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Traumatic Brain Injury Re-entry Services for School-Aged Children in Idaho

by

Sara E. Wenig

A thesis submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN SPEECH LANGUAGE PATHOLOGY

IDAHO STATE UNIVERSITY

August 2015

Idaho State
UNIVERSITY

Office for Research Integrity
921 South 8th Avenue, Stop 8046 • Pocatello, Idaho 83209-8046

October 8, 2014

Sara Wenig
6200 N River Pointe Dr
Apt I-206
Garden City, ID 83714

RE: Your application dated 9/26/2014 regarding study number 4161: TBI Re-entry Services for School-Aged Children in Idaho

Dear Ms. Wenig:

I have reviewed your request for expedited approval of the new study listed above. T is to confirm that I have approved your application.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

Submit progress reports on your project in six months. You should report how many subjects have participated in the project and verify that you are following the methods and procedures outlined in your approved protocol. Then, report to the Human Subjects Committee when your project has been completed. Reporting forms are available on-line.

You may conduct your study as described in your application effective immediately. The study is subject to renewal on or before 10/8/2015, unless closed before that date.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Tom Bailey (208-282-2179; fax 208-282-4723; email: humsubj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

DEDICATION

I dedicate this thesis to the educators across the state of Idaho whose contributions were essential in completing this study. Without their dedication, cooperation, and participation in the survey, this study could not have been accomplished. As a result of their tireless dedication to their jobs as educators, I hope to provide a service to this great state in presenting a thorough examination of their perceptions regarding TBI re-entry services for students.

ACKNOWLEDGEMENTS

This project was able to come to fruition with all the support and enthusiasm from my friends and family. Most important to thank is my mother, Jennifer, father, Mark, step-mother, Lisa, and sister, Martha who have all endured and believed in me throughout my academic career. Thanks also to the many people involved in this study which made it possible: my thesis director, Dr. Nick Altieri, who provided positive guidance; my mentor and advisor, Cally Stone CCC-SLP, who pioneered this study during her graduate work and entrusted me to pick up where she left off and produce valuable work; the additional ISU faculty who contributed greatly to my research design and literature review, Dr. Jeanne Johnson, Dr. Tony Seikel, and Dr. David Mercaldo (GFR); and to Russell Spearman, Senior Research Associate with the Institute of Rural Health-ISU, whose contributions regarding the incidence and prevalence rates of TBI in Idaho helped to formulate the synopsis that there is most definitely a significant need in our great state for citizens suffering from TBI and mTBI.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Traumatic Brain Injury Re-entry Services for

School-Aged Children in Idaho

Thesis Abstract – Idaho State University (2015)

The current study is an evaluation of the school re-entry programs for Idaho students who have experienced an acquired brain injury, specifically a traumatic brain injury (TBI). The present study will explore: 1) whether the guidelines for the re-entry of students with a traumatic brain injury recommended and distributed by the Idaho State Department of Education in 1995, are being implemented in school districts across the state of Idaho; 2) whether an improvement has been observed in recognizing milder forms of traumatic brain injury in students, and 3), whether this has affected policy and procedure development for school re-entry programs? Additionally, we will consider the extent to which there continues to be a difference in the number of school re-entry services implemented for students with an acquired brain injury in school districts of different size (i.e., large or small). Within the burgeoning literature on TBI, there is evidence advocating improving re-entry programs for students recovering from a mild TBI (mTBI). It is expected that with the more recent evidence and the sizeable improvements and implementations of policies and procedures for re-entry programs, there should be a subsequent intensification in the recovery of a students' academic (cognitive), neuromotor-physical, and social and behavioral success post-TBI. Comparison of results between Stone's original findings and the current replicated analysis will be presented descriptively with areas of strength, need and statewide trends being discussed.

CHAPTER ONE

Introduction

The purpose of this study was to design a survey to evaluate the progress of previously surveyed school re-entry programs within the state of Idaho. Stone (1996) carried out a study to investigate how school-age children with acquired brain injuries were being served across Southern Idaho upon re-entering the educational system. School re-entry services and sports-related return-to-play (RTP) plans are developed for students who have suffered some form of traumatic brain injury (TBI). Specifically, these services aim to establish a plan for transitioning the student from a rehabilitation setting to the home and school. The purpose of this research is twofold in that it is a follow-up study examining if the school age brain injured population is being better served in Idaho since original findings in 1995, and also as a preliminary study to determine if awareness and abilities in recognizing signs and symptoms of milder forms of TBI are due in part to additional training of faculty within Idaho schools as a result of improved policy and procedures.

Statement of the Problem

In a previous evaluation of the efficacy of these re-entry guidelines, Stone (1996) reported that, “little empirical research is available surrounding the transition and re-entry of students with an acquired brain injury into schools” (p. 1). Furthermore, prior to 1995, research indicated that students with mild to moderate traumatic brain injuries (mTBI) often did not have access to formalized

re-entry programs into the education system. However, within the past two decades, substantial scientific research has been published regarding improved diagnoses and classifications of mTBI. This is in addition to established recommendations for schools to develop re-entry programs better suited to the milder forms of brain injury.

In the review of literature, updates to the revised definitions of TBI and mTBI are presented. Subsequently, within Idaho, thorough examinations of the rise in incidence and prevalence, as well as causative factors, are compared to the rest of the nation. The continued pervasiveness in failing to identify students who are temporarily or permanently disabled by milder forms of TBI is also reviewed. As Gordon et al. (2013) states:

> With more severe injuries and for those with mild injuries who remain symptomatic, schools need to ensure that the child is identified as soon as educational challenges are evidenced. Identification must set in motion a timely assessment of functioning and provision of services and accommodations that are responsive to the educational needs so identified (p. 2).

For a school-aged child with a brain injury, the natural consequences are evidenced by some form of poor academic and social-behavioral effects. Due to these phenomena, major policy and procedure entities have influenced the prognosis of school re-entry programs at the state and federal legislative levels.

A review of reentry and RTP programs and their issues shows us that while there has been much advancement in developing resources to address all TBI's, there are continual adaptations being made to address the individual needs of the student with a mTBI while adhering to strict policies and somewhat vague

guidelines (i.e., guidelines are not uniform throughout the nation). There is not much data in this area yet, so the need for further investigation on how effective these re-entry programs and RTP guidelines are to the student and student athlete with mTBI will be discussed. The development of more effective re-entry programs for the mTBI student will be reviewed in this report in light of recent legislative movements. Finally, a replication of Stone's data with new participants is examined to assess how effective changes to policy have been in implementing practical change within the school systems.

Research Questions

Specifically, this study is examining the following research questions:

1. Are the guidelines for the re-entry of students with an acquired brain injury, recommended and distributed by the Idaho State Department of Education in 1995, being implemented currently in school districts across the state of Idaho?

2. Does there continue to be a difference in the number of school re-entry services implemented for students with an acquired brain injury in school districts of different size (i.e., large or small)?

3. Has an improvement been observed in recognizing and identifying milder forms of traumatic brain injury (MTBI) in students?

4. How has this affected policy and procedure development for school re-entry programs?

Review of Literature

Revised Definitions of Traumatic Brain Injury (TBI)

According to the Brain Injury Association, an *acquired brain injury (ABI)* is an injury to the brain, which is not hereditary, congenital, degenerative, or induced by birth trauma. An ABI is an injury to the brain that has occurred after birth; this includes all types of traumatic brain injuries and also brain injuries caused after birth by cerebral vascular accidents (commonly known as stroke), and loss of oxygen to the brain (hypoxic brain injury). Injuries to the brain that are present at birth or progressive in nature such as Alzheimer's disease or Parkinson's disease are not considered a traumatic or acquired brain injury.

A ***traumatic brain injury*** *(TBI)* is an injury to the brain caused by an external force after birth. Common causes of a traumatic brain injury include gunshot wounds, motor vehicle crashes, assaults, or falling and striking your head. TBI is defined as an alteration in brain function, or other evidence of brain pathology, caused by an external force. Diffuse axonal injury from such brain trauma can result in syndromes such as second impact syndrome, penetrating injury, shaken baby syndrome, or locked in syndrome (Smith, 2009). The distinction between ABI and TBI is that TBI is one of the numerous sub-classifications of ABI; thus, one could state that all TBI's are ABI's, but all ABI's are not TBI's (Brain Injury Network, 2015).

The 1990 Individuals with Disabilities Education Act (IDEA) definition and the 1993 Idaho State Department of Education criteria for special education

services for the student with a TBI were used as measures in Stone's (1996) original work. In 2004, however, IDEA issued an overhaul in alignment with the 2001 No Child Left Behind Act where the resulting definition of TBI did not change, but Idaho adopted this newer means of meeting criteria and is now in the Idaho State Department of Education Special Education Manual (2015):

> Traumatic brain injury means an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance. Traumatic brain injury applies to open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem-solving; sensory, perceptual, and motor abilities; psychosocial behavior; physical functions; information processing; and speech. Traumatic brain injury does not apply to brain injuries that are congenital or degenerative, or to brain injuries induced by birth trauma (IDEA, Part 300, A, 300.8, c12).

According to the 1974 Glascow Coma Scale (GCS), and the educational classifications according to Carter's (1995) work, TBI can be classified into varying degrees of severity. The GCS is a tool used worldwide for "assessing the depth and duration of impaired consciousness and coma" (Harrahill, 1996, p. 81). The following eligibility criteria for receiving special education services under the TBI domain as outlined by the Idaho State Department of Education (2015) are given by the following:

> An evaluation team will determine that a student is eligible for special education services as a student who has a traumatic brain injury when all of the following criteria are met:
>
> 1. An evaluation that meets the procedures outlined in Section 5 of this chapter (Chapter 4) has been conducted.

> 2. The student has an acquired injury to the brain caused by an external physical force resulting in a total or partial functional disability or psychosocial impairment, or both.
>
> 3. The student has documentation of diagnosis by a licensed physician as having a traumatic brain injury.
>
> 4. The student's condition adversely affects educational performance.
>
> 5. The student needs special education (p. 62).

In addition, the 2015 manual delineates that:

> A speech language pathologist is a required member who may collaborate with or replace the school psychologist as the professional required to conduct and interpret evaluative examinations for a *specific learning disability* (p. 35).

Also, speech language pathology is considered a *related service* as the manual states:

> Related services means transportation and such developmental, corrective, and other supportive services as are required to assist the child with a disability to benefit from special education. An IEP team may determine that a student found eligible for special education has a need for a related service. However, if the student with a disability needs only a related service and not special education, then the student is not eligible for the related service, unless it is considered to be special education under State standards, as in the case of speech therapy and language therapy (p. 45).

In respect to TBI, these definitions have been interpreted to mean that a student is exempt from needing to meet standardized assessment criteria of falling below the threshold of 1.5-2.0 standard deviations below the mean in order to be eligible to receive the related services of speech-language therapy.

Within the scope of practice for SLP's are the evaluation and treatment of the cognitive impairments generally found with TBI, thereby warranting speech-language therapy as a supportive service for school-aged children diagnosed with a TBI no matter what the severity.

Stone (1996) stressed the importance that diagnosticians and educators *not* rely on severity classifications as predictive indicators for a student's re-entry success. Interestingly, in more recent years, the GCS has come under heavy scrutiny. According to Green (2011), for instance, the GCS has multiple subjective elements and low inter-rater reliability in a variety of settings (e.g. within hospital and out-of-hospital) that lend to an overly complex and potentially outdated measure. In fact, Green suggested that the GCS be abandoned altogether and that a simpler, alternative neurologic scoring system be utilized instead (Green, 2011). One such alternative is the Simplified Motor Scale (SMS), developed in 2010-2011 as a three-point measure of TBI. The SMS has been shown in multiple studies to be just as effective as the unnecessarily complex 15-point GCS, since it simplifies and eases the process of evaluating patients with TBI (Caterino & Raubenolt, 2011; Haukoos, Gill, Rabon, Gravitz, & Green, 2007; Singh et al., 2013; Thompson et al., 2011). This information is relevant for the current review in that severity ratings of student's TBI may be confused by the potential inconsistencies across measures if in-hospital and out-of-hospital clinicians are using the two different rating scales. These data may confound the re-entry protocol and/or eligibility for services should there be discrepancies amongst providers and their diagnoses.

New findings

Typically, students with moderate to severe TBI who re-enter school settings are served in special education classrooms for students with varying degrees of physical or mental disabilities (Stone, 1996). However, children with mTBI were often mislabeled "learning disabled". As a result, children with mTBI were often overlooked or underserved by the special education services within schools. However, as previously mentioned, newer research in the past decade regarding recognizing the signs and symptoms of mTBI has facilitated more awareness among educators and is reviewed thusly.

Re-defining mTBI. In 2003, the Centers for Disease Control and Prevention (CDC) was deemed by Congress' *Children's Health Act of 2000* to respond to the increasing public health concern to improve identification of mTBI and acknowledgement of the pervasive problems that result from such injuries. Creating a standard definition for mTBI and mTBI-related impairments and disabilities was the immediate area of concern. With the approval from the World Heath Organizations (WHO) Task Force on mTBI, the following definition has been used worldwide for surveillance purposes:

> The conceptual definition of mTBI is an injury to the head as a result of blunt trauma or acceleration or deceleration forces that result in one or more of the following conditions for any period of observed or self-reported signs and symptoms: Transient confusion, disorientation, or impaired consciousness; dysfunction of memory around the time of injury; loss of consciousness lasting less than 30 minutes.
>
> Observed signs of neurological or neuropsychological dysfunction, such as: Seizures acutely following injury to the head; among infants and very young children: irritability, lethargy, or vomiting following head injury; symptoms among older children and adults such as headache, dizziness,

> irritability, fatigue or poor concentration, when identified soon after injury, can be used to support the diagnosis of mild TBI, but cannot be used to make the diagnosis in the absence of loss of consciousness or altered consciousness. Research may provide additional guidance in this area (p. 10).

Additionally, to develop a standard assessment tool to identify prevalent cases of mTBI-related impairments and functional limitations, the CDC (2003) proposed using a survey to develop future operational definitions with the following criteria:

> Current symptoms reported consequent to mTBI not present before injury or those made worse in severity or frequency by the mTBI: Problems with memory, problems with concentration, problems with emotional control, headaches, fatigue, irritability, dizziness, blurred vision, seizures.
>
> Current limitations in functional status reported consequent to mTBI: Basic activities of daily living (e.g., personal care, ambulation,travel), major activities (e.g., work, school, homemaking), leisure and recreation, social integration, financial independence (p. 20).

To sum up, the rationale for addressing mTBI is to bring attention to a growing national and global problem that has subsequently increased public awareness and should encourage health care workers, including speech-language pathologists, and educators working with school-age children to obtain the latest information about this significant health issue.

mTBI syndromes and diseases. As a result of the CDC's (2003) report, these conceptual and operational definitions of mTBI encompass the pathophysiology of a concussion (used interchangeably with mTBI) and have led to further research into the consequences of repeated brain injury on the development of sport-related concussion (SRC) (Elbin, Covassin, Gallion, & Kontos, 2015; Wright, 2014; Dominguez & Raparla, 2014), post-concussive syndrome (PCS) (Dominguez & Raparla, 2014; Jeter, Hergenroeder, Hylin,

Redell, Moore, & Dash, 2013), diffuse axonal injury (DAI) (Ryu, Horkayne-Szakaly, Xu, Pletnikova, Leri, Ebherhart, Troncoso, & Koliatsos, 2014), secondary injury syndrome (SIS) (Bey & Ostick, 2008; Johnson, 2012; Cifu, 2012), and chronic traumatic encephalopathy (CTE) (Dominguez & Raparla, 2014; Gavett, Stern, & McKee, 2011). The latter two, SIS and CTE, refer to co-morbid conditions occasionally found in school-aged children and student athletes who have suffered multiple or repeated mTBIs.

Sport-Related Concussion (SRC). The impact of an mTBI on an athlete is an acute process of neurometabolic upheaval. Athletes are at particular risk for mTBI in that primary factors influencing a potential SRC are related to sport type and setting, equipment, sex, age/level of competition, neck strength, playing style, rule modification/enforcement, genetics, history of concussion, and pre-existing migraine history, learning disability, or hyperactive disorders (Elbin, Covassin, Gallion, & Kontos, 2015). The trauma-induced impairment of the brain's glucose metabolism and mitochondrial function requires the athlete take a period of physical and cognitive rest in order to restore energy balance and normalize glucose metabolism (Wright, 2014). During this fragile recovery time, if a still symptomatic athlete (headaches, dizziness) returns to play and undergoes a second injury, a resulting catastrophic outcome of brain cell death may result (Dominguez & Raparla, 2014).

Post-Concussive Syndrome (PCS). PCS refers to the condition most notably associated with mTBI. PCS is described by the Brain Injury Resource Center as a specific set of neuropsychological (thinking, behavioral, and

emotional) disorders that manifest in symptoms such as impaired memory, mood, and attention (Fisher, 1998). In adolescents, these symptoms are further aggravated by the social, familial, and academic pressures that were already relatively challenging pre-injury. PCS is in its most acute state during the first 7-10 days post-injury, and while acute symptoms generally subside by the third month, some residual effects may still linger for up to three years post-onset. It should be noted that, while all concussions are considered to be mTBI, not all mTBI's can be diagnosed as concussions; this is due in large part to the absence of positive neuroimaging findings, and therefore diagnosis can be subjective and often is based on self-reported neurological symptoms. Either way, though, mTBI usually induces some form of swelling and stretching of axonal white matter that can cause major disruption or even disconnection of axons leading to what has been termed diffuse axonal injury, which is described further below (Dominguez & Raparla, 2014; Jeter, Hergenroeder, Hylin, Redell, Moore, & Dash, 2013).

