

2015

Investigating self-efficacy and potential contributing factors for adolescents who are deaf or hard of hearing

Aimee Gao

Washington University School of Medicine in St. Louis

Follow this and additional works at: http://digitalcommons.wustl.edu/pacs_capstones

Recommended Citation

Gao, Aimee, "Investigating self-efficacy and potential contributing factors for adolescents who are deaf or hard of hearing" (2015). *Independent Studies and Capstones*. Paper 713. Program in Audiology and Communication Sciences, Washington University School of Medicine.
http://digitalcommons.wustl.edu/pacs_capstones/713

This Thesis is brought to you for free and open access by the Program in Audiology and Communication Sciences at Digital Commons@Becker. It has been accepted for inclusion in Independent Studies and Capstones by an authorized administrator of Digital Commons@Becker. For more information, please contact engesz@wustl.edu.

**INVESTIGATING SELF-EFFICACY AND
POTENTIAL CONTRIBUTING FACTORS FOR
ADOLESCENTS WHO ARE DEAF OR HARD OF HEARING**

by

Aimee Gao

**An Independent Study
submitted in partial fulfillment of the
requirements for the degree of:**

Master of Science in Deaf Education

**Washington University School of Medicine
Program in Audiology and Communication Sciences**

May 15, 2015

**Approved by
Heather Hayes, Ph.D., Independent Study Advisor**

Abstract:

This study investigates the self-efficacy beliefs of adolescents who are deaf or hard of hearing in regards to perceived academic self-efficacy and self-efficacy for self-regulated learning. In addition, it examines any relationships that personality traits and difficulties listening in educational settings may have with these beliefs.

Copyright by

Aimee Gao

2015

Acknowledgements

First and foremost, I would like to thank Dr. Heather Hayes for her significant insight and support during this year-long endeavor. I am grateful for her guidance throughout the research process, her never-ending encouragement, and her helpful feedback.

I would also like to thank Dr. Mitchell Sommers for his invaluable input and assistance, particularly by helping me navigate the Institutional Review Board process.

Many thanks to Central Institute for the Deaf, Hands & Voices, and Special School District for aiding me with my recruitment efforts.

Finally, I would like to thank my family for offering me encouragement and support throughout my graduate school experiences.

Disclosures

This work is intended for review only. It is not intended for citation, quotation, or other use in any form.

Human Subjects Approval: Research reported in this independent study was approved by Washington University's Institutional Review Board. Approval #: 201411009 on 11/10/2014.

Use of Research Electronic Data Capture (REDCap): Supported by Clinical and Translational Science Award (CTSA) Grant [UL1 TR000448] and Siteman Comprehensive Cancer Center and NCI Cancer Center Support Grant P30 CA091842.

Table of Contents

Introduction	1
Methods	9
Results	13
Discussion	15
References	20
Tables	22
Appendix	27

List of Tables

Table 1	<i>Characteristics of Participants</i>	22
Table 2	<i>Mean Scores of Self-Efficacy for Self-Regulated Learning</i>	23
Table 3	<i>Mean Scores of Perceived Academic Self-Efficacy</i>	24
Table 4	<i>Mean Scores of Big Five Inventory</i>	25
Table 5	<i>Mean Scores of Listening Inventories for Education - Revised</i>	26

Introduction

Children who are deaf or hard of hearing have difficulty obtaining academic success compared to their hearing peers (Traxler, 2000). Different factors, such as cognitive skills (Huber & Kipman, 2012), reading achievement (Geers, Tobey, Moog, & Brenner, 2008), and writing abilities (Geers & Hayes, 2011) influence the overall academic achievement of children who are deaf or hard of hearing. Other factors that may also contribute to these academic difficulties deserve exploration. Psychosocial aspects—the factors that relate to one's psychological and social development and behavior—should be further investigated to consider how they impact the academic achievement of children who are deaf or hard of hearing. My study examined self-efficacy, a psychosocial factor about one's perception of his capabilities. Research indicates that self-efficacy beliefs can contribute to the academic achievement and career decisions of children with typical hearing (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Caprara et al., 2008; Caprara, Vecchione, Alessandri, Gerbino, & Barbaranelli, 2011). Thus, it is worth exploring the self-efficacy of children who are deaf or hard of hearing as these beliefs may also affect their academic achievement and career decisions. To my knowledge, there are no known studies in which children who are deaf or hard of hearing measure their self-efficacy beliefs. Therefore, the first goal of my study was to investigate the self-efficacy beliefs of adolescents who are deaf or hard of hearing with the purpose of describing a general profile that may emerge. The second goal was to determine if personality traits and the ability to listen well in school settings contribute to these beliefs.

