

COGNITIVE EFFECTS OF ALCOHOL ABUSE: AWARENESS BY STUDENTS AND
PRACTICING SPEECH-LANGUAGE PATHOLOGISTS

A thesis by

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The following faculty members have examined the final copy of this thesis for form and content, and recommend that it be accepted in partial fulfillment of the requirement for the degree of Master of Arts with a major in Communication Sciences and Disorders.

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DEDICATION

To my parents, who have faithfully prayed for my endurance and success, modeled strong work ethic, and encouraged me throughout my education.

ACKNOWLEDGEMENTS

I want to thank my supervisor and committee chair, Dr. Julie Scherz, for her guidance and support throughout this process. I would also like to thank my additional committee members, Dr. Douglas Parham and Dr. Victoria Mosack, for their advice, feedback, and time. An extra thank you to Taylor Esposito for his assistance in developing the two surveys.

ABSTRACT

The purpose of this study was to compare the perceptions of three groups about the effects of alcohol abuse and binge drinking trends as a whole: students enrolled in a Communication Sciences and Disorders (CSD) program, speech-language pathologists (SLP) who are practicing in the schools, and practicing speech-language pathologists with an identified special interest/proficiency in neurologically-based communication disorders, including traumatic brain injury.

Two surveys containing questions about the cognitive effects of alcohol abuse, as well as basic demographic information, were developed and administered using Survey Monkey™. CSD students from Wichita State University, members of the American Speech-Language-Hearing Association (ASHA) Special Interest Group 2 (SIG 2; Neurophysiology and Neurogenic Speech and Language Disorders), and members of ASHA Special Interest Group 16 (SIG 16; School-Based Issues) received and responded to the survey.

A total of 119 participants responded to the surveys. Responses from 37 students, 57 SLPs from SIG 2, and 25 SLPs from SIG 16 revealed no statistically significant differences between the three groups. However, an overall trend of poor awareness about alcohol abuse and binge drinking was demonstrated among all of the participants.

Because of the lack of awareness of each group of participants, education and further research is necessary. Professionals must be educated in order to inform students. SLPs and students must both become educated to provide evidence-based practice to individuals experiencing the cognitive effects of alcohol abuse.

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CHAPTER I

Introduction

It is widely known that alcohol abuse and binge drinking has a negative impact on one's health and physical well-being (National Institute on Alcohol Abuse and Alcoholism [NIAAA], n.d.; Zieve, 2011). Research demonstrates that such abuse can cause damage to the brain (Zieve, 2011; Bermudez, 2007). However, there is little known about the signs and symptoms of this type of brain damage. Assumptions have been made based on the functions of the different areas of the brain that are affected by alcohol abuse and binge drinking. For example, because the role of the hippocampus in the function of memory can be altered by alcohol, it might be assumed that long-term alcohol use could alter one's overall memory (Messina, 2011). Scientists have begun to research cognitive functioning in alcohol abusers and binge drinkers as well as issues related to prevention, identification, and intervention strategies for this population (George, Potts, Kothman, Martin, & Mukundan, 2004; Monnot, Nixon, Lovallo, & Ross, 2001; Munro, Saxton, & Butters, 2000; Weitzman, Nelson, Lee, & Wechsler, 2004). Specific deficits, such as a decrease in memory, are being directly linked to alcohol abuse and patterns of binge drinking; policies are being changed to prevent and identify these consumption patterns in all populations; and researchers are seeking ways to intervene for those whose cognition has already been altered by alcohol consumption.

Despite this increase in research and these positive societal changes, public and professional awareness of the affects of alcohol on cognition are minimal. For example, many college textbooks in the field of Communication Sciences and Disorders - a profession associated with the treatment of cognitive functioning skills - have minimal information regarding the effects of alcohol use and related cognition and communication disorders. Such

disorders include aphasia and apraxia of speech, which are commonly observed in individuals who have suffered a traumatic brain injury (TBI). Textbook authors often include a segment about such injuries involving alcohol. However, they seldom mention the possible cognitive effects of alcohol abuse itself (cf. Gillis, 1996; Kimbarow, 2011; Ylvisaker, 1998).

Students on college campuses are also undereducated. As an effort to teach them the negative consequences of drinking, students often hear stories of tragic accidents caused by an individual driving under the influence of alcohol (Bloch, 1999). Social and academic repercussions might also be stated prior to each school year to those willing to listen. Potential changes in cognition, however, go unmentioned. Because of these gaps in education, it is possible that many students and professionals are unaware of the cognitive risks of alcohol abuse.

CHAPTER II

Review of the Literature

Roughly 17% of Americans have a drinking problem (Zieve, 2011). In some cases, alcohol abuse is an individual's choice. For example, 48% of college students who drink choose to do so to become intoxicated (Wechsler & Nelson, 2008). However, there is also a genetic component that could increase one's chances of becoming alcohol dependent (NIAAA, n.d.; Zieve, 2011). Additionally, psychological and environmental factors, such as depression and stress, play a role in one's risk of abusing alcohol after using it for the first time (Zieve, 2011). Nevertheless, the use of alcohol is not always considered abuse.

When an individual drinks in excess on one occasion it is called binge drinking. In the United States, binge drinking is defined by an individual's blood alcohol concentration (BAC) rather than the number of drinks they consume. Furthermore, a BAC of 0.08% or more is considered binge drinking (NIAAA, n.d.). If binge drinking occurs at least once a week, the individual is more likely to become an alcoholic. According to Zieve (2011), it only takes five drinks at a time, once a week to fall into this at-risk category. He also notes that men who consume 15 or more alcoholic beverages and women who consume at least 12 throughout the span of seven days are also deemed at risk for alcoholism.

Consumption of large amounts of alcohol during a short period of time begins to cause physiological damage to the brain (Cairney, Clough, Jaragba, & Maruff, 2007). The frontal lobe, hippocampus, basal ganglia, cerebellum, and nerve cells are among the structures of the brain that may be affected. Shrinking of the gyri and widening of the sulci have been found extensively throughout the brain in individuals who abuse alcohol (Oscar-Berman, 1988). Each portion of the brain that is damaged may present patients with varying physical and cognitive

symptoms. According to Bermudez (2007), teenagers who drink heavily could lose up to “10 percent of their mental capacity” (p. 2).

Many cognitive functions have their anatomical correlates within the brain’s frontal lobe (George et al., 2004; Stephens & Duka, 2008). Initiation of language, memory, and problem solving are most closely related with cognitive functioning. Similarly, the hippocampus aids in memory storage and organization (Munro et al., 2000). It is also responsible for attaching emotions to new memories that are made. The cerebellum is responsible, in part, for muscle coordination (Bermudez, 2007). Damage there can result in balance problems, which are common in individuals who are intoxicated. The nerve cells play a role in the sending and receiving of messages in the brain (Bermudez, 2007; Oscar-Berman, 1988). Consequently, if this neural communication is hindered, the whole body can experience negative effects (Bermudez, 2007). Some neurochemicals have also been affected by alcoholism (Gass & Olive, 2012). Dopamine, serotonin, GABA, glutamate, and other neurotransmitters are altered by alcohol. These changes can account for impulsivity, social withdrawal, and dependence on alcohol.