Diffuse Axonal Injury (DIA). DIA was recently examined in the donated brains of deceased veterans with histories of blast exposure from combat in Iraq and Afghanistan. The presence of amyloid precursor protein (APP)-positive axonal abnormalities were discovered in several brain sites, particularly the medial dorsal frontal white matter. Typical of DAI, the tissue matter featured "clusters of axonal spheroids or varicosities in a honeycomb pattern with perivascular distribution." Since most of the subjects in the study died of opiate overdose, what distinguished the findings from typical DAI resulting from motor vehicle accident APP (+) axonopathy was the cumulative impact of multiple

pathogenic factors and morbidities working together to produce the unique pattern of blast-associated APP axonopathy observed by the researchers (Ryu, Horkayne-Szakaly, Xu, Pletnikova, Leri, Ebherhart, Troncoso, & Koliatsos, 2014).

Effects of Multiple Concussions. In a review conducted by Bey and Ostick (2008), *second impact syndrome* (SIS) was described as occurring with any two events that involve head trauma. The first event involves a person suffering post-concussive symptoms following injury, and if this same person sustains a second head injury in a successive event, diffuse cerebral swelling, brain herniation, and even death can occur (Bey & Ostick, 2008). Johnson (2012) further investigated this condition in youth athletes and found throughout the literature that "there is agreement that children and adolescents are uniquely susceptible to SIS, with all confirmable cases having been observed in adolescents 18 and younger" (p. 181). This condition is controversial because of the differentiation between what constitutes true SIS and another condition termed repetitive head injury syndrome (RHIS). In regards to RHIS, Cifu (2012) noted that the effect of multiple concussions over time remains significant, and consequently with RHIS, the impaired child will have long-term neurological and functional deficits. However, with SIS, Cifu (2012) also claimed that what generally results from a true SIS condition is sudden death.

Chronic traumatic encephalopathy (CTE) refers to a form of neurodegenerative dementia associated with the lasting effects of repeated head trauma that most commonly occur in sport-related concussive and subconcussive head trauma (Gavett, Stern, & McKee, 2011). The authors stated that, "The exact

relationship between concussion and CTE is not entirely clear, although repetitive axonal perturbation may initiate a series of metabolic, ionic, membrane, and cytoskeletal disturbances that trigger the pathological cascade that leads to CTE in susceptible individuals" (p. 7). In other words, repeated insult can lead to immunotoxicity causing neuronal damage and subsequent neurodegeneration (Dominguez & Raparla, 2014).While this is a disease whose symptoms generally manifest in mid-life (e.g., irritability, depression, short-term memory loss, and aggression), it is sometimes observed in the younger athletes; their recovery from the effects of the acute and post-acute head trauma that may determine their acquiring CTE in later years.

Demographics of Traumatic Brain Injury

Incidence and prevalence for all ages in U.S. Much more extensive research has been reported by various entities to track the causes and trends of TBI in school-age children, as well as the prevalence estimates according to incidence statistics with the development of the new protocols in 2004. Given the timeframe of Stone's original study, national demographics of TBI were submitted from the years 1992-1995 for adults and children.

In order to emphasize the progression of incidence and prevalence on a national level, Table 1-1 compares Stone's (1996) reporting to more recent findings. One can see that TBI continues to be a major cause of death and disability in the United States for all ages with the incidence and prevalence rising since the 1990's. In regards to adolescents, it seems that the overall rates of hospitalizations due to TBI have decreased, whereas the overall rate of ER visits

has increased with sports and recreation-related TBI's. Additionally, a longitudinal study tracking children from birth revealed that about 17% experienced a brain injury requiring medical attention by age 15 (Brain Injury Association, 2013).

Table 1-1. National Progression of Incidence and Prevalence of TBI
Comparing Reported Rates of TBI in 1996 to Updated Findings from 2005-2013

1992 – 1996	2005-2009	2010-2013
The Brain Injury Association, Inc. estimated that 2 million people sustain TBI every year[1].	TBI continues to be a major public health issue among U.S. adolescents as a leading cause of death and disabilities[6]	In 2010, the CDC reported that 2.5 million emergency department (ED) visits, hospitalizations, or deaths were associated with TBI—either alone or in combination with other injuries—in the United States.
6 million children <16 yrs old experience TBI . 1 million of these are severe in nature[2]	67 per 100,000 children ages 10 to 19 have experienced a TBI-related hospitalization. However, rates of adolescent TBI-related hospitalizations have decreased overall by > 20% from 2005 to 2009[6]	TBI contributes to about 30% of all injury deaths[7] TBI contributed to the deaths of more than 50,000 people[7] Every day, 138 people in the United States die from injuries that include TBI[7]
TBI is the leading cause of death and disabilities in school age children in the U.S.[3]	42% of in-hospital adolescent fatalities resulting from TBI and other mod-to-severe injuries to body regions due to motor vehicle accidents[6]	TBI was a diagnosis in more than 280,000 hospitalizations and 2.2 million ED visits. These consisted of TBI alone or TBI in combination with other injuries[7]
1 child in 500 receives brain injuries severe enough for hospitalization each year[4,5]	39% of in-hospital adolescent fatalities resulting from TBI due to fatal gunshot wounds to the head[6]	In 2013, the Brain Injury Association, Inc. reported that up to 7 million school children (5-15 yrs) have experienced a brain injury who sought medical assistance. This is a conservative estimate since not included are ages >15 or brain injuries who did not seek medical assistance.
Metro school districts report 75 new TBI cases each year[4,5]	In 2009, an estimated 248,418 children (age 19 or younger) were treated in U.S. EDs for sports and recreation-related injuries that included a diagnosis of concussion or TBI[7]	
Small communities report 3-4 new TBI cases each year[4,5]	From 2001 to 2009, the rate of ED visits for sports and recreation-related injuries with a diagnosis of concussion or TBI, alone or in combination with other injuries, rose 57% among children (age 19 or younger)[7]	

Note. Adapted from:
1. Stone (1996)
2. Polluck (1993)
3. NICHCY (1993)
4. Tucker & Colson (1992); 5. Tyler & Mira (1993)
6. Asemota, George, Bowman, Haider, & Schneider (2013)
7. CDC (2010)

Causes of traumatic brain injury in U.S. children. Beukelman and Yorkston (1991) and the Brain Injury Association (1995) reported that the leading causes of TBI in U.S. children were motor vehicle accidents at 50% and falls trailed behind at 20%. Violence and accidents due to sports and recreational activities were recognized as other causes, but there were no identifying statistics presented. Asemota et al. (2013) concluded that during the years of data analysis 2005-2009, motor vehicle accidents continue to be the leading cause for ages 10 to 19 at 35%, while falls/striking/cutting/piercing were the cause of TBI at 10-25%.

It is worth noting that the limitations found in Asemota et al.'s (2013) research were that mild, sports-related injuries were not reported since these TBI's did not require inpatient care. Interestingly, during the similar timeframe of 2006-2010, the CDC (2010) reported that more than half (55%) of TBIs among children 0 to 14 years were caused by falls; close to a quarter (24%) of all TBIs in children less than 15 years of age were related to blunt trauma; among all age groups, motor vehicle crashes were the third overall leading cause of TBI (14%); and about 10% of all TBIs are due to assaults as they accounted for 3% of TBIs in children less than 15 years of age.

While it initially appears that the CDC's report conflicts with Asemota et al.'s (2013) findings, one must consider that the former study collected data from nationwide emergency department visits and hospitalizations for all ages under 19 as reported by the National Hospital Discharge Survey (NHDS), the National Hospital Ambulatory Medical Care Survey (NHAMCS) and the National Vital

Statistics System (NVSS), while the later analyzed data from the Nationwide Inpatient Sample for TBI-related hospitalizations and only reported for the adolescent population (10-19 years).

Incidence and prevalence for Idaho. According to an interview conducted with Russ Spearman representing the Institute of Rural Health at Idaho State University (February 23, 2015), the following prevalence trends of TBI in Idaho are reported. According to CDC published reports, traumatic brain injuries occur at a rate of 798 injuries per 100,000 populations. This translates to 3,224 TBI injuries in Idaho per year (United States Census Bureau, 2014). The World Institute on Disability estimates that just over 2% of the population lives with a disability resulting from a TBI, which means that about 32,243 Idahoans are currently affected by a TBI (Thurman, Alverson, Dunn, Guerrero, & Sniezek, 1999). The state office of Rural Health and Primary Care reported that 97% of the state is designated as a Primary Care Health Professional Shortage Area (HPSA), with 100% of the state as a Mental Health HPSA. Seventy-one percent of the state is designated as a Medically Underserved Area or as having a Medically Underserved Population, including Ada County where the capital city is located (Health Resources and Services Administration, 2010). In addition to the increased risk associated with rural living, Idaho has a significant number of active-duty service personnel deployed to and returning from duty in Iraq. Among active duty military personnel, shock wave blasts, grenades, and land mines are responsible for the majority of brain injuries. Considered to be the hallmark or “signature” wound of the current military conflict, TBI is a growing

concern in the life quality of many returning men and women (Kennedy, Jaffee, Leskin, Stokes, Lea, & Fitzpatrick, 2007). TBI tends to be an invisible wound; non-documented cases of mild to moderate brain injury far outnumber those confirmed by a physician. Spokane, WA has had 175 and Boise, ID has had 286 confirmed TBI diagnoses via the comprehensive evaluation process in military personnel (Battershell, 2014). The Department of Defense has data on the national numbers of TBI of varying severity levels: 82.5% mild, 8.2% moderate, 2.6% penetrating/severe, and 6.8% not classified (Department of Defense, 2012). Idaho is in the top 10 states for suicide, motor vehicle traffic deaths due to TBI, and suicide due to TBI (Stamm, Kirkwood, & Spearman, 2013). The Federal Traumatic Brain Injury Program has ranked Idaho as 7th lowest in the nation for hospitalization and rate of disability due to TBI (Spearman & Horrocks, 2009).

Incidence and prevalence for children in Idaho. Stone (1996) reported that no specific incidence information could be obtained for the state of Idaho, but assumptions were made from the national statistics. Established in 2006, there is now an Idaho Trauma Registry (ITR) that collects data from acute care hospitals needed to analyze the incidence, severity, causes, costs, and outcomes of trauma in Idaho (2012). The ITR was established by Idaho Code §57-2003-§57-2007 to collect data needed to analyze the incidence, severity, causes, costs, and outcomes of trauma in Idaho. ITR started collecting qualifying traumatic brain injury cases in 2006 with only 14 hospitals due to budget and funding constraints. The collection process includes site visits to smaller facilities and the importing of data from the five facilities with a registry staffed within the hospital. ITR has collected almost 25,000 trauma cases from 2006 through 2012;

data is presented in an annual report 2 years post-data collection (i.e., data collected in 2012 is presented in the 2014 annual report). The 2010 and 2011 Idaho Trauma Registry (2012, 2013) data revealed that in Idaho, the most common type of brain injury is to the cerebrum, which is responsible for language, learning and memory, and movement. In 2013 ITR will collect cases from 37 of the 38 Idaho acute care hospitals (Spearman, 2015).

In 2012, 31 of Idaho's 38 acute care hospitals reported head injuries to the ITR for the 2014 annual report using the Abbreviated Injury Scale. School-aged males accounted for a higher percentage of head injuries between both ages range of 5-14 years old (65%) and 15-24 years old (71%) when compared to females in the same age ranges. The major causes of head injuries were Other Transport (31%) for ages 5-14 years and MVC Traffic (50%) for ages 15-24 years. For all ages, the majority of minor and moderate head injuries were from falls (43%), while slightly more of the severe head injuries were due to MVC Traffic (39%). The very severe head injuries were nearly equal in etiology - falls (34%) and MVC Traffic (33%).

Essentially, data from the 2012 ITR is consistent with national data in that males of all ages are more prone to head injury than females and therefore had higher rates of TBI hospitalizations and ED visits (CDC, 2010). For younger children between the ages of 5-14 years, other forms of transport and car accidents were the main causes of TBI, but this is reversed for older children/young adults in that car accidents and other forms of transport were the main causes. Without knowing ages or gender, for the milder forms of TBI falls

were the leading cause of TBI; more severe TBI was mainly due to car accidents but falls were a close second.

The 2013-14 Fall Concussion Report, sponsored by the Idaho High School Activities Association, found that the overall concussion rate for Fall activities (e.g., football, volleyball, cross country, girls and boys soccer, cheer, and dance) was at 4.45% according to the surveyed participants from qualifying Idaho schools (http://old.idhsaa.org/concussions/FallConcussion2013.pdf).

Child Count and TBI Categories. Stone (1996) reported the numbers of students who were identified and received services under the TBI disability category in Idaho, noting that there has been a steady increase from the school years 1991-92 to 1994-95 (See Figure 1-1).

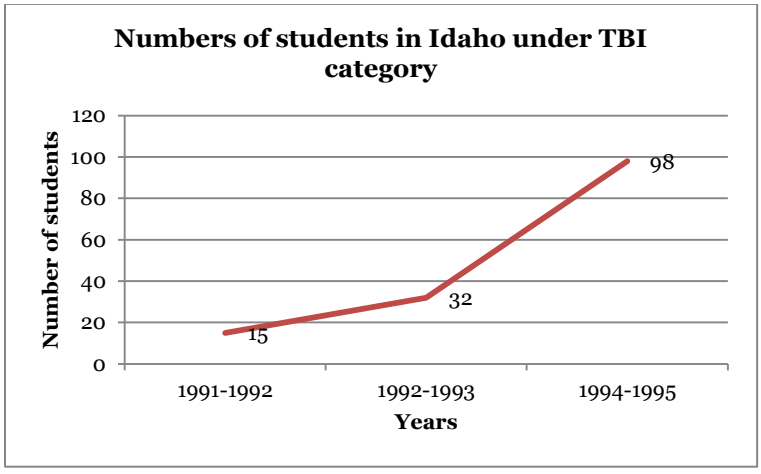


Figure 1-1. Data reported in Stone (1996) for the number of Idaho students registered under the TBI category for special education services. 1993-94 not included as students were not differentiated from students with other low incidence disabilities so data was not available. Adapted from Fox, A.C., (1996). *Serving exceptional children: A report to the Idaho Legislature*. Boise, ID: Author.

Under IDEA's law and regulations, each state has been tracking annual child counts of the number and percentage of children with disabilities (IDEA 2012 Child Count and Census). In 2014, the Idaho Department of Education

published their report *Identification of Children with Disabilities* comparing Idaho student enrollment numbers with the nation's student enrollment numbers based on the 2012 Child Count data tracking the years from 2004 to 2010 (Idaho Part B Data Display 2014). Children receiving special education services under the TBI category in Idaho for SY's 2004-2010 were 147 in 2004-2005 (.51%), 133 in 2005-2006 (.46%), 141 in 2006-2007 (.5%), 138 in 2007-2008 (.49%), 131 in 2008-2009 (.47%), and 132 in 2009-2010 (.47%).

Comparing Figure 1-1 and Figure 1-2, one will note the continued steady increase over the 18 years since the previous research findings reported the number of students enrolled in special education services under the TBI category in Idaho.

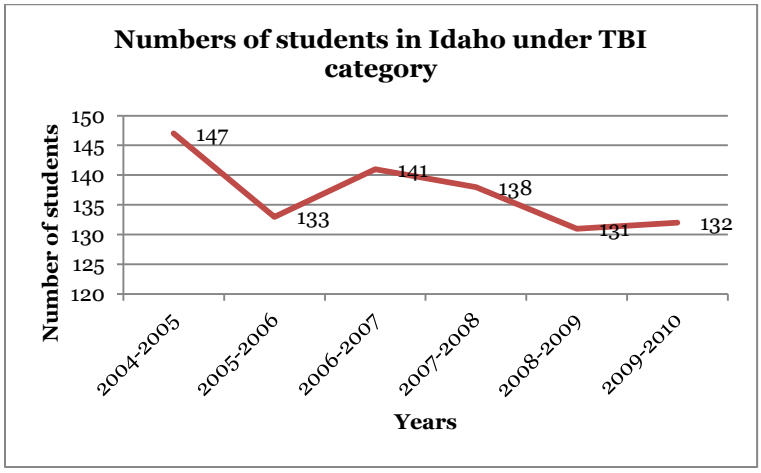


Figure 1-2. Data reported from annual Idaho State Child Count. Adapted from *Identification of Children with Disabilities* (Idaho Part B Data Display 2014).

Referring to Figures 1-3 and 1-4 for analysis, in 2012, the total number of students enrolled nationally was 44,960,222; all students enrolled in Idaho schools were 256,634. Of these total enrollments, 5,823,844 were children identified under IDEA nationwide, while Idaho held enrollments at 23,803.

