

# The Relationship between Elementary Deaf and Hard of Hearing Students' Writing Performance and Writing Motivation

Kimberly A Wolbers<sup>1\*</sup>, Hannah M Dostal<sup>2</sup>, Kelsey Holton<sup>1</sup>, Joan Weir<sup>2</sup> and Alaa Alsabei<sup>1,3</sup>

<sup>1</sup>Department of Theory and Practice in Teacher Education, University of Tennessee, USA; <sup>2</sup>Department of Curriculum and Instruction, University of Connecticut, USA; <sup>3</sup>Department of Special Education, Jazan University, KSA

## ABSTRACT

This study is in response to the lack of research that exists related to the role of motivation in the writing development and achievement of deaf and hard of hearing (d/hh) students. We investigated whether demographic and language variables were associated with writing motivation among 76 third through fifth grade d/hh elementary students, and whether motivation for personal narrative, information report and persuasive writing was related to writing performance in the same genres. Demographic variables such as gender, age, and hearing level, and the language variable of American Sign Language receptive skills, did not show an association with writing motivation measured by the Situated Writing Activity and Motivation Scale. Knowledge of English, however, showed a weak to moderate positive correlation with motivation. In a simple linear regression model, English was a statistically significant predictor of motivation across all genres. There was also a statistically significant relationship between motivation for writing personal narratives and one's performance in the genre, yet an association was not found between motivation for information report and persuasive writing and performance in the same genres.

**Keywords:** Writing motivation; Deaf students; Hard of hearing students; Elementary; Writing performance

## INTRODUCTION

Children project an innate curiosity and playfulness as they learn about the world around them [1]. This self-driven propensity toward curiosity and exploration is the kind of motivation that teachers wish to preserve and promote during school-age years. Indeed, motivation has been identified as an important factor when it comes to student success in school [2]. Motivation theories and constructs are described as multifarious [1], multifaceted [3], multidimensional [2], domain-specific, and situationally dependent [4]. When examining motivation in relation to learning, it is necessary to consider the learning context and the learner, as motivation has been known to be impacted by a multitude of variables such as school subject, age, or sex. Existing literature has demonstrated that motivation plays an important role in the development of writing and writing performance [4]. The purpose of this study is to examine demographic variables of deaf and hard of hearing (d/hh) students that may impact writing motivation and investigate whether a relationship exists between student writing achievement and motivation to write within the same genre.

## Learner variables impacting motivation

Demographic variables such as age and sex have been widely addressed in motivation literature [4,5] and appear to play a role in students' motivation. For example, it was found that, for math and reading, motivation declined as age increased, but for social studies, motivation increased over time [6]. Some researchers have also shown that female students have a higher level of motivation for writing tasks, but this increase appears to dwindle as students age [7,8]. Collie et al. [9] contend that boys have poorer writing outcomes than girls. Others, such as Tomlinson [10] have found that, even when learning conditions are altered based on gender, there is not enough research to support the notion that gender impacts learning or achievement. The impact of demographic variables on writing outcomes has not previously included d/hh students, nor has the impact of additional variables such as linguistic competence been studied in relation to the writing motivation of d/hh students.

Observational studies involving deaf and hard of hearing (d/hh) preschoolers have indicated that their emergent writing abilities are

\*Correspondence to: Kimberly A Wolbers, Department of Theory & Practice in Teacher Education, University of Tennessee, A214 Bailey Education Complex, 1126 Volunteer Blvd, Knoxville TN 37996-3442, USA, Tel: 1(865)974-2375; E-mail: kwolbers@utk.edu

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similar to hearing-aged peers [11]. However, many d/hh children arrive to school without a solid foundation in a first language [12], which causes early writing skills to diverge from those of hearing children at the juncture of spelling [12] and at conventional writing instruction [13]. For struggling d/hh writers who do not have age-appropriate language or literacy skills, it is possible that linguistic competence influences motivation to write, more than demographic variables.