There have been many studies to determine exactly which brain functions are most affected by alcohol abuse and binge drinking. One study was conducted on individuals who admitted to “heavy episodic drinking” (Cairney et al., 2007). On average, these participants reported drinking for nine years prior to the study and had consumed a median of 14 alcoholic beverages per occasion. The control group consisted of participants who reportedly abstained from drinking at the time of the study and had consumed little to no alcohol in the past. The specific areas of reaction time, self-monitoring, working memory, incidental learning, and associative learning were among the neurological functions assessed. Tasks from a cognitive assessment battery were used for each assessment. The two groups of individuals, those

classified as heavy episodic drinkers and those who were not, were assessed in each area. Participants reported their past and present alcohol consumption to determine whether they belonged in the experimental or control group. Heavy episodic drinkers were defined by their past and present consumption practices. The study showed that those engaging in heavy episodic drinking had a slower reaction time as well as lower accuracy on working memory and incidental and associate learning tasks than the control group. No significant differences were found in the area of self-monitoring. The results confirm the fact that alcohol can, in fact, alter cognitive functions necessary for daily living.

Another study revealed the effects of abstinence from alcohol on the potential for regaining of cognitive functions (Munro et al., 2000). Many factors such as age, duration of abstinence, age when heavy drinking began, and total years of drinking were considered. Two experimental groups were formed based on the participants' length of abstinence. These groups had a history of at least ten years of alcohol abuse and a minimum of four weeks abstinence prior to the study. A control group was comprised of individuals who had no history of alcohol abuse. Individuals were excluded from the study if they had any history of cognitive impairments. Each participant was evaluated using a variety of cognitive assessments such as the Mini-Mental State Exam (Folstein, Folstein, & McHugh, 1975). The results revealed that, although some cognitive damage was irreversible, many functions returned to normal when the individuals underwent a period of abstinence of about six months. The team of researchers concluded that executive functions remain impaired regardless of the duration of abstinence. For example, organization and planning continued to be difficult for individuals despite their improvement in visuospatial skills. The findings of this study are helpful in understanding the long-term cognitive effects an individual may experience during abstinence, possibly well after he or she stops drinking.

Goldstein, Haas, Shemansky, Barnett, and Salmon-Cox (2005) studied the effects of cognitive rehabilitation among recovering alcoholics. They used tasks from several neuropsychological assessment batteries, such as the Wisconsin Card Sorting Test (Heaton, Chelune, Talley, Kay, & Curtiss, 1993), to evaluate the cognitive skills of each participant before and after the rehabilitation program. Participants were randomly assigned to either the experimental cognitive intervention group or the control group. In the experimental group, participants received five 30-minute intervention sessions over a period of three weeks. Skills such as psychomotor speed, visual scanning, and perceptual analysis were taught and practiced during this time. Participants in the control group met with a counselor for 30 minutes on a daily basis to discuss current events. They were given access to current media or asked to discuss a recent news story. Goldstein and colleagues (2005) found that most participants in the experimental group were capable of improvement on the skills assessed if they had adequate time and training. Progress occurred consistently across sessions. Additionally, the participants demonstrated generalization as they improved on cognitive tasks that were not directly targeted in intervention. Those in the control group did not make any statistically significant progress in the targeted tasks. These results support the idea of providing cognitive intervention for individuals recovering from such addiction.

Monnot et al. (2001) examined individuals' social skills. Such skills can include solving problems and understanding social cues such as facial expressions and intonation. The researchers explored the comprehension of prosody (e.g. the rhythm and intonation of one's speech) in individuals with Fetal Alcohol Syndrome, alcoholism, and a control group. Four groups of participants were formed based on the individuals' alcohol history: (1) alcoholics without Fetal Alcohol Syndrome, (2) alcoholics with Fetal Alcohol Syndrome, (3) individuals

with Fetal Alcohol Syndrome but no history of alcoholism, and (4) a control group with no history of alcoholism or Fetal Alcohol Syndrome. The researchers assessed each participant by means of self-report, formal evaluation, and interviews. Monnot and colleagues found that individuals with Fetal Alcohol Syndrome and alcoholics struggled to comprehend emotions and prosodic clues in others' voices. The team concluded that this lack of understanding could have a long lasting impact on individuals in the area of social competency.

Research regarding alcohol abuse screening tools used the World Health Organization's (WHO) definitions of hazardous and harmful drinking to survey older adults about their health status and drinking habits (Fink, Morton, Beck, Hays, Spritzer, Oishi, et al., 2002). They used the second edition of the Alcohol Use Disorder Identification Test (AUDIT) created by Babor, Higgins-Biddle, Saunders, and Monteiro (2001). Each participant in the study was given the AUDIT, which was designed to obtain a more comprehensive look at individuals' habits and potential health risks. With the survey responses, the researchers classified each individual as a harmful, hazardous, or non-hazardous drinker. Hazardous drinkers put their health at risk by drinking alcohol. Harmful drinkers may cause physical or psychological damage to their body by choosing to drink. Non-hazardous drinkers have no additional risks when drinking. An example of a hazardous drinker is an individual whose medication may not work effectively if mixed with alcohol. Harmful drinkers might have a health problem such as cirrhosis that was caused by alcohol or could be worsened by continued alcohol consumption. The results revealed that more men were considered harmful drinkers than women, more women were considered nonhazardous drinkers, and there were no differences between men and women for hazardous drinking. Although these results are not generalizable to all men and women, the questionnaire helped gain a greater understanding of the habits of each group. Additionally, the screening tool may be

helpful in gaining a more holistic view of individuals' drinking habits to inform them of additional risks they may be incurring by choosing to drink.

Because of the growing knowledge of alcohol abuse among older adults, Reid, Tinetti, Brown, and Concato (1998) studied physicians' awareness of such disorders among patients 65 and older. One hundred-fifty physicians participated in an interview via the telephone about the subject in the context of their own practices. Questions regarding the physicians' estimated prevalence of alcohol use disorders (AUDs) in their patients, knowledge of alcohol abuse screening tools, and demographics were asked of each participant. It is important to note that the researchers considered a range of drinking habits in their definition of AUDs. They began the range of disorders with "heavy" drinking associated with hazardous or harmful drinking patterns, which were defined by the World Health Organization. Alcohol abuse and dependence were among the more severe end of their AUD spectrum. Participants were given the opportunity to describe the various drinking problems that their patients experienced. Approximately 40% of physicians estimated AUDs in four percent or less of their older patients. Another 40% reported an estimate of about five to 14%. The remaining 20% of physicians estimated at least 15% AUDs among their patients. The average range of AUDs in older patients cited in previous studies is between five and 23%. Within those studies, AUDs only included alcohol abuse and dependence, leaving out heavy drinking as defined in this study. These findings suggest that, as a whole, physicians tend to underestimate the number of patients with an AUD. Furthermore, 27% of the physicians interviewed reported that they did not regularly screen their older patients for AUDs. Among the 73% of physicians who did report using screening tools, only two participants used a comprehensive tool such as the Alcohol Use Disorder Identification Test (Babor et al., 2001) to detect hazardous and harmful drinking habits. If Reid and colleagues are accurate in

their conclusion of underestimated AUDs, many older adults may be in danger because their risky drinking patterns are undetected by primary care providers who are unaware of the severity of the problem. Therefore, they could potentially endure unnecessary and preventable physical and cognitive health declines.