I will begin by defining the concept of self-efficacy and two specific self-efficacy domains that relate to academics, *self-efficacy for self-regulated learning* and *perceived academic self-efficacy*. Then I will describe the research pertaining to self-efficacy for self-

regulated learning, perceived academic self-efficacy, and academic achievement for children with typical hearing. Finally, I will explain the rationale and hypothesis of my study, which measured the self-efficacy beliefs of adolescents who are deaf or hard of hearing in addition to two potential contributing factors, personality and listening ease/difficulty in educational settings.

Self-Efficacy

Self-efficacy is one's set of beliefs in his abilities to successfully accomplish a task (Bandura, 1977). These beliefs do not focus on the individual judging himself as a whole; rather, they are domain-specific. For instance, one can have a high sense of self-efficacy for learning math but a low sense of self-efficacy for learning science.

Self-efficacy differs from self-esteem (Pastorelli et al., 2001). Self-esteem is based on how one judges his self-worth while self-efficacy beliefs are based on how one judges his personal capabilities. A person can have high self-esteem while possessing low self-efficacy for a particular task. For example, one may believe that he is incapable of learning English, resulting in low self-efficacy for that academic subject. However, if that person does not value learning English, this low self-efficacy will not affect his self-esteem.

According to Bandura's (1977) theory of self-efficacy, different factors—performance accomplishments, vicarious experiences, verbal persuasion, and physiological state—can shape one's self-efficacy. Performance accomplishments, or one's previous experiences, influence self-efficacy; succeeding at a task can promote self-efficacy while experiencing failure can diminish it. For instance, if a student performs well on a math test, he will feel more capable of learning math. Likewise, if that student does not perform well on a math test, then he will feel less

capable at learning math. Observing others succeeding at a task offers a vicarious experience that can enhance self-efficacy. Additionally, verbal persuasion, such as encouraging a student to succeed, can increase self-efficacy. Physiological states also affect self-efficacy as high levels of stress can make one feel less capable of achieving a task.

Self-efficacy is important to educators because it impacts the goals a person sets for himself (Bandura, 1977). People tend to participate in activities where they know they will be successful and they avoid activities where they will not be successful. Therefore, if the goal is for children who are deaf or hard of hearing to participate in academic endeavors and have high expectations for their academic achievement, then we must consider their self-efficacy for academics.

Pastorelli and colleagues (2001) described two self-efficacy domains that relate to academics: *self-efficacy for self-regulated learning* and *perceived academic self-efficacy*. Self-efficacy for self-regulated learning is the belief system about one's abilities to self-regulate learning activities, such as using the library to obtain information or concentrating on school subjects. Perceived academic self-efficacy is a person's judgments about his abilities to master a specific academic subject, such as how well he learns English grammar or general mathematics. Being interested in the academic achievement of children who are deaf or hard of hearing, I examined these two self-efficacy domains in my study.

Self-Efficacy and Children with Typical Hearing

A plethora of research has explored self-efficacy for self-regulated learning and perceived academic self-efficacy for children and adolescents with typical hearing. It is important to consider the self-efficacy beliefs of a population with typical hearing so we can

compare the results with children who are deaf or hard of hearing to reveal any potential differences. Additionally, it is worth investigating this line of research to find out if any relationships exist between self-efficacy and academic success.

Caprara and colleagues (2008) examined these relationships by measuring self-efficacy for self-regulated learning in 412 Italian students with typical hearing. This longitudinal study followed the students from ages 12 to 22. The researchers discovered a progressive decline in self-efficacy for self-regulated learning in adolescent years from junior to senior high school. Those who exhibited less decline in these self-efficacy beliefs had higher grades in senior high school and a higher likelihood of staying in senior high school. These results suggest that adolescents who believe in their ability to self-regulate learning activities, such as taking notes during class instruction or arranging a place to study without distractions, have a greater chance at achieving academic success. This conclusion illustrates the importance of self-efficacy in regards to academic achievement, as self-efficacy for self-regulated learning may lead to greater academic success in senior high school.

Considering how important self-efficacy for self-regulated learning is for academics, we should explore perceived academic self-efficacy to find out how children with typical hearing view their capabilities to learn an academic subject as these beliefs may also affect academic achievement. In a study of 412 Italian students (ages 13 to 19 years old) with typical hearing, Caprara and colleagues (2011) used self-reports to measure self-efficacy for self-regulated learning, perceived academic self-efficacy, and personality traits. The study analyzed these factors to determine any relationships they may have with academic achievement. The results indicated that self-efficacy acts as a mediator linking early academic achievement to future academic success. As Bandura's (1977) original theory of self-efficacy explained, successful

experiences can enhance one's self-efficacy. Thus, early academic success fostered a higher sense of self-efficacy which later contributed to future academic success.