**Impact of motivation on student writing**

Regardless of age and gender, there is a demonstrated relationship between students’ motivation to write and their writing performance [4,14,15]. It is also known that students’ motivation may vary across learning contexts and learning tasks [16]. Students who are motivated writers are more likely to perform better on standardized measures of writing achievement [4], possess more stamina during difficult writing tasks [17], and make better use of efficacious writing strategies [18]. Motivated student writers are also more likely to demonstrate interest in writing activities than unmotivated student writers [4]. D/hh writers in previous studies have been described as disliking or avoiding writing, or portrayed as frustrated with writing [19,20]. Yet, it’s not clear the extent to which writing achievement has a relationship with writing motivation for d/hh writers, and whether that differs across writing domains or genres (e.g., recount/personal narrative, information report, and persuasive writing genres).

**The motivation construct**

Motivation is complex and unwieldy, made up of many constructs involving cognitive and psychological elements [21]. As defined by Lo and Hyland, it is “a dynamic process subject to continuous flux” which makes it challenging to study [22]. Troia [23] has focused much of his research toward student writers with disabilities [23], struggling writers [24], and writing motivation among these populations [4]. Therefore, we utilize the work of Troia to frame our understanding of motivation in writing when looking at d/hh students.

Troia et al. [4] breakdown the construct of writing motivation into the following: goal orientation, attributions for outcomes, self-efficacy, and task interest and value. See Table 1 for a description of each element. In this study, we examined writing motivation, with a particular emphasis on self-efficacy and interest, through the administration of survey questions.

**Self-efficacy**

Self-efficacy in writing is a student’s belief in her competence to write different types of text [25]. Students with high self-efficacy tend to use better learning strategies [26] and more self-monitoring of their learning outcomes [27-29] than students with low self-efficacy. Positive self-efficacy has a tremendous impact on the student’s task persistence [30] and academic outcomes [4,31]. Students with positive self-efficacy have been shown to be able to set more

effective goals and have an increase in writing stamina [9,25,32]. The ability to self-regulate learning is thought to depend on self-efficacy [33-36]. Additionally, there is an established correlation between a positive sense of self-efficacy and task choice [37,38], effective study activities [31], and skill acquisition [39]. Further still, a positive sense of self-efficacy is predictive of writing competence [5,9,25]. These outcomes have been associated with self-efficacy regardless of age, gender or ethnicity [4]. Self-efficacy is context-specific and consists of both outcome and efficacy expectations [40-42]. Outcome expectations include the belief that there will be a successful conclusion, and efficacy expectations include the belief that you are capable of performing tasks necessary to complete a goal [4].

A study by Graham and Harris [43] determined that students with learning disabilities often overestimate their skill sets in the area of creative writing. Young children in general may have an inflated sense of self-efficacy that moderates over time as skills and experience develop and feedback is given [4]. Troia [23] explains that students with disabilities sometimes learn to attribute successes and failures with writing to variables that are out of their control, such as the amount of teacher assistance that was received, or luck with one assignment over another. These misunderstandings can lead to deep doubts about competencies, which in turn, can negatively impact students’ self-efficacy for writing [23]. Similarly, a d/hh student may experience a lower level of self-efficacy because of previous struggles with writing due to language deprivation, which gives the student fewer linguistic resources from which to draw upon. Or, in the case of a student who uses American Sign Language (ASL), lower self-efficacy may be experienced because of difficulty mediating between two languages.

**Task interest and value**

Task interest and value is another important construct of motivation that influences how goals are set [4]. Interest has been defined as the interactional relationship between a person and aspects of his environment [44] and has a positive impact on academic achievement across individuals, knowledge domains, and subjects [40,44]. Interest is comprised of personal and situational interest with personal interest being based on individual preferences while situational is focused on the environment and context [4,40,44].

Hidi and Harackiewicz [44] argue that situational interest is a powerful tool in the classroom and can significantly increase student motivation. An example of situational interest would be when a teacher takes a routine task like memorizing spelling rules and turns it into a game. In 1990 and 1991, Hidi and McLaren found that although interest plays a part in the writing outcomes of students, it alone was not sufficient, but paired with content knowledge, it impacted writing outcomes [45,46]. In the case of d/hh children experiencing language deprivation, they may bring to the task of writing less background knowledge and limited vocabulary to express a topic which, in turn, impacts quality regardless of interest.

