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BIBLIOMETRIC ANALYSIS OF READING RESEARCH IN DEAF
EDUCATION JOURNALS

A thesis submitted to
the Graduate College of
Marshall University
in partial fulfillment of
The requirements for the degree of
Education Specialist

In
School Psychology
by

Lisha Ann Tignor

Approved by

Dr. R. Lanai Jennings, Committee Chairperson
Dr. Sandra Stroebel, Committee Member
Dr. Linda Winter, Committee Member

Marshall University
May 2016

APPROVAL OF THESIS

We, the faculty supervising the work of Lisha Ann Tignor, affirm that the thesis, Bibliometric Analysis of Reading Research in Journals for the Deaf, meets the high academic standards for original scholarship and creative work established by the School Psychology Program and the Graduate College of Marshall University. This work also conforms to the editorial standards of our discipline and the Graduate College of Marshall University. With our signatures, we approve the manuscript for publication.

Dr. R. Lanai Jennings, Department of School Psychology, Committee Chairperson Date



5/2/2016

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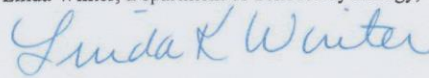
Date



5/2/2016

Dr. Linda Winter, Department of School Psychology, Committee Member

Date



5/2/2016

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ABSTRACT

There are known differences in reading development between DHH and hearing populations, but there is limited research in the field of reading development in DHH populations. The aim of this study is to use bibliometric analysis to examine two major journal outlets focused on the advancement of the education of children and adults who are DHH to determine 1) the extent to which the peer-reviewed literature focuses on reading instruction and its five elements; 2) the most influential authors being cited in this area of research; 3) the age of the research being cited; 4) the influence of related disciplines on instructing children who are deaf and hard of hearing in reading. Results showed a limited amount of articles published related to reading and the majority of those articles related to reading in general. The most frequently cited authors and journals shows that this is a highly insular field and there is collaboration with other broad fields. Two of the most influential reading journals were cited fairly often. Although phonology was not listed as being a topic frequently published within the journals, it was the topic of the most frequently cited article. The majority of the research cited was published between 2001 and 2011.

CHAPTER 1

LITERATURE REVIEW

Hearing loss occurs in five out of every 1,000 newborns and approximately 15% of children between the ages of six- and 19-years-old have a measurable hearing loss in one ear (Center for Hearing and Communication n.d.). Profound, early-onset deafness is present in 4-11 children out of every 10,000 (Marazita, Ploughman, Rawlings, Remington, Arnos, & Nance, 1993). The 2011 child count of students with disabilities from the Office of Special Education Programs states that there are about 6.5 million children between the ages of six and 19-years-old in the United States receiving special education services. Of those 6.5 million children, approximately 79,000 children receive services due to deafness or a hearing impairment, which includes all levels of severity (U.S. Department of Education, 2012). These 79,000 children are at significant risk of experiencing reading difficulties due to a unique set of reasons, which will be discussed later. Children who have a mild hearing loss can miss as much as 50% of classroom instruction and discussion (Center for Hearing and Communication, n.d.). The more severe the hearing loss, the greater the probability the student will have difficulties in reading. The aim of this study is to use bibliometric analysis to examine two major journal outlets focused on the advancement of the education of children and adults who are deaf and hard of hearing to determine 1) the extent to which the peer-reviewed literature focuses on reading instruction and its five elements; 2) the most influential authors being cited in this area of research; 3) the age of the research being cited; 4) the influence of related disciplines contributing to the field of deaf education.

Reading Delays in Students who are Deaf and Hard of Hearing

Reading refers to a set of print-based decoding and rudimentary thinking skills necessary to remember text (Harris & Hodges, 1981). It is also defined as “the learning of a complex set of strategies, skills, concepts, and knowledge enabling individuals to understand visual and print-based information” (Ruetzel & Cooter, 2012 pg. 23). The overall goal of reading instruction is defined as “empowering readers to learn, grow, and participate in a vibrant and rapidly changing information-based world” (Ruetzel & Cooter, 2012, pg 24). For students who are deaf and hard of hearing, it is particularly critical that they master the reading of print-based information so they are better able to communicate in a hearing world.

Research consistently shows differences in reading development between hearing individuals and individuals who are deaf or hard of hearing. There are four major ways that being deaf or hard of hearing (DHH) can affect a child’s development: the impairment can cause a delay in the development of receptive and expressive communication; the language deficit can cause learning problems resulting in reduced academic achievement, specifically in reading comprehension; the communication difficulties can lead to social isolation or poor self-esteem; and the impairment may have an impact on future vocational choices (American Speech-Language-Hearing-Association, 2013).

Very early national surveys indicated that only 8% of students who are DHH read above the fourth-grade level (Furth, 1966). Contemporary research continues to substantiate the same gap in reading achievement. Children with mild to moderate hearing loss perform one to four grade levels below their hearing peers in reading

achievement (Effects of hearing loss on development, 2013), while children with severe to profound hearing loss may never achieve skills higher than the third- or fourth-grade level unless intensive early intervention occurs (Allen, 1994; Effects of hearing loss on development, 2013). Wolk and Allen (1984) found that the average student who was DHH gained one-third of a grade level change each school year, which means it takes three years for these students to increase one grade level in their reading development.

Research has also shown that although there is some overlap in how students who are DHH develop reading skills, there are also significant differences that may factor into the lag that many of these individuals face. One major factor surrounding delayed reading development involves insufficient language development (signed or spoken) directly related to the language disparity that exists since 95% of children who are DHH are born to hearing parents (Hermans, Knoors, Ormel, & Verhoeven, 2008; Ormel 2008; Reitsma, 2009; Rinaldi and Caselli, 2009; Yoshinaga-Itano, 2004). The development of reading skills is also confounded since reading is a speech-based system, further complicating reading development in children who are DHH who either do not voice or cannot hear their own voice (Geers and Hayes, 2011).

Essential Components of Reading with Deaf and Hard of Hearing

In 2000, the National Reading Panel found evidence to support the five essentials of early reading instruction, which are phonemic awareness, alphabets (phonics), fluency, vocabulary, and comprehension. (National Reading Panel, 2000). Any child, hearing or not, who has deficits in any of these five constructs will more than likely have difficulties in reading. Children and adolescents who are DHH, like their hearing peers, can struggle in any of these five essential areas of reading.

Phonemic awareness is the knowledge that spoken words can be broken down into smaller sound segments known as phonemes (National Reading Panel, 2000). Phonemic awareness is encompassed by the larger domain of phonological awareness which includes rhymes and syllable segmentation. Because sound is integral to this area of early reading, children who are DHH struggle significantly with skill acquisition of phonemic awareness. Although educators and reading experts generally view phonemic awareness as an essential requisite skill to reading proficiency, this notion is more controversial for children who are DHH. Some researchers, like Kelly and Barac-Cikoja (2007) purport, 1) children who are DHH need to acquire an awareness that words are made of individual phonemes, which can be manipulated, and 2) phonemic awareness deficits prevent later rapid and accurate decoding of written words (Leybaert, 2000; Perfetti & Sandak, 2000). Other researchers, however, identify skilled readers who are DHH who perform poorly on tests of phonemic awareness and thereby maintain phonemic awareness is nonessential (Mayberry, del Giudice, & Lieberman, 2011, McQuarrie & Parrila 2009; Miller, 2010; Miller, 2011; Narr, 2008;). For example, Kyle and Harris' (2010) three-year longitudinal study revealed that phonological awareness was not a precursor to word reading proficiency in deaf and hard of hearing children as it is in hearing children. Miller and Clark (2011) similarly conclude phonological and phonemic awareness deficits do not adequately explain reading failure in prelingually deaf individuals.