Like older adults, college students are a vulnerable population that may be greatly harmed by alcohol abuse and binge drinking. According to Wechsler and Nelson (2008), cognitive functioning declines before an individual consumes the amount of alcohol required to legally be considered “intoxicated.” Zeigler et al. (2005) found that small amounts of alcohol can interfere with learning and memory. Increased neurocognitive deficits and cognitive functioning impairments were found in adolescents in comparison to adults who participated in binge drinking (Zeigler, et al., 2005). Since many studies have revealed that approximately half of college students who drink, do so with intentions of becoming intoxicated, it is clear that the risk of cognitive decline is extremely prevalent among this population. Furthermore, roughly 30% of college students meet the criteria to receive a diagnosis of alcohol abuse (Knight, Wechsler, Kuo, Seibring, Weitzman, & Schuckit, 2002). The American Psychiatric Association (2000) criteria for alcohol abuse from the DSM-IV-TR is as follows:

(A) A maladaptive pattern of drinking, leading to clinically significant impairment or distress, as manifested by at least one of the following occurring within a 12-month period:

- Recurrent use of alcohol resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to alcohol use; alcohol-related absences, suspensions, or expulsions from school; neglect of children or household)
- Recurrent alcohol use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by alcohol use)
- Recurrent alcohol-related legal problems (e.g., arrests for alcohol-related disorderly conduct)

- Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol (e.g., arguments with spouse about consequences of intoxication).

(B) Never met criteria for alcohol dependence. (p. 199)

Researchers surveyed college students across the nation regarding the consequences of binge drinking (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). Students were randomly selected from 140 campuses across the United States. After analyzing the completed surveys, the team of researchers discovered that roughly half of college students participate in binge drinking. As a result, many students encounter secondary problems related to alcohol. The 12 secondary problems included in this study were: hangovers, missing class, falling behind in school, regretting something he or she did, forgetting where he or she was, getting into an argument, unplanned sex, unprotected sex, damaged property, getting in trouble with the law, getting injured, and obtaining medical treatment due to an overdose. Among students classified as binge drinkers, 47% experienced five or more of the 12 secondary problems listed on the questionnaire. The results reveal that there are serious consequences involved with binge drinking, which occur on college campuses nationwide.

In a similar study, Weitzman et al. (2004) examined the contextual factors that affect students' drinking patterns. They compared various colleges participating in the "A Matter of Degree" (AMOD) (a program that funds environmental changes to reduce alcohol abuse) to find out which strategies were the most effective. High and low implementation groups were each compared to campuses that were not participating in the program. Environmental changes included factors such as the price of alcohol, advertisement, and campus policies. The number and difficulty of each change determined whether a campus was assigned the high or low intervention group. The contextual changes and drinking patterns were recorded for each

participating campus. The results revealed that a combination of environmental strategies are helpful in reducing alcohol abuse on college campuses, but the amount of strategies needed to promote change is extremely high and costly.

Wachtel and Staniford (2010) reviewed the literature to investigate the efficacy of intervention for binge drinking and alcohol abuse among adolescents in emergency health care settings. Motivational interviewing, harm minimization, and face-to-face interviews were common techniques used. None of them proved to be statistically significant intervention strategies. However, motivational interviewing did demonstrate the most reduction in alcohol misuse. The authors concluded that this might have been due to confounding factors such as maturity of the participants.

Taken together, these studies show the types of deficits and consequences individuals may suffer if they choose to abuse alcohol or binge drink. Long-term memory, short-term memory, working memory, organization of information, attention, social differences, and learning difficulties are all among the list of potential problems an individual may experience. Some may benefit from abstinence from drinking, although they will most likely not recover fully from the acquired cognitive limitations. As the study by Cairney et al. (2007) notes, the number of years involved in heavy drinking and the age of the individual play a large role in his or her ability to recuperate. In addition to the physiological implications of alcohol abuse, traumatic brain injuries are also associated with heavy drinking patterns. Alcohol is involved in roughly half of all traumatic brain injuries (TBI) in the United States (Bermudez, 2007). Furthermore, TBIs can result in long lasting physical and neurological damage manifested through disorders such as aphasia.

College students involved in binge drinking are at a high risk of such injuries due to the amount of alcohol that many of them consume per occasion. The statistics show that this trend has remained steady over the past decade (Wechsler & Nelson, 2008). However, researchers have not attempted to find out these students' perceptions of the effects of alcohol on cognition. Similarly, Speech-Language Pathologists' knowledge of alcohol abuse and binge drinking is also unknown. The topic is scarcely found in textbooks addressing neurology and related subjects.

Purpose

Finding students' perceptions of alcohol abuse could be very helpful in reducing harmful drinking patterns on college campuses. According to the findings of Weitzman et al. (2004), creating intervention programs that highly alter campuses' environment could potentially reduce the harmful effects of alcohol for this population. If students are unaware of the consequences of alcohol abuse and binge drinking, these types of programs could positively transform students' awareness and risk of harmful consequences. However, it is possible that students are already aware of these risks and choose to participate in risky drinking behaviors despite their knowledge and warnings. If this is true, professionals on college campuses and in healthcare need to be aware of these effects as well.

Because professionals with expertise in neurological functioning could specialize in many different areas, their educational backgrounds could be very diverse. Some may have learned a great deal about alcohol abuse. Others may have had minimal training in this area. Professionals' perceptions and awareness could directly affect the clients they treat. A lack of knowledge about alcohol abuse and binge drinking could lead to misdiagnoses or a simple lack of understanding of clients' complete case histories. Fully educated healthcare providers could

make proper referrals, offer realistic prognoses, accurately diagnose, and create and promote prevention programs to promote healthy choices.

Research Questions

The purpose of this study is to compare the perceptions of three groups (students enrolled in a CSD program, speech-language pathologists who are practicing in the schools, and practicing speech-language pathologists with an identified special interest/proficiency in neurologically-based communication disorders, including traumatic brain injury) to provide a better understanding of alcohol abuse and binge drinking trends as a whole. The following research questions will be addressed:

(1) How do college students' awareness of the effects of alcohol abuse differ from those of speech-language pathologists with expertise in neurological functioning?

(2) How do participants' consumption habits compare with their awareness of the effects of alcohol abuse and binge drinking?, and

(3) Do school-based SLPs have differing awareness of the effects of alcohol abuse and binge drinking in comparison to SLPs who specialize in neurogenic communication disorders?

Hypotheses

It is hypothesized that: a) Students will have little awareness of the cognitive effects of alcohol abuse and binge drinking, b) speech-language pathologists will have greater awareness than students, and c) the American Speech-Language-Hearing Association (ASHA) Special Interest Group 16 (SIG 16; School Based Issues) will have less awareness than ASHA SIG 2 (Neurogenic Communication Disorders).