**Table 1:** Motivation construct [4].

Goal Orientation	Consists of mastery and performance goals Can be directed toward attaining competence or knowledge or receiving acknowledgment.
Attributions for Outcomes	Refers to one’s perception of why one attains success or failure
Self-efficacy	Belief in ability in a domain rather than a task-specific event A student’s belief in her competence to write different types of text
Task Interest and Value	Refers to the interest one has in a task related to the amount of effort involved to complete it.

Troia et al. [4] include task value as a part of the interest construct. Value includes aspects of the intrinsic-the extent to which an individual is curious or challenged, the utility or importance of a task, and the cost which is the amount of effort or anxiety a task presents [4]. Although a part of the interest construct, task value can operate independently of interest. A person is able to have high interest in a subject without attaching great value to it, and likewise, is able to attach high value to an activity that is of little interest. For instance, a student might understand that writing a persuasive essay is an important part of a graded assignment but have little interest in engaging in the writing.

## METHOD

Although research on writing motivation and its constructs exists for the general population, currently there exists no research on the d/hh population. The aim of the current study was to investigate the demographic and language variables that may be relevant to writing motivation for d/hh students, and to investigate the relationship between students' writing performance in three genres (recount, information report, and persuasive) and their writing motivation for each genre. We examined writing motivation of d/hh students through the administration of a survey including self-efficacy and task interest/value items. The following research questions guided the design of this study: (1) Is there a significant relationship between writing motivation and (a) demographic variables including the gender, age, and hearing level, and (b) language variables such as written English competence and ASL receptive skills? (2) Is there a significant relationship between the writing performance of d/hh students on recount, information report, and persuasive genres and their writing motivational beliefs for those genres?

### Setting and participants

The sample for this study included 76 d/hh students in grades 3 through 5. The sample and data presented here come from a larger, year-long efficacy trial on writing funded by the Institute of Education Sciences. There was a nation-wide open enrollment period during which teachers could enroll if they provided language and literacy instruction to 3rd-5th grade d/hh students for a minimum of 2 hours a week.

Student data were collected at 12 school programs including four bilingual schools for the deaf, two schools for the deaf that used total communication, two schools for the deaf transitioning from total communication to bilingual, two public school listening and spoken language programs, one public school listening and spoken language/total communication program, and one public school bilingual program. Based on teacher survey responses, approximately 40% of the students had recently transferred to their current school programs, having received education in a program with a different communication approach the year prior. Seven students who were previously mainstreamed (some with sign exposure from an interpreter and/or itinerant teacher and some with no sign exposure) were now enrolled in bilingual, transitioning, or total communication schools for the deaf. Six students who were previously mainstreamed (some with sign exposure from an interpreter and/or itinerant teacher and some with no exposure) were now enrolled at the public-school bilingual program. Thirteen students previously enrolled at total communication day schools or schools for the deaf were now enrolled in bilingual programs. Two students who were previously enrolled at orphanage schools for the deaf in another country were now enrolled in the public-school

bilingual program. One student who was previously enrolled at a Montessori program was now enrolled at the listening and spoken language public school program. The student population was largely transient with inconsistencies in language and communication histories. Additionally, data for this study were collected at the beginning of the school year; consequently, transfer students had not yet experienced instruction in their current settings. Thus, for this study, it was not feasible to examine associations between d/hh students' writing motivation and school setting or communication philosophy.

Student demographic data were additionally reported by classroom teachers via an online survey. Demographic data were based on teachers' observations and available student records. Eight student participants were excluded based on cognitive disability classification, or teacher reports indicating that students experienced substantial difficulties taking the survey. A total of 68 responses were included in the analyses. Ages of participants ranged from 7.67 to 12.92 years, with a mean age of 9.91. Participants' gender, hearing level, amplified hearing level, and primary language are displayed in Table 2. It's important to note that there were 21 audiograms that did not indicate students' amplified hearing levels, and teachers reported that an additional 22 students did not use their hearing aids or cochlear implants at all. Therefore, we did not include amplified hearing thresholds in the analyses since there were not meaningful data for two-thirds of the participants.