Another essential component of reading closely related to phonemic awareness is phonics. Phonics is the knowledge that letters of the alphabet represent phonemes and that these sounds are blended to form words (National Reading Panel, 2000). Phonics is

considered necessary in hearing individuals because it allows these readers to sound out words that they haven't yet learned without having to memorize the word (National Reading Panel, 2000). Again, this aspect of reading instruction relies heavily on sound, making it a difficult skill for children who are DHH to acquire (Geers & Hayes, 2011). Due to this difficulty, children who are DHH frequently memorize whole words and rely more heavily on sight words rather than learning to decode words. As a result, such children who are DHH are likely to have difficulty differentiating between words that look similar.

Phonemic awareness and phonics are closely associated in readers who are DHH as they are both considered to be very controversial areas for generally the same reasons. Although phonics and phonemic awareness are considered to be two of the best predictors of later reading achievement, there is a lack of research on explicit instruction of both areas for students who are DHH (Wang, Sychala, Harris, & Oetting, 2013). Historically, both phonemic awareness and phonics instruction have not been viewed as viable options for children who are DHH. However, in the last decade, there has been more research, albeit controversial, demonstrating that explicit instruction of these skills through Visual Phonics and Cued Speech is somewhat effective (Wang, et al., 2013).

The third essential component, vocabulary, involves word meaning. Students are taught new words, either as they appear in text or by introducing new words. The introduction and assimilation of new words enhances reading ability (National Reading Panel, 2000). Vocabulary knowledge is the most studied area when it comes to reading in DHH populations since phonics and phonemic awareness have been thought in previous years to be unable to obtain in students who are DHH.

Vocabulary instruction is defined as teaching word meanings and how a person determines word meanings from an understanding of word parts and contextual clues (Ruetzel & Cooter, 2012). Knowledge of vocabulary is the greatest predictor of school success (Cooter & Cooter, 2010) and accounts for over 80% of variance in student's reading comprehension test scores (Ruetzel & Cooter, 2012). There is direct relationship between vocabulary knowledge and reading comprehension (Clark, 2001). Vocabulary knowledge becomes increasingly predictive of reading proficiency as students progress to upper elementary school wherein the vocabulary of content-area texts, like science and social studies, becomes more advanced (Scarborough, 2005; Storch & Whitehurst, 2002; Williams, 2012). Once children transition into the upper elementary grades, teachers begin to focus less on explicit reading and vocabulary instruction. At this point, teachers often expect children to be proficient readers and have prior knowledge of certain vocabulary words.

Hearing children develop their spoken vocabularies or oral language abilities through auditory exposure (i.e., hearing and overhearing words) in a variety of contexts which allows them to "passively discover the meaning of words" (Bloom & German, 2000). Hart and Risley's (1995) seminal research revealed hearing children from professional families received exposure to an average of 2,153 words per hour while children from working class families hear an average of 1,251 words per hour. Moreover, children from families receiving welfare hear an average of 616 words per hour.

Children who are DHH usually only overhear a small fraction of these words per hour, if any. The amount of words a child who is DHH hears per hour is unknown

because this depends on the child's residual hearing and audiological profile. It is also not known how many signs a deaf child of deaf parents is exposed to within an hour, but research suggests a child who is DHH is more likely to reach high levels of linguistic competency when their parents have a higher socioeconomic status and education level which aligns with Hart and Risley's study (Pribanic, 2006). Research additionally reveals that children who are DHH who are exposed to sign language from birth appear to be better at oral tasks than those exposed to oral language (Morford & Mayberry, 2000). Exposure to sign language from birth allows for the normal development of linguistics in these children (Grosjean, F, 1992), but the majority of deaf children are born to hearing parents who have no knowledge of sign language (Pribanic, 2006).

One study reported that over the past 15 years of research, children who are DHH learn language at only 50-60% the rate of hearing children (Sarant, Holt, Dowell, Rickards, 2009). Consequently, children who are DHH may only experience half of the incidental learning moments in comparison to hearing children. Sarant, Holt, Dowell, and Rickards (2009) found that although more than half of the children in their study had been diagnosed, obtained a hearing aid, and/or participated in an early intervention program by the age of one-year, oral language skills were delayed for almost half of the participants regardless of socioeconomic status.

Much of the literature states that students who are DHH -across all degrees of hearing loss- have reduced vocabulary knowledge compared to hearing peers (Luckner & Cooke, 2010) due to more limited opportunities for passive exposure to words (Walde, 2015). Passive exposure affords multiple opportunities for children to learn new vocabulary. Limited exposure to new words due to the inability to hear those words can

ultimately have a negative impact on reading comprehension (Coppens, Tellings, Verhoeven, & Schreuder, 2013). Not only have students who are DHH been found to be delayed in the acquisition of vocabulary knowledge, they also acquire new words at a slower rate and have a narrower range of contexts that result in word learning (Cole & Flexer, 2007; Easterbrooks & Estes, 2007; Lederberg, 2003; Lederberg & Spencer, 2001; Marschark & Wauters, 2008; Paul, 2009; Rose, McAnally & Quigley, 2004; Schirmer, 2000; Trezek, Wang, & Paul, 2010).

Another manner in which to conceptualize a student's prior oral language, vocabulary, and general knowledge obtained through explicit education and early experiences in the home setting is through the theory of crystallized intelligence. Flanagan, Ortiz, and Alfonso (2013) underscore the direct relationship between reading achievement and certain cognitive abilities and processing, such as crystallized intelligence (Gc). Crystallized intelligence is formally defined as "the breadth and depth of knowledge and skills that are valued by one's culture that are developed through formal education as well as general learning experiences," (Flanagan, Ortiz, & Alfonso, 2013, pg 621). Crystallized intelligence deficits are directly associated with difficulties in vocabulary acquisition, using prior knowledge to support learning, understanding fact-based or informational questions, decoding, and reading comprehension (Flanagan, Ortiz, & Alfonso, 2013). As stated previously, students who are deaf miss vital information due to fewer chances for incidental learning in such general learning experiences (Walde, 2015). These opportunities for incidental learning do not occur solely in the formal education setting; they are ongoing from birth. Incidental learning, especially in regards to vocabulary acquisition, can occur when an infant or toddler is exposed to

conversations between the adults in his or her life.

Fluency is the ability to recognize words easily, read with greater speed, accuracy, and expression, and to better understand what is being read (National Reading Panel, 2000). Fluency focuses on three aspects: a) speed- the number of words read within a time period, b) accuracy- the amount of correctly read words and phrases, and c) expression- the phrasing, intonation, attention to punctuation (Bursuck & Damer, 2011; Easterbrooks, 2010; National Institute of Child Health and Human Development, 2000). Welsch (2007) described fluency as “a bridge between word recognition and comprehension”. Reading fluency is also strongly associated with reading comprehension according to research (Rasinski, Rikli, & Johnston, 2009). Reading fluency is tied to reading comprehension due to working memory. Working memory holds information in immediate awareness to make connections to current input while concurrently maintaining the overall theme of the text (Swanson & O’Connor, 2009).