These studies support the theory that self-efficacy for self-regulated learning and perceived academic self-efficacy are important psychosocial aspects for the academic achievement of adolescents with typical hearing in junior and senior high school. But does self-efficacy impact one beyond high school? Bandura and colleagues (2001) discovered a lasting impact of self-efficacy: career choice. The researchers conducted a study involving 272 Italian children and their parents. The child participants ranged from 11 to 15 years old and had typical hearing. This study analyzed relationships that existed among: the child's perceived academic, social, and self-regulatory self-efficacy; the parent's perceived academic efficacy (how well a parent can assist his child's academic development); academic aspirations of the parent and child; the child's academic achievement; the child's perceived occupational self-efficacy; and the child's occupational choices. When it comes to making a career choice, children's academic, social, and self-regulatory self-efficacy are key determinants of their career aspirations and choices. Self-efficacy exerted a greater influence on career decisions than academic achievement or parental influence. In fact, the study concluded that parental self-efficacy stems from the child's self-efficacy beliefs.

In summary, self-efficacy is an important contributor to academic achievement and future aspirations for children with typical hearing. Self-efficacy for self-regulated learning has a positive impact on senior high school students in regards to grades and staying in school. Additionally, self-efficacy plays a mediating role between early academic success and future academic achievement. Perhaps most important, self-efficacy beliefs guide children's occupational choices as they are a key determinant of career aspirations and decisions.

Rationale

As previously stated, children who are deaf or hard of hearing have difficulties with academic achievement. Various psychosocial factors, including self-efficacy, should be explored to investigate any effects on academic success. Taking into consideration the influence of self-efficacy on academic achievement and career choice for children with typical hearing, I believe it is pertinent to study the self-efficacy beliefs of children who are deaf or hard of hearing. There is research related to self-efficacy and hearing loss that is focused on parental and teacher efficacy. However, to my knowledge, there are no known studies in which children who are deaf or hard of hearing rate their self-efficacy beliefs in regards to self-efficacy for self-regulated learning and perceived academic self-efficacy.

Research studies have explored psychosocial factors, such as self-concept, motivation, and peer relations, for children who are deaf or hard of hearing. These psychosocial factors are not only important for one's well-being but also influence one's academic success. For instance, Albertini, Kelly, and Matchett (2012) surveyed students enrolled in an associate's degree program at National Technical Institute for the Deaf, a college of Rochester Institute of Technology. They found a variety of personal factors that contributed to academic achievement and could be significant predictors of future academic success. These personal factors included psychosocial aspects, such as attitude toward teacher, motivation, use of support strategies, and self-discipline. Therefore, as psychosocial aspects influence academic achievement, I wanted to specifically learn about self-efficacy and whether or not it could affect my future students' academic success.

My Current Study

Given the paucity of information regarding this topic for children who are deaf or hard of hearing, the primary purpose of my study was to investigate self-efficacy for self-regulated learning and perceived academic self-efficacy for adolescents who are deaf or hard of hearing by administering a self-report measure of these self-efficacy domains. Additionally, knowing the significance of self-efficacy for academic achievement and career decisions, I found it important to consider factors that could potentially influence these self-efficacy beliefs. Thus, my study examined two potential contributing factors: personality traits and listening difficulty at school. A rationale for analyzing each potential contributing factor will be provided.

Rationale for Investigating Personality as a Factor

Studies suggest that self-efficacy acts as a mediator between personality traits and academic achievement (Caprara et al., 2011) as well as other areas like health-related quality of life (Axelsson, Lötvall, Cliffordson, Lundgren, & Brink, 2013). As described earlier, Caprara and colleagues (2011) investigated self-efficacy beliefs, personality traits, and academic achievement for Italian students with typical hearing. The authors found that self-efficacy played a mediating role between the personality traits of Openness and Conscientiousness and academic success. The personality trait Openness displayed importance in junior high school as it contributed to academic achievement. Because self-efficacy is influenced by previous experiences, this academic success in junior high school enhanced self-efficacy, which subsequently contributed to future academic achievement. Contrary to Openness, Conscientiousness did not directly influence academic achievement; it contributed to self-efficacy which then influenced academic achievement in senior high school. The study

discovered that these self-efficacy beliefs played a greater role in academic achievement during senior high school than junior high school.

Though the study by Caprara and colleagues (2011) was conducted with adolescents who have typical hearing, the results drove my rationale for assessing the personality traits of my study's participants. We know that certain personality traits can contribute to academic success both directly (Openness) and indirectly (Conscientiousness). If a similar relationship occurs with children who are deaf or hard of hearing, teachers of the deaf may be able to identify students who could benefit from self-efficacy interventions. Thus, my study implemented a personality assessment, which was similar to those used by other researchers, so the relationships between self-efficacy and personality traits could be analyzed.