CHAPTER III

Methods

Study Instrument

The study instrument was an electronic survey with questions related to the demographics of each participant and facts related to alcohol abuse and binge drinking. Demographic questions were developed with consideration of alcohol abuse screening tools such as the CAGE Questionnaire (Ewing & Rouse, 1970) and the Michigan Alcohol Screening Test (National Council on Alcoholism and Drug Dependence of the San Fernando Valley, Inc., 1971). These questions were included to compare participants' awareness of the effects of alcohol abuse and binge drinking to their patterns of consumption. The questions regarding alcohol facts were developed by reviewing literature from various journals and nationally funded research such as *Alcoholism: Clinical and Experimental Research* (Monnot, et al., 2001; Munro, et al., 2000) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA, n.d.).

Two separate surveys were developed, one for students and one for Speech-Language Pathologists (SLPs). Each survey contained the same base set of 8 demographic and 13 alcohol fact questions. The SLP survey (see Appendix A) contained additional questions regarding their education and alcohol abuse and binge drinking as related to healthcare. The student survey (see Appendix B) had additional questions regarding alcohol consumption among college students in the United States.

Participants

Two groups of eligible participants for this study were (a) speech-language pathologists who are certified members of the American Speech-Language-Hearing Association (ASHA) and (b) students enrolled in the Department of Communication Sciences and Disorders at Wichita

State University for the Spring 2013 semester. Professional participants who completed the SLP survey were recruited from listservs serving ASHA's Special Interest Group 2 (SIG 2): Neurophysiology and Neurogenic Speech and Language Disorders, and Special Interest Group 16 (SIG 16): School-Based Issues. It was expected that members of ASHA SIG 2 may have more awareness of the effects of alcohol use/abuse on cognitive function than those in SIG 16 because of their specialized interest in neurogenic communication disorders. The members of Special Interest Group 16, therefore, served as a more "naïve" professional group. The survey link was posted for individuals to complete on a volunteer basis. Participants who completed the student survey were recruited using a Wichita State University Department of Communication Sciences and Disorders in-house listserv. An e-mail was sent to each listserv with a link to the survey at www.surveymonkey.com.

Survey Administration

Each survey response was anonymous due to its electronic nature. No identifying information was asked of participants. The purpose of the study and the voluntary nature of participation was explained in an email prior to the participants agreeing or disagreeing to complete the survey (see Appendix C). Participants who agreed to the informed consent were able to view and answer the survey questions. A second email was sent to each listserv three weeks after the initial request for participation in an effort to increase the number of participants.

Data Analysis

Statistical analyses included:

1. Means and standard deviations to analyze alcohol awareness in each group of participants.

2. A chi-square test to compare the level of awareness in each group of participants. The SLP responses were compared to the student responses. Additionally, the responses from the two special interest groups were compared.

CHAPTER IV

Results

Demographics

A total of 38 students, of 189 enrolled, and 87 speech-language pathologists, of 4320 total SIG 2 members and 8156 total SIG 16 members, participated in the study. Four respondents who participated in the SLP survey were excluded from the analysis due to lack of certification as a speech-language pathologist. Of the 83 remaining SLPs, 25 were members of SIG 16 and 57 were members of SIG 2. The majority of respondents from both participant groups were white (91%) and female (94%). Only 15% of the student respondents were under 21 years old. The majority of students, almost 70%, were between 21 and 35 years old. The SLP respondents were fairly evenly distributed mostly between the ages of 26 and 65, with the highest percentage of participants falling between 26 and 35 years old.

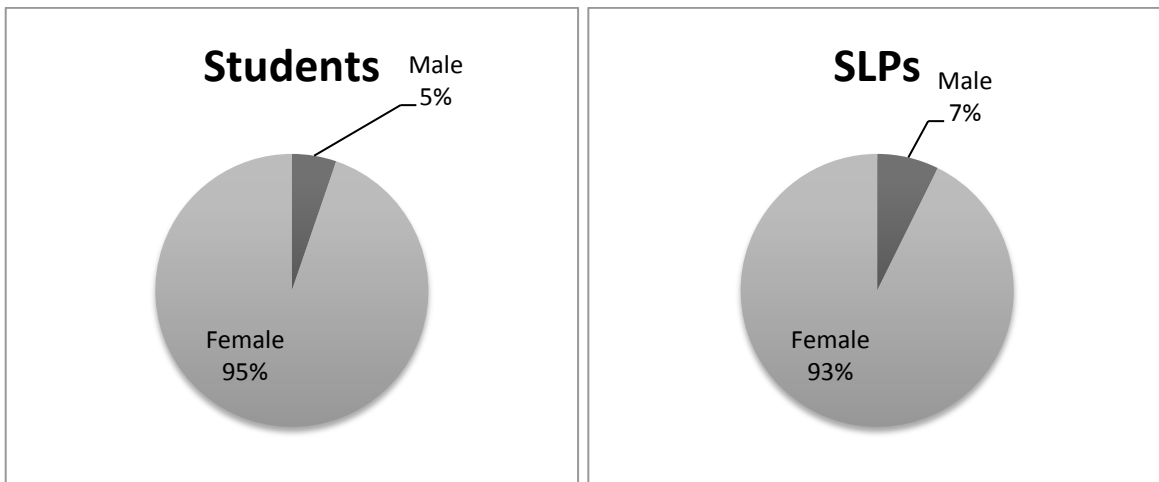


Figure 1. Gender.

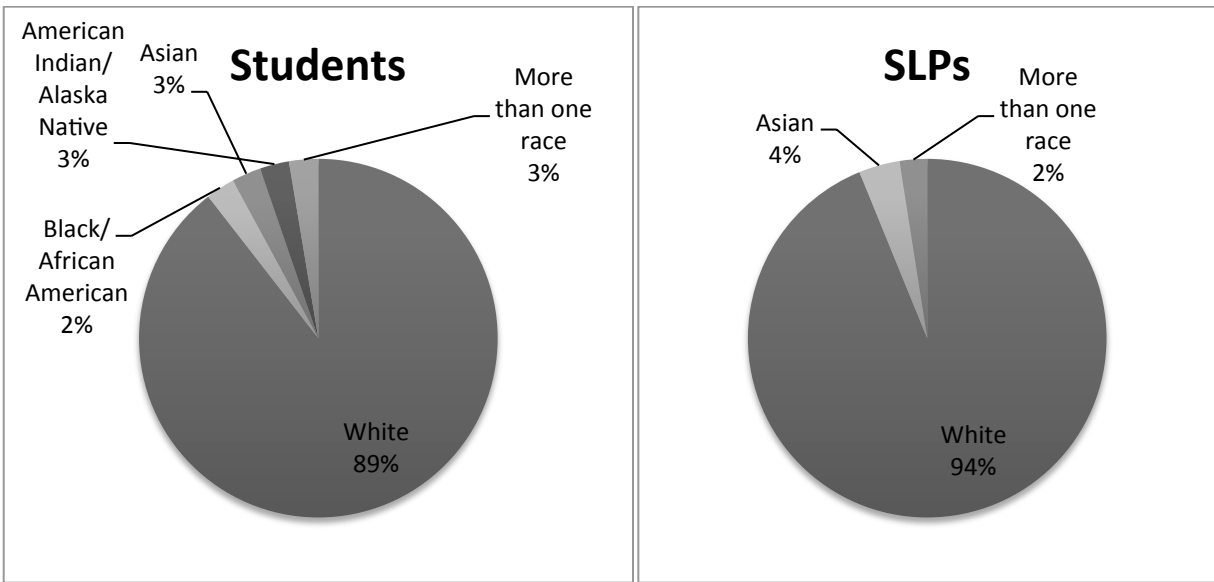


Figure 2. Ethnicity.