Students who have fluency issues tend to read text laboriously as well as spend large amounts of time and cognitive resources focused on lower level skills such as decoding and word recognition, which impedes their reading comprehension (Kelly, 2003; Perfetti, 1985). Repeated reading is a strategy used to increase reading fluency in which a student reads a small passage aloud to an adult. When the student struggles with a word or hesitates, the adult provides the word or definition. The student then re-reads the passage multiple times until they successfully read it correctly. One study found that the repeated reading strategy was effective with students who are DHH to improve their reading fluency (Schirmer, Therrien, Schaffer, & Schirmer, 2009), but another study found that this didn’t translate over to gains in reading comprehension in this population

(Bryant, Vaugh, Linan-Thompson, Ugel, Hamff, & Hougen, 2000; Freeland, Skinner, Jackson, McDaniel & Smith, 2000; Vaugh, Chard, Bryant, Coleman & Kouzekanani, 2000). This has been stated, but there is not a plethora of research to evaluate reading fluency in students who are deaf and hard of hearing. Luckner and Urbach (2012) conducted a synthesis study on reading fluency in this population and found that only six peer-reviewed studies were conducted over the course of thirty-nine years.

Reading comprehension involves understanding of text (National Reading Panel, 2000). Overall, general wide-spread prior knowledge is necessary for any student to master reading comprehension, but most hearing students acquire these skills incidentally while students who are DHH need more explicit instruction (Borgna, Convertino, Marschark, Morrison, & Rizzolo, 2011). The National Reading Panel has stated that good readers have the ability to activate prior knowledge: constantly evaluate their reading goals: formulate predictions and make inferences: and read selectively (2000). Both fluency and reading comprehension are considered to be higher-level skills which rely on an individual's prior knowledge of phonics, phonemic awareness, and vocabulary. With this being said, researchers have stated that the reason students who are DHH struggle with these higher-level skills is because they are still struggling to grasp the lower-level requisites such as phonics and vocabulary (Banner & Wang, 2011; Moores & Martin, 2006).

Reading Meta Studies and Synthesis Research for Students who are DHH

In addition to reviewing the research on the five essential elements of reading individually, it is noteworthy to describe the extant meta-analyses and synthesis studies, as these contributions can concisely summarize the reading research for individuals who

are DHH. Eleven such synthesis studies are outlined in Table A1 in Appendix A. These 11 studies encompass scholarly works from 1963-2015 and include nine actual meta-analyses and two other synthesis studies including qualitative reviews of the literature and content analyses.

Collectively, several themes emerge from the eleven scholarly contributions with a DHH focus, in general, and a reading focus in particular. The first theme is “sparseness” or shortages (Andrews & Wang, 2015; Luckner & Cooke, 2010; Luckner & Handley, 2008; Luckner, Sebald, Cooney, Young, & Muir, 2006; Strassman, 1997). Although vocabulary is the most researched area for those who are DHH, a paucity of evidenced-based studies exists across all areas of reading, including vocabulary. For example, Luckner & Cooke (2010) conducted a meta-analysis of peer-reviewed vocabulary research in DHH populations that was published in the *American Annals of the Deaf*. The criteria for inclusion in the meta-analysis required: 1) the articles be published in a peer-reviewed journal outlet between 1967 and 2008; 2) participants be identified as students who were deaf or hard of hearing between three and 21 years of age; and 3) the research topic directly address vocabulary (Luckner & Cooke, 2010). Using the aforementioned criteria, the authors identified only 41 articles for study inclusion. Some of the limitations revealed through this meta-analysis were that many of the studies did not have a reading intervention, were descriptive in nature, and were causal-comparative in nature (Luckner & Cooke, 2010). Overall, Luckner and Cook purported the shortage of research prohibited the establishment of evidence-based vocabulary practices in deaf education (Luckner & Cooke, 2010). Another study stated that the interventions used consistently to teach students who are DHH have little to no

evidence to support their efficacy due to a lack of empirical studies (Luckner et al., 2006).

The second pervasive and related theme or limitation in research for individuals who are DHH is small sample size (Moore, Anderson, Ayers, Krantz, Lafferty, Locke, & Weide, 2008; Luckner, Sebald, Cooney, Young, & Muir, 2006; Luckner & Urbach, 2010). Moore and colleagues (2008) examined issues and trends in the American Annals of the Deaf Publications by analyzing the content of all articles from 2001 through 2007. The authors coded the publication content according to the broad categories which span beyond the scope of literacy: Instruction, Teacher/Professional Characteristics, Teacher Preparation, Social/Social-Emotional, Health and Medical, Vocational, and Cultural (Moore, Anderson, Ayers, Krantz, Lafferty, Locke, & Weide, 2008). The Instruction category was subsequently subdivided into the areas of Literacy, Communication, Academic Placement, and Technology, Academic Content and Related Academic Content, and Student Characteristics of Parents/Families (Moore et al., 2008). The review study indicated many articles over the eight-year period had relatively few participants due to the low incidence nature of the disability (Moore et al., 2008). In fact, Moore et al. maintained that sample sizes served as a barrier to determining evidence-based best practices (2008). Another study also showed within their meta-analysis that the most frequently cited difficulties within the studies were the low-incidence nature of this population as well as the difficulty that surrounded random assignment to form treatment and control groups (Luckner et al., 2006). An example of this limitation was specifically discussed in another meta-analysis investigating fluency research in DHH population. It stated that one of the six studies they examined needed to

be replicated with a larger group of students from educationally diverse backgrounds as the original study utilized 29 students from the same school (Luckner & Urback, 2010). This article also stated within the discussion of its limitations how small sample sizes were a problem overall (Luckner & Cooke, 2010).

Other methodological weaknesses including the number of poorly designed studies, the lack of common measures and replication, and the overall lack of strong evidence for effective instructional strategies (Moore, Anderson, Ayers, Krantz, Lafferty, Locke, Huntley Smith, & Vander Weide, 2008; Luckner & Cooke, 2010; Luckner et al., 2006; Wang & Williams, 2014). The Luckner and Cooke study stated that there were five articles out of the 41 (12%) that were case studies that could not be replicated and the rest of the studies were a scattering of correlational, single-subject case studies and within-student multiple baseline studies (2010). A separate meta-analysis also discussed how none of the studies within its meta-analysis contained replications of previous research, as well as, how many studies contained insufficient information about the characteristics of its participants (age breakdown, gender breakdown, and degree of hearing loss) (Luckner et al., 2006). Another study explained that seemingly contradictory results were due to the lack of operational definitions of interventions and their measurements and not about the effectiveness of the intervention itself (Wang & Williams, 2014).

Many of the studies focused around various case study designs due to the lack of participants. One study found that 48% of the dissertations it examined were qualitative in nature and 22% were qualitative case studies (Andrews, Bryne, & Clark, 2015). Another study, although the authors did not explicitly discuss the issues surrounding

various research designs within their results, did report that 15% of the articles they reviewed were case study designs with multiple being one-shot case study designs (Luckner & Handley, 2008). Luckner and Urbach stated in their research that causal-comparative and correlational designs did not permit strong conclusions about cause-and-effect relationships, yet two of the six studies they examined in their meta-analysis fit this criteria (2010). These methods are frequently used within the research of DHH populations as shown in this current study, yet they do not provide the ability to generalize any of the findings to the overall population of people who are DHH.