### DATA SOURCES

Five sets of data were used to address the research questions for this study, including: motivation survey responses, writing samples, Woodcock Johnson IV Broad Written Language scores, ASL-Receptive Skills Test scores, and teacher surveys.

### Motivation survey

The Situated Writing Activity and Motivation Scale (SWAMS) was used in this study to measure students' motivation to write. Many items on the SWAMS were derived from developed scales [47-49]. The aggregate internal consistency reliability is reported at 0.88. Since the first use of the SWAMS with over 600 students in grades 4 through 10 [15], it has been further refined. The original survey containing 30 questions across 4 sub-constructs of motivation (i.e., self-efficacy, success attribution, task interest/value, and goal orientations) was subsequently refined to 15 questions representing the two sub-constructs of self-efficacy and task interest/value. In reliability analyses conducted by the survey developer, low internal consistency was found among questions intended to measure the latent constructs of success attribution and goal orientation. Since items did not reliably measure the constructs, they were removed (G.A. Troia, personal communication, October 19, 2018). In this study, we administered the updated SWAMS to students. There were three surveys of 15 questions each-one survey for recount, information report, and persuasive genres. Each survey started with a scenario to provide context for writing in the genre. For example, the information report survey began:

Your teacher asks you to write a feature article about something at which you are an expert, like a sport, hobby, person, or place, although you will need to do some additional research for your article. Your article will be published in a class newspaper to be circulated throughout the school. You will want to write an informative article that will help others learn about your topic. Now, respond to the statements below about this assignment.

Table 2: Student demographics.

Variable	n	%
Gender Groupings		
Female	29	42.6
Male	39	57.4
Hearing Level Groupings		
0-15dB normal	2	2.9
16-25 slight	1	1.5
26-40 mild	5	7.4
41-55 moderate	8	11.8
56-70 moderately severe	12	17.6
71-90 severe	11	16.2
9+profound	28	41.2
Missing	1	1.5
Hearing Level (Amplified) Groupings		
0-15dB normal	0	0
16-25 slight	0	0
26-40 mild	13	19.1
41-55 moderate	6	8.8
56-70 moderately severe	3	4.4
71-90 severe	3	4.4
91+ profound	0	0
Not reported on audiogram	21	30.9
Does not use amplification	22	32.4
Primary Language Groupings		
ASL	41	60.3
English (speech only or sign support)	25	36.8
Significant language delay	1	1.5
Missing	1	1.5

Questions were measured along a likert scale from 0-totally disagree to 6-totally agree. An example of a question designed to measure self-efficacy is: I would be able to come up with great ideas and include lots of details for this article. An example of a task interest and value question is: I think this writing assignment is boring.

Each of the survey questions were presented to students in written English. Students were also given access to questions in ASL (via video) and/or spoken English (via voice recording).

### Writing samples

Three writing samples (representing recount, information report, and persuasive genres of writing) were collected from each student at the beginning of the academic year over three days by their classroom teacher, for a total of 204 samples. Students were given unlimited time to respond to three prompts similar to the 4th grade National Assessment of Educational Progress (NAEP) [50] which asked students to convey an experience through writing, explain, and persuade. The recount prompt asked students to share a personal experience and was administered to all students. In addition, all students responded to one of three information report prompts, which asked them to describe an animal or insect, a game or activity, or a familiar teacher. Last, students responded to one of three persuasive prompts in which they argued for or against a pool or trampoline, an ipad or a laptop, or owning a pet. The teachers did not assist students in writing or revising.

Students' writing samples were scored for genre-related writing traits, by drawing upon the NAEP rubric's three broad domains

of writing: development of ideas, content, and organization of ideas. The three traits were assessed using a six-point scale (i.e., 1=little to no skill, 6=effective skill), and a composite score of the three traits for each genre was used in the analyses. The recount writing rubrics included items focused on orienting the reader to an event and describing the event, while the rubric for information report writing had items focused on clearly identifying the topic and related subtopics, and providing relevant, supporting details. Finally, the persuasive writing rubric included the writer's ability to state an opinion and provide reasons and examples that justify the opinion. All rubrics also included a score for organization, as it relates to the genre. Approximately twenty percent of the writing samples were double coded. Intra Class Correlation Coefficient (ICC) for recount samples was 0.966, 0.930 for information report samples, and 0.962 for persuasive samples.