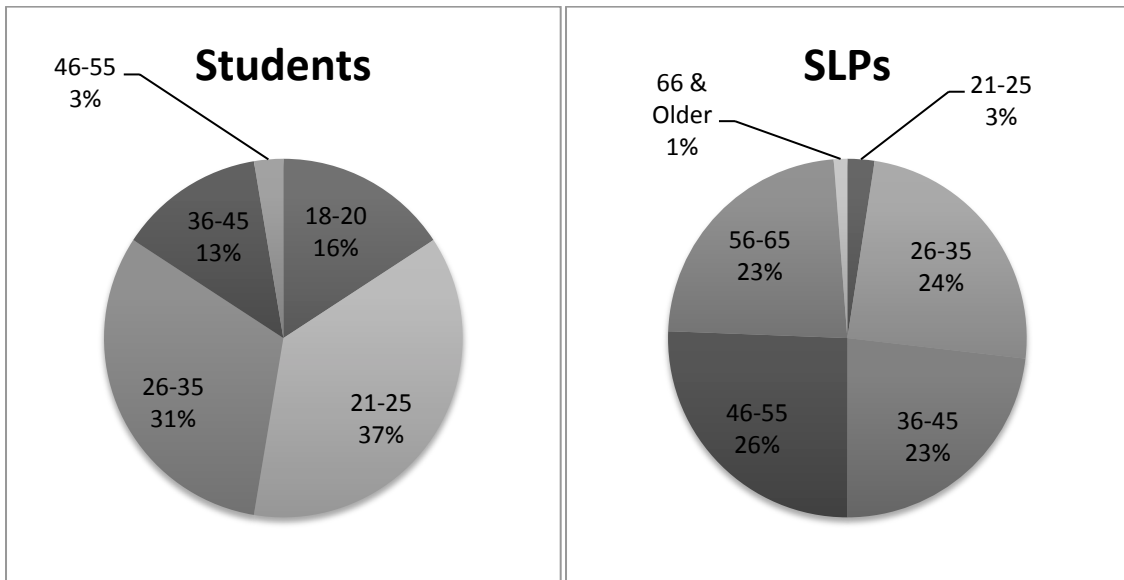


Figure 3. Age.

Students conveyed varying frequencies of alcohol consumption with 40% choosing “rarely or never”. Another 29% reported drinking one to two times per month. Furthermore, 76% of students reported drinking one to three beverages per occasion. Similarly, 78% of SLPs

reported similar levels of consumption. However, their responses for frequency varied in comparison to the students. Drinking one to two times per week, one to two times per month, and three to four times per month each received approximately 20% of the responses.

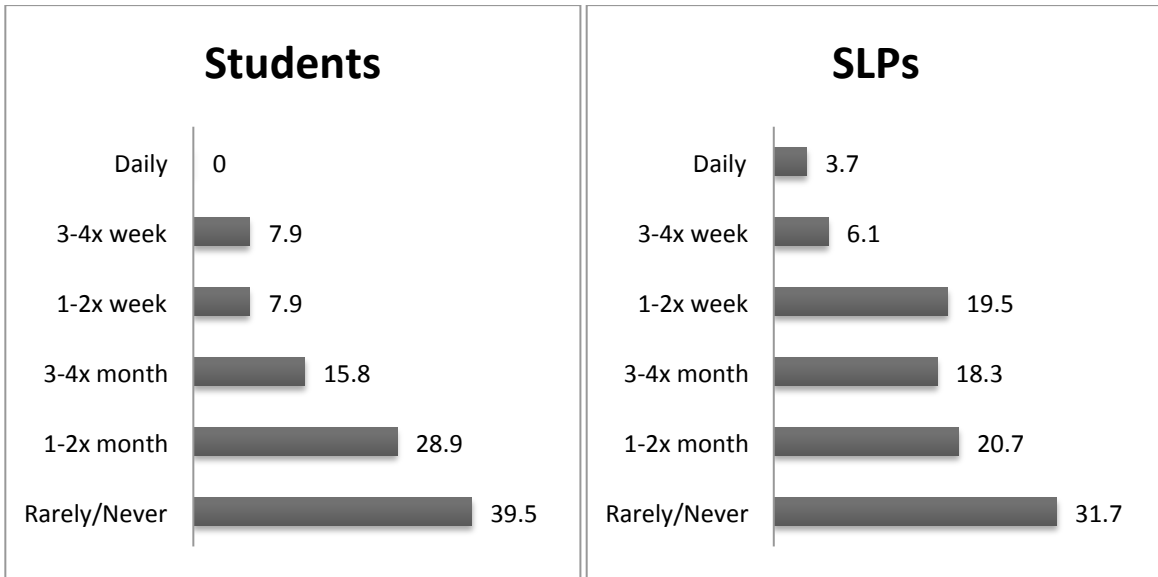


Figure 4. Consumption Frequency (%).

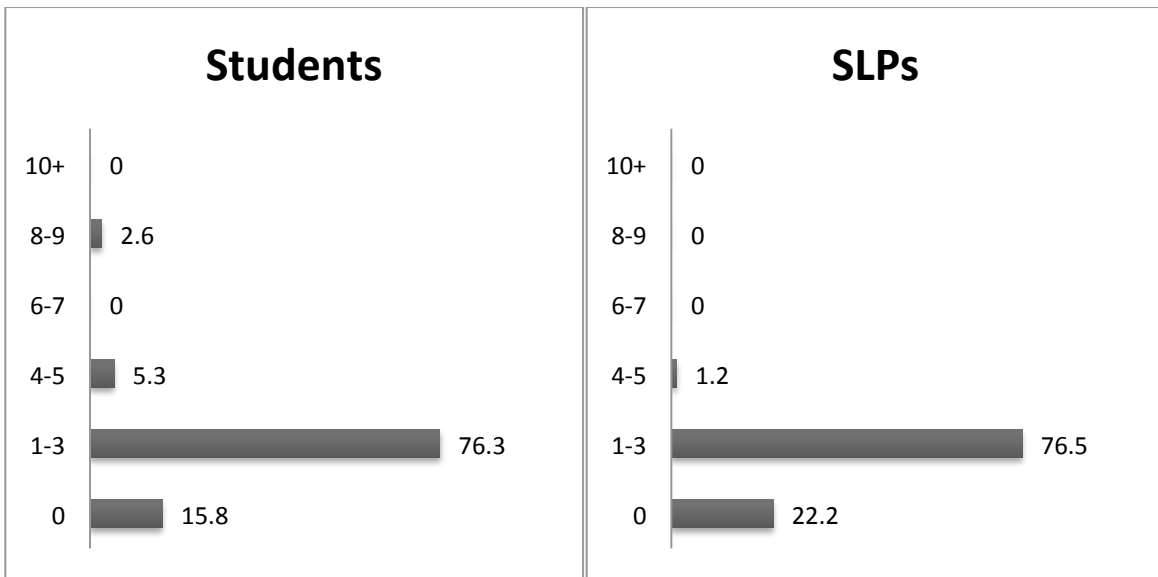


Figure 5. Number of Drinks Consumed at One Period of Time (%).