Rationale for Appraising Listening Difficulty as a Factor

Despite the availability of assistive listening devices (e.g., hearing aids, cochlear implants, FM systems) for children who are deaf or hard of hearing to use in the classroom, this type of technology is assistive, not corrective. A hearing loss is never "cured" by using listening devices. There are a number of different factors that affect access to sound and quality of sound for children who are deaf or hard of hearing. For instance, background noise can make listening more difficult for children who are deaf or hard of hearing. If a child has difficulty listening to the content, he will likely miss key information which will make him feel less capable of learning the material. Additionally, if listening at school is challenging, the child may exert more cognitive resources toward effortful listening. The more resources the child uses to simply listen to the content, the less resources the child has to exert on complex cognitive processes, such as making connections and synthesizing concepts. As a result of missing key information and

exerting cognitive resources into effortful listening, the child may feel less capable of performing academic tasks, thus lowering his sense of self-efficacy for academics. Therefore, it is important to consider the child's listening abilities in school as they may impact self-efficacy. To determine if this relationship exists, participants in my study appraised the ease or difficulty of different listening situations in educational settings.

Hypothesis

Based on the results of Caprara and colleagues (2011), I hypothesized that similar results would occur with children who are deaf or hard of hearing in which Openness and Conscientiousness would be positively correlated with self-efficacy for self-regulated learning and perceived academic self-efficacy. I also hypothesized that data would show difficulty with listening in school settings contributes to a lower sense of self-efficacy as poor listening reception could negatively impact academic achievement.

Methods

Participants

Participants were recruited from a local school for the deaf, local school districts' Special Education programs, referral via colleagues, and a recruitment page on the Hands and Voices website. Participants' families received an email outlining the details of the study and an online link to a survey.

Materials

A survey containing four parts—a parent questionnaire, a self-efficacy measure, a personality assessment, and an appraisal of listening difficulty—collected the responses of the participants and their parents.

Parent Questionnaire. Responses collected from a parent questionnaire determined participant eligibility. The complete parent questionnaire is provided in Appendix A. Eligible participants were 13 to 17 years old, used assistive listening devices (e.g., hearing aids, FM system), utilized spoken language as the primary mode of communication, and spoke English at home. These exclusions limited the generalizability of the study's results but were necessary in order to control for variability in this population. Additionally, eligibility criteria required that the participants read on a seventh grade level or higher to ensure they could comprehend the survey questions.

Parents also answered questions regarding general demographic information. Data specific to hearing loss were collected, including age of identification, type and degree of hearing loss, types of assistive listening devices, and percentage of time the participant spends in a general public education setting.

Children's Perceived Self-Efficacy. The Children's Perceived Self-Efficacy scales (Bandura, 1990) measure seven domains of self-efficacy. My study evaluated two of those domains: self-efficacy for self-regulated learning and perceived academic self-efficacy. Participants completed the measure via survey. Participants read questions regarding specific tasks and then ranked how well he believes he can accomplish a task on a 5-point Likert scale,

from "Highly certain can do" to "Cannot do." Participants answered 11 questions regarding self-efficacy for self-regulated learning and 7 questions regarding perceived academic self-efficacy.

Sample questions are listed below:

Self-efficacy for self-regulated learning: How well can you study when there are other interesting things to do?

Perceived academic self-efficacy: How well can you learn general mathematics?

Big Five Inventory. To assess personality traits, participants completed questions from the Big Five Inventory (John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008) to examine the Big Five personality traits: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Form 46-A (BFI-46-A) was used because this form incorporates more child-friendly language. Participants read statements and responded on a 5-point Likert scale from "Agree strongly" to "Disagree strongly." Statements included:

Openness: I see myself as someone who is curious about many different things.

Conscientiousness: I see myself as someone who does things carefully and completely.

Extraversion: I see myself as someone who generates a lot of enthusiasm.

Agreeableness: I see myself as someone who has a forgiving nature.

Neuroticism: I see myself as someone who gets nervous easily.

Participants responded to 46 statements of which 44 measured the Big Five personality traits and two measured likeability. Some of the items were negatively-keyed and reverse-scored to ensure consistency in the responses.

To score this assessment, responses for each trait were averaged, creating a scaled score for each trait and, thus, providing a personality profile.

Listening Inventory for Education - Revised. The final section of the survey consisted of one section from the Listening Inventory for Education - Revised (LIFE-R) (Anderson, Smaldino, & Spangler, 2011). The LIFE-R was designed to be used in a pre-test/post-test format to study the effectiveness of an accommodation, such as using a personal FM listening device. It contained two components: student self-report and teacher self-report.