These numbers translate into 13% of the nation's students and 9.3% of Idaho's students were enrolled under IDEA. Of these children, .06% in the nation and .04% in Idaho were identified in the category of TBI. For the school years (SY) 2011-12 and 2012-13, Idaho's percentage of children with disabilities (CWD) ages 6 through 21 years old were at 6.3% while the national percentage for SY 2012-13 was at 8.6%. Of this same age range, 0.5% of Idaho's CWD's had a TBI as compared to the nation's 0.4%. The significance of these numbers is that when compared to Stone's (1996) data, the counts in Idaho have risen from 98 in SY 1994-1995 to a number of students aged 6 through 21 receiving services under the TBI category at approximately 120 enrolled for SY 2012-2013.

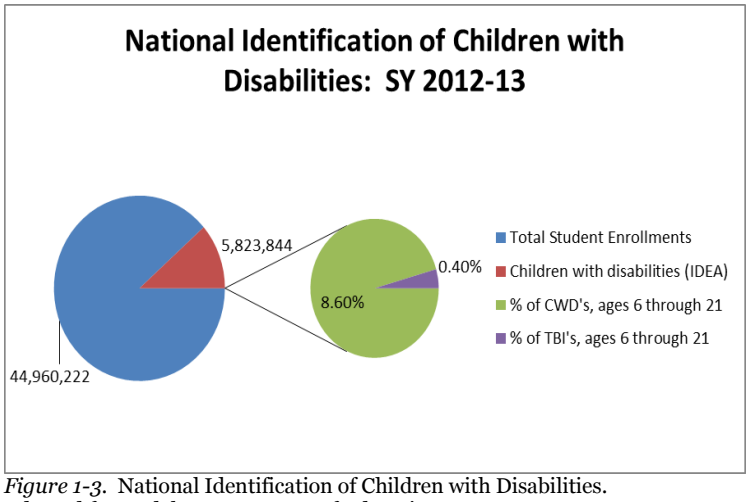


Figure 1-3. National Identification of Children with Disabilities. Adapted from Idaho Department of Education 2014 report.

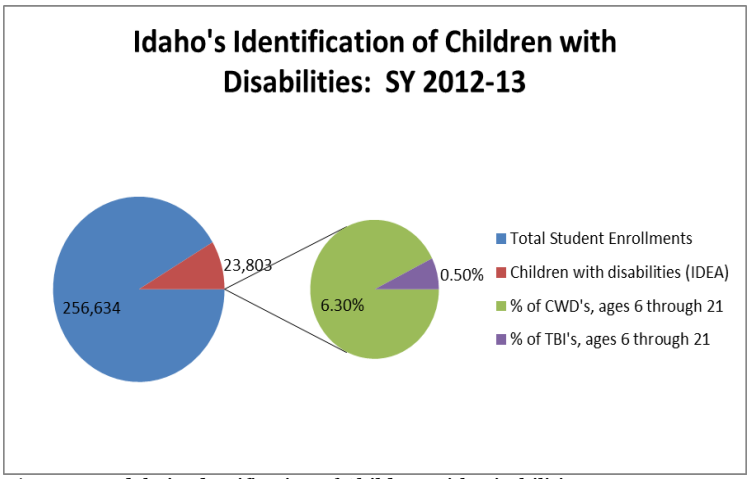


Figure 1-4. Idaho's Identification of Children with Disabilities.
Adapted from Idaho Department of Education 2014 report.

Updates and Changes in Policy and Procedure

The 1990 IDEA served as the basis for how children with TBI would be served in the school system. Since then, in 2004, there were amendments made outlining new provisions aligning IDEA with the 2001 No Child Left Behind Act. Moreover, several innovative laws have been passed to address the serious health problem of TBI in the United States. Table 1-2 is an overview and timeline of the development of federal and state policy and procedures that have directly influenced the advancement of school re-entry programs for TBI's both on a national and local level.

Table 1-2. Federal and State Policy and Procedures
Summary of Legislative Mandates and Key Features

Years	Legislation	Law (or Reauthorization) and Key Features
1989-90	Federal	The Education of the Handicapped Act Amendments of 1990 renamed the Individuals with Disabilities Education Act (IDEA) and added categories for autism and traumatic brain injury[1].
1995-96	State	Idaho Department of Education distributes the manual *Traumatic Brain Injury: A Guidebook for Idaho Educators* (Carter, 1995).
1996	Federal	Passage of the Traumatic Brain Injury (TBI) Act of 1996 signaled a national recognition of the need to improve state TBI services systems. The act authorized the Health Resources and Services Administration to award grants to States for the purpose of planning and implementing needed health and related service systems changes[2].
1997-98	Federal	The Individuals with Disabilities Education Act Amendments of 1997 reauthorized IDEA with an emphasis in Part B on keeping students in the general education curriculum and changed Part H to Part C[1].
2000	Federal	Children's Health Act of 2000, Title XIII: Traumatic Brain Injury adds a national education and awareness campaign regarding TBI. Authorizes the Secretary to make grants to (1) States to operate the State's TBI registry; and (2) academic institutions for applied research that will support registry development[3].
2001-02	Federal	The No Child Left Behind Act of 2001 (NCLB) was enacted as part of the reauthorization of the Elementary and Secondary Education Act (ESEA), which was originally passed in 1965[1].
2003-04	Federal	The Individuals with Disabilities Education Improvement Act of 2004 (IDEA '04) introduced a number of changes and twelve diagnostic categories (e.g. traumatic brain injury)used to identify a child with a disability who needs special education and related services (e.g. Speech & Language)[1].
2009	State	Zackery Lystedt Law passed in Washington state and has served as the foundation for similar laws passed in all 50 states. It requires medical clearance of youth athletes suspected of sustaining a concussion, before sending them back in the game, practice or training[4].
2010-11	Federal	No Child Left Behind (NCLB) returns to original title of Elementary and Secondary Education Act (ESEA). The Common Core State Standards (CCSS) is adopted by 45 states, including Idaho, to provide a consistent, clear understanding of what public school students are expected to learn[5].
2010	State	Idaho Session Laws, Chapter 299 (2012 HB 632): Requires sports related concussion and head injury guidelines to be developed by the Department of Education and the Idaho High School Activities Association to inform and educate coaches, parents/guardians, and youth athletes[6].
2011-16	Federal	Core Violence and Injury Prevention Program (Core VIPP) supports 20 state health departments to strengthen capacity to collect and use data to create a better understanding of local injury issues, like the Motor Vehicle Child Injury Prevention Policy (MVP). Idaho is *not* one of the 20 states selected for this program[7].
2012	State	Idaho Session Laws, Chapter 299 (2010 HB 676): All Idaho schools that offer an organized athletic league to develop protocol to be followed for removing athletes from play in the event of a concussion. Athletes may not return to play until athlete is evaluated and authorized to return by a qualified health care professional who is trained in the evaluation and management of concussions[6].
2014-19	Federal	Traumatic Brain Injury Reauthorization Act of 2014 directs the Centers for Disease Control and Prevention (CDC) to review the scientific evidence related to brain injury management in children and identifies opportunities for research using prevention and surveillance or registry programs[8].
2015	Federal	The Congressional Brain Injury Task Force (CBITF) set the date for Brain Injury Awareness Day for March 18, 2015. March is the official month for Brain Injury Awareness[9].

Note. Adapted from:

1. Nelson, N.W. (2010)
2. http://www.idahotbi.org/site/374/about_us.aspx
3. https://www.congress.gov/bill/106th-congress/house-bill/4365
4. http://www.tbiwashington.org/tbi_wa/bill1824.shtml
5. Schraeder, T. (2013)
6. http://www.ncsl.org/research/health/traumatic-brain-injury-legislation.aspx
7. http://www.cdc.gov/injury/stateprograms/index.html
8. https://www.congress.gov/bill/113th-congress/senate-bill/2539
9. http://www.biausa.org/brain-injury-awareness-month.htm

School Re-entry Programs

Carter (1995) developed the *Traumatic Brain Injury: A Guidebook for Idaho Educators* as an introduction for educators and a guide to educational resources published in this field. This guidebook was made available to educators through distribution from the Idaho Department of Education during 1995-1996. This guidebook was the basis for Stones' (1996) investigation, and a comparison of how the guidelines have been used for better identification of students who have sustained a mTBI from then to now is surveyed. Moreover, the newer laws, policies and procedures have brought national attention to the necessity to ensure re-entry plans are established for the brain injured student and student-athlete.

The cognitive, behavioral, and social deficits resulting from TBI's are presented with updated research findings, as well as an outline of the research for behavioral, academic, and social supports and interventions. Most notable are the cognitive deficits one finds in the adolescent population post-brain injury. Adolescence is a period of biological upheaval; the frontal lobes and cerebral cortex of the adolescent brain are going through major neuro-biological reconfiguring. As a result, we often witness typical "teenage behaviors" of, for example, mood swings, poor anger control, impulsivity, and inattentiveness to their surroundings. But if this normal re-wiring of the frontal lobes is interrupted with a mild, moderate, or severe brain injury, we will see heightened or extreme deficits to the higher executive functioning growth of memory, attention, problem-solving, processing speed and flexibility that Carter (1995) first reported in Table 1-3.

Table 1-3. Review of Cognitive, Behavioral, and Social Effects of TBI
Comparing Areas of Deficit Reported in 1995 to Updated Findings from 2005-2013

AREAS OF DEFICIT	CARTER (1995)[1]	UPDATED FINDINGS (2005-2013)
Cognitive	▪ Communication and language ▪ Short and/or long-term memory, especially for learning and retaining new information ▪ Organizational abilities ▪ Perception ▪ Attention and concentration ▪ Judgment, planning, and decision making ▪ Ability to adjust to change (flexibility)	▪ Executive functioning skills – difficulty maintaining attention and mental effort for prolonged periods of time, focusing and concentrating, and using efficient methods of problem-solving that involve abstract concepts[2]
Behavioral	▪ Self-esteem (loss of confidence) ▪ Self-control (impulsivity) ▪ Awareness of self and others (lacking or heightened) ▪ Sexuality ▪ Appearance and grooming ▪ Age-appropriateness (fluctuating)	▪ Guiding and managing one's own behaviors and thought processes to achieve a goal ▪ Hyperactivity (impulsivity) ▪ Inattention (distractibility) ▪ Low frustration tolerance in dealing with changes in functioning[3]
Social	▪ Family relationships ▪ Isolation from peers	▪ Difficulty following rules and interacting appropriately with others[3] ▪ Social isolating effects due to higher rates of absenteeism from school due to prolonged hospitalization and rehabilitation[4] and presence of physical limitations[5] ▪ Victimized by peers for being "different"[6]
Psychological-Emotional	▪ Frustration ▪ Sadness ▪ Anger ▪ Depression ▪ Anxiety	▪ Shock ▪ Emotional numbing ▪ Fear regarding re-injury ▪ Loss or change about their identity or fear of possible loss/change ▪ Denial/avoidance ▪ Distressed family/support systems ▪ Overload/overstimulated ▪ Feeling conflicted ▪ Adherence/follow-through ▪ Pressures for RTP, academics, other usual responsibilities[7]
Neuromotor-Physical	▪ Vision and hearing ▪ Speed and coordination of movement ▪ Stamina and endurance ▪ Balance, strength, and equilibrium ▪ Motor function ▪ Speech ▪ Eye-hand coordination ▪ Spatial orientation	▪ Lack of self-initiative as a result of physical health challenges ▪ Headaches ▪ Fatigue ▪ Seizures ▪ Respiratory problems ▪ Bowel incontinence[5]

Note. Adapted from:
1. Carter (1995)
2. Jantz & Coulter (2007)
3. Mayfield & Homack (2005)
4. Kaffenberger (2006)
5. Schilling & Getch (2012)
6. Rubin, Bukowski, & Parker (2007)
7. White (2013)

Components for successful re-entry. Stone (1996) reported on three primary components for ensuring that the student with a TBI effectively returns to the academic setting: communication, education, and documentation.

Communication. An essential component of a successful school re-entry program is maintaining communication between the family and designated team members. The family's education and involvement is vital to providing information about the student's pre-injury performance, current performance, problems, strengths, and needs. A systematic exchange of information must also be maintained between providers in the medical and educational settings in order to ensure that medical conditions, academic issues, organizational details, and the social and emotional concerns are addressed in a complete manner. A case manager and/or facility liaison should act as the coordinator of the communications between facilities as recommended by the *Traumatic Brain Injury: A Guidebook for Idaho Educators* (1995).

Generally, a child with a diagnosed brain injury will first be seen by hospital staff, and depending on severity, will either be released to go home and back to school or be released to outpatient services with a rehabilitation team before returning to school. Regular staffings, involving those designated to provide educational accommodations (i.e. team members) for the students, are scheduled throughout the transition back to school. Schilling and Getch (2012) suggest steps in the facilitation of re-entry that would require continual communication amongst team members. Important timelines would be for the team to stay informed of injury status before the student returns to school, pre-

plan for the school re-entry services, carefully track progress within the first week back, review supports at the end of the first month back, and finally evaluate adequacy of services at other important milestones (e.g., midterm point following reentry, before the beginning of the second term, midpoint of second term, and at educational transitions) (p. 61). All throughout these steps, the team can work in unison to develop treatment goals according to the 504 plan or the Individualized Education Plan (IEP).

Education. School personnel commonly involved with a student who has suffered a TBI are general and special education teachers, school counselors, and school psychologists; related services may also be required from occupational therapists, physical therapists, and speech-language pathologists. Given the nature and severity of the injury, school nurses, principals, coaches, and athletic trainers will also be a part of the team. Before and during the planned and implemented school re-entry services, it is imperative that faculty and staff who will be working with the student be adequately educated and trained in TBI and associated disabilities.

As Stone (1996) reported, "often educators responsible for these students following their re-entry into the schools have no experience or training with TBI disabilities (p. 16)." To combat this problem, the development of such informational publications such as the *Traumatic Brain Injury: A Guidebook for Idaho Educators* and online training programs like the CDC's 30 minute *Heads Up: Concussion in Youth Sports* may lead to more appropriate evaluations and better planning by the transition team members. Moreover, it is entirely possible

that Idaho educators are using other means to educate themselves. If one were to enter the search phrase 'traumatic brain injury and concussions in children' into the Amazon.com online shopping website, nearly 140 relevant results are given. One could choose from a plethora of textbooks in multiple medical disciplines, as well as guidebooks and anecdotal stories, all ranging in publication dates from 1995 to 2015, the majority published in more recent years (i.e., since 2011). Nonetheless, it is vital that educators be well-trained to address the variable needs of children with TBI through the use of evidence-based practices to improve outcomes, hands-on training, in-classroom consultation by experts, and ongoing educational support (Gordon et al., 2013).

Documentation. Stone (1996) stated that a record of treatment history and progress is necessary by medical, rehabilitation, and educational professionals involved with the brain injured student because complete documentation aids in the maintenance of communication within and between facilities and team members. Examples of matters that must be documented in a child's school record are a profile of skills and capabilities at the time of re-entry, an IEP or 504, a transitional and/or vocational plan, a health care plan, and a communication log for tracking on-going exchange of information. Gordon et al. (2013) discovered that one of the ways in which a failure to identify, track and take appropriate educational action for children with brain injuries is within the documentation process. The researchers describe scenarios where the school is notified of a student's brain injury, but the information is not translated into an appropriate response: (a) the injury simply is not recorded in the child's school

record, resulting in awareness of the injury being lost over time; and/or (b) the brain injury is identified via parental report, but the medical documentation of the TBI may be unavailable so special services do not get implemented in time (p. 3).

School Transition Issues. Stone (1996) mentioned that, "Individuals with TBI proceed through a continuum of care beginning in an emergency department of a medical facility and most often ending with the child at home with their family" (p.11). While this continues to hold true for those brain injuries that present with more overt signs and symptoms, this may not be the case for those milder forms of injury resulting in the covert signs and symptoms associated with a concussion. A child who suffers a blatant injury to the head will likely receive immediate health care and subsequent continuum of care in the community. Whereas, the child whose head injury goes unacknowledged, unreported, or whose symptoms are not as transparent and are expressed by mild disruption, will likely not receive the same level of care and attention by his or her community. In other words, concussions may or may not receive emergency treatment and the child is left to manage emerging symptoms on their own while navigating the now compromised school and sports-related activities.

From the perspective of speech-language pathology (Crawford & Sirmon-Taylor, 2014), the following sub-topics, and issues within each, are addressed for the current follow-up study: rehabilitation (if the student is hospitalized or not), re-entry into school (pre-plan, plan, and implementation), evaluation (ongoing

follow-up), return to play guidelines (for injured student athletes), and service delivery issues (the barriers to implementation).

Issues in Identification of TBI and mTBI. Even with the heightened awareness to design research studying the short and long-term effects of TBI and mTBI, concurrent research has been conducted relating to the continued pervasiveness in failing to identify students who are temporarily and permanently disabled by TBI and mTBI. One such study by Shutz et al. (2010) reported on the progress in identifying children with TBI comparing numbers between 1997-1998 and 2004:

> The public information and epidemiological studies reviewed find less than .05% of students are classified under TBI, whereas the prevalence rate is estimated at 2.5 to 4.7%. Those figures mean that one to two percent of the academically disabled students have been correctly identified and made eligible for the special services they need. It also means that 98% to 99% of the disabled students are either misclassified into programs that cannot help them or unclassified and left on their own. These data define a massive cohort of students who have dropped off the radar screen while becoming academic and psychosocial casualties (p. 62).