### Language knowledge

The Broad Written Language Cluster of the Woodcock Johnson Test of Achievement IV (WJ-IV) was used to measure all participants' knowledge of English through the administration of writing tasks. This achievement battery of the WJ-IV includes subtests of Spelling, Sentence Writing Fluency, and Writing Samples, which together create a composite Broad Written Language score. The Broad Written Language subtest reliabilities (when administered following the standard protocol) are 0.8 or higher [51].

The ASL Receptive Skills Test (ASL-RST) [52], a 40-item norm-referenced assessment (ages 3-13), was used with 61 participants

who use sign language. Sign language use ranged from minimal use such as sign-supported speech to those who use ASL as a primary form of communication. The ASL-RST is not an overall assessment of ASL communicative competence; rather, it is designed to assess students' receptive knowledge of ASL morphological and syntactic structures. Test developers reported on a measure of marginal maximum likelihood reliability of the standardization data (N=203), which showed a high correlation of  $r=0.88$ . Subsequent psychometric testing (ages 3-5) demonstrated reliability (0.96) and validity, whereby the test resulted in significantly different scores by age group and by whether sign was or was not regularly used in the home [53]. Similar studies have not been completed for children 6 and older, and it should be noted that, even though there are norms up to age 13, more than half of the standardization participants were ages 3-5. Participants' standard scores were used in the analyses.

### STATISTICAL ANALYSIS

To explore the first research question, demographic data that were categorical such as gender and hearing level were analyzed with independent t-tests or ANOVA to determine if there was a significant difference by group (e.g., difference in writing motivation between genders). Correlations were examined for demographic and language data that were continuous such as age, English, and ASL language variables. Data were then examined using a multiple linear regression in order to predict motivation (criterion variable) based on demographic or language variables (predictor variables).

A linear regression was calculated for the second research question to determine if there was a significant relationship between the writing performance of d/hh students on recount, information report, and persuasive genres (criterion variables) and their reported motivation for the associated genre (predictor variables).

### RESULTS

#### Research question 1

Our first analyses compared demographic variables such as gender, age, and hearing level with writing motivation. Independent t-tests were used to compare female students' scores on recount motivation (M=4.01, SD=0.940), information report motivation (M=4.07, SD=0.911), and persuasive motivation (M=4.17, SD=0.978) with male students' motivation on the same genres (M=3.85, SD=1.08; M=4.09, SD=0.966; M=3.98, SD=1.02). The t-tests demonstrated no significant differences between male and female students with respect to motivation in recount,  $t(66)=0.662$ ,  $p=0.249$ , information report,  $t(65)=-0.090$ ,  $p=0.529$ , or persuasive,  $t(66)=0.767$ ,  $p=0.912$  genres.

Results of the Pearson correlation indicated that there was not a significant association between age and motivation on recount

writing,  $r(66)=-0.064$ ,  $p=0.603$ , information report writing,  $r(65)=0.104$ ,  $p=0.401$ , or persuasive writing,  $r(66)=0.076$ ,  $p=0.538$ . We further examined the data by gender and age and found that as girls become older, there is a significant positive correlation with information report writing motivation,  $r(29)=0.411$ ,  $p=0.027$ , and persuasive writing motivation,  $r(29)=0.372$ ,  $p=0.047$ , that does not occur for boys or recount writing.

A one-way between subjects ANOVA was conducted to examine the effect of hearing level on writing motivation. There was not a statistically significant difference between hearing level groups for recount writing motivation,  $F(6,60)=0.905$ ,  $p=0.498$ , information report writing motivation,  $F(6,59)=0.965$ ,  $p=0.457$ , or persuasive writing motivation,  $F(6,60)=1.13$ ,  $p=0.315$ . Mean and standard deviation by hearing level is presented in Table 3.