For the purposes of my study, the survey incorporated only one section from the LIFE-R: Student Appraisal of Listening Difficulty–Classroom Listening Situations. This section consisted of 10 classroom and 5 social listening situations a child would face in a typical school day, including:

Classroom listening situation: The teacher is talking. She is also walking and moving around the room. How well can you hear and understand the words the teacher is saying if you can't see her face and she is across the room?

Social listening situation: There is a school meeting or assembly. Many classes of kids are sitting together. The kids are listening to a teacher. The teacher is talking without a microphone. How well can you hear the words the teacher is saying?

Participants read listening situations and rated their listening ease or difficulty on a 5-point Likert scale, from "Always easy" to "Always difficult."

The LIFE-R Instruction Manual states examiners should read the questions aloud to participants and elaborate with details as necessary. However, because the identities of the participants were unknown to the researchers and the participants completed the survey in the privacy of their homes, this was not possible. Furthermore, the photos that accompany the listening situations were not included in this survey.

Results

Five adolescents, ranging from 14 to 17 years old ($M = 16$, $SD = 1.41$), participated in the study. All five participants used spoken language as the primary mode of communication and spoke English at home. All had bilateral sensorineural hearing loss and used assistive listening devices. They spent the majority of the school day (75-100%) in a general education setting. A description of each participant's age of identification, degree of hearing loss, types of assistive listening devices, and reading levels can be found in Table 1.

In regards to self-efficacy beliefs, the participants exhibited high self-efficacy for both self-regulated learning ($M = 4.6$, $SD = 0.38$) and academics ($M = 4.4$, $SD = 0.69$). When rating their abilities to self-regulate learning tasks, all participants reported that they were highly certain they could organize their school work ($M = 5$). The participants also felt highly capable of finishing homework assignments by deadlines ($M = 4.8$, $SD = 0.45$), arranging a place to study without distractions ($M = 4.8$, $SD = 0.45$), and motivating oneself to do school work ($M = 4.8$, $SD = 0.45$). Studying when there are other interesting things to do had the lowest group mean ($M = 4.0$, $SD = 1.0$). However, though it had the lowest mean for self-regulated learning, it still indicated that the participants believed themselves to be capable of this task. Additional data for all of the self-regulated learning tasks are reported in Table 2.

Compared to self-efficacy for self-regulated learning, perceived academic self-efficacy had a slightly lower mean ($M = 4.4$, $SD = 0.69$). Yet, this score still shows that the participants believed in their abilities to learn academic subjects. The participants felt most capable in learning science ($M = 4.8$, $SD = 0.45$) and least capable at learning foreign languages ($M = 3.6$, $SD = 1.14$). Data pertaining to each academic subject is reported in Table 3.

The participants rated themselves in response to different questions to create a personality profile. The participant scores were averaged to create a mean for each personality trait. Liking, which is not a personality trait but was included in the Big Five Inventory, had the highest score ($M = 4.70$, $SD = 0.45$), demonstrating that the participants perceived themselves as being well-liked by others. Of the Big Five personality traits, Conscientiousness ($M = 4.31$, $SD = 0.53$) and Agreeableness ($M = 4.13$, $SD = 0.30$) had the highest scores, indicating these traits are strong characteristics in this group of participants. Openness ($M = 3.82$, $SD = 0.48$) and Extraversion ($M = 3.78$, $SD = 0.65$) had lower scores, suggesting that these two traits were not strong characteristics of this group. The lowest score was for Neuroticism ($M = 2.18$, $SD = 0.31$). Table 4 shows the mean results from the Big Five Inventory.

Overall, participants reported that it was mostly easy to listen in school settings ($M = 2.1$, $SD = 0.56$). The easiest listening situation was when the teacher is talking in front of the class and the other students are quiet ($M = 1$); all participants ranked this listening situation as "Always easy." The most challenging listening situation was listening to school announcements ($M = 2.8$, $SD = 1.30$), followed by the teacher talking with his back turned ($M = 2.4$, $SD = 0.55$), another student answering a question during discussion ($M = 2.4$, $SD = 0.89$), and listening in a large room ($M = 2.4$, $SD = 0.89$). All of the data regarding listening ease and difficulty is displayed in Table 5.

The data collected from the study were analyzed to determine any correlations. Significant correlations were found between: Conscientiousness and self-efficacy for self-regulated learning, $r(3) = .88$, $p < .05$; Conscientiousness and perceived academic self-efficacy, $r(3) = .94$, $p < .05$; and Neuroticism and perceived academic self-efficacy, $r(3) = -.98$, $p < .01$. All other correlations were not significant.