The majority from each group, 49% of SLPs and 46% of students, reported that they knew of no one within their social network with an alcohol problem. Approximately 5% of the students reported having a drinking problem. When comparing their drinking habits to those of their peers, nearly three-fourths of the student respondents claimed to drink less.

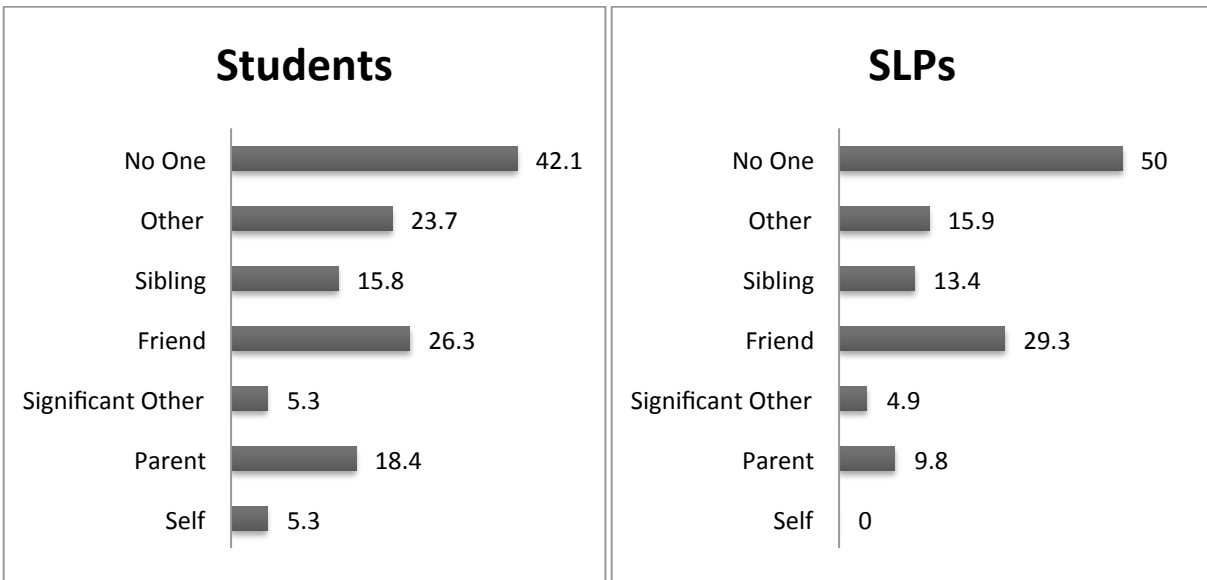


Figure 6. Alcohol Abuse within Social Network (%).

Students identified negative consequences of alcohol about which Wichita State University had attempted to inform them in various ways. The most common topic of discussion, according to 78% of the respondents, was that of drinking and driving. Approximately 53% of the participants learned about binge drinking and alcohol abuse, closely followed by 47% who heard about alcoholism and negative health consequences as it related to alcohol. Only 39% of respondents were educated about neurological differences as a result of alcohol.

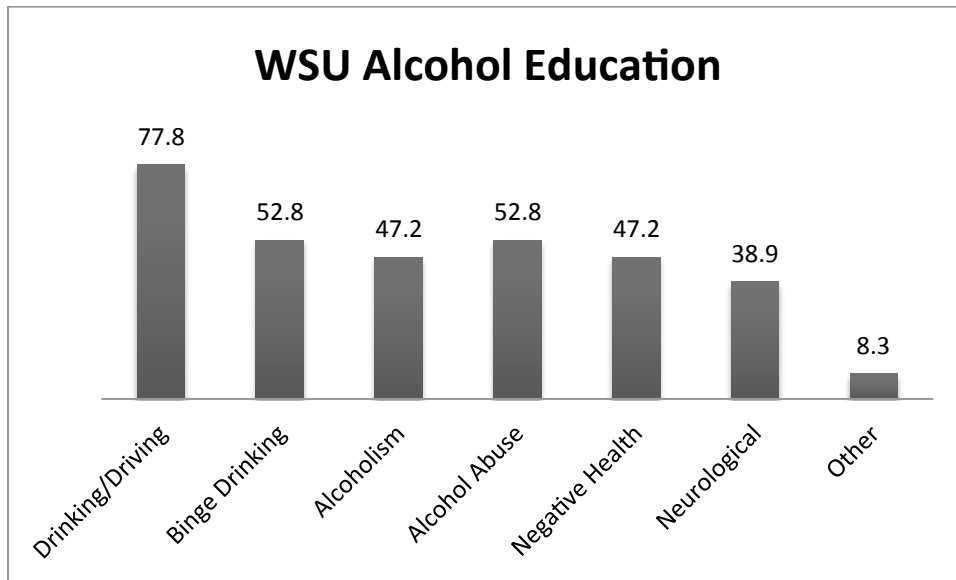


Figure 7. Students' Education (%).

Rather than recalling specific topics, SLPs reported on the frequency with which alcohol abuse was addressed during their professional education. Roughly 38% of the respondents never recalled having discussed it during their coursework and 48% only had one class discussion. A mere 1% reported a full course dedicated to the subject of alcohol's effects on cognitive function. Almost 8% of participants were educated in multiple courses and another 8% had one whole unit of lecture concerning alcohol abuse.

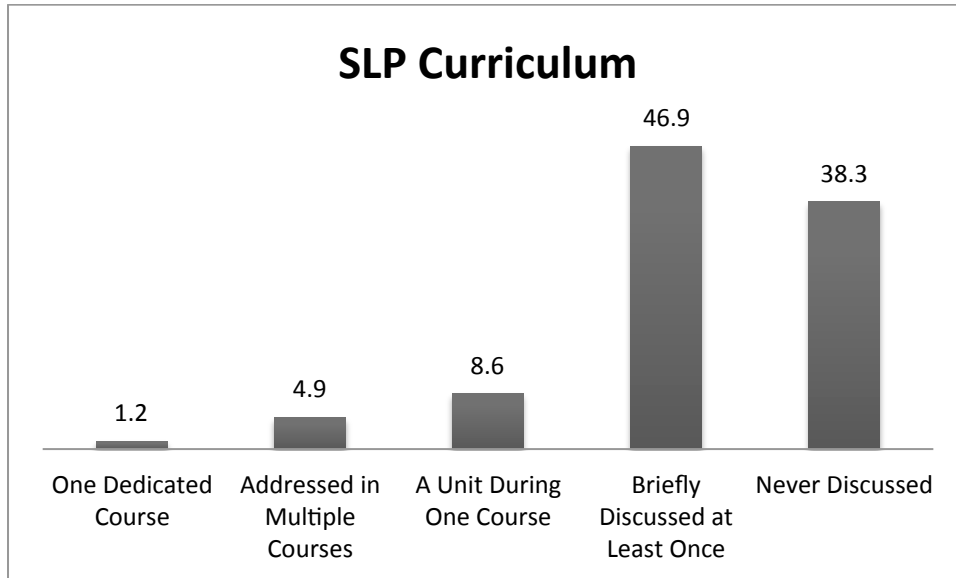


Figure 8. SLP Education (%).