Furthermore, both Schilling & Getch (2012) and Gordon, Oswald, Vaughn, Connors & Brown (2013) concluded that there is a lack of adequate training of school personnel in identification of mTBI, and that it is mTBI's that are commonly the most difficult to identify within schools.

Rehabilitation Issues. Depending on the severity of the TBI, children may be seen in either or all of these settings: acute care, inpatient rehabilitation, or outpatient rehabilitation. In an acute care hospital, a speech-language pathologist (SLP) may not have the opportunity to conduct a thorough investigation into the cognitive-communicative functioning of the brain injured

child as imminent medical procedures will take precedence, the patient has limited cognitive and linguistic demands, and symptoms may not emerge until the child returns home and to school. If a child is admitted for inpatient rehabilitation post-acute care, the interdisciplinary team will target functional outcomes for return to school or play. For those children with mTBI, admission into an inpatient setting is not common, and therefore intervention is sought through outpatient rehabilitation where similar accommodations are implemented, but are not nearly as involved as inpatient rehabilitation. Nonetheless, from these settings, medical records will be transferred to the child's school, upon permission given by the parent, and the continuum of care will be carried on "immediately post-injury or for months to years following the onset of the injury" (p. 168).

Reentry Issues. It is completely within the SLPs scope of practice to suggest accommodations for successful reentry and to educate key personnel on concussion management. With mTBI and concussion, "factors such as executive function impairments, sensory overload, and cognitive exertion can yield subtle deficits that can impact functional return to school" (p. 166); but given this symptomology, the school-related services of speech-language intervention may be underutilized if the student is not formally placed on a 504 Plan or IEP. Alternatively, failure to identify, track and take appropriate educational action can lead to schools not implementing appropriate assessment and programming because of, for example, a misdiagnosis/misclassification (i.e., a child suffers a

TBI, but due to lack of knowledge amongst educators, they are labeled “Learning Disabled” or “Other Health Impairment: ADD/ADHD”) (Gordon et al., 2013).

Return to Play (RTP) Issues. In recent years, educational campaigns have swept the nation targeting coaches, athletic trainers, and the athletes themselves about the prevention and potential consequences of concussion. Due to this increased awareness in the culture of sports and to the state legislatures that have passed laws, sports-related concussions are managed more efficiently. While this empirically has been a step in the right direction for student athletes and the overall functioning of best practices for sports teams, there continues to be concern for RTP guidelines being the exclusive approach to addressing the problem of subconcussive brain trauma.

Johnson (2012) conducted a literature review of sport-related concussions in high school football players and the effects of these injuries on their academic and athletic performances. The focus is on the emergence of RTP guidelines being the exclusive approach to addressing the problem of subconcussive brain trauma, but how these postconcussion management methods actually neglect the more effective approach of concussion prevention. Johnson essentially concluded that RTP’s do not address the chronic damage incurred by these brain injuries, and that only through eliminating tackling from school football with further modifications to the game will there be a reduction in brain trauma for athletes under the age of 16.

Johnson concisely summarized 21 different literature sources for the pathophysiology of concussion, chronic traumatic encephalopathy (CTE) and

subconcussive brain trauma. The background information given is limited to a brief account of the 2001-2005 statistics of nonfatal traumatic brain injuries and hospitalizations provided by Gilchrist, Thomas, Wald and Langlois in a 2007 report.

Findings from the Gilchrist et al. (2007) report were that:

> There are approximately 23,000 football-related, nonfatal traumatic brain injuries resulting in emergency department visits annually in the United States; adolescents 5 to 18 years old account for 90% of these injuries (as cited in Johnson, p. 180).

Broglio, Sosnoff, Shin, He, Alcaraz, and Zimmerman (2009) concluded that while the majority of concussion research and risks has focused on college and professional athletes, it turns out that, "high school players make up the single largest cohort of football players," and therefore "account for the majority of sport-related concussions" (as cited in Johnson, p. 181).

The Lystedt Law from the State of Washington in 2009 is presented as the main point of reference to Johnson's findings. It was the first RTP to be legally mandated, and essentially states that any player suspected of having a concussion must be benched for the remainder of the game and not return to the sport until all symptoms have cleared. Johnson (2012) reports that only a handful of states have passed similar RTP laws, but they are evolving to include, "education on concussion detection and the risks of concussion" (p. 182). He further clarifies how RTPs do not address the problem of football-related concussion for several reasons. First, RTPs are a postconcussion tool, and can only prevent those secondary concussions that might occur in already concussed athletes who return

to football participation too soon. Secondly, no evidence-based guidelines for safe return to play following sport-related concussion have been validated in children. According to two reports from Boutin, Lassonde, Robert, Vannassing, and Ellemberg (2008) and Talavage, Nauman, Breedlove, et al. (2010) cognitive deficits in child athletes can be evident for up to three years, and can affect verbal learning and memory, cognitive flexibility and inhibition, and attention and speed of information processing (as cited in Johnson, p. 182). Third, RTPs do not prevent or manage the repetitive subconcussive brain trauma implicated in CTE and cognitive deficits in nonconcussed athletes (Boutin et al., 2008; Talavage et al., 2010). Finally, if Second Impact Syndrome (SIS), a rare neurological condition involving catastrophic diffuse cerebral swelling and brain herniation, is not reliant on a second impact, then the RTPs provide no protection against SIS (the reason behind the Lystedt Law) and in effect become moot.

Johnson (2012) noted the barriers that have arisen in the implementation of the Lystedt Law, such as inadequate medical follow-up, lack of concussion management training for medical personnel, the lack of baseline neuropsychological testing that is not mandated by the law for student athletes, and the liability and financial concerns for youth sports programs. Because RTPs are a fairly recent model, further research into the effectiveness of RTPs as educational tools is warranted.

As a direct result to the RTP findings from above, Johnson (2012) further clarified the significance of concussion prevention and the drastic measures he and other researchers believe must be implemented in order to alter the modes of

play and rules of contact in tackle football for athletes under the age of 16. It is only from these changes to the sport that scientists could then conduct comparative research assessing these measures against current practices. He stresses the "urgency of reform" by recommending collective restructuring of school-based football to promote player safety and for "providing an equal level of safety and injury protection for all student athletes" (p. 183-184). It is Johnson's supposition that while improving concussion awareness and adopting strict RTPs ultimately benefits the athlete, it will not solve the football-related concussion problem. Better prevention of concussion is necessary.

Finally, to reiterate an earlier point, while it is suggested throughout the literature that student athletes recovering from sports-related concussions be referred to the SLP for best management, it is possible that these referrals are not being made due to various factors that are later discussed.

Service Delivery Issues. The recent survey study conducted by the Brain Injury Research Center of Mount Sanai (BIRC-MS) continued to find that across the whole of the United States, school districts have yet to provide evidence-based training workshops for their school personnel, and that best practices for teaching children with TBI have not been successfully disseminated nor adopted by schools (Gordon et al., 2013). Additionally, states, such as Idaho, that have more rural settings with smaller populations than urban settings with larger populations, may lack the services or available personnel to implement recommended assessment and interventions.

CHAPTER TWO

Methods

Research Design

Stones' (1996) ex-post facto descriptive study examined school re-entry programs for students with acquired brain injury who had already re-entered school(s) in southern Idaho. Her study was considered as a portion of evaluation research, which was further subdivided into process and impact evaluation research. The current examination will follow suit in that it is a descriptive study to answer the question "has there has been an improvement in recognizing milder forms of traumatic brain injury in students since 1995, and how has this affected policy and procedure development for school re-entry programs in Idaho?" Additionally, the follow-up question addressing if the uniform guidelines in the *Traumatic Brain Injury –A Guidebook for Idaho Educators* have been more commonly utilized by educators since 1995, and have these guidelines made a difference in the re-entry programs across Idaho was analyzed. Lastly, the question of whether or not there continues to be a difference in the number of school re-entry services implemented for students with an acquired brain injury in school districts of different size was reported using data trends in figures. The data was obtained using a survey approach by way of telephone interviews with the participants and the scope of sampling was widened from southern Idaho to the whole state of Idaho.

Most notable in the research design are the alterations made in the target population. Stone (1996) originally was able to trace specific school-aged children

with acquired brain injuries from hospitals, rehabilitation centers, and parents across Southern Idaho to their respective school district as they re-entered into the system. Coincidentally, in the same year of Stones' (1996) research, the Health Insurance Portability and Accountability Act of 1996 (HIPAA) was created. Due to the subsequent complications in obtaining protected health information in the same manner as the previous investigator, the design of the study was altered to target only those professionals who work directly with school-aged children with traumatic brain injuries. Consequently, no specific children were considered in the current investigation.

Materials. The survey instrument used in Stones' (1996) study has been replicated mostly as is, with adjustments made to accommodate the removal of personal history information (PHI) (i.e., no specific children were targeted) and remain in accordance with the Privacy Rule (1996). Thus, all questions were altered from asking targeted respondents about a target student to asking about brain injured students/student athletes in general.

Both questionnaires are provided as Appendix A and B. A thorough demographic section was added to the new questionnaire for a representative sampling analysis. The questionnaire itself changed from closed-ended binary questioning (yes-no) to tertiary closed-ended questioning (yes-no-unsure). The open-ended (opinion) questions remained intact. Additional follow-up questions were added to target the means of reference for re-entry protocol along with new questions targeting milder forms of traumatic brain injury (See Appendix A-questions 6, 7, 14b, 15, 16a & b, 19, & 20); compare with Appendix B-Stone's

(1996) original questionnaire). For purposes of delineating between diagnosis and meeting standardized assessment criteria, question 6 was modified from, "Has an individualized education plan (IEP) been prepared for (student's name)" to "does a student diagnosed with a brain injury qualify to receive therapy services if they don't meet standardized assessment criteria (i.e. will a student diagnosed with a brain injury who does NOT fall below the threshold of 1.5-2.0 standard deviations below the mean on a standardized assessment be eligible to receive services in the schools)?" Per recommendation from Stone, a change was made to question 7, emphasizing significant school transitions (e.g., transition from elementary school to middle school) as the original question was limited to only those students of adolescent age who transition out of high school. Question 20 was moved from the original questionnaire to the demographic section to streamline the interview. Given these alterations, the new questionnaire has a total of twenty-one questions, with sub-questions embedded (questions 13-16); whereas the previous had twenty questions with no embedded sub-questions.

The telephone interview was conducted using the primary investigator's personal cellular phone. All conversations were recorded using a handheld, digital voice recorder for later transcription and/or accuracy checks. The principle investigator manually recorded answers and comments on individual questionnaires.

Classifications

For the purposes of this study, the term traumatic brain injury (TBI) is used to refer to the students because it is a more accurate descriptor (rather than

'acquired') of the individuals included as a whole in the study and is the more commonly used term. Acquired brain injuries result from damage of sudden onset such as the disease processes meningitis, encephalitis, and tumors, in addition to the traditional open and closed head injuries. This definition *does not include* any congenital or degenerative brain injuries (e.g., syndromes), or birth trauma injuries (e.g., anoxia). Stone's (1996) demographics included students suffering from different types of acquired brain injuries, ranging from concussions to closed head injuries and self-inflicted gunshot wounds, as well as a Cerebral Vascular Accident (CVA), astrocytoma's and viral encephalopathy. For the current study, TBI is used in reference to the population who has experienced an open or closed head injury involving trauma (e.g., motor vehicle accidents, sports-related injury, falls, and gunshot wounds). It should be emphasized that federal terminology uses TBI more globally to include any acquired brain injury, hence the use of the term TBI rather than acquired brain injury in the questionnaire. To avoid confusion for the respondent, TBI is used in the survey as this is likely the more familiar term.

Participants

The target populations are within Idaho School Districts that have re-entered students with a traumatic brain injury into their school systems within the past 3 to 8 years. Specific participants must be adults (over age 18) and be part of an interdisciplinary team employed by an Idaho State School District. An interdisciplinary team member includes any employee/faculty through which re-entry services for students/student athletes are implemented. The scope has been

broadened from Stone's (1996) original sample of speech language pathologists, school counselors, and regular and special education teachers to include superintendents, speech language pathologists, school nurses, school psychologists, school counselors, regular and special education teachers, athletic directors, activities directors, coaches, athletic trainers, and paraprofessionals.

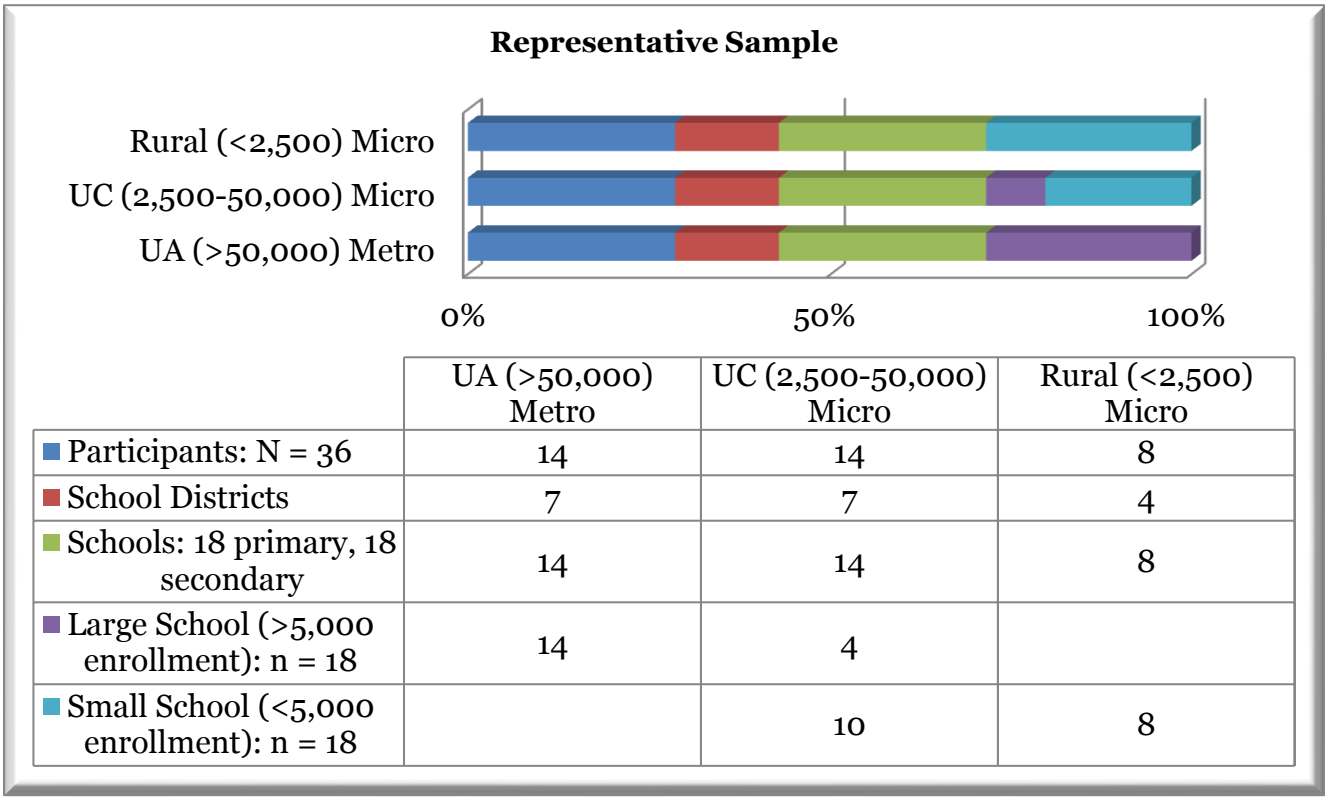
The convenience sampling process was used by Stone (1996) to select participants from the pool of individuals that were available at the time (1995-1996) because of their close geographic proximity (i.e., southern Idaho) and the lack of advanced technology to broaden the range to the whole state of Idaho. According to Meline (2010) "the problem with convenience sampling is that it severely limits the researchers' ability to generalize results to the larger population" (p. 97). In order to control for this limitation, the current study used stratified sampling to divide the target population into *strata* (non-overlapping subpopulations) by way of geographical regions throughout the entire state of Idaho. Random samples from each of the subpopulations were selected for by locality of school (e.g. urban or rural), school district, and size of school (e.g. large or small). It is expected that through identifying interdisciplinary team members statewide through randomly selected school districts, trailed by follow-up emails outlining the study, higher participant numbers than Stones' original 18 will result, yielding a more comprehensive outcome (n=36).

At the onset, in order to determine such school districts, a representative sample was considered as the focus shifted from southern Idaho to span the entire state. First, the classifications are delineated according to the United

States Census Bureau's (USCB) urban-rural decennial census and other data, with the last census taken in 2010. The Census Bureau identifies two types of urban areas: 1. Urbanized Area (UA)-50,000 or more people and 2. Urban Clusters (UC)-at least 2,500 and less than 50,000 people; "Rural" encompasses all population, housing, and territory not included within an urban area. In addition, the Office of Management and Budget (OMB) delineates geographic entities by metropolitan and micropolitan statistical areas (micro and metro areas) by which the USCB bases their collection, tabulations, and eventual publishing of their statistics. A metro area contains a core urban area of 50,000 or more population, and a micro area contains an urban core of at least 10,000, but less than 50,000, population. Each metro or micro area consists of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration with the urban core (see Appendix C for representative maps of Idaho).