Discussion

It is known that children who are deaf or hard of hearing struggle with academic difficulties (Traxler, 2000) and, in efforts to address these difficulties, we should investigate potential psychosocial aspects that may contribute to academic achievement. This study focused on the psychosocial aspect of self-efficacy, which is one's perception of his abilities to accomplish a task. In research with children who have typical hearing, studies suggest that these beliefs can influence academic achievement and career decisions (Bandura et al., 2001; Caprara et al., 2008; Caprara et al., 2011). To my knowledge, there are no studies in which children who are deaf or hard of hearing rate their self-efficacy for self-regulated learning and perceived academic self-efficacy. Thus, the primary purpose of my study was to examine these self-efficacy beliefs in adolescents who are deaf or hard of hearing. The secondary purpose was to determine if personality traits and the ability to listen well in school settings contribute to these beliefs.

In summary, the participants demonstrated a high sense of self-efficacy in regards to self-efficacy for self-regulated learning and perceived academic self-efficacy. The data imply that the participants felt capable of managing school activities and learning new academic subjects. The lowest score for perceived academic self-efficacy was learning a foreign language. Considering that children who are deaf or hard of hearing typically require direct instruction to develop spoken language, I was not surprised that learning additional languages would be perceived as a more difficult academic subject for these participants.

Certain personality traits seemed to affect these self-efficacy beliefs for adolescents who are deaf or hard of hearing. As hypothesized, participants who had high scores in Conscientiousness displayed a higher sense of self-efficacy. Conscientiousness and self-efficacy

for self-regulated learning had a very strong correlation, as did Conscientiousness and perceived academic self-efficacy. These results are similar to the data for adolescents with typical hearing (Caprara et al., 2011), in which Conscientiousness directly contributed to self-efficacy. In this study, the participants who had higher scores for Conscientiousness rated themselves as "Highly certain can do" in response to items such as not being easily distracted, doing things quickly and correctly, and being a reliable worker. These descriptors portray characteristics valued in educational settings. Therefore, the relationship between Conscientiousness and self-efficacy for self-regulated learning and perceived academic self-efficacy is logical. Participants who believe themselves to be hard workers in the classroom also feel more capable of accomplishing academic tasks.

Contrary to my hypothesis, Openness did not have a significant relationship with the self-efficacy domains. However, it is important to note the data showed a strong negative relationship between Openness and self-efficacy for self-regulated learning. Caprara and colleagues (2011) studied adolescents with typical hearing and discovered that Openness indirectly contributed to self-efficacy via academic achievement in junior high school. The authors noted that Openness played a less significant role in senior high school than it did in junior high school. Because of the ages of the participants for the current study (range = 14 to 17 years old), the potential positive influence of Openness may not be observed in the data as most of the participants are already in senior high school. Thus, it could be expected that Openness may have positively contributed to their self-efficacy beliefs in earlier years but Openness does not currently play a significant role in their self-efficacy.

Though Openness did not contribute to self-efficacy as I had hypothesized, the data in this study showed that Neuroticism negatively contributed to the perceived academic self-

efficacy of adolescents who are deaf or hard of hearing. The participants who exhibited more Neuroticism had a lower sense of perceived academic self-efficacy. Bandura's (1977) original theory of self-efficacy suggests that a high level of stress can diminish one's self-efficacy. The characteristics of Neuroticism, such as feeling moody, nervous, and tense, may indicate that the individual has a higher level of stress which may impact their beliefs about how well they can accomplish a task.

It is important for educators and counselors to recognize Conscientiousness and Neuroticism as contributing factors to the self-efficacy beliefs of adolescents who are deaf or hard of hearing. As Caprara and colleagues (2011) noted, personality traits are relatively stable. However, these personality traits can help educators and counselors identify students that may benefit from interventions to enhance self-efficacy. Based on the data from this current study, a student who is deaf or hard of hearing and exhibiting low Conscientiousness or high Neuroticism may benefit from such interventions.

Because the participants are deaf or hard of hearing, it was important to take into consideration the participants' abilities to listen well in school settings, as these listening abilities may contribute to self-efficacy. Overall, the participants rated the listening situations to be "Mostly easy." As is evident in the data presented in Table 5, when the listening environment was not acoustically optimized (e.g., teacher talking with back turned, listening in a large room) or in situations when listening to technology occurred (e.g., announcements, multimedia), the participants rated themselves as having more difficulty listening. However, none of the participants ranked any listening situation as being "Always difficult." Therefore, the participants of this study seemed to be able to listen well in the majority of school settings.

The data suggested a very strong negative relationship between listening ease or difficulty and perceived academic self-efficacy, though the relationship was not statistically significant. Of the participants in this group, those who rated themselves as having less difficulty listening in school settings presented with higher perceived academic self-efficacy. Though the relationship is not statistically significant, it is worth exploring the factors in future research as the relationship may be significant for children who have poor access to sound.