Effective-based instruction strategies and interventions were also a common theme throughout this compilation of articles. Multiple articles stated that many of the instruction strategies and interventions were not deemed “evidence-based” and that many studies did not examine interventions (Luckner & Cooke, 2010; Luckner & Handley, 2008; Luckner et al., 2006; and Luckner & Urbach, 2012). The Luckner and Cooke article stated that 76% of the studies in their meta-analysis did not have an intervention and of the ones that did, only two studies showed a positive intervention outcome (2010). Another stated that after a review of 40 years of literature, it is suggested that the field of deaf education does not have what the U.S. Department of Education (2003, pp. 10-11) refers to as “strong evidence of effectiveness” or even “possible evidence of effectiveness” about any specific educational intervention for promoting literacy in students who are DHH (Luckner & Handley, 2008; Luckner et. al., 2012).

Bibliometric Citation Analysis

Although several meta-analysis and content type reviews exist, no bibliometric citation analyses were identified in the peer-reviewed literature when examining all meta-

analysis and synthesis studies. Hawkins described bibliometrics as the application of quantitative analysis in the bibliographical references of a body of literature (1977). Lancaster has described it as the study of patterns of authorship, publication, and literature use by applying statistical analyses (1977). Others have described it as “the scientific study of recorded discourse” (Shrader, 1981). The most in-depth definition of bibliometrics was cited in Osareh (1996). Rasig originally stated that:

Rasig (1962) originally stated that the demonstration of historical movements, the determination of national and universal research use of books and journals, and the ascertainment in many local situations of the general use of books and journals is possible by the assembling and interpretation of statistics relating to those books and periodicals (pg. 151).

Regardless of which specific definition is used to describe bibliometric analysis, the main reason for this type of research is to improve scientific documentation, information, and activities by the quantitative analysis of library collections and services (Osareh, 1996). Bibliometric techniques enable researchers to evaluate scholarly works and examine the contribution of studies on future works (Soper, Osborne, & Zwezig, 1990). Ranking publications according to importance, identifying core literature, tracing the diffusion of ideas, measuring the impact of publications, studying the relationships between subjects, investigating the structure of knowledge, and improving bibliographic control are possible by using bibliometric techniques (Soper, Osborne, & Zwezig, 1990).

Citation analysis, a component of bibliometrics, was originally targeted towards identifying the quality and quantity of an author’s research by measuring the number of times a work was cited. (Garfield, 1979). Citation analysis can play a significant role in

the tenure review process, assessment of core journal titles in certain disciplines, and the relationships between authors from different institutions and schools of thought (University of Wisconsin- Madison Libraries).

Citation analysis, more specifically, is an analytical tool, which uses reference citations of scientific papers (Garfield, Malin, & Small, 1978) and is characterized by its objective ability to highlight how information moves within and between a scientific discipline (Kwak, 2002). Citation analysis involves determining how often a journal, journal article, book, book chapter, or other publication is referenced in subsequent publications (Kwak, 2002). This analysis focuses on the quantitative assessment of citation patterns in a body of literature (Holden, Rosenburg, & Barker, 2005). It applies various techniques dealing with research, such as citation counting for evaluating scientific publications, bibliographic coupling and co-citation analysis for studying the development of science in a specific field (Lord, 1984). This type of analysis also deals with the links among citations (i.e. who cites whom, which journal is cited by other journals, what subjects are cited more in the literature of a specific discipline) (Lancaster, 1991).

Citation analysis can focus on the documents themselves, their authors, the journals (either as cited or citing the source of the publication), and countries as the producers of those documents (Osareh, 1996). Lastly, it can be used to define disciplines and emerging specialties through the relationship with other journals and to determine the inter- or multidisciplinary character of research programs and projects (Osareh, 1996).

Citation Analyses, Deaf Studies, and Special Education

As stated above, the search for meta-analyses and synthesis studies revealed no citation analyses in the literature. When additional searches using the terms “deaf education” and “citation analysis” were employed between Academic Search Premier, ERIC, PsychINFO, and PsychArticles, the search engines rendered no results. Other searches of “deaf education” and “bibliometrics” and “deaf”, “education”, and “citation analysis” similarly produced no results. A search of these same databases for “special education” and “citation analysis” yielded sixteen peer-reviewed results, with only fourteen directly relating to citation analysis.

Within these fourteen articles, citation analysis was generally used to examine the impact factor of certain articles and journals. More specifically, citation analysis was used to assess the recency of information cited in introductory special education textbooks (Hospodka, Sediak, & Sabatino, 1985); rank of special education doctoral programs based on citations (Sindelar & Schloss, 1987); reveal the characteristics of prominent articles in special education (Swanson, 1988); and understand which disciplines were contributing to the field (Wray, 2011). It was also used to analyze early childhood articles (Pool, Macy, McManus, & Noh, 2008); the scholarly contributions to *School Psychology International* (Jennings, Ehrhardt, & Poling, 2008); Thomas Kuhn’s writing (Loving & Cobern, 2000); formal communication in school psychology (Frisby, 1998); the relationships between special education journals (Narin & Garside, 1972); and evidence-based interventions for students with challenging behavior in school settings (Thompson, 2011). This exhaustive search shows to date no formal citation analyses exist in the field of deaf education, let alone, on the subject of reading in deaf education.

Purpose of the Present Study

Research Question 1: What percentage of these articles published in the American Annals of the Deaf and The Journal of Deaf Studies and Deaf Education between the years 2011 and 2015 are devoted to reading overall?

Research Question 2: Of those articles devoted to reading, what percentage focuses on general reading, phonics, phonemic awareness, vocabulary, reading comprehension, fluency, or two or more of these areas?

Research Question 3: In regards to articles devoted to reading in deaf education, which are the most frequently cited first authors, what are the most frequently cited journals, and what are the most frequently-cited articles?

Research Question 4: What is the extent to which the major reading journals influence the literature in deaf education related to The American Annals of the Deaf and The Journal of Deaf Studies and Deaf Education?

Research Question 5: What is the recency of the citations for the reading articles in the American Annals of the Deaf and The Journal of Deaf Studies and Deaf Education?



CHAPTER 2

METHOD

Scholarly Outlets with a DHH Focus

An array of peer reviewed journals exist today to extend the research base for individuals who are deaf and hard of hearing such as The Journal for Professionals Networking for Excellence in Service Delivery with Individuals who are Deaf and Hard of Hearing, Deafness and Education International; The Journal of the British Association of Teachers of the Deaf; Journal of Rehabilitation of the Deaf; Deafness and Education International; Sign Language Studies; Journal of Communication Disorders; and Deaf Studies, & Hearing Aids.

Although many contemporary outlets exist, there are two flagship journals with a focus on children and adults who are deaf or hard of hearing: The American Annals of the Deaf and Journal of Deaf Studies and Deaf Education (L. Edington, personal communication, April 14, 2016). The American Annals of the Deaf was first published in 1847 and is the oldest and most widely read journal dealing with deafness and the education of deaf individuals (American Annals of the Deaf, n.d.). It focuses primarily on the education of deaf students as well as information for educational professionals who work with these students (American Annals of the Deaf, n.d.). This journal is the official journal of the Council of American Instructors of the Deaf (CAID) and the Conference of Educational Administrators of Schools and Programs for the Deaf (CEASD) and currently holds an impact factor of .88 (Research Gate, 2015).

The second journal utilized, the Journal of Deaf Studies and Deaf Education, states that it “is a peer-reviewed scholarly journal integrating and coordinating basic and

applied research relating to individuals who are deaf, including cultural, developmental, linguistic, and education topics” (Journal of Deaf Studies and Deaf Education, n.d.). This journal’s inception was 1996 and boasts a five-year impact factor of 2.227 (Journal of Deaf Studies and Deaf Education, n.d.).