Original Representative Sample. Idaho has 43 urban areas – 7 UAs and 36 UCs – and 115 unified school districts. In order to obtain a representative sample from the school districts spread throughout the micro and metro urban core of Idaho, as well as the rural designations, N = 36 was parsed out as a 40-40-20 split. The list is comprised of a representative sample from three population pools within UAs (40%, n=14.4), UCs (40%, n=14.4), and rural classifications (20%, n=7.2). In accordance with Stones' (1996) original definition, the sample size of 36 schools are classified as either small (<5000

total enrollment for the district) or large (>5000 total enrollment for the district) based on the Idaho State Department of Education's November 1, 2013 non-weighted enrollment count (see Figure 2-1). Using an online random number generator (www.stattrek.com), a final list of randomized districts with one primary (elementary) and one secondary school (junior high or high school) were randomly chosen to participate in the statewide survey. A complete list of the school district names and school names were de-identified during data analysis. To keep in accordance with protecting the anonymity and confidentiality of the respondents who chose to participate in this survey, this list is not provided to the reader.



	UA (>50,000) Metro	UC (2,500-50,000) Micro	Rural (<2,500) Micro
Participants: N = 36	14	14	8
School Districts	7	7	4
Schools: 18 primary, 18 secondary	14	14	8
Large School (>5,000 enrollment): n = 18	14	4	
Small School (<5,000 enrollment): n = 18		10	8

Figure 2-1. Original Proposed Representative Sample.

Final Representative Sample. After a rigorous 11 weeks of following strict recruitment protocol, the final outcomes are reported. A total of 77 potential participants were contacted either by email or telephone, and 30 qualifying respondents answered the survey. A 39.0% response rate is noted for the total respondents contacted who participated; however, a 97% response rate is dually noted in that out of 31 qualifying respondents, 30 were surveyed. Approximately half of the 47 non-participants did not respond to the original emails sent out for recruitment, while the other half did not meet qualification standards (i.e. did not have experience in re-entry services for students with brain injuries and/or not employed by the school district). All participants interviewed were employed by the designated school district and were either at an elementary school (grades K-5) or (grades K-8), a middle school (grades 6-8), or a high school (grades 9-12). If the participant was employed at an elementary school with grades K-8, this school was counted as both a primary and secondary school. See Figure 2-2 for the final representative sampling data.

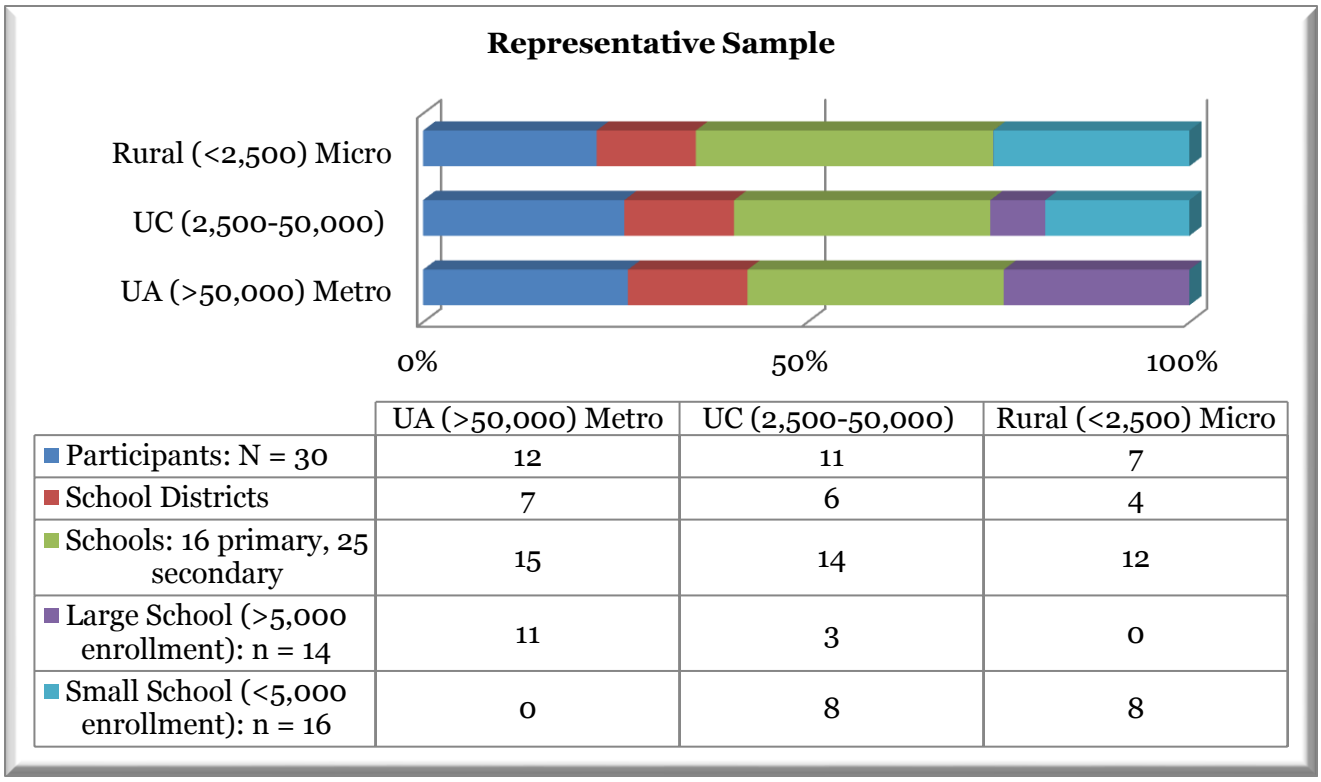
Urbanized Area (UA). Permission was obtained to conduct research by all seven superintendents from the seven school districts within the seven UA regions of Idaho (100% approval). Of the 33 potential candidates who were contacted, a response rate of 36.3% was obtained (12/33). To meet n = 14, two more interviews would have needed to be conducted. One candidate signed the consent form, but could not be reached during repeated scheduling attempts; 2 potential candidates were interviewed at length via email, but the survey was not given due to not meeting qualification standards. Thus, 85.7% of the targeted

population was met (12/14). The 12 participants who were interviewed represented 6 elementary schools and 9 secondary schools, again the cross-over being those who were employed at a K-8 school were counted for both a primary and secondary school. A total of 15 schools were represented, exceeding the original 14 needed by 107%. Of the 18 large schools needed for sampling, 11 were from UA's (61.1%); no small school sizes were represented by this sampling.

Urbanized Cluster (UC). Permission was obtained to conduct research by six superintendents from the ten school districts contacted within the 36 UC regions of Idaho (60% approval). Given these numbers, a 60% approval rate seems less than favorable, but approval was originally targeted for seven UC districts, so an 85.7% (6/7) approval rate was actually recorded. Half of the superintendents simply did not approve the research (2/4), and the other half did not respond to email or telephone inquiries (2/4). Of the 32 potential candidates who were contacted, a response rate of 34.3% was obtained (11/32). To meet n = 14, three more interviews would have needed to be conducted. One candidate was interviewed at length via telephone, but the survey was not given due to not meeting qualification standards. The remaining two targets simply could not be obtained after repeated attempts to gain consent from several candidates. Thus, 78.6% of the targeted population was met (11/14). Alternatively, two respondents independently answered the survey with no interview conducted by the researcher. The 11 participants represented five elementary schools and nine secondary schools, again the cross-over being those who were employed at a K-8 school were counted for both a primary and secondary school. A total of 14

schools were represented, meeting the original 14 needed at 100%. Of the 18 large schools needed for sampling, 3 were from UC's (16.6%). Of the 18 small school sizes needed for sampling, eight were accounted for by this sampling (44.4%).

Rural Area (RA). Permission was obtained to conduct research by four superintendents from the five school districts contacted within the RA regions of Idaho (80% approval). Gaining approval from four RA districts was in the original research design, so a 100% (4/4) approval rate was actually achieved. One school district simply did not respond to the original recruitment inquiries. Of the 12 potential candidates who were contacted, a response rate of 66.6% was obtained (8/12). Of the eight respondents interviewed, one survey was not given due to the candidate not meeting qualification standards. Thus, 87.5% of the targeted population was met (7/8). The eight participants represented five elementary schools and seven secondary schools; the common cross-over in a RA being those educators who are responsible at both primary and secondary schools. A total of 12 schools were represented, exceeding the original eight needed by 150%. Of the 18 small school sizes needed for sampling, eight were accounted for by this sampling (44.4%).



	UA (>50,000) Metro	UC (2,500-50,000)	Rural (<2,500) Micro
Participants: N = 30	12	11	7
School Districts	7	6	4
Schools: 16 primary, 25 secondary	15	14	12
Large School (>5,000 enrollment): n = 14	11	3	0
Small School (<5,000 enrollment): n = 16	0	8	8

Figure 2-2. Final Representative Sampling.

Final Key Participants. The original survey (1996) was administered to key educators consisting of 9/18 SLP's, 4/18 counselors, 3/18 general education teachers, and 2/18 special education teachers working with primary and elementary student's diagnosed with acquired and/or traumatic brain injuries ranging in severity from mild, moderate, to severe (see Figure 2-3).

The current survey marks an increase of 12 additional respondents to the original survey, totaling 30 interviews. The total sampling is comprised of SLPs (9/30), athletics (e.g. coaches, trainers) (8/30), special education teachers (6/30), counselors (5/30), school nurses (3/30), school psychologist (3/30), school administrators (3/30), and regular education teachers (2/30). The distribution of respondents is slightly skewed in that several educators hold

various positions within their school district, hence the apparent higher count for total respondents (n = 39). However, distribution of data was analyzed for the actual total of 30 participants. To illustrate the discrepancy, one respondent held three different roles as a key educator; in order to account for this person's various roles, they were included in each of the three categories for a fair representation (see Figure 2-4). All respondents interviewed had some form of a higher education with a Bachelor's, Master's, or doctoral degree. Many of the interviewees held additional certifications and/or multiple degrees that only expands and enhances their credentials as key educators. The range of years of experience in being employed within their current school district varied from 2 to 28 years, with the majority within the range of 8-20 years of employment. The range of years of overall experience in working as an educator became even wider and more varied from 2 to 35 years, with work experiences in different regions and districts across Idaho or some in other states.

Lastly, a distribution of the key educators across discipline, school classification (primary vs. secondary), and school size (small vs. large) is provided in Figure 2-5. Again, note that several respondents hold various positions within their school districts, as well as responsibilities across both primary and secondary schools. Nonetheless, the majority of respondents for this sampling work in a small, secondary school setting (17/30) while the least amount are employed in a large, primary school setting (6/30). School counselors and SLPs were evenly represented across all of the parameters, while the remaining disciplines lacked in representation from at least one parameter (e.g.,

there is no representation of a school nurse in both the primary and secondary divisions of a smaller school size.)

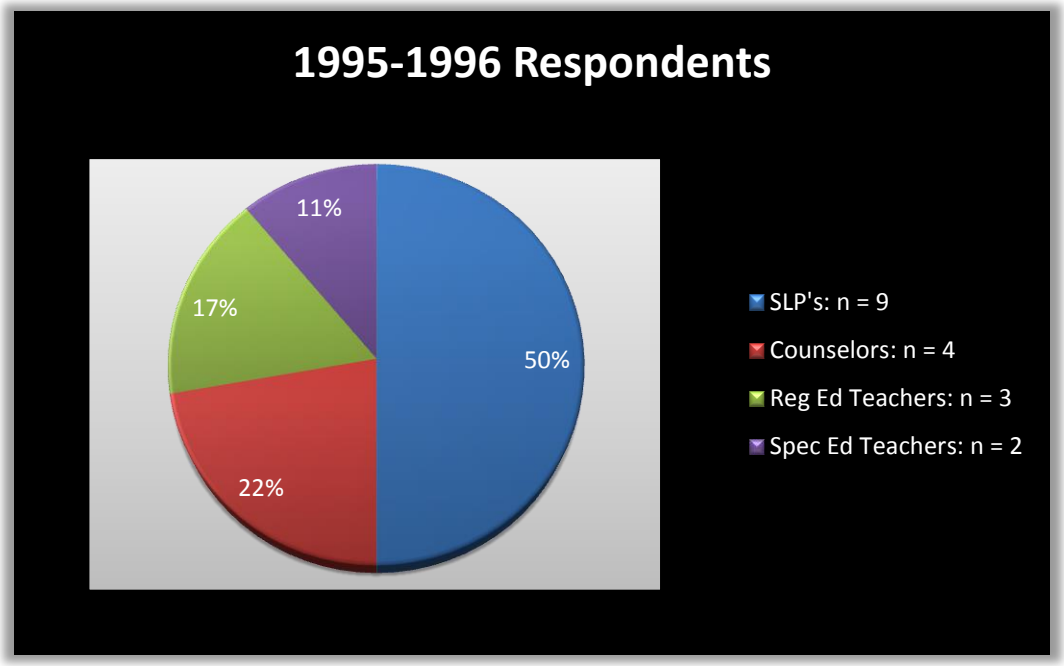


Figure 2-3. Total percentages of respondents from SY 1995-1996 (Stone, 1996).

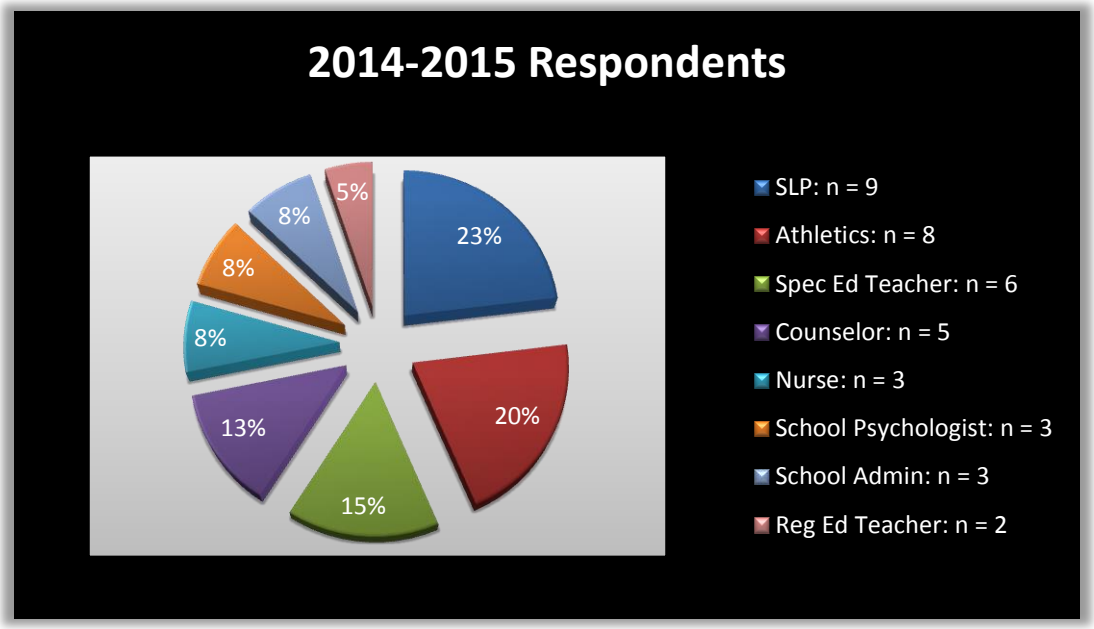


Figure 2-4. Total percentages of respondents from SY 2014-2015.