Alcohol Awareness

Each group scored low on quantitative measures of the cognitive effects of alcohol.

TABLE 1

Group Accuracy

Question	% of students correct	% of SIG 2 correct	% of SIG 16 correct	Total % correct
1. Recovery of cognitive deficits is possible after a period of abstinence from alcohol. (T)	47.2	64.4	52	54.3
2. Men are more likely to experience health problems as a result of drinking. (F)	50	63.3	57.2	57
3. 17% of Americans have a drinking problem. (T)	63.9	57.6	68	63.2
4. Individual 21 years and older drink more per occasion than those under 21. (F)	70.3	61.4	62.5	64.7
5. Intervention approaches that modify environmental factors of drinking such as price and advertisement are effective ways of preventing the harmful effects of alcohol abuse. (T)	38.9	48.2	25	37.4

TABLE 1 (Continued)

6. Some individuals are genetically predisposed to alcoholism. (T)	97.3	98.2	96	97.2
7. Aphasia is a neurological disorder characterized by the loss of receptive and/or expressive language skills and can be caused by a traumatic brain injury. (T)	100	96.5	100	98.8
8. The length of one's period of abstinence from alcohol is not related to his or her ability to be successful in a treatment program. (F)	70.3	68.4	58.3	65.7
9. 55% of individuals who binge drink become dependent on alcohol. (F)	47.4	28.1	29.2	34.9
10. How many alcoholic beverages must be consumed for a male to be considered to be abusing alcohol?	54	56.1	62.5	57.5
11. How many alcoholic beverages must be consumed for a female to be considered to be abusing alcohol?	35.1	30.4	28	31.2
12. Which of the following is true regarding rate of binge drinking on college campuses in America?	64.9	70.2	58.3	64.5

Each respondent's correct responses on the factual knowledge true/false questions were summed to derive a total accuracy score. A one-way analysis of variance (ANOVA) was completed to test for differences in accuracy scores among the three groups. There was no significant difference in accuracy scores among the three groups, $f(2, 123) = 0.768, p = .466$.

Each group responded appropriately to the question regarding the cognitive effects of alcohol abuse (see Table 2). All of the responses available were accurate choices. Attention, working memory, and short-term memory were the most common responses with a mean of 99.4, 99.1, and 98.5% respectively. Long-term memory was the least acknowledged cognitive effect, with only 83.6% response rate. Students were the least likely of the three groups to recognize long-term memory as a potential deficit resulting from alcohol abuse.

TABLE 2

Cognitive Effects of Alcohol

Cognitive Effect	% of Students Correct	% of SIG 2 Correct	% of SIG 16 Correct	Total % Correct
Attention	100	98.2	100	99.4
Working Memory	97.3	100	100	99.1
Comprehension	91.9	87.7	95.8	91.8
Social Communication	89.2	91.2	91.7	90.7
Short-term Memory	97.3	98.2	100	98.5
Long-term Memory	73	86	91.7	83.6

Speech-language pathologists answered two additional questions related to alcohol abuse and the profession. There were consistent differences between SIG 2 and SIG 16 (see Table 3). However, it is notable that SIG 2 had a higher accuracy on the question related to alcohol abuse screenings. SIG 16, on the other hand, scored higher on the question related to older adults’ alcohol consumption.

TABLE 3

SLP Questions (%)

Question	SIG 2	SIG 16
Most existing alcohol abuse screening measures include questions regarding additional risk factors associated with drinking such as comorbid diseases and medications.	47.4	37.5
According to the World Health Organization, harmful drinking occurs when an individual’s alcohol use causes “physical or psychological complications.” Which best describes the trend in harmful drinking as individuals reach 75 years of age?	15.8	29.2

When the participants were asked about their confidence in their responses, over 40% were not confident at all. Participants from SIG 16 (School-Based Issues) reported the least confidence whereas SIG 2 had the highest percentage of confident participants. These

percentages demonstrate an overall lack of confidence in the subject of cognition and alcohol abuse.

TABLE 4
Response Confidence (%)

How confident are you in your answers to these survey questions?	Students	SIG 2	SIG 16	Average
Not at all	42.5	40.4	48	43.6
Fairly confident	55.2	56.1	52	54.4
Confident	2.3	3.5	0	1.9
I know they are correct	0	0	0	0

CHAPTER V

Discussion

Students in this study demonstrated little awareness of the cognitive effects of alcohol abuse and binge drinking. However, the SLPs appeared to have an equivalent awareness deficit, nullifying the expectation that SLPs would have a greater awareness than students. Furthermore, SIG 16 (School Based Issues) exhibited similar awareness in comparison to SIG 2 (Neurogenic Communication Disorders), yielding another null hypothesis: that SIG 2 would excel in comparison to SIG 16.

It is possible that the two SLP groups showed no significant differences because of a lack of overall understanding. Furthermore, none of the participant groups demonstrated adequate awareness of the cognitive effects of alcohol abuse. These scores demonstrate a large overall deficit in education. It is possible that, because many professionals are relatively unaware of the cognitive effects of alcohol abuse, they do not have current information to share with their students. Practicing SLPs experienced the same gap in information that students are experiencing today. This cycle of unfamiliarity with the topic will continue until a shift in education has occurred. Such a shift must include current students and professionals alike, so future and current SLPs will have equal opportunity to provide evidence-based practice to individuals who may be suffering the cognitive consequences of alcohol abuse.

The curriculum for Communication Sciences and Disorders programs may need to be modified to accommodate the latest evidence regarding the cognitive effects of alcohol abuse. New courses or altered materials of current courses may be warranted. Additionally, textbook authors should investigate the topic to provide the most recent evidence. Professors must also gain more insight into the subject before they are able to effectively teach the students.

Education also needs to be provided to practicing SLPs. Continuing education opportunities addressing the topic could be offered. Scientists in the area could present the latest research at state and national conferences hosted by organizations such as the American Speech-Language-Hearing Association (ASHA). Finally, companies that employ medical professionals, SLPs included, should provide the latest research to their employees to increase evidence-based practice. For example, in-services or online resources could be made available and easily accessible.

Interdisciplinary collaboration is necessary to increase awareness among both students and professionals. Other medical professionals such as doctors and nurses may be very helpful in shedding light on the cognitive effects of alcohol abuse. Similarly, psychologists and other social science professionals would be beneficial team members. By working as a team, professionals will be able to expand their knowledge and provide the best possible care for a variety of clients.

Further research on this topic would be very beneficial. In addition to researching ways to educate individuals in the field of speech-language pathology, it would be helpful to know other medical and social science professionals' knowledge of the cognitive effects of alcohol abuse. Professionals would benefit from understanding the setting in which these clients will most likely be served and evidence-based approaches that will guide therapy.

Although the results of the study did not yield differences among CSD students and speech-language pathologists regarding their awareness of the cognitive effects of alcohol abuse as hypothesized, it provided useful information. A lack of understanding is prevalent among students and professionals. Because of gaps in knowledge, more must be done to educate students and current professionals in the profession of speech-language pathology.