The purpose of this research is to describe authorship patterns, percentage of articles related to reading, seminal articles in the field of reading education with deaf students, the age of seminal research, authors/articles who are becoming influential in this field, and how other disciplines are influencing this field of study. The properties of interest were author identifying information, year of the publication, name of the publishing journal, publisher (for books), and whether the content of the article related to reading. Most such data were accessed via EBSCOhost Research Databases (EBSCOhost Industries, Ipswich, MA). Some articles were also requested electronically via Interlibrary Loan through Marshall University.

Research Question 1: What percentage of the articles published between the years 2011 and 2015 are devoted to reading overall? To answer this question, all articles from the 2011-2015 time period from both journals were obtained. Any editorials, book reviews, or any other content not related to empirical manuscripts were omitted from this study. All of the journal articles’ titles were scanned for the word “reading” and their abstracts were examined for any content related to reading in deaf and hard of hearing students. Every article’s name was then coded into Microsoft Excel to give it an alphanumerical designation. To obtain the percentage of articles related to reading, the author reviewed the content of the abstract and coded the article as either “reading” or

“non-reading.” These numbers were then totaled and compared to the total number of articles in each journal.

Research Question 2: Of those articles devoted to reading, what percentage focuses on general reading (none of the five essentials of reading were mentioned with the study), phonics, phonemic awareness, vocabulary, reading comprehension, fluency, or two or more of these areas? To determine this, the abstracts of each article related to reading in *The American Annals of the Deaf* and *The Journal of Deaf Studies and Deaf Education* between the years 2011-2015 were examined. During this examination, the author determined if the article’s focus was on any of the five areas of reading (phonics, phonemic awareness, vocabulary, reading comprehension, fluency). If the article did relate to any of those areas, it was coded to reflect that. If the article did not mention any of the five areas of reading, it was coded as being related to “general reading.” If the article focused on two or more of the five areas of reading, then it was coded as such.

Research Question 3: In regards to articles devoted to reading in deaf education, who are the most frequently cited authors, what are the most frequently cited journals, and what are the most frequently cited articles? A sort function was performed by author or editor name, and a frequency table was generated. A sort function was performed by journal name, and a frequency table was generated. For the most frequently cited articles, a sort function was also performed by article title, and a frequency table was generated. The ten authors most frequently referenced in both journals, the ten most frequently referenced journals, and the ten most frequently cited articles were listed within these tables. Finally, all journal articles published from 2011-2015 were searched to determine the total number of publications generated by the most frequently referenced authors.

Research Question 4: Which of the major reading journals influence the literature in deaf education related to reading? Again, simple descriptive statistics were utilized and a sort function was employed to sort the citations by their publishing journals. Only the citations that included the major reading journals were used and a frequency table was generated to show which journals were utilized the most. Marshall University's library services were utilized to determine the top ten major reading journals in the field. Those journals were Reading Teacher, Reading Research Quarterly, Reading Research and Instruction, Reading and Writing, Journal of Research in Reading, Journal of Reading Education, Journal of Reading Behavior, Journal of Reading, Journal of Adolescent and Adult Literacy, and Australian Journal of Language and Literacy (L. Edington, personal communication, April 8, 2016).

Research Question 5: In regards to articles devoted to reading in deaf education, what were the most frequently cited publication years? A sort function was performed by publication year to show in what years was the most research published and a frequency table was generated.

CHAPTER 3

RESULTS

During the time period examined, 257 empirical manuscripts were published within the American Annals of the Deaf and The Journal of Deaf Studies and Deaf Education. Of these published, 75 (29%) were in some way related to reading, which means the author reviewed the articles' titles and abstracts looking specifically for content related to reading.

Table 1

The Total Amount of Articles Related to Reading

Category	Amount	Percentage Overall
Related to Reading	75	29%
Not Related to Reading	182	71%

The abstracts of these 75 articles were then examined more in depth in order to categorize them into the five essentials of reading as determined by the National Reading Panel (2000) as well as two additional categories for articles generally related to reading or articles targeting two or more essential areas of reading. There were 31 articles (41%) in the Generally Related to Reading (i.e., any one of the five essential areas of reading was not explicitly stated) category. The next highest category involved two or more of the essential areas of reading with 22 (29%) articles, whereas the third highest category was phonics with 11 (14%) articles. For the remaining articles, 9 (12%) addressed solely vocabulary, 2 (2%) were specific to reading comprehension, and 0 (0%) were related to fluency or phonemic awareness.

Table 2

The Amount of Reading-Related Articles Focusing on the Five Essentials of Reading

Category	Frequency	Rank	Percentage
Generally related to reading (<i>none of the five essentials of reading was mentioned in the article</i>)	31	1	41%
Related to two or more essential areas	22	2	29%
Phonics	11	3	14%
Vocabulary	9	4	12%
Reading Comprehension	2	5	2%
Fluency	0		0%
Phonemic Awareness	0		0%

The 75 articles rendered 4,042 citations for the purpose of the analysis. When analyzed collectively, the 4,042 citations yielded the 10 most frequently cited first author counts, as outlined in Table 3. The first most frequently cited first author was Peter V. Paul of The Ohio State University. Paul is an editor of *The American Annals of the Deaf*. The second most frequently cited first author was Paul Miller, a researcher and lecturer at the University of Haifa in Israel. The third most frequently cited first author was Beverly Trezek of DePaul University who is on the Editorial Board for *American Annals of the Deaf* and is an Associate Editor at *Journal of Deaf Studies and Deaf Education*. Collectively, the 75 articles cited these ten authors 566 times, accounting for 14% of all citations.

Table 3

The Top Ten Most Frequently Cited First Authors

Author Name	Frequency	Rank
Paul, P (P.V.)	71	1
Miller, P	65	2
Trezek, B (B.J)	59	3
Mayer, C	44	4
Marschark, M	42	5
Allen, T (T.E.)	41	6

Geers, A (A.E.)	38	7
Harris, M	37	8
Easterbrooks, S (S.R.)	34	9
Kyle, F (F.E.)	34	9
Luckner, J (J.L.)	34	9
Perfetti, C (C.A.)	34	9
Wang, Y	33	10

The next research question went further in analyzing the top ten most frequently cited authors. This part focused on the top ten most frequently cited authors regardless of their authorship rank in an article. The most frequently cited author regardless of authorship rank continued to be Peter V. Paul of The Ohio State University. The second most frequently cited author was Ye Wang of Teachers College, Columbia University and the Senior Associate Editor of the American Annals of the Deaf. The third most frequently cited author was Beverley Trezek of DePaul University.

Table 4

The Top Ten Most Frequently Cited Author, Any Authorship Order

Author Name	Frequency	Rank
Paul, P (P.V.)	129	1
Wang, Y	110	2
Trezek, B (B.J)	103	3
Mayberry, R.I.	91	4
Miller, P	87	5
Harris, M	83	6
Easterbrooks, S (S.R.)	75	7
Lederberg, A. R.	71	8
Luckner, J (J.L.)	67	9
Marschark, M.	64	10

The next research question was related to the most frequently cited journals within the field of reading development in DHH populations. The most frequently cited journal was the Journal of Deaf Studies and Deaf Education with 463 citations and the

second most frequently cited journal was the American Annals of the Deaf with 265 citations. The third most frequently cited journal was the Journal of Educational Psychology with 82 citations. For the rest of the journals, two were related to speech and language, three were related to general reading education, one was related to psycholinguistics, and one was not a journal at all, as Unpublished Doctoral Dissertations ranked eighth. The 10 most cited journals yielded 1,239 citations in all, cumulatively representing one-third of all citations from the 75 articles.