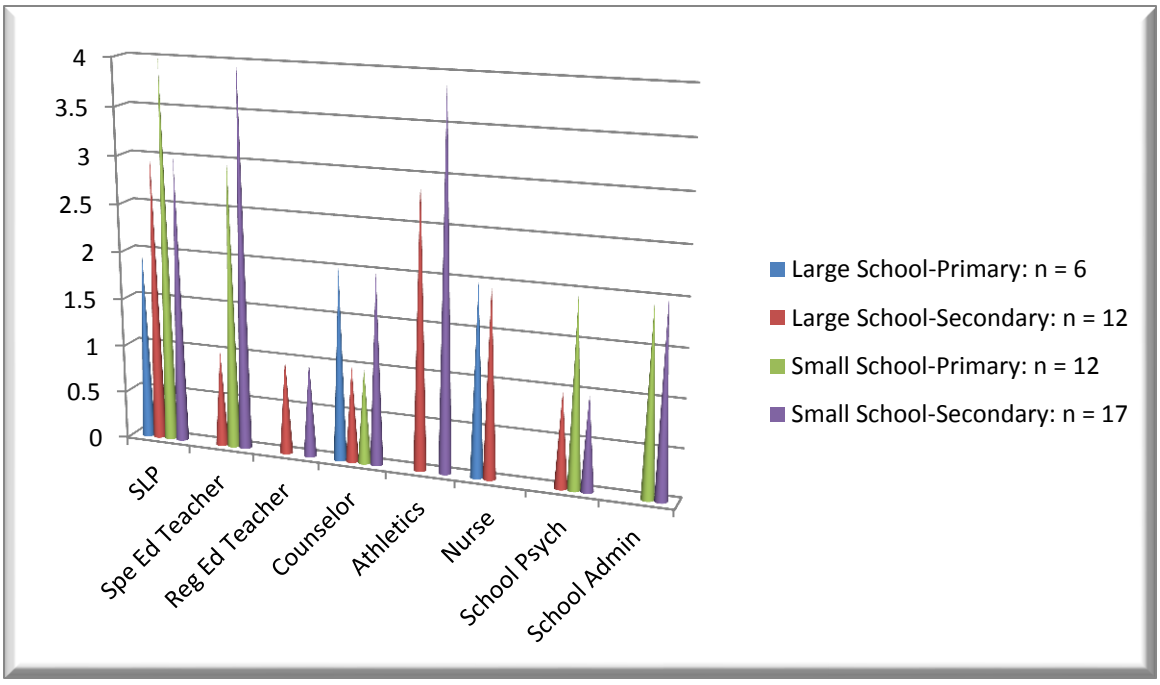


Figure 2-5. Distribution of respondents across discipline, school classification, and school size from SY 2014-2015. K-8 schools
are counted as both primary and secondary.

Procedures

Upon determination of the school districts, the administrator/superintendent in charge of research participation for each school district was contacted to obtain permission to use the school district in the study and for identification of the key educators involved in a brain injured student's re-entry program. Key educators most directly involved with the academic re-entry services of brain injured students are generally the school nurse, special education teachers, the SLP, or the school counselor. Coaches, athletic trainers, activities directors and athletic directors are considered the first contact for return-to-play services of a brain injured student athlete. Following identification, the key educator was contacted via email to request consent for participation in the study and were subsequently scheduled for a telephone

interview. Interdisciplinary team members (e.g., school psychologist, regular education teacher, and paraprofessionals) were also contacted as key educators. Email was used to eliminate the burden of financial costs for mailing surveys through the United States Postal Service. See Appendix D for email format used to promote consistent correspondence.

Upon first contact, informed consent forms were sent out by email to subjects and returned to the investigator via scanned or faxed signature. Per recommendation from Stone (1996), a methods modification to yield higher participant numbers was designed in the form of a follow-up email to targeted participants to whom original releases of information/informed consent had been sent out. Once the consent form was obtained by the investigator, scheduling the telephone interview was done either through email or by telephone. When a date and time were established, the questionnaire and instructions were immediately sent out via email so that the participant had sufficient time prior to the telephone interview to review. The purpose of providing the survey in advance was to increase the possibility for accurate and complete responses as well as the efficiency of the telephone interview. At the time of the telephone interview, the interviewer collected the demographic information necessary for analysis. Demographic information requested includes the interdisciplinary team members name, school district employed by, and name of school; this information was de-identified for purposes of autonomy. Additional demographics are the person's job title and amount of years employed with the school district. This information was not de-identified. As recommended by

Dillman (2014) , the question was asked if the respondent is using a cell phone or landline, and if using a cell phone, are they driving a vehicle? If the subject was driving a vehicle, they were asked to find a safe place to park their vehicle and if this was not possible, the interview would have been rescheduled. The five remaining demographic questions are about the specifics of experience the participant has in assisting students/student athletes with TBI's and their re-entry or return-to-play services.

As the interview moved forward, standardized instructions for completing the telephone interview were presented (see Appendix A). The interview consisted of 21 questions presented by one principle investigator (the thesis author). The first 16 are objective yes-no-unsure questions and the remaining five are opinion questions. Each interview was conducted via speaker phone in order that it may be recorded on a handheld digital audio recorder for later review. Total interview time was averaged to be 34 min across the 28 telephone interviews with 17:40 as the shortest interview while the longest recording was at 53:20 (the previous 1996 investigation reported a total averaged interview time of 10-15 minutes). Two of the thirty respondents answered the questionnaire independently without an official interview, so there is no record of how long it took these respondents to answer the questions.

CHAPTER THREE

Results

Data Collection

Stone's (1996) research was retrospective in that it involved school districts that had re-entered a brain injured student into their system within the past 3 years, or were in the process of re-entering a newly injured student. It is the objective of the current research to also retrospectively examine re-entry services from the past 3 years (2011-2014), but for some educators this timeline needed to be expanded to the past 8 years (2006-2014) due to limited caseload histories.

The data collection method was comprised of a questionnaire that was emailed to the participant (e.g. SLP's, teachers, athletic trainers) so that they could familiarize themselves with the survey. A phone interview then ensued using the procedural format of yes-no-unsure questions for data analysis combined with open-ended opinion questions for later discussion and possible future areas of research.

Data Analysis

The survey was developed to obtain data from school personnel working directly with a student who has had a traumatic brain injury within the past 3-8 years. The yes-no-unsure questions are used for data analysis to determine at what rate the 1995 state guidelines for the re-entry of students with a traumatic brain injury into school districts across Idaho are being implemented, and also to

determine the rate at which there has been a noticeable improvement in identifying students re-entering with mild traumatic brain injuries. Objective yes-no-unsure questions are used for the data analysis to avoid the influence of attitudes, beliefs, and attributes in the study. The open-ended questions are used primarily for the discussion and possible areas for future research. All questions in each component that are marked 'Y&N' for 'yes' and 'no' were ultimately counted as 'yes' responses and are later discussed in the documentation section. Table 3-1 displays the individual respondent's replies, demonstrating the spread of yes-no-unsure answers; these have been organized according to the three domains of communication, documentation, and education. All of the data results are summarized in a descriptive manner to match the presented table. Refer to Appendix A for the questionnaire designed for the interview used in this study; refer to Appendix B for the original survey used by Stone (1996).

Communication

The first six yes-no-unsure questions address a wide variety of situations and policies regarding communication prior to, during, and following a student's re-entry into academics or sports play. Results continue to indicate that communication still holds as the strongest area of the re-entry program for students with traumatic brain injury across the state of Idaho. Seventy-three percent (22/30) of the responses indicated that an individual in their school is designated as liaison and coordinator of networking for the re-entry programs in their school district; six percent (2/30) of the responses were unsure. Ninety-three percent (28/30) of the educators indicated that there are established school

policies and procedures for exchanging information and communicating with other agencies. Eighty-six percent (26/30) of the respondents stated that there was a preliminary meeting between educators, family, and the rehabilitation/medical team regarding the student's transition prior to the re-entry; sixteen percent (5/30) made the distinction that the preliminary meeting only happens if the brain injury is severe enough in nature to warrant such a meeting of said persons. Ninety-three percent (28/30) of respondents said that there was a plan for the exchange of information between family, educators, and other professionals to inform of changes in status or performance or plans; ten percent (3/30) clarified that this exchange of information is not necessarily an established plan, but exchange of information does occur on a regular basis. One hundred percent (30/30) of the educators stated that ongoing communication about the student's performance is maintained between family, educators, and other professionals; thirteen percent (4/30) expounded that this variable depends on the severity of the injury and the family's willingness to maintain communication. Forty-six percent (14/30) of the interviewees indicated that a review mechanism exists in which the re-entry program of the student is evaluated to determine overall successfulness; ten percent (3/30) were unsure; another ten percent (3/30) noted that there are mechanisms for athletes and special education students, but not necessarily for other students who have suffered a mild brain injury who are not in athletics or who do not qualify for special education services. Comparisons of the 1996 results to current data are presented in Figure 3-1. Overall, there has been growth in communication, the first essential component of a successful school re-entry program, since 1996.

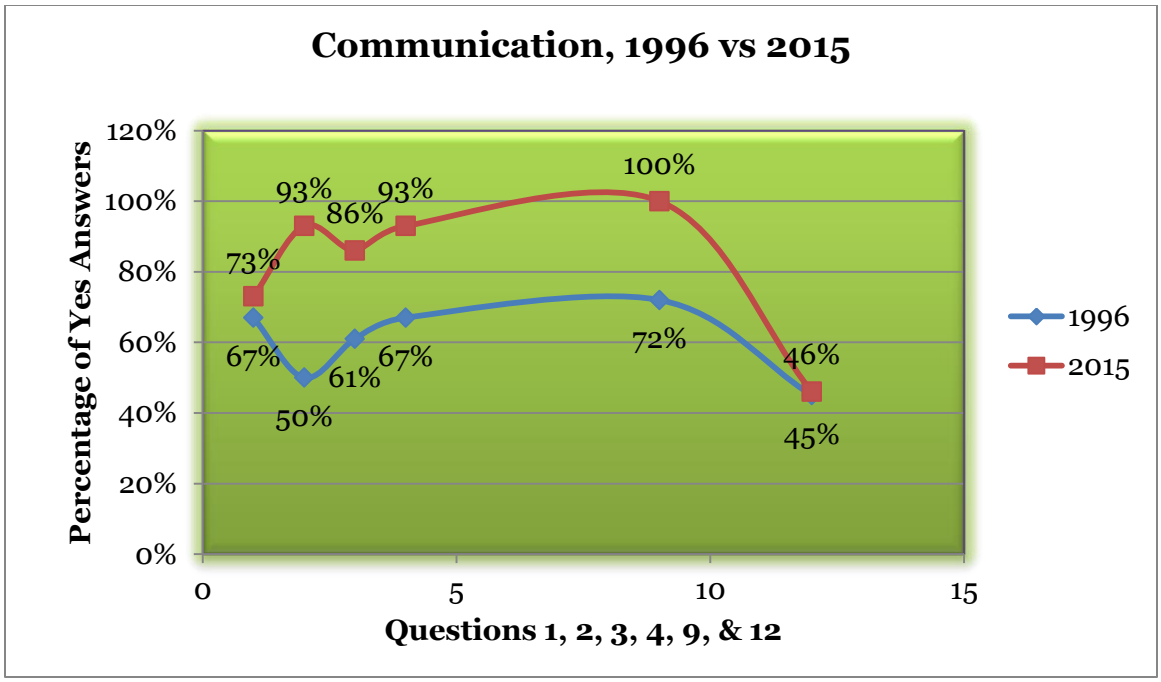


Figure 3-1. Comparison of the percentage of 'yes' answers to the communication questions for the original survey in 1996 to
the current survey of 2015.

Documentation

Documentation was the second area addressed in the questionnaire; however, due to the survey being general in nature, there was no recording of how many students were actually on current specific plans where documentation was necessary. Respondents were advised to answer questions 5 through 8 in hypothetical terms, as if they were re-entering a student with a brain injury. One will notice that many answers were ambivalent, in that the number of responses had both 'yes' and 'no' for their answer. This dilemma will be further discussed later in the paper.

Seventy percent (21/30) of educators confirmed that a record of the student's medical or rehabilitation records are in their educational file; twenty percent (6/30) claimed that medical records exist only if the parents provide the

information and/or if the student was officially placed on an IEP or a 504 plan. Fifty-three percent (16/30) of the educators understand that a student diagnosed with a brain injury is eligible to receive related therapy services (e.g. Speech and Language therapy) even if they don't meet standardized assessment criteria; thirty percent (9/30) were unsure; and ten percent (3/30) stressed that the student would need to have an IEP or 504 plan in place to receive therapy services. Eighty percent (24/30) of the interviewees identified that a vocational or educational transition plan would be in place as part of the re-entry program with severe brain injuries; thirteen percent (4/30) were unsure; and thirty-three percent (10/30) emphasized that if a student had a mild to moderate injury, then they would more than likely not receive any type of transition plan. Eighty percent (24/30) acknowledged that a written health care plan is maintained as a part of the student's file; thirteen percent (4/30) were unsure. Comparisons of the 1996 results to current data are presented in Figure 3-2. Overall, there has been an increase in the documentation of school re-entry planning and treatment since 1996.

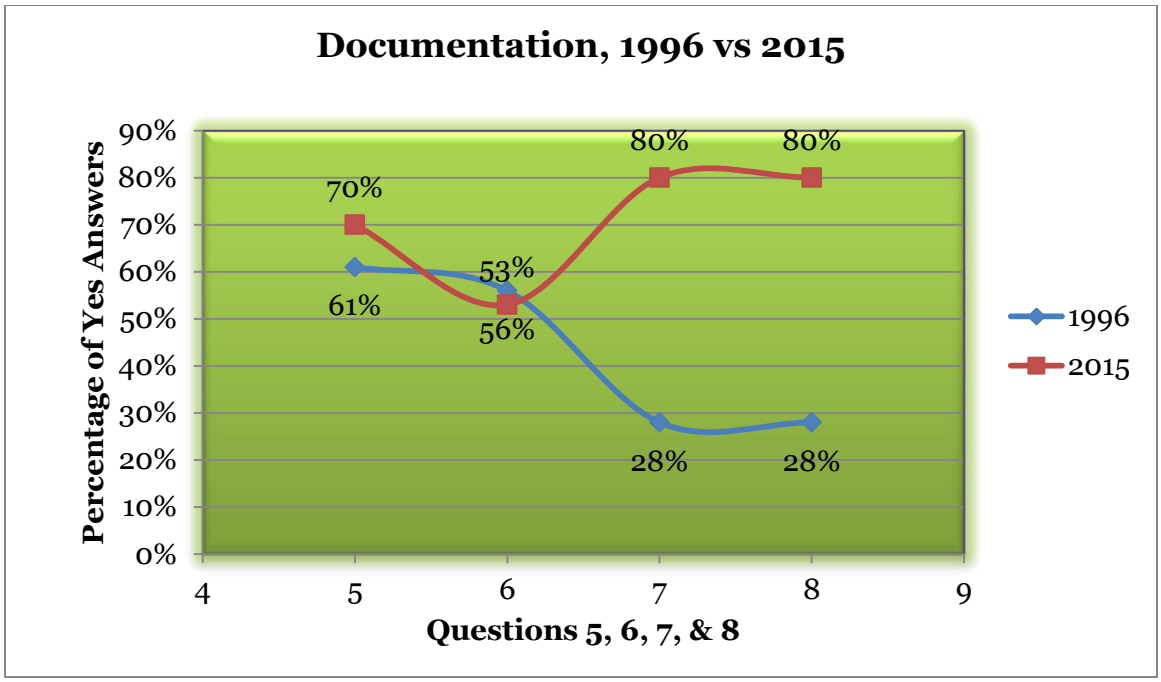


Figure 3-2. Comparison of the percentage of 'yes' answers to the documentation questions for the original survey in 1996 to the current survey of 2015. Note: question number six was altered from the original.

Education

The general education of faculty, staff, and peers was addressed in the questionnaire with the final six yes-no-unsure questions. Forty percent (12/30) of respondents recall that specific training regarding TBI (i.e., presentation, workshop, seminar) was conducted for faculty and staff directly involved with students suffering from a brain injury; however, of the 40%, most respondents were either affiliated with athletics or were educators who knew of the training that coaches and athletic trainers are getting in TBI return-to-play management for student athletes. Thirty percent (9/30) of the educators stated that peer training regarding TBI for friends and/or classmates was conducted prior to the student's re-entry or return-to-play; of this 30%, three educators emphasized that

the peer training was informal and not a standard practice or procedure; thirteen percent (4/30) were unsure of any peer training being conducted.

Question 13 asked whether the educator had a copy of the *Traumatic Brain Injury: A Guidebook for Idaho Educators* manual distributed to school districts by the Idaho Department of Education in October 1995. Twenty percent (6/30) of educators had a copy of the manual, but it should be noted that four of these six educators had only learned about it when this survey brought it to their attention so they were able to obtain a copy using 'Google Search'. A remaining 10% (3/30) of respondents were uncertain if they had been exposed to the manual at one point in their careers, but they thought it sounded familiar. The remaining 21 educators were not aware of this resource or the statewide guidelines. Only two respondents (6%) have a copy of the manual and use it regularly to help plan a brain injured students' re-entry services. A comment was made that the use of this guidebook is vital as, "we need to use it, otherwise the school will get sued."

To those who responded 'no' to using the *Guidebook* (1995), question 14 b. was then asked as to what other means of reference does the educator use to set up any portion of a re-entry program. Arrays of responses were given alternating between consultative services with medical professionals, evidence-based practice from recent research, and independently sought-after conferences. The most consistent response was in consulting with TBI/concussion specialists from hospital brain injury teams, neurologists, neuropsychologist, primary care physician, counselors, social workers, regional consultants from Idaho State

University, rehabilitation team, parents, and the district registered nurse. Next in uniformity was referencing a variety of publications consisting of the special education manual for eligibility criteria, American Speech-Language-Hearing Association (ASHA) Leader, University of Oregon-The Center on Brain Injury Research & Training (http://cbirt.org/tbi-education/concussion/reentry-school-after-concussion-or-closed-brain-injury/), School-Wide Concussion Management (http://brain101.orcasinc.com/1000/), the textbook *Social and Communication Disorders Following a TBI (http://www.routledge.com/books/details/9781848721357/)*, *An Educators Guide to Concussion in the Classroom* (http://www.nationwidechildrens.org/concussions-in-the-classroom)*, TBI in School-age Children: Step by step strategies (unable to find source-from the early 1990s according to survey respondent)*. The least mentioned means of reference amongst only a handful of respondents was attending local workshops and/or national trainings and conferences focused on TBI, post-concussive syndrome, etc. The most prevalent answer amongst respondents employed in athletics (trainers, coaches, etc.) was the Concussion Management Program designed by the National Federation of State High School Associations (http://www.nfhs.org/sports-resource-content/suggested-guidelines-for-management-of-concussion-in-sports/). In 2012, the *Idaho Concussion Management Implementation Guide for School and Sport Administrators* was developed by the Idaho State Board of Education and the Idaho High School Activities Association (http://old.idhsaa.org/concussions/default.asp) due to the recent legislative measures to improve return-to-play guidelines. Accordingly, all

Idaho school-based employees working with student athletes are required every two years to watch a free 30 minute, internet-based *HEADS UP to Youth Sports: Online Training* developed by the CDC http://www.cdc.gov/HeadsUp/youthsports/training/index.html).