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APPENDICES

Appendix A

SLP Survey

Age

- a) 21-25
- b) 26-35
- c) 36-45
- d) 46-55
- e) 56-65
- f) 66 or older

Please indicate your ethnicity.

- a) White
- b) Hispanic/Latino
- c) Black/African American
- d) Asian
- e) American Indian/Alaska Native
- f) More than one race
- g) Unknown
- h) Other

Please indicate your gender.

- a) Male
- b) Female

Are you a certified Speech-Language Pathologist?

- a) Yes
- b) No

Which ASHA Special Interest Group are you a member of?

- a) SIG 2 – Neurophysiology and Neurogenic Speech and Language Disorders
- b) SIG 16 – School-Based Issues

Approximately how much of your professional education addressed alcohol abuse?

- a) One dedicated course
- b) Addressed in multiple courses

- f) Other
- g) No one

True or False:

(T) Recovery of cognitive deficits is possible after a period of abstinence from alcohol.

(F) Men are more likely to experience health problems as a result of drinking.

(T) 17% of Americans have a drinking problem.

(F) Individuals 21 years and older drink more per occasion than those under 21.

(T) Intervention approaches that modify environmental factors of drinking such as price and advertisement are effective ways of preventing the harmful effects of alcohol abuse.

(T) Some individuals are genetically predisposed to alcoholism.

(T) Aphasia is a neurological disorder characterized by the loss of receptive and/or expressive language skills and can be caused by a traumatic brain injury.

(F) The length of one's period of abstinence from alcohol is not related to his or her ability to be successful in a treatment program.

(F) 55% of individuals who binge drink become dependent on alcohol.

(F) Most existing alcohol abuse screening measures include questions regarding additional risk factors associated with drinking such as comorbid diseases and medications.

(All options) Alcohol abuse can result in deficits in which of the following areas? (Check all that apply.)

- Attention
- Working Memory
- Comprehension
- Social Communication
- Short-term Memory
- Long-term Memory

(b) How many alcoholic beverages must be consumed for a male to be considered to be abusing alcohol?

- a) 3
- b) 5
- c) 7

d) 9

(b) How many alcoholic beverages must be consumed for a female to be considered to be abusing alcohol?

- a) 3
- b) 4
- c) 6
- d) 7

(b) According to the World Health Organization, harmful drinking occurs when an individual's alcohol use causes "physical or psychological complications." Which best describes the trend in harmful drinking as individuals reach 75 years of age?

- a) Increases
- b) Decreases
- c) Does not change

(e) Which of the following is true regarding rate of binge drinking on college campuses in America?

- a) Northern states have the highest rate.
- b) Western states have the highest rate.
- c) Southern states have the highest rate.
- d) Eastern states have the highest rate.
- e) Binge drinking occurs in equal proportions across the U.S.

How confident are you in your answers to these survey questions?

- a) Not at all
- b) Fairly confident
- c) Confident
- d) I know they are correct

Appendix B

Student Survey

Age

- a) 18-20
- b) 21-25
- c) 26-35
- d) 36-45
- e) 46-55
- f) 56-65
- g) 66 or older

Please indicate your ethnicity.

- a) White
- b) Hispanic/Latino
- c) Black/African American
- d) Asian
- e) American Indian/Alaska Native
- f) More than one race
- g) Unknown
- h) Other

Please indicate your gender.

- a) Male
- b) Female

How long have you attended Wichita State University (WSU)?

- a) Less than 1 semester
- b) 1-2 semesters
- c) 3-4 semesters
- d) 5-6 semesters
- e) 7-8 semesters
- f) 9 or more semesters

Which best describes your current living situation?

- a) WSU Housing
- b) WSU Greek Housing

- c) Off campus with friends
- d) Off campus with family
- e) Off campus with no roommates

Is your major in a health care related profession?

- a) Yes
- b) No

Many universities inform students about the negative effects of alcohol. Please indicate which topic(s) you have heard about while attending WSU. (Check all that apply.)

- Drinking and driving
- Binge drinking
- Alcoholism
- Alcohol Abuse
- Negative health consequences as a result of alcohol
- Neurological differences as a result of alcohol
- Other (Please specify) _____

About how often do you consume alcohol?

- a) Rarely or Never
- b) 1-2 times per month
- c) 3-4 times per month
- d) 1-2 times per week
- e) 3-4 times per week
- f) Daily

On average, how many beverages do you consume on one occasion?

- a) I do not drink.
- b) 1-3
- c) 4-5
- d) 6-7
- e) 8-9
- f) 10 or more

Approximately how many years have you consumed alcohol?

- a) 1 or less
- b) 2-5
- c) 6-10

- (T) 33% of U.S. college students qualify for a diagnosis of alcohol abuse.
- (F) 65% college students who binge drink started doing so in high school.
- (F) 55% of individuals who binge drink become dependent on alcohol.
- (F) 60% of college students in the United States binge drink.
- (T) 48% of U.S. college students drink to get drunk.
- (F) Roughly 3500 U.S. college students die each year due to alcohol-related injuries.

(All options) Alcohol abuse can result in deficits in which of the following areas? (Check all that apply.)

- Attention
- Working Memory
- Comprehension
- Social Communication
- Short-term Memory
- Long-term Memory

(b) How many alcoholic beverages must be consumed for a male to be considered to be abusing alcohol?

- a) 3
- b) 5
- c) 7
- d) 9

(b) How many alcoholic beverages must be consumed for a female to be considered to be abusing alcohol?

- a) 3
- b) 4
- c) 6
- d) 7

(e) Which of the following is true regarding rate of binge drinking on college campuses in America?

- a) Northern states have the highest rate.
- b) Western states have the highest rate.

- c) Southern states have the highest rate.
- d) Eastern states have the highest rate.
- e) Binge drinking occurs in equal proportions across the U.S.

How confident are you in your answers to these survey questions?

- a) Not at all
- b) Fairly confident
- c) Confident
- d) I know they are correct

Appendix C

Informed Consent E-mail

Dear (Wichita State University Student/ASHA member),

We are writing to let you know about a research study opportunity. Lauren McGuigan and Dr. Julie Scherz, of the Department of Communication Sciences and Disorders, are conducting a study entitled “Cognitive Effects of Alcohol Abuse: Awareness by Students and Practicing Speech-Language Pathologists”.

The purpose of the study is to learn about students’ and speech-language pathologists’ awareness of the cognitive effects of alcohol abuse and binge drinking. Your responses will help the researchers to understand how environmental variables impact participants’ level of awareness.

You are being asked to take part in this study because you were identified as a (student enrolled at Wichita State University/member of ASHA special interest group 2 or 16). Participation in this study is completely voluntary. By linking to the survey, you are agreeing to participate in the study. If you decide to participate, you will be asked to complete the brief (5-10 minutes) online survey. The researchers will not have access to your identity, just the responses you provide in the survey. Individual study information is held in strict confidence.

If you have any further questions, please contact Lauren at lemcguigan@wichita.edu, Dr. Julie Scherz at julie.scherz@wichita.edu or (316) 978-5344, or the Office of Research Administration at (316) 978-3285.

To proceed to the survey please follow the link below.

Thank you for your time,

Lauren McGuigan, BA

Dr. Julie Scherz, PhD, CCC-SLP