Table 5

The Ten Most Frequently Cited Journals

Journal Name	Frequency	Rank
Journal of Deaf Studies and Deaf Education	463	1
American Annals of the Deaf	265	2
Journal of Educational Psychology	82	3
Journal of Speech, Language, and Hearing Research	73	4
Ear and Hearing	70	5
Volta Review	65	6
Reading and Writing	58	7
Unpublished Doctoral Dissertations*	57	8
Applied Psycholinguistics	54	9
Reading Research Quarterly	52	10

Note: Unpublished Doctoral Dissertations is not a peer-reviewed journal.

The next part of this research question was related to the most frequently cited journal articles. Table 6 illustrates the most frequently cited articles identified from the analysis of the 4,042 citations.

Table 6

The Top Ten Most Frequently Cited Journal Articles

Article Title and Author	Frequency	Rank
The Role of Phonology and Phonological Skills in Reading Instruction for Student who are Deaf and Hard of Hearing (Wang, Trezek, Luckner, and Paul, 2008)	21	1

The Stanford Achievement Test (9 th Edition) National Norming and Performance Standards for Deaf and Hard-of-Hearing Students (Traxler, 2000)	21	1
Reading Achievement in Relation to Phonological Coding and Awareness in Deaf Readers: A Meta-Analysis (Mayberry, del Giudice, Liebermann, 2011)	20	2
Concurrent Correlates and Predictors of Reading and Spelling Achievement in Deaf and Hearing School Children (Kyle & Harris, 2006)	15	3
Reading Optimally Builds on Spoken Language: Implications of Deaf Readers (Perfetti & Sandak, 2000)	15	3
The Efficacy of Utilizing a Phonics Treatment Package with Middle School Deaf and Hard-of-Hearing Students (Trezek & Malmgren, 2005)	15	3
Grapheme-Phoneme Acquisition of Deaf Preschoolers (Beal-Alveraz, Lederberg, Easterbrooks, 2012)	14	4
Phonology and Reading: A Response to Wang, Trezek, Luckner, & Paul, (Allen, Clark, del Giudice, Koo, Lieberman, Mayberry, & Miller, 2009)	14	4
Phonology is Necessary but Not Sufficient: A Rejoinder (Paul, Wang, Trezek, & Luckner, 2009)	14	4
Using Visual Phonics to Supplement Beginning Reading Instruction for Students who are Deaf and Hard-of-Hearing (Trezek, Wang, Woods, Gampp, & Paul, 2007)	14	4
Implication of Utilizing a Phonics-based Reading Curriculum with Children who are Deaf and Hard of Hearing (Trezek & Wang, 2006)	12	5
A Summary of Vocabulary Research with Students who are Deaf and Hard of Hearing (Luckner & Cooke, 2010)	11	6
Building the Alphabetic Principle in Young Children who are Deaf and Hard of Hearing (Bergeron, Lederberg, Easterbrooks, Miller, & Connor, 2009)	11	6
Further Evidence of the Effectiveness of Phonological Instruction with Oral-Deaf Readers (Guardino, Syverud, Joyner, Nicois, &	11	6

King, 2011)

Large-Scale Academic Achievement Testing of Deaf and Hard-of-Hearing Students: Past, Present, and Future (Qi & Mitchell, 2012)	11	6
An Examination of the Evidence-based Literacy Research in Deaf Education (Luckner, Sebald, Cooney, & Young, 2005)	10	7
How do Profoundly Deaf Children Learn to Read? (Goldin-Meadow & Mayberry, 2001)	10	7
Longitudinal Patterns of Emerging Literacy in Beginning Deaf and Hearing Readers (Kyle & Harris, 2011)	10	7
Predictors of Reading Delay in Deaf Adolescents: The Relative Contributions of Rapid Automatized Naming Speed (Dyer, MacSweeney, Szczerbinski, Green, & Campbell, 2003)	10	7
Teaching Reading to Children who are Deaf: Do the Conclusions of the National Reading Panel Apply? (Schirmer & McGough, 2005)	10	7
Emergent Literacy Skills During Early Childhood in Children with Hearing Loss: Strengths and Weaknesses (Easterbrooks, Lederberg, Miller, Bergeron, & Connor, 2008)	9	8
Relation Between Deaf Children's Phonological Skills in Kindergarten and Word Recognition Performance in First Grade (Colin, Magnan, Ecalle, & Leybaert, 2007)	9	8
Teaching Phonological Skills to a Deaf Reader: A Promising Strategy (Syverud, Guardino, Seiznick, 2009)	9	8
Phonemic Awareness is not Necessary to Become a Skilled Reader (Miller & Clark, 2011)	8	9
Phonological Awareness, Reading Skills, and Vocabulary Knowledge in Children who use Cochlear Implants (Dillon, de Jong, & Pisoni, 2012)	8	9
Phonological Representation in Deaf Children: Rethinking the "Functional Equivalence" Hypothesis (MacQuarrie & Parrilla, 2008)	8	9
The Contribution of Phonological Awareness and Receptive and	8	9

Expressive English to the Reading Ability of Deaf Students with Varying Degrees of Exposure to Accurate English (Luetke-Stahlman & Nielsen, 2003)		
What Really Matters in the Early Literacy Development of Deaf Children (Mayer, 2007)	8	9
Current State of Knowledge: Language and Literacy of Children with Hearing Impairment (Moeller, Tomblin, Yoshinaga-Itano, Connor, & Jerger, 2007)	7	10
How Psychological Science Informs the Teaching of Reading (Rayner, Foormna, Perfetti, Pesetsky, & Seidenbery, 2001)	7	10
Phonological Awareness and Decoding in Deaf/Hard-of-Hearing Students Who Use Visual Phonics (Narr, 2008)	7	10
Phonological Coding in Word Reading: Evidence of Deaf and Hearing Readers (Hanson & Fowler, 1987)	7	10
Predictors of Reading Skill Development in Children with Early Cochlear Implantation (Geers, 2003)	7	10

The top two journals related to general reading education also appeared on the top ten most frequently cited journal list. The two journals were Reading and Writing with 58 citations and Reading Research Quarterly with 52 citations. All other top reading journals aside from the Journal of Research in Reading demonstrated little influence in the American Annals of the Deaf and the Journal of Deaf Studies and Deaf Education reading specific articles. Cumulatively, the top ten reading journals accounted for only 3.5% (140 of 4,042) of the total citations.

Table 7

The Influence of the Top Ten Journals in Reading Education

Journal Name	Frequency	Rank
Reading and Writing	58	1
Reading Research Quarterly	52	2
Journal of Research in Reading	20	3

Reading Teacher	6	4
Journal of Reading Behavior	3	5
Journal of Reading	1	6
Australian Journal of Language and Literacy	0	
Journal of Adolescent and Adult Literacy	0	
Journal of Reading Education	0	
Reading Research and Instruction	0	

The last part of this research question was related to the most cited publication year. This shows the top ten years in which the most research related to reading in DHH populations has been published within the two journals. The year in which the most articles in this field were published was 2010, in which 242 articles were published. The second most cited publication year was 2011 with 224 articles, and the third was 2000 with 219 articles. The research being cited in this field is current with approximately 50% of the citations sourced from the years illustrated in Table 7 alone.