This study was limited by the small sample size. With only five participants, most of the relationships analyzed in the data were not significant. A similar study conducted with a larger sample size may provide stronger relationships among self-efficacy, personality traits, and the ability to listen well in school. Another limitation is this study's focus on a specific population within the deaf or hard of hearing community. Only those who use spoken language, speak English at home, use assistive listening devices, and read at a 7th grade level or higher were included in the study. Though this seemed to be an appropriate starting point for investigating the self-efficacy beliefs of adolescents who are deaf or hard of hearing, it limits this study from being generalized to a larger population of people who are deaf or hard of hearing. Therefore, future research with different inclusion criteria would be beneficial.

My original interest in exploring this topic derived from my desire to improve academic achievement for children who are deaf or hard of hearing. However, as this study did not collect information regarding the participants' academic achievement, it was not possible to determine how these beliefs influenced academic success. Future research should be conducted to determine whether there is a relationship between self-efficacy and academic achievement for children who are deaf or hard of hearing. Additionally, my study explored personality traits and listening ease or difficulty in school as potential contributing factors to self-efficacy. Other

potential contributing factors could be studied so we can add to our knowledge base about what influences the self-efficacy beliefs of children who are deaf or hard of hearing.

It is important for educators and counselors to attempt to identify students who may be at risk for low self-efficacy. Though personality traits are stable and likely will not change, they can be used to help educators and counselors identify students that could benefit from self-efficacy interventions. A student who is deaf or hard of hearing with low Conscientiousness or high Neuroticism may need support to increase his self-efficacy for self-regulated learning and perceived academic self-efficacy. Furthermore, the very strong negative relationship observed between listening abilities and self-efficacy in my current study, while not significant, reinforces the importance of providing good access to sound for children who use listening and spoken language.

References

- Albertini, J.A., Kelly, R.R., and Matchett, M.K. (2012). Personal factors that influence Deaf College students' academic success. *Journal of Deaf Studies and Deaf Education, 17*(1), 85-101.
- Anderson, K. L., Smaldino, J. J., & Spangler, C. (2011). Listening inventory for education - revised [Survey and instruction manual]. Retrieved from <http://successforkidswithhearingloss.com/life-r>
- Axelsson, M., Lötvall, J., Cliffordson, C., Lundgren, J., & Brink, E. (2013). Self-efficacy and adherence as mediating factors between personality traits and health-related quality of life. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation, 22*(3), 567–575.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191–215.
- Bandura, A. (1990). *Multidimensional scales of perceived academic efficacy*. Stanford, CA: Stanford University.
- Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (2001). Self-Efficacy Beliefs as Shapers of Children's Aspirations and Career Trajectories. *Child Development, 72*(1), 187.
- Caprara, G. V., Fida, R., Vecchione, M., Del Bove, G., Vecchio, G. M., Barbaranelli, C., & Bandura, A. (2008). Longitudinal analysis of the role of perceived self-efficacy for self-regulated learning in academic continuance and achievement. *Journal of Educational Psychology, 100*(3), 525–534.

- Caprara, G. V., Vecchione, M., Alessandri, G., Gerbino, M., & Barbaranelli, C. (2011). The contribution of personality traits and self-efficacy beliefs to academic achievement: a longitudinal study. *The British Journal of Educational Psychology*, *81*(Pt 1), 78–96. <http://doi.org/10.1348/2044-8279.002004>
- Geers, A. E., & Hayes, H. (2011). Reading, writing, and phonological processing skills of adolescents with 10 or more years of cochlear implant experience. *Ear and Hearing*, *32*(1 Suppl), 49S–59S. <http://doi.org/10.1097/AUD.0b013e3181fa41fa>
- Geers, A., Tobey, E., Moog, J., & Brenner, C. (2008). Long-term outcomes of cochlear implantation in the preschool years: from elementary grades to high school. *International Journal of Audiology*, *47* Suppl 2, S21–30. <http://doi.org/10.1080/14992020802339167>
- Huber, M., & Kipman, U. (2012). Cognitive Skills and Academic Achievement of Deaf Children with Cochlear Implants. *Otolaryngology -- Head and Neck Surgery*, *147*(4), 763–772. <http://doi.org/10.1177/0194599812448352>
- John, O. P., Donahue, E. M., & Kentle, R. L. (1991). The Big Five Inventory--Versions 4a and 54. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.
- John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 114-158). New York, NY: Guilford Press.
- Pastorelli, C., Caprara, G. V., Barbaranelli, C., Rola, J., Rozsa, S., & Bandura, A. (2001). The structure of children's perceived self-efficacy: A cross-national study. *European Journal of Psychological Assessment*, *17*(2), 87–97.