Question 15 was new to the survey and asked whether there have been improvements in identifying students/student athletes suffering from milder forms of TBI. Eighty-three percent (25/30) of interviewees agreed that there have been advances during their careers as educators. Many of the educators attributed this to heightened awareness from media exposure and some scientific literature they had personally investigated. When subsequently asked Question 16 a), 56% (17/30) of the educators attributed the improvements to their own personal training and/or better education that they have received over the course of their careers. Once more, 83% (25/30) do think that it would be beneficial to receive more thorough training and/or better education in recognizing the signs and symptoms of milder TBIs. Most respondents would like to have the training once a year as a refresher, while others thought once every two years would suffice. Comparisons of the 1996 results to current data are presented in Figure 3-3.

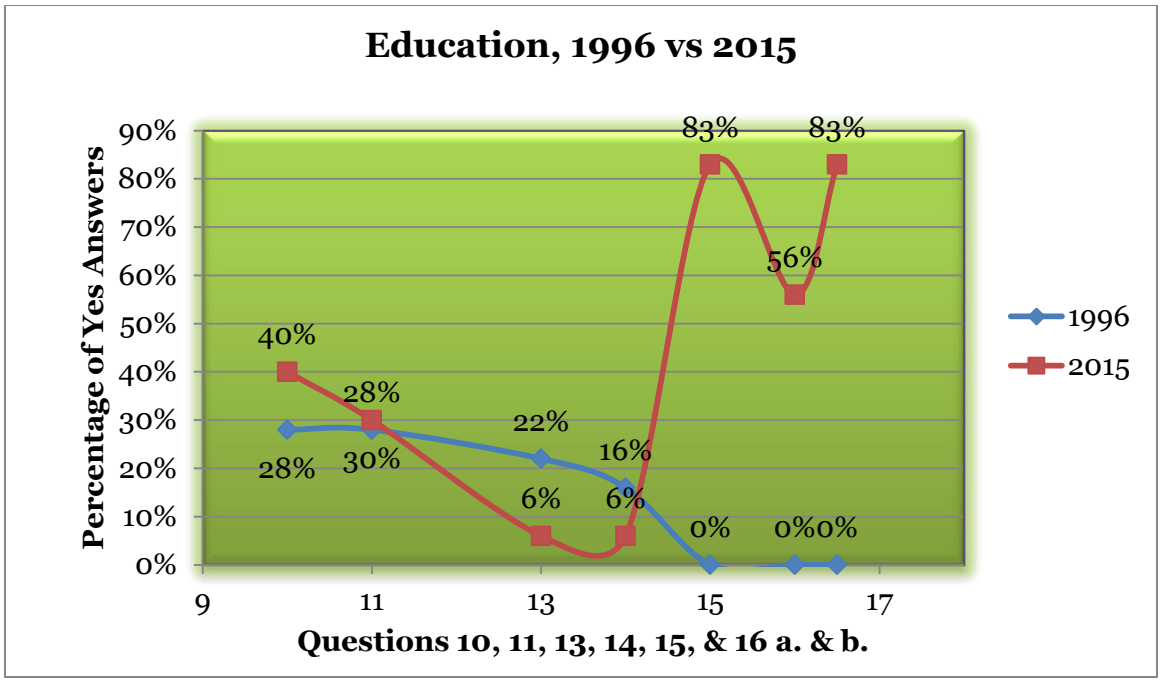


Figure 3-3. Comparison of the percentage of 'yes' answers to the education questions for the original survey in 1996 to the current survey of 2015.

Finally, question 18 asked the educator to rate the re-entry transition of the student on a scale of 1-7 with 1 being ineffective and 7 being completely effective. The overall mean response across the representative sampling was 4.85, a slight drop from Stone's (1996) outcome of a solid 5 rating. The lowest rating was a 1, accompanied by the statement that, "we are clueless at the elementary level." The highest rating of 7 was given by two educators, with the explanations that, "the kids came back to school, did well in classes and self-advocacy, and developed social skills," and that, "re-entry for TBI is definitely a rating of 7, but I am unsure about what to rate concussions." In RA, only one of the educators assessed below the average (i.e., 3.5 scale rating), while the remaining 86% (6/7) RA educators rated re-entry services above average with a mean score of 5.9. In UC, only one educator rated services just at the average, but the remaining 10 respondents appraised their school services above average with the mean

response of a 5.2. In UA, 42% (5/12) of the interviewees graded below the average, whereas 58% (7/12) rated their school's re-entry services above average with a mean score of 5.

Table 3-1. Respondent answers* to the 16 yes-no-unsure questions regarding re-entry services

	Respondant														
Domains	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
Communication															
1. liason or coordinator	✓ 2	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✗ 0	! 1	✗ 0	✓ 2	! 1	✓ 2
2. policies for information exchanges	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2
3. preliminary meeting	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2	! 1	✓ 2
4. information exchange plan	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2
9. ongoing communication	✓ 2	✓ 2	Y&N	✓ 2	✓ 2	✓ 2	✓ 2	Y&N	✓ 2	Y&N	✓ 2	✓ 2	Y&N	✓ 2	✓ 2
12. evaluation mechanism	✗ 0	✗ 0	✓ 2	✓ 2	✓ 2	✗ 0	✓ 2	✗ 0	Y&N	✗ 0	! 1	✓ 2	Y&N	✓ 2	✗
Documentation															
5. medical records in file	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	Y&N	✓ 2	✗ 0	Y&N	✓ 2	✓ 2	Y&N	Y&N	✓ 2
6. qualify for related therapy services	! 1	✓ 2	✓ 2	✓ 2	✓ 2	! 1	✓ 2	! 1	! 1	✓ 2	! 1	✓ 2	✓ 2	✗ 0	Y&N
7. voc./educ. transition plan	! 1	✓ 2	Y&N	✓ 2	✓ 2	! 1	Y&N	✓ 2	✗ 0	Y&N	✓ 2	✓ 2	Y&N	Y&N	Y&N
8. health care and emergency plan	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	! 1	✓ 2	Y&N	✓ 2	! 1	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2
Education															
10. faculty /staff TBI training	Y&N	! 1	✗ 0	Y&N	✗ 0	✓ 2	✗ 0	✗ 0	Y&N	Y&N	✓ 2	✗ 0	✗ 0	✗ 0	Y&N
11. peer training	✓ 2	✓ 2	✗ 0	✓ 2	✗ 0	✓ 2	✓ 2	✗ 0	✗ 0	✗ 0	! 1	✗ 0	✗ 0	! 1	! 1
13. have Idaho TBI manual	✗ 0	✗ 0	✗ 0	! 1	✓ 2	! 1	✗ 0	✗ 0	✗ 0	✗ 0	! 1	✓ 2	✗ 0	✗ 0	✓ 2
14. use Idaho TBI manual	✗ 0	✗ 0	✗ 0	✗ 0	✗ 0	! 1	✗ 0	✗ 0	✗ 0	✗ 0	✗ 0	✗ 0	✗ 0	✗ 0	✗
15. better at identifying mTBI	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	! 1	✓ 2	Y&N	✗ 0	✓ 2	! 1	✓ 2	✓ 2	✓ 2
16 a. had training in mTBI identification	✓ 2	✗ 0	✓ 2	✓ 2	✗ 0	✓ 2	n/a	✓ 2	✓ 2	n/a	✓ 2	n/a	✗ 0	✓ 2	✗
16 b. need more training in mTBI	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	n/a	✓ 2

[yes]	✓	2
[unsure]	!	1
[no]	✗	0

Y&N: Yes, for athletics or at high school level or a severe TBI (IEP or 504 plan); No, for educational setting or elementary level or a mTBI (no IEP or 504 plan)

Table 3-1 (continued). Respondent answers* to the 16 yes-no-unsure questions regarding re-entry services

	Respondant														
Domains	R16	R17	R18	*R19	*R20	*R21	R22	R23	R24	R25	R26	R27	R28	R29	R30
Communication															
1. liason or coordinator	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✗ 0	✗ 0	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2
2. policies for information exchanges	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2
3. preliminary meeting	Y&N	Y&N	Y&N	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	Y&N	✓ 2	✓ 2	✓ 2	Y&N
4. information exchange plan	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	Y&N	✓ 2	Y&N	✓ 2	Y&N
9. ongoing communication	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2
12. evaluation mechanism	✗ 0	! 1	Y&N	✗ 0	✗ 0	! 1	✗ 0	✗ 0	✗ 0	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2
Documentation															
5. medical records in file	✓ 2	✓ 2	Y&N	✓ 2	✗ 0	! 1	Y&N	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2
6. qualify for related therapy services	! 1	✓ 2	✗ 0	✓ 2	! 1	! 1	✓ 2	✓ 2	! 1	Y&N	✓ 2	Y&N	✓ 2	✓ 2	✓ 2
7. voc./educ. transition plan	! 1	✓ 2	Y&N	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	! 1	Y&N	Y&N	✓ 2	✓ 2	✓ 2	Y&N
8. health care and emergency plans	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	! 1	Y&N	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	! 1
Education															
10. faculty/staff TBI training	✗ 0	✗ 0	✗ 0	✗ 0	✓ 2	✓ 2	✗ 0	✗ 0	✓ 2	✓ 2	✗ 0	! 1	✗ 0	✗ 0	✓ 2
11. peer training	✗ 0	✗ 0	✗ 0	✗ 0	✗ 0	✗ 0	Y&N	✗ 0	✗ 0	Y&N	Y&N	✗ 0	✓ 2	! 1	✗ 0
13. have Idaho TBI manual	✗ 0	✗ 0	✗ 0	✗ 0	✓ 2	✗ 0	✗ 0	✗ 0	✓ 2	✗ 0	✗ 0	✗ 0	✓ 2	✗ 0	✗ 0
14. use Idaho TBI manual	✗ 0	✗ 0	✗ 0	✗ 0	✗ 0	✗ 0	✗ 0	✗ 0	✓ 2	✗ 0	✗ 0	✗ 0	✓ 2	✗ 0	✗ 0
15. better at identifying mTBI	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2	! 1	✓ 2	✓ 2	Y&N
16 a. had training in mTBI identification	✗ 0	✓ 2	✓ 2	✓ 2	! 1	✗ 0	✗ 0	✗ 0	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2
16 b. need more training in mTBI	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	n/a	✓ 2	✓ 2	✓ 2	✗ 0	✓ 2	✓ 2	✓ 2	✓ 2	✓ 2

[yes]	✓	2
[unsure]	!	1
[no]	✗	0

Y&N: Yes, for athletics or at high school level or a severe TBI (IEP or 504 plan); No, for educational setting or elementary level or a mTBI (no IEP or 504 plan)

Effects of School District Size

The secondary research question addressed whether a difference existed in the number of school re-entry services implemented for students with a traumatic brain injury in school districts of different size. Recall that participating school districts were divided into two groups, large defined as enrollment >5,000 and small defined as enrollment <5,000 based on the original demarcations set in place by Stone (1996). Child Counts have been added to the current report to indicate the reporting of special education data. Recall that Child Counts are only marked for those students placed on an IEP and not 504 plans.

For the 2013-2014 SY, 14 districts were classified as large with total student enrollments ranging from 5,706 to 36,111; total Child Counts stretched from 480 to 3500. The 16 districts that were classified as small had total student enrollments ranging from 138 to 4,130; total Child Counts extended from 22 to 360. Data was not gathered on how many of the Child Count cases were attributed to a brain injury and were subsequently placed on an IEP under the TBI category. However, according to the educators interviewed, Table 3-2 displays the data collected on how many students in the large schools were injured and were given some form of re-entry or RTP plan within the past 3 to 8 years; Table 3-3 displays the same data for the small school size. Numbers marked with an asterisk reflect discrepancies in differentiating mTBI's (concussions) as a TBI due to either the TBI categorical definition for special

education services or the general thought that concussions are too mild in nature to be considered a TBI.

Table 3-2. Data results of large school size, total number of re-entry students, and their TBI etiology.

LARGE SCHOOL SIZE	Total Number of Students per Educator	Etiologies
How many students/student athletes with TBI worked with in past 3 years?	10-12, 2, 1, 5, 5, 2, *9, *0, 3, 20, ?, 25	Anoxiation, MVA, recreational sports (ATV), re-injury, sports-related (collisions)
How many of those TBIs were mTBIs (concussion)?	9, 2, 0, 3, 3, 0, *7, *2, 0, ?, ?, 23-24	Sports-related, falls, recreational sports (snowmobile, skiing), playground, P.E.
How many students/student athletes with TBI worked with in past 3-8 years?	1, 1, 3-5	MVA, recreational sports,
How many of those TBIs were mTBIs (concussion)?	0, 0, 1	Fall

Table 3-3. Data results of small school size, total number of re-entry students, and their TBI etiology.

SMALL SCHOOL SIZE	Total Number of Students per Educator	Etiologies
How many students/student athletes with TBI worked with in past 3 years?	2, 2, *1, *2, 3, 3, 2, 2, 2, 2, 1	Firearm, MVA, recreational sports (bicycle, ATV), re-injury (multiple TBI's), sports-related (collisions)
How many of those TBIs were mTBIs (concussion)?	0, 1, *10-15, *150, 1, 0, 1, 1, 2, 0	Sports-related, falls, recreational sports (motorcycle), playground, P.E.
How many students/student athletes with TBI worked with in past 3-8 years?	3, *0, 2, *0, 1	Shaken Baby Syndrome, recreational sports (logging)
How many of those TBIs were mTBIs (concussion)?	1, *4, 0, *3, 0	MVA

Table 3-4 charts the number of 'yes' answers per question in each of the three main domains parsed out by small and large school districts in each of the population areas. In the domain of communication, both small and large schools nearly match in the response rate of 'yes' answers (i.e. 75 total 'yes' responses for small schools, 73 total 'yes' responses for large schools), further indicating that communication amongst providers for re-entry services is an area of strength for educators across both district sizes. In regards to documentation, a similar strength is noted (i.e., 53 total 'yes' responses for small schools, 42 total 'yes' responses for large schools) but a discrepancy between the small schools and large schools for qualifying a student diagnosed with a brain injury for therapy services when they do not meet standardized assessment criteria (Question 6) is substantial (i.e., 12 'yes' responses for small schools, 5 'yes' responses for large schools). Evidently, educators in smaller districts/schools are more likely to provide therapy services to students diagnosed with brain injuries that do not meet formal standardized eligibility scores but still meet the special education requirements as outlined by the Idaho Special Education Manual (2015). Lastly, with education, of the 16 educators that were surveyed from the small schools and the 14 educators from the large schools, less than half of the questions regarding education were 'yes' responses verifying that education on TBI and mTBI is lacking and enhanced training is needed (i.e., 53 'yes' responses for small schools, 43 'yes' responses for large schools).

Table 3-4. Data results in relation to school districts of small and large size in rural areas, urban clusters, and urban areas.

DOMAINS	RURAL AREA (RA)	URBAN CLUSTER (UC)		URBAN AREA (UA)	TOTALS	
Communication	**Small School**	**Small School**	**Large School**	**Large School**	**Small School**	**Large School**
1. liaison or coordinator	6	5	3	8	11	11
2. policies for info exchange	6	7	3	12	13	15
3. preliminary meeting	6	8	2	10	14	12
4. info exchange plan	6	8	3	11	14	14
9. ongoing communication	7	8	3	12	15	15
12. evaluation mechanism	4	4	1	5	8	6
Documentation						
5. medical records in file	7	8	1	10	15	11
6. qualify for therapy services	5	7	1	6	12	7
7. voc/educ transition plan	5	7	2	10	12	12
8. health care plan	6	8	1	11	14	12
Education						
10. faculty/staff training	3	2	3	4	5	7
11. peer training	5	4	0	0	9	0
13. have TBI manual	1	2	1	2	3	3
14. use TBI manual	0	2	0	0	2	0
15. better identifying mTBI	6	6	3	10	12	13
16. a. had training in mTBI	4	5	1	7	9	8
16. b. need more training in mTBI	6	7	2	10	13	12
TOTALS	83	98	30	121	181	151

Figure 3-4 shows a visual display of the trends between the UA, UC, and RA in communication, documentation, and education. It is evident that communication leads the way with the highest percentage of 'yes' responses amongst all three population areas of Idaho, and the UC and RA in an even agreement of 83%. Documentation follows closely with an almost even percentage match to the communication domain for the RA at 82% and 83%. Lastly, within the realm of education, this study found the most blatant drop in the number of 'yes' responses across all three population areas in the state of Idaho, most notably in the UA with the lowest numbers of 'yes' responses.

