the variance between groups was not statistically different and no correction was needed and the t-test showed non-significant differences between the mean scores on the post-tests between the two groups $t(37)$ = -1.14, p > .05. Therefore, the scores on the post-test were not significantly different between the two groups. Although no significant differences were seen across the two groups, the negative t value demonstrates that both groups had higher mean scores after several weeks of instruction (see Table 4).

Table 4

Results of Independent Samples T-Tests

	Mean	SD
Pre-Test		
Treatment	15.56	3.26
Control	14.98	4.12
Post-Test		
Treatment	18.00	2.84
Control	17.15	1.78

Note. SD = Standard Deviation

After determining the differences between pre and post assessment scores between two groups, two paired t-tests were run for both groups (i.e., treatment and control) to determine if participants mean scores from pre to post were significantly different within each group (see Table 5). Results for each group were as follows: treatment group, $t(15) = -4.94, p < .001$; control group, $t(22) = -2.56, p < .01$. Thus, both groups had statistically significant differences in scores from pre to post-test. Additionally, the negative t-value for both the treatment and control groups indicates an increase in scores from pre to post assessment. Although both groups increased their mean scores from pre to post, the treatment group did score .85 points higher on average than the control group; however, this difference was not statistically significant. Further, both groups had standard deviations that decreased from pre-test to post-test, meaning that both groups scores were closer to the mean on the post-test. By decreasing the standard deviation from pre to post, both groups had less variance between scores and therefore scores on the assessments were clustered closer together around the mean; thus, both groups performed more consistently on the post-test.

Based on these results, the hypothesis that intermediate ASL students who receive both written ASL grammar lessons via glossing and signed vocabulary lessons would improve their

understanding of ASL structure and thus improve their ability to produce fluent ASL was

partially upheld. The treatment group showed improvement from pre-test to post-test but not

statistically significant growth and therefore the researcher was unable to fully accept the

hypothesis. Future studies should seek to replicate this study using a larger sample in an attempt

to find statistically significant results.

Table 5

Results of Paired T-Tests

	Mean	SD
Treatment Group		
Pre	15.56	3.26
Post	18.00	2.84
Control Group		
Pre	14.98	4.12
Post	17.15	1.80

Note. SD = Standard Deviation

Discussion

The purpose of this study was to determine whether student understanding of ASL

grammar and language fluency was greater in hearing intermediate ASL students who received

explicit ASL grammar instruction coupled with traditional language instruction than for students

who only received traditional language instruction. This study included 15 students who

received explicit grammar lessons with traditional language instruction and 22 who received only

traditional language instruction over a number of weeks. Based on previous studies (e.g.,

Buisson, 2007) the hypothesis was that glossing lessons would improve participant

understanding of ASL structure and increase student fluency when paired with traditional

vocabulary lessons.

One difference from Buisson's (2007) study was the instant feedback provided to the treatment group during their grammar lessons. Participants were given direct and immediate feedback at the end of the lessons that explained why the answer was correct, partially correct, or incorrect. This immediate feedback helped participants understand how parts of ASL grammar functioned in various instances. There were participants in the control group who seemed to struggle with some of the concepts that were taught in the lessons and who may have benefitted from explicit grammar lessons with immediate feedback. Participants in the treatment group were able to apply the feedback from the grammar lessons to their signed production of ASL almost immediately, but participants in the control group had to wait until their assignments were graded by the instructor. Students who receive immediate feedback on assessments increase their comprehension of the material and can begin to apply feedback sooner than those who are given delayed feedback (El Saadawi et al., 2010).

Results indicated that the pairing of explicit ASL grammar instruction with traditional lessons made a difference on participants' scores on the post-test. The results of the post-test for both groups showed the participants improved, but the results of the treatment group showed greater improvement. Although both groups were given full class periods to move through the lessons, the treatment group was given a full hour during the last class of the week to work on a language lesson and a grammatical lesson that related to the activity. This exposure allowed the participants an opportunity to understand why certain aspects of ASL occured rather than just learning what aspects were present (see Buisson, 2007).

The hypothesis was partially accepted due to the statistical similarities between the treatment and control groups after the completion of the post-test. It was hypothesized that the treatment group would show improvement when compared to the control group after receiving

explicit grammar instructions that accompanied language instruction. The treatment group made

marked improvements as a whole which showed the intervention was helping to some degree,

however, several participants in the control group improved drastically which created similarities

in the post-test paired *t*-test data. These results are similar to what Buisson (2007) found in his

study of pre-service deaf education students. This study is the first to use hearing, intermediate

level ASL students in a language-only program as a sample for glossing and grammar education

and will add to the literature regarding ASL L2 acquisition in hearing students, the benefits of

ASL grammar instruction, and the use of glossing as an educational tool. Although the sample

showed improvement, there were limitations to this study.

Limitations & Directions for Future Research

One limitation of this study was having a small sample size ($n = 37$). Future studies on

this topic should have a larger sample size and be conducted at schools with and without Deaf

Studies majors. Using a larger population would increase external validity and strengthen the

literature regarding ASL L2 acquisition. A population at a school with a language-only program

would assess the effectiveness of written grammar lessons on participants who are not aimed

toward fluency for post-graduate employment. Studies done at schools with Deaf Studies majors

will be able to assess the effectiveness of introducing explicit grammar in students with a higher

likelihood of using ASL in a professional manner. By utilizing this population, researchers could

establish a more explicit connection between the need for explicit grammar instruction in all

ASL language classes. Another limitation of this study was the inability to consistently

implement the intervention. The lessons were provided through the online classroom portal and

were accessible both on and off campus, however, there was no way to increase student

completion of the weekly lessons. If the lessons were all completed by all participants, the

results may show greater differences between the treatment and control groups.