Our second set of analyses examined whether there was a significant relationship between writing motivation and language variables such as written English competence and ASL receptive skills. English competence as represented by the Broad Written Language Cluster on the WJ-IV ranged from a standard score of 11 to 105 (N=68, M=61.69, SD=24.35) and ASL receptive skills standard scores ranged from 70 to 117 (N=61, M=99.25, SD=9.03). Results of the Pearson correlation indicated that there was not a significant association between ASL receptive skills and motivation for recount writing,  $r(61)=0.220$ ,  $p=0.089$ , information report writing,  $r(61)=0.237$ ,  $p=0.068$ , or persuasive writing,  $r(61)=0.211$ ,  $p=0.103$ . There was, however, a statistically significant positive correlation between English and motivation for recount writing,  $r(68)=0.449$ ,  $p=0.000$ , information report writing,  $r(68)=0.335$ ,  $p=0.006$ , and persuasive writing,  $r(68)=0.311$ ,  $p=0.010$ . Increases in English scores showed a weak to moderate association with increases in writing motivation across the genres.

A simple linear regression was calculated to predict writing motivation based on English competence. The results indicate that English significantly predicted recount motivation ( $\beta=0.019$ ,  $p<0.000$ ) and explained approximately 20% of the variance,  $F(1,66)=16.64$ ,  $p<0.000$ , and the  $R^2$  was 0.201. Thus, participants' predicted motivation score (from 0-low to 6-high) is equal to  $2.76+0.019$  (English standard score), and a participant's writing motivation increases 0.019 for every point increase in standard score of the Broad Written Language. Similarly, English was a statistically significant predictor of information report writing motivation ( $\beta=0.335$ ,  $p<0.006$ ) and persuasive writing motivation ( $\beta=0.311$ ,  $p<0.010$ ). Each of the regression models were significant,  $F(1,66)=16.64$ ,  $p<0.000$  for information report and  $F(1,66)=16.64$ ,  $p<0.000$  for persuasive, although less variance was explained at 11 and 10% respectively.

In summary, neither demographic variables (i.e., gender, age, and hearing level of d/hh students) nor the language variable of ASL

Table 3: Motivation across genres by hearing level.

Hearing Level	Motivation Mean (M) and Standard Deviation (SD)		
	Recount M (SD)	Info. Report M (SD)	Persuasive M (SD)
0-15dB normal (n=2)	3.67 (1.23)	3.33 (0.471)	3.25 (0.354)
16-25dB slight (n=1)	4.73 (NA)	5.00 (NA)	5.33 (NA)
26-40dB mild (n=5)	4.70 (0.899)	4.42 (0.590)	4.55 (0.717)
41-55dB moderate (n=8)	3.49 (1.15)	3.83 (0.872)	3.85 (1.05)
56-70dB moderate-severe (n=12)	3.83 (1.13)	3.90 (0.711)	3.86 (0.803)
71-90dB severe (n=11)	3.78 (1.14)	4.36 (0.770)	3.86 (0.681)
91+dB profound (n=28)	4.00 (0.908)	4.19 (1.02)	4.28 (1.13)

receptive skills showed an association with writing motivation in the three genres. While the English language variable had a statistically significant relationship with writing motivation, only a small amount of the variance (10-20%) could be explained.

## Research question 2

In our second research question, we asked whether there was a significant relationship between writing performance and motivation of the same genre. Performance scores on recount writing ranged from 0 to 9 out of a total possible 18 rubric points (N=67, M=4.45, SD=2.32), and recount motivation ranged from 1.67 to 6.00 on a 6-point rubric (N=68, M=3.92, SD=1.02). Results of the Pearson correlation indicated a weak positive association between performance and motivation on recount writing,  $r(67)=0.362$ ,  $p=0.003$ . A linear regression was calculated, finding a statistically significant relationship,  $F(1,65)=9.79$ ,  $p<0.003$ , with an  $R^2$  of 0.131. The unstandardized coefficient was 0.827, indicating that as the motivation score increased by 1 point, recount performance increased by 0.827 points. A small amount of the variance in recount performance scores (13%) can be accounted for by a student's motivation to write recounts.