Table 8

The Top Ten Most Cited Publication Year

Publication Year	Frequency	Rank
2010	242	1
2011	224	2
2000	219	3
2008	207	4
2005	196	5
2009	194	6
2006	192	7
2003	179	8
2001	169	9
2007	166	10

CHAPTER 4

DISCUSSION

Articles Related to Reading

Of the 75 articles meeting the study criteria, only twenty-two (29%) focused on the individual areas of reading. Although 29% may seem like a fairly low number, these journals examine a broad spectrum of issues affecting the DHH community such as technology, autism, captioning, employment, and culture (American Annals of the Deaf, n.d.). There were no studies examining phonemic awareness or fluency alone. This is consistent with other research studies, which noted the lack of research in this area (Wang, Spsychala, Harris, & Oetting, 2013). This finding is not surprising though. Phonemic awareness relies heavily on knowledge of sounds and it is a controversial topic within the field as stated previously in the literature review (Kyle & Harris, 2010, Mayberry, del Giudice, & Lieberman, 2011, McQuarrie & Parrila 2009; Miller, 2010; Miller, 2011; Narr, 2008). The lack of research solely in this area shows the research may have been included in a study where two or more essentials were examined or it could show how little research is being conducted in this area. Fluency is considered to be a higher-level skill that builds upon lower level skills such as vocabulary, phonics, and phonemic awareness (Kelly, 2003; Perfetti, 1985). Although this study doesn't attempt to understand why numerous fluency studies aren't available, fluency is most often measured using oral reading fluency tasks- a task sometimes deemed inappropriate for students who are DHH.

The overall finding of the current study is consistent with what many articles stated previously: there is a need for more research (Andrews & Wang, 2015; Luckner &

Cooke, 2010; Luckner & Handley, 2008; Luckner, Sebald, Cooney, Young, & Muir, 2006; Strassman, 1997). Specifically, the research needs to focus more on the individual essentials of reading instead of reading in general or in multiple areas. Even if a more wholistic or balanced literacy approach is more appropriate for children who are DHH, study of the individual areas can help to confirm this hypothesis. In researching the individual essentials more, specifically those essentials and interventions related to them, research could begin to give the field of deaf education more information on how to direct reading instruction based upon evidence. Although the DHH literature has a paucity of evidence-based reading intervention, this concern is not unique to the DHH population, but rather common across the field of education in general (Miller, 1999).

Most Frequently Cited Authors

This research question analyzed who were the top ten most frequently cited first authors. Examination of this set of authors showed that much of the research in the field of reading in DHH populations is produced by the same core set of authors, which shows the insularity of this field. The combined total of the citations produced by the top ten most frequently cited first authors are almost 15% of all of the citations gathered for this study. The final contribution of this core set of authors from all authorship placements accounts for almost 22% of the overall citations. It is also noted that six of the top first authors are either editors or on the editorial board of the *American Annals of the Deaf*. Another four authors were either editors or on the editorial board of *Journal of Deaf Studies and Deaf Education*, with a few authors working for both publications. Similar connections to the journals were seen upon investigating the top ten authors regardless of authorship ranking although it is unknown as to whether this is the norm for other fields

as well. Although these researchers have made incredible contributions to the field of reading development in DHH populations, this same group of authors has been making some of the biggest contributions for the past decade. It does not seem that there are many new contributors coming into this field.

Another interesting aspect within the most frequently cited authors were that there were few authors cited that focused purely on general reading research. Even after examining the entire list of authors (not just the top ten), it is noted that there were very few general reading researchers. This also confirms the highly insular nature of this field, as the researchers within it are not branching out to the general reading field often.

The Most Frequently Cited Journals

The analysis for this research question showed an interesting trend. The two most frequently cited journals were *The Journal of Deaf Studies and Deaf Education* and the *American Annals of the Deaf*. There was a striking contrast between how many times those two journals were cited and the rest of the journals (463 and 265 times in comparison to a range of 52 to 83 times). There is a high amount of self-citation happening within the field of deaf education, which shows the high level of insularity in the field. This is an insular area of research requiring a high level of specialization, so there is some self-citation to be expected. Although it is a highly provincial field, interdisciplinary collaboration was evident; speech-language pathology, educational psychology, and general reading and psycholinguistics were positioned among the top ten most frequently cited journals with respect to the 75 reading articles. Moreover, many other less influential journals specific to the two flagship deaf and hard of hearing

journals were cited from the fields of education, special education, psychology, child psychology, and literacy.

There was also one ranking within this area which was not a peer-reviewed journal. This ranking was Unpublished Doctoral Dissertations. It was decided that this would be kept in the ranking as it was deemed interesting that so many studies in this field were citing Unpublished Doctoral Dissertations. There was one study within the research that looked solely at unpublished research, but it is unknown as to whether that study was the reasoning for this inflated ranking or not.

The Most Frequently Cited Articles

Examination of the most frequently cited articles shows that there seems to be a trend related to phonology and phonological awareness. Many of these articles, as well as the first ranked most frequently cited article, were related to phonology. Although this is considered somewhat of a controversial topic in the field of deaf education (Wang et al., 2013), there is a trend in the research to determine if or how this area may be beneficial to this population of students. This trend is also interesting since few articles within the American Annals of the Deaf and the Journal of Deaf Studies and Deaf Education focus on this area, yet articles related to phonics and phonological awareness are the most frequently cited among the 75 articles related to reading. There is not much research being published, but it seems to be a very popular and highly discussed topic within the field.

The Influence of the Top Ten Most Influential Journals in Reading Education

This study also investigated how often the most influential reading journals were cited in American Annals of the Deaf and Journal of Deaf Studies and Deaf Education to

understand how the field of deaf education incorporates scholarly works from the major reading outlets. Findings suggest two peer-reviewed reading journals in the top ten ranking (L. Edington, personal communication, April 14, 2016) that were also considered to be influential in their respective fields. Findings suggest two peer-reviewed reading journals- Reading and Writing and Reading Research Quarterly- were among the top most frequently cited journals from the DHH reading articles. The Journal of Research in Reading, moreover, had 20 citations and was considered the third most cited of the top ten influential reading journals. Although these scholarly outlets were cited more often than the other reading journals, the total number of citations was quite small in comparison to the other most frequently cited journals among the DHH literature analyzed. Furthermore, the remaining prominent reading journals received six or fewer citations and four reading journals were never cited in the 75 DHH articles related to reading. Overall, this area of deaf education does not frequently use scholarly contributions from the majority of the most influential reading journals outlets. Consequently, the authors of DHH reading articles may benefit from heightened cross-disciplinary collaboration with these influential reading journals, as some valuable ideas, methodology, and evidenced-based practices may be currently under-utilized.

Most Frequently Cited Publication Year

Although the author hypothesized the majority of the citations would be significantly dated, the results illustrate the DHH authors are generally citing contemporary works. This finding suggests a positive trend in that the DHH sources are current and generally within 10 years from the publication date. At the beginning of this study, the author thought that most of the research being cited was dated as there were

many citations from the 1960s in current articles. Analysis of this showed that all of the most cited publication years were from the year 2001 to 2011.