One recommendation for future studies is to have a larger sample size. While there was

statistically recognizable improvement in the treatment group from pre to post assessment, the

size of the sample is too small to see statistically significant differences when the groups are

compared. Another recommendation for future studies is to conduct similar research at colleges

and universities with Deaf Studies majors. The motivation of students in ASL classes at a

college or university with a Deaf Studies major may be higher with larger sample sizes. The

situation for this study was not ideal as treatment group participants were provided with the

grammar lessons via an online platform which increased their chances of neglecting to complete

it during class time in favor of completing it at home. This increased the probability of the

grammar lesson not being completed at all.

Although ASL has become a popular option for foreign language instruction, it is

important for ASL teachers to explicitly teach the grammar of the language to hearing learners in

language classes. This instruction will increase student understanding and production of ASL

and may produce more fluent ASL signers. The goal of language education is understanding and

production of the language and with this comes comprehension of grammar (Buisson, 2007;

Prinz & Strong, 1998; Quinto-Pozos, 2011). If grammar is not explicitly taught in ASL classes,

especially in schools without Deaf Studies majors where linguistics classes are not offered, then

true fluency and acquisition is less likely to occur. Since the overall goal of second language

acquisition is to have learner becomes fully immersed and fluent in the language; the inclusion of

ASL grammar into classrooms for all students would provide the opportunities for students to

become stronger ASL signers.

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Appendix A

7.5 & 7.6 Lab Assignment – Translations with Spatial Verbs

Directions: Below you will find twenty (20) English sentences using the five forms of "Have" (7.5) and spatial verbs (7.6) learned in class. You should read each sentence carefully to identify what aspects of the units are present in the sentences. Then, translate them into your best ASL structure on this paper (including facial expressions if possible). If there are any signs you do not know, ask for them from me. Once you've translated all of the sentences, create a video of yourself signing the sentences how you translated them. The video should be posted to YouTube and the link submitted to iLearn. This is due by the end of class today.

1. I don't have a phone.
2. I haven't cleaned my car yet.
3. I picked up my sister from work and took her to school.
4. I drove to the library yesterday.
5. After I had lunch I went to the store.
6. She took her mom home.
7. He hasn't eaten yet.
8. I have a lot of shoes but no socks.
9. I drove to my dorm after work.
10. I haven't gotten your email.
11. I have 3 sisters and 4 brothers. I am the youngest.
12. Have you finished your homework?
13. When I am done with school, I go to work, then drive home.
14. Please remember to bring your book to class tomorrow.
15. She picked me up and then took me to San Francisco.
16. Jason has to bring his dog to the vet.
17. Susie took Michael's jacket.
18. I have to go to my teacher's office hours.
19. I haven't talked to my mom today.
20. Do you have to go to work today?

Appendix B

8.1 - 8.5 Lab Assignment – Translations with Spatial Verbs

Directions: Below you will find twenty (20) English sentences making and responding to requests, using directional verbs, and various concepts and vocabulary learned in Unit 8.1-8.5. You should read each sentence carefully to identify what aspects of the units are present in the sentences. Then, translate them into your best ASL structure on this paper (including facial expressions if possible). If there are any signs you do not know, ask for them from me. Once you've translated all of the sentences, create a video of yourself signing the sentences how you translated them. The video should be posted to YouTube and the link submitted to iLearn. This is due by the end of class today.

1. I think I left my phone in my car.
2. Lee told me that Rachel teased him.
3. Smoking is banned in all restaurants.
4. My aunt bought a new all-in-one printer/scanner/copier but doesn't know how to connect it to her laptop.
5. I told you that John liked cooking.
6. I don't want Jack to come to the party on Saturday.
7. I have a flight tomorrow at 7am at San Jose. I was planning to drive myself but my car broke down. Would you be able to give me a ride?
8. I'm sorry, I can't postpone dinner. I have class tomorrow at 7pm.
9. I want to see a show in San Francisco but you can only buy tickets online and I have no idea how to do that. Can you please help me?
10. Did you get the letter I sent you?
11. I don't mind helping you, but first I have to drop off my mom at the airport.
12. Remember we had plans to go out to eat tonight? Well, I can't make it because I have to work overtime.
13. I'm so sorry to hear that! I suggest that you go to the store and get some medicine, drink some water, and rest.
14. I can't drive you to the airport because I don't have a car. Maybe you could ask your roommate?
15. Sure I can help you study for class, but understand that I have to study for a different test first. Then I can help you study.
16. Yeah I can drive you to the airport, but first you can buy me some coffee.
17. I just wanted to inform all of you that you have a test next Wednesday.
18. I'm sorry! I can't help because I have no clue how to do that! But my cousin Tim knows a lot about computers and can help.
19. I bought a shirt online but they never sent it to me.
20. My mom called me yesterday but I missed it and haven't called her back yet.