Performance scores on information report writing ranged from 0 to 10.5 (N=68, M=4.38, SD=2.31), and scores on persuasive writing ranged from 1.5 to 11.5 (N=64, M=5.76, SD=2.60). Information report motivation scores ranged from 1.33 to 5.80 (N=67, M=4.08, SD=0.935), while persuasive motivation scores ranged from 1.93 to 5.93 (N=68, M=4.06, SD=0.998). The Pearson correlation did not indicate a significant association between performance and motivation with information report writing,  $r(67)=0.189$ ,  $p=0.125$ , or persuasive writing,  $r(64)=0.239$ ,  $p=0.057$ . Overall, these findings indicate that there doesn't appear to be a strong relationship between one's motivation for genre writing and performance in the genre among d/hh students as demonstrated in studies with hearing students.

## DISCUSSION

In this study, we examined whether demographic and language variables predict d/hh elementary students' writing motivation, and whether motivation for recount, information report and persuasive writing genres is related to performance in the same genres. Findings showed that demographic variables of gender, age, and hearing level were largely not associated with writing motivation for this population. However, upon closer examination of gender and age, we found that as girls in elementary school increase in age, their motivation for information report writing and persuasive writing increases as well. Language variable outcomes were mixed. ASL receptive skills did not show a statistically significant relationship with writing motivation; while, knowledge of English, as measured by the WJIV Broad Written Language cluster, was a significant predictor of motivation, explaining 10-20% of the variance of the regression model. Lastly, an investigation into the relationship of recount motivation and writing performance yielded a statistically significant relationship. Approximately 13% of the variance in the model was explained with recount motivation predicting recount writing performance. A statistically significant relationship was not found between motivation and performance for information report and persuasive writing genres.

## IMPLICATIONS

We began this study with a practical question in mind: How necessary is it for educators of the deaf to ignite motivation among

their students for learning about and composing text? Motivation to write has been shown to be an important aspect of successful writing for the broader population of writers [4,54-56]. While this study provided an initial look at the relationship between writing motivation and performance for d/hh elementary students, the results lead to a need for additional research.

Some of the findings of this study reflect conclusions drawn from previous literature. Demographic variables such as gender have favored females in previous studies on writing self-efficacy beliefs [40]; however, this difference was found to decrease over time [7] or found non-significant when prior achievement was controlled [8]. In terms of writing outcomes, there has not been an abundance of research supporting the notion that gender impacts achievement [10]. In this study, which investigated gender differences in writing motivation of d/hh students, no significant relationship was found.

In terms of age, some studies have found that writing motivation had an inverse relationship with age [6]; however, this study with d/hh students did not find age to have a significant association with writing motivation. There was however a correlation between girls' increase in age and motivation on information report and persuasive writing. One possible explanation for this is increased STEM opportunities for girls today, which then impacts participation in disciplinary writing of expository text types. Additional research is needed to explore the reach of these findings, as prior literature tells us that girls' motivation diminishes or even reverses through middle and high school [17,57].

Prior research has compared d/hh college students' academic writing motivation with hearing peers, and found no significant difference between the two groups [58]; however, no recent research has focused on the relationship between degree of hearing level and writing motivation for K-12 students. Our study found no statistically significant relationship between the variable of hearing level and writing motivation.

Students' motivation to write is context-specific [4,57], and previous literature has reported that student response to writing varies based on writing task [40] and genre [42]. Results from this study add to the existing literature on writing motivation across genres, highlighting the significant relationship between narrative writing (specifically in this study, recount writing) and writing motivation [42]. Although this study reported a small amount of variance explained (13%), the significant relationship found between d/hh students' motivation for recount writing and their writing performance ( $p<0.003$ ) echoes significant findings found in Martin's 2016 study [42] involving elementary students' narrative writing self-efficacy and subsequent writing achievement ( $p<0.01$ ). These significant findings for recount writing but not information report or persuasive writing affirm that the relationship between writing motivation and achievement varies across genres for d/hh students, just as it does for hearing students, and favors the narrative genre.