Although this is more recent than what the author originally assumed for the most frequently cited publication years, some of these citations were up to 15 years old at the time of this study. This is somewhat dated, but it is unknown as to why research this dated continues to be cited so frequently. The year 2001 may have included a seminal work or classic paper that is of central importance to reading development in students who are DHH. Questions for future research include the following: Was there a good deal of research conducted during that year this is now considered to be seminal? Or is there just so little research that the researchers feel they must go back this far in order to obtain the information needed? Also, are these studies from 2001 being updated and replaced?

In conclusion, the analysis of the citations and content of these two journals points to a field that is highly insular. This was shown through frequent citation of a core group of authors who are also involved in the editing of the journals, as well as frequent citation of these two journals themselves within the empirical studies that it publishes. The high insularity was again shown by the infrequent citation of journals in other related fields. Although it is unknown as to how common this practice is, steps to reduce the insularity within this field could benefit the research overall. Due to the low incidence nature of this field, high levels of narrowness are anticipated. Even though this is anticipated, increased collaboration with other fields as well as an increase in new researchers in this field could help with the problems of scarce research, lack of evidence-based instruction in specific areas of reading, and the age of some of the research.

Limitations

Potential limitations of the present study need to be noted. An attempt was made to conduct an exhaustive review of the research, but it is possible that applicable studies were not included because the search terms used were insufficient. Secondly, a study may have been conducted within the two journals that focused on reading or an essential area of reading that was either not included or not categorized correctly. This may have happened because its relationship to reading was not reflected in the title or abstract of the article. Finally, an interrater was unable to be obtained to review the data for inaccuracies.

For future research directions, it is recommended that this study be replicated to include additional years as well as more journals such as *Deafness and Education International*. A greater span of years, preferably ten years, covering this topic would make the data much stronger.

It would also be beneficial for this study if it were known if these highly cited authors publish to other journals or fields. If these authors are continually being published within the journal for which they are editors, it continues to show the high level of insularity. If the authors are publishing in outside fields or other journals, it shows that the field is trying to expand, but it may not be at a rate as quick as others. It is also somewhat known that high insularity is common in some more specialized fields, but it is not known to what extent. There is a need for more research clarifying the insularity of other fields as well the effect of insularity on the research.

Another future direction for this study would be to examine the gender of the most frequently cited authors especially when differentiating between first authorship and

other authorship placements. Are women holding more first authorship positions or are they found within other placements? As a more general questions, how many of this contributing core group of authors are women? Also, of these authors, how many of them are also part of the DHH community?

Lastly, the use of inter-rater reliability would be beneficial for this type of study especially when expanding this study to contain more years. This would help to eliminate any possible inaccuracies in the data.

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APPENDIX A

Table A1

Summary of Trends in Reading Research with Students who are DHH of Synthesis

Studies Focusing on Reading Research in DHH Populations

Source	Years Examined	Number of Studies That Met Inclusion Criteria	Area of Focus Related to Reading	Content
Strassman, 1997	--	--	Generally Related to Reading (any one of the five essential areas of reading was not mentioned within the study)	Although the research is sparse, it implies that current instructional practices used to teach reading to deaf children may hinder their development of metacognitive knowledge. Low-level reading material typically given to deaf children might not provide the opportunity for them to practice or use metacognitive strategies. The research shows that deaf students can benefit from metacognitive strategy instruction.
Luckner, Sebald, Cooney, Young, & Muir, 2006	1963-2003	22 out of 964	Involves more than two essential areas of reading	No two studies examined the same dimension of literacy (i.e. reading comprehension, vocabulary, etc). No replications of previously conducted studies were undertaken. The authors were unable to establish categories or apply meta-analytic techniques with any group of studies. The field of deaf education does not have a “strong evidence of effectiveness” and more research is needed.
Luckner & Handley, 2008	1963-2005	52 studies	Reading Comprehension	None of the studies met the U.S. Department of Education for “strong” or “possible” evidence of

				effectiveness. Only 27 of the 52 published studies involved an intervention. The study stated that explicit comprehension strategy instruction, teaching story grammar, modified directed-reading thinking activity, activating background knowledge, and using well-written high-interest texts. Overall, the review stated that there is a need for more research in this critical area.
Moores, Anderson, Ayers, Krantz, Lafferty, Locke, Huntley Smith, & Vander Weide, 2008	2001-2007	183 articles (100 of which focused on instruction)	Various Areas of Reading Along with Various Areas of General Education	Focused specifically on literacy: Literacy constituted the single largest category over the seven year period. There were very few well-designed studies, with little replication and limited data. It showed that reading and writing is moving away from whole word method continues, with focuses on bottom-up and interactive approaches. There was focus on morphological, phonics, and visual codes. The research also demonstrated a relationship between the manual alphabet and orthographic knowledge.
Luckner & Cooke, 2010	1967-2008	41 studies	Vocabulary	Students who are DHH lag behind their hearing peers in the area of vocabulary knowledge. Repeated exposure to vocabulary is beneficial to students who are deaf and hard of hearing. A shortage of research in this area currently exists. Interventions specific to vocabulary instruction in this population were listed.
Mayberry, Giudice, & Lieberman, 2010	--	57 of 230	Phonological Coding and Awareness	Phonological coding and awareness skills are a low to moderate predictor of reading achievement in

				deaf and hard of hearing individuals. Most notably, language ability has a greater influence on reading development, as has been found in the hearing population.
Miller & Clark, 2011	--	Literature Review	Phonemic Awareness and Reading Comprehension	Notwithstanding the poor phonemic awareness of the prelingually deaf, readers who are DHH succeed in developing word-reading strategies that sustain written word recognition at comparable levels to their hearing peers. The evidence suggests that there is no direct causal relationship between their sensitivity to the phonological properties of words and their ability to comprehend text. It further indicated that these readers might gain from orthographic knowledge along with syntactic awareness and metacognitive skills.
Luckner & Urbach, 2012	1979-2009	6 studies	Reading Fluency	Fluency is a critical aspect that has not been explored by researchers in deaf education. Unfortunately, this means that professionals may not be assessing or teaching the skill. The authors state that an urgent need exists to further all components that attribute to reading in students who are deaf and hard of hearing.
Wang & Williams, 2014	2000-2013	11 qualitative and 39 quantitative	Various areas of reading/Reading instruction	Examined research with typically developing hearing students, special education hearing students, and DHH students. It found that contradictory results most often resulted from differing definitions of interventions and their measurements. The analysis provided several

Andrews, Byrne, & Clark, 2015	1973-2013	31 dissertations	Generally Related to Reading (any one of the five essential areas of reading was not mentioned within the study)	instructional approaches that support reading instruction in students who are DHH.
Andrews & Wang, 2015	2014-2015	9 studies/"teams"	Involves more than two essential areas of reading	<p>The 1970s trend in reading with DHH populations was focused on communication methodology. In the 1980s, the focus was on English reading skills. 1990-2013 had a focus on ASL/English bilingualism to support the acquisition of literacy. Most of the dissertations used a combination of qualitatively similar and qualitatively different epistemologies in their research. All of these findings were related to a) the role of the deaf reading researcher, b) historical and current trends in reading research, and c) the qualitative similarity hypothesis.</p> <p>This was part of a two-part special issue that examined the qualitative similarity hypothesis. Two of the teams concluded that there is research supporting both the qualitative similarity hypothesis and the qualitative difference hypothesis. All of the teams recognized that many aspects of the reading acquisition process of DHH children and the QSH is tenable if it is "modality independent". The study included future directions, implications for teacher education, and implications for future research and for policymakers.</p>