Traxler, C. B. (2000). The Stanford Achievement Test, 9th Edition: National Norming and Performance Standards for Deaf and Hard-of-Hearing Students. *Journal of Deaf Studies and Deaf Education*, 5(4), 337–348. <http://doi.org/10.1093/deafed/5.4.337>

Table 1

Characteristics of Participants

Participants	Gender	Age	Age of Identification (months)	Degree of Hearing Loss	Devices	Reading Grade Level
1	F	14	0.0	Moderately-severe to severe	CI, ALD	9-10
2	M	17	0.1	Profound	CI	11-12
3	M	17	13.0	Profound	CI	11-12
4	M	15	0.0	Profound	CI	9-10
5	F	17	36.0	Mild to profound	HA, ALD, SA	9-10
MEAN		16	9.8			

Note. F = Female; M = Male; CI = Cochlear Implant; HA = Hearing Aid; ALD = Assistive Listening Device; SA = Soundfield Amplification

Table 2

Mean Scores of Self-Efficacy for Self-Regulated Learning

How well can you...	<i>M</i>
Finish homework assignments by deadlines	4.8
Study when there are other interesting things to do	4.0
Concentrate on school subjects	5.0
Take class notes of class instruction	4.4
Use the library to get information for class assignments	4.2
Organize your school work	5.0
Plan your school work	4.4
Remember information presented in class and textbooks	4.6
Arrange a place to study without distractions	4.8
Motivate yourself to do school work	4.8
Participate in class discussions	4.6
MEAN	4.6

Note. Participants responded on a scale of 1 to 5. 1 = Cannot do, 5 = Highly certain can do

Table 3

Mean Scores of Perceived Academic Self-Efficacy

How well can you learn...	<i>M</i>
Math	4.4
Geography	4.6
Science	4.8
English literature	4.6
English grammar	4.6
History	4.4
Foreign language	3.6
MEAN	4.4

Note. Participants responded on a scale of 1 to 5. 1 = Cannot do, 5 = Highly certain can do

Table 4

Mean Scores of Big Five Inventory

Personality Trait	<i>M</i>
Extraversion	3.78
Agreeableness	4.13
Conscientiousness	4.31
Neuroticism	2.18
Openness	3.82
Liking	4.70

Note. Participants responded on a scale of 1 to 5. 1 = Disagree strongly, 5 = Agree strongly

Table 5

Mean Scores of Listening Inventory for Education - Revised

Classroom Listening Situation	<i>M</i>
Teacher talking in front of the room	1.0
Teacher talking with back turned	2.4
Teacher talking while moving	2.2
Student answering during discussion	2.4
Understanding directions	2.0
Other students making noise	2.0
Noise outside of the classroom	1.8
Multimedia (video, computer)	2.2
Listening with fan noise on	2.0
Simultaneous large and small group	2.2
Cooperative small group learning	2.0
Announcements	2.8
Listening in a large room	2.4
Listening to others when outside	1.8
Listening to students during informal social times	2.2
MEAN	2.1

Note. Participants responded on a scale of 1 to 5. 1 = Always easy, 5 = Always difficult

Appendix A

Parent Questionnaire

Your child is:

- Male
- Female

How old is your child?

- under 13
- 13
- 14
- 15
- 16
- 16
- 17
- 18 or older

What are the first three digits of your zip code? *(Please do not provide all 5 digits of your zip code.)* _____

Is English the primary language spoken at home?

- Yes
- No

Which of the following describes your child's primary mode of communication? *(Please select one.)*

- Spoken language
- ASL
- Total Communication
- Other

At what age was your child diagnosed with hearing loss? _____

Please select the descriptors that most accurately describe your child's hearing loss. *(Check all that apply.)*

- Unilateral (only one ear has hearing loss)
- Bilateral (both ears have hearing loss)
- Sensorineural
- Conductive
- Mixed

Approximately what degree is your child's hearing loss in his/her RIGHT ear? *(Check all that apply.)*

- Mild
- Moderate
- Moderately-severe
- Severe
- Profound

Approximately what degree is your child's hearing loss in his/her LEFT ear? *(Check all that apply.)*

- Mild
- Moderate
- Moderately-severe
- Severe
- Profound

Which listening devices does your child use when at school? *(Check all that apply.)*

- Bone-anchored hearing aids (i.e. BAHA, Ponto)
- Cochlear implants
- Hearing aids
- Personal FM or DM (i.e. Roger)
- Soundfield amplification

What percentage of time at school is your child spending in a general education (mainstream) setting?

- 0-25%
- 25-50%
- 50-75%
- 75-100%

What is your child's approximate reading level?

- 6th grade or lower
- 7th - 8th grade
- 9th - 10th grade
- 11th - 12th grade