Previous studies with English learners (ELs) have supported the perception that confidence and competence of the English language plays a significant role in predicting student writing motivation and writing outcomes [56]. In the meta-analysis of Gardner and colleagues' research on motivation in second language learning, 75 independent samples involving over 10,000 participants highlighted a strong, positive correlation between English language achievement and motivation [59]. The same breadth of studies is not available for the d/hh student population; however, in this

study, there was a significant relationship between English (as demonstrated on the WJ Broad Written Language) and student writing motivation. Additional research is necessary to explore this relationship further.

By investigating the available research for writing motivation of ELs, some relevant connections can be drawn with the d/hh student population; however, an important linguistic consideration must be made. D/hh students are often deprived of exposure to accessible language for acquisition and have fewer linguistic resources in American Sign Language (ASL) and/or English to bring to the task of writing [60-62]. It stands to reason that if a student does not have access to the language to express a thought or experience, writing will be impacted. More research is needed to fully examine the impact of language delay and deprivation on writing motivation and outcomes.

The results of this study present researchers and teachers with potential new directions for examining the sources behind writing motivation for d/hh students. Classroom instruction potentially plays a stronger role in individual student motivation. Troia [23] highlights the importance of task interest and value for writing motivation as this construct focuses on students' background knowledge and interest in classroom activities. Studies have shown that even with high student interest, difficulty in writing persists if students do not have sufficient background knowledge in a topic [46,63]. In the present study, the relationship between student motivation for recount writing and student writing outcomes was statistically significant. This result was not entirely unexpected, as this genre provides students with the most choice. Not only does choice allow students to write about topics that are of interest to them, but also allows students to leverage and capitalize on their available language resources to communicate their knowledge and background experience on the topic.

## LIMITATIONS AND FUTURE DIRECTIONS

There were limitations related to administering the measures. Because of the need to provide ASL interpretation and English voice recordings for each question of the motivation surveys, administration time was lengthy. We observed that the student participants were restless when taking the survey, and we question the extent to which this had an impact on their responses. Additionally, we question the impact of language delay and deprivation on student participants' ability to understand survey items. While we were able to identify and remove some surveys of students that demonstrated lack of understanding with the help of teacher reporting and by reviewing survey responses (e.g., they didn't respond differently to negatively stated items), triangulation with additional measures such as observation and interviews would provide greater assurance. Similarly, students may have been constrained by their English knowledge when writing to the sample prompts, and it is possible that additional analyses of ASL compositions may reveal greater writing and genre knowledge for some students.

Another limitation of the study was the measures used to collect data. Both the writing performance and the motivation data were collected through the use of scoring rubrics. Ordinal data, such as data from scoring rubrics, are categorical data that are rank ordered (e.g., poor to excellent). While the practice is common to use rubric scores in analyses, there are limitations. For example, it is difficult to discern the degree of difference between rubric scores which is implied in statistics using means and standardized deviations.

Additionally, through examination of the ASL data collected in this study using the ASL receptive skills test, we did not find that scores were broadly spread to represent students' differentiated levels of ASL knowledge that teachers and researchers observed. We recommend future psychometric testing of the ASL receptive skills test with older d/hh children in later elementary school.

A final limitation of the study was the sample size which constrained the number of predictor variables. A larger N is recommended in future research in order to examine the relationship of motivation to performance while controlling for language variables such as English knowledge. It would also be possible to investigate the extent to which amplified hearing levels played a role in students' writing motivation.

## CONCLUSION

In this study, we examined whether demographic variables such as age, gender, hearing level, or language competency were predictive of elementary d/hh students' writing motivation, and whether the students' motivation for writing in three various genres was related to their writing performance in each genre. English language competency and writing motivation were found to have a statistically significant relationship, as well as students' motivation for writing recounts and performance in the same genre; however, only a small portion of these variances were explained. It is suggested that additional studies examining writing motivation, language, and writing performance are needed in order to examine more clearly the extent to which motivation plays an important role in the writing performance of d/hh children.

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