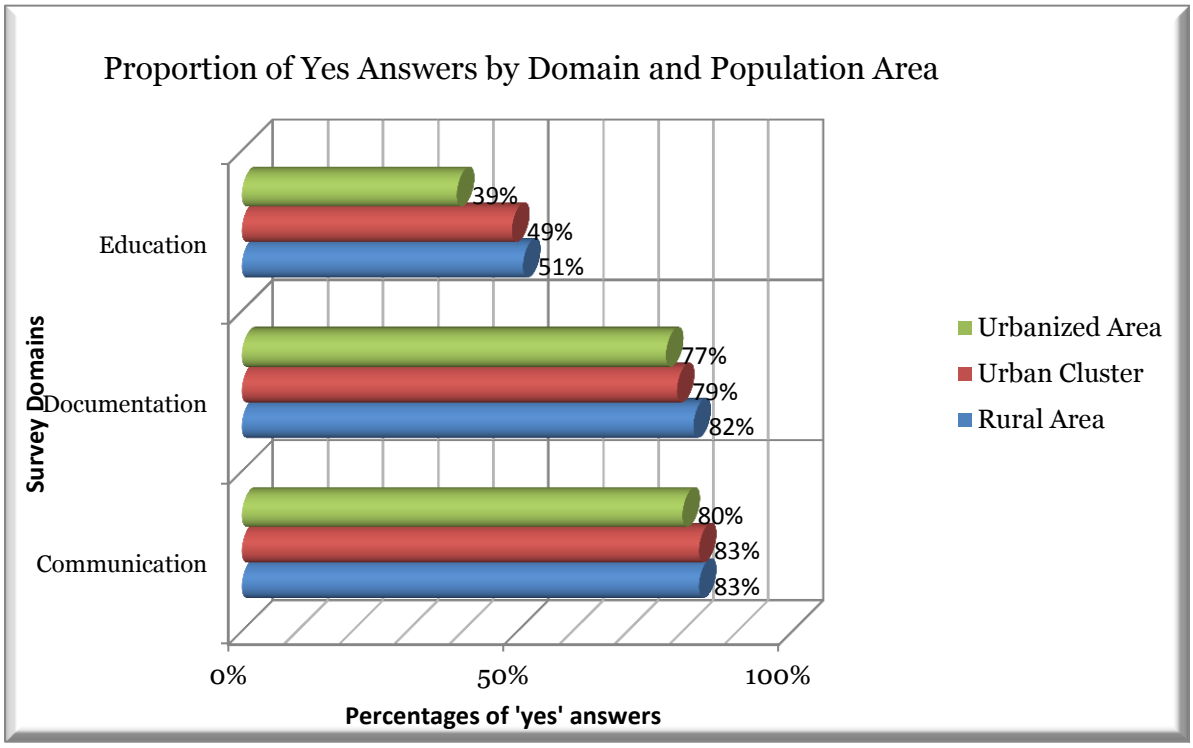


Figure 3-4. Comparison between population classifications of the three main domains.

Finally, Figure 3-5 presents the comparison of small schools to large schools, based on the criteria of question type (i.e., the percentage of yes

responses), using both the 1996 and 2015 data. The development for the number of services or policies in place for the categories of communication, documentation, and education, along with total services/policies in place, show an overall improvement over the past 19 years. In the communication domain, 78% of the 2015 respondents in the small districts answered 'yes' to the six different areas involved with complete communication amongst providers, showing a 13% improvement from the educators in 1996. An even greater improvement of 34% is revealed for the large school districts in the category of communication. In the documentation domain, 83% of the 2015 interviewees in the small districts answered 'yes' to the four different areas involved with documenting the student's re-entry services, displaying a 39% enhancement from the educators in 1996. Within the large school districts, similar progress is noted at 32% in the category of documentation. Most prominent results are observed in the education domain, where there continues to be advancements but not as significant as the other two domains for re-entry. Forty-seven percent of the 2015 educators in the small districts answered 'yes' to the seven questions regarding improved education/training of TBI and mTBI, exemplifying a 13% evolvement from the educators experiences in 1996. The large school districts show an even greater development with a 29% increase in education for TBI and recognizing signs and symptoms of mTBI for re-entry.

Overall, the total differences between the small and large school districts across all areas of the re-entry program for 2015 were 66% 'yes' responses in the small districts and 55% in the large districts, indicating that more

services/policies are set in place for the re-entry programs of students in the smaller districts (see Figure 10). This result is consistent with Stone's (1996) results, as it was also found that smaller districts had more progressive services/policies set in place for brain injured students. Most remarkable is the same 11% difference between small and large school sizes in both sampling years, signifying that both school sizes have seemingly maintained their level of re-entry services over the past 19 years.

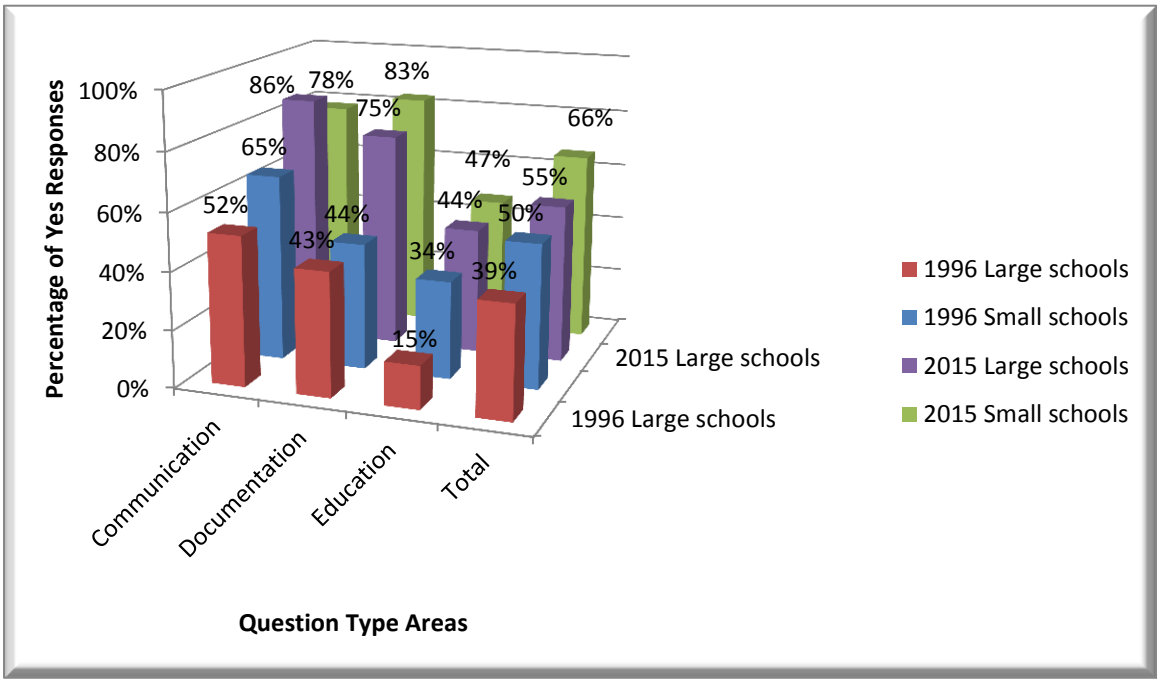


Figure 3-5. Comparison between districts of large and small size, 1996 vs. 2014.

CHAPTER FOUR

Discussion

This study is an examination of traumatic brain injury (TBI) and the re-entry services for school-aged children in Idaho. The dynamics of guidelines, recognition of mild TBI (mTBI), policy and procedure, and school size were investigated to determine what factors aid in the successful re-entry of brain injured students. While the study is multi-faceted in its purpose, the ultimate goal is to provide further scientific evidence into the growing national health problem of TBI and concussions. It is meant to contribute to evaluation research in education and potentially support developing best practices for educators in the management of returning students post brain injury.

Since this research was partially a follow-up study, it followed suit in that it is only a small portion of a loftier question regarding the successfulness of school re-entry services. Beyond the scope of this report for evaluating successfulness of re-entry are quality of life areas such as the student's support system outside of the school, their medical treatment and rehabilitation, and personal characteristics. Fully examining the circumstances of a student's re-entry would require considering factors like premorbid strengths and limitations of the student, official type and severity of injury, and the overall inspection of the injury. Rather, this report addresses the re-entry support of the educational professionals in Idaho and their knowledge of the widely variable effects of TBI in their students.

The overall national count for children ages 5-15 years old seeking medical attention as a result of a head injury has raised from approximately 6 million to 7 million since the 1990's (Polluck, 1993; The Brain Injury Association, 2013). Rates of hospitalizations for children and adolescents with head trauma have decreased, implying that there is not as much of a need for continuous medical care since there may be a trend in the reduction of severe brain injuries being diagnosed (Asemota, George, Bowman, Haider, & Schneider, 2013). In contrast, visits to the emergency department have increased for concussions, indicating that milder forms of brain injury are rising and these children are being released back to their homes and schools without continuous medical care (CDC, 2010).

Idahoans are at higher risk for TBI compared to other populations; rural people are particularly vulnerable to chronic illnesses and diseases, and are at increased risk for an injury-associated disability due to limited health care access and availability (Beedasy, 2010). Generally speaking, TBI treatment is complicated in rural states by difficult geography, minimal or inadequate infrastructure, and isolation. In addition, low population density translates to fewer people with TBIs for professionals to serve and, ultimately, a lack of appropriate services and supports. As an example, over half of Idaho's hospitals qualify as federally designated Critical Access Hospitals, defined as hospitals with fewer than 25 beds. The only level II trauma center is in Boise, the state capital, which including the surrounding metropolitan area, is home to about one-third of the state's population (Spearman, 2015).

According to the 2012 Idaho Trauma Registry (ITR), a total of 102 children between the ages of 5-14 and 254 adolescents between the ages of 15-24 visited an acute care hospital for a reported head injury (2014). While it is not made explicitly clear by ITR the level of severity by age group, the majority of cases reported a severity diagnosis of moderate brain injury (629 for all ages) followed by the minor severity rating (420 for all ages). With a total count of 1, 049 out of 1, 558 registered cases, 67% of TBI's that are being seen by Idaho's acute care hospitals are in the mild-moderate severity range. One could surmise that these numbers match the overall national trend being reported that there is a rise in incidence of mild to moderate brain injuries being seen for medical attention amongst school-age children. And yet, these children are more than likely not receiving re-entry services within the schools due to a variety of issues.

Given that the CDC (2003) has announced that, "most TBIs that occur each year are mild, [and are] commonly known as concussions," it goes without saying that awareness in recognizing the signs and symptoms of these milder forms of TBI is necessary for our educators in the school systems of Idaho. It seems there have been remarkable improvements amongst the athletic departments of schools in Idaho as far as providing access to more return-to-play guidelines and concussion management training, but this only affects those students who are active in organized sports. There are still those students who return to school with mild to moderate injuries from falls, recreational sport activities, MVAs, and numerous other causes. Most of the educators surveyed in this study who work directly with these students in the academic settings are

eager to receive similar training that the athletic educators are receiving, as well as relevant guidance as to how best they can serve a student for re-entry.

A larger question that this study attempted to address is whether or not mTBI's are being better serviced in the academic setting. One educator claims that, "It's like night and day in regards to increased awareness in the community since I started my career 20 years ago. The damages from re-injury or re-occurrence rates (of brain injury) were not even discussed not too long ago." Over a five year period (2004-2009), Idaho State Counts of school-aged children receiving special education services under the TBI category averaged 137 (Idaho Part B Data Display 2014), an increase from the previously reported 98 in 1994-1995.

Recall that in order for a student to be eligible under the TBI category, three main components must align in that the student must have an official physician's diagnosis of suffering from a TBI, demonstrate that their condition adversely affects their educational performance, and that they need specialized instruction. Thus, when a student is diagnosed with an mTBI and is suffering, say, from post-concussive syndrome (PCS), and their school work is negatively affected, then they are eligible to receive special education services under the TBI category. It is not revealed in the Idaho State Count whether or not the level of severity of TBI (i.e., more mTBIs) has been the main contributor to the increase in numbers since Stone's (1996) findings, but it may be surmised that with the increase in children being seen in emergency departments for concussion or TBI that this would carry over to the schools in some form. Of course, this speaks only

to those cases of diagnosed TBI and excludes other forms of acquired brain injury, like a CVA or hypoxic injury. Variables such as population increase affecting increased student body size and subsequent increases in special education numbers are not accounted for in this study.

Another comment gleaned from the athletics perspective regarding changes to awareness is that:

> The old terminology of saying an athlete has had his 'bell rung' has evolved and awareness in safety has greatly improved. Especially with physician's care now directly involved with treatment and recovery. It is a relief as a coach to not have to make those calls anymore. Due to heightened awareness, parents are purchasing high-tech safety gear that provides better safety (e.g., they are buying $400 football helmets rather than using the schools $200 helmets that are provided). During the past 5-6 years, participation in football for Idaho dropped drastically possibly due in part to the fear of head injury from increased media exposure to TBIs and concussions. But the numbers have slowly been rising in participation both on the national and local levels, and just this year we saw the highest increase.

It is not without consideration that TBI and concussions are highly individualized injuries that can be complex in their signs and symptoms and cannot be easily categorized for treatment planning. To simply label a brain injury as mild, moderate, or severe and then prescribe a broad treatment plan to a patient is not best practice for any professional working with this population, especially pediatrics. Return-to-school and return-to-play (RTP) for injured students and student athletes are dependent on attentiveness to recovery and on the knowledge of the team members responsible for the student's health. A common statement amongst educators that is consistent with previous research

is that, “the amount and intensity of re-entry set in place for the injured student are dependent upon the severity of the TBI.”

The Glascow Coma Scale (GCS) is the common tool used by medical professionals to determine the severity of injury. However, due to the inconsistencies in the definition of severity classifications for acquired brain injury, heavy scrutiny as to the validity of the GCS has prompted an alternative neurologic scoring system. As previously mentioned, the Simplified Motor Scale (SMS) may be used in place of the GCS by medical personnel for ease of classification. It is possibly being utilized by medical facilities, but the current study did not account for this new system due to the target population changing. Whichever scale is applied, the severity classification was not obtained from the student’s medical records and included in the data analysis since the recruitment process did not warrant gathering this specific medical information. Nonetheless, it would be interesting for future research to examine exactly how an injury is being labeled as mild, moderate, or severe in nature and how this severity classification ultimately affects the treatment planning for re-entry and RTP.

Structure or Degree of Re-entry Programming

The three primary components for successful re-entry that were examined via the survey were communication, documentation, and education. Communication is necessary for the obvious reason that it is the foundation of information exchange. Documentation is necessary because it serves as a check that the communication is in fact occurring and is consistent and accurate. Education is critical in that it provides the knowledge of what information to

exchange and why (Stone, 1996). Each of these mechanisms are discussed using the survey responses from the opinion/open-ended questions numbered 17, 19, 20, and 21 (see Appendix A for reference). Only one respondent claimed to have not seen anything problematic within the re-entry services they were a part of; they expanded by stating that general education and special education are willing to implement plans put in place by the team.

Communication. As it was found in previous research, and confirmed in this study, communication continues to be the area of greatest strength for educators in Idaho. Opinion-question number 19 of the survey arbitrarily asked what the general strengths of a brain injured student's/student athlete's re-entry transitions are and the common response that had nearly 100% consistency amongst all of those surveyed was in the area of communication. As one educator stated, the communication amongst providers starts with "initiating on the outside and building from the inside." Coming together as a team during the pre-planning stages to discuss signs and symptoms and strategies to use (behaviorial, medical, etc.) creates best practices and continual communication for the academic team. Finding and implementing appropriate accommodations after a lot of pre-planning for re-entry develops a sense of hope, especially when there are medical experts working directly with school. The added support of special education and therapy services for re-entry is beneficial. Of course, several educators mentioned that when the parents are on board and involved, then the team is able to provide best care when working closely with the family. Furthermore, the legally binding formal planning with IEP's and 504's forces

compliance by educational staff and also enhances regular communication between the educators and case managers about the student's performance.

Amongst those working in athletics, communication between key people on the team (trainers, nurses, physicians) starts the moment an injury report is made on the field. The family is notified, a referral is made to the counselor/case manager, and the student athlete is evaluated by medical personnel. Communication must be a constant so as to follow the doctor's orders and adapt game play to the students' needs to ensure that students can RTP. Awareness by the general education teachers allows for flexibility in recovery - "if teachers are on board, then there is a 90% success of RTP."

A common discussion during this opinion section of the survey was in relation to case management and the overall impact this has on communication of re-entry services. It is suggested by the *Guidebook* (1995), and also underscored by several respondents, that it is important to have one liaison to act as case manager who has knowledge of TBI, whether it is the SLP or school nurse, as long as the point person knows about prognosis and treatment outcomes to create effective treatment plans. Most noteworthy was that some respondents were adamant about counselors NOT being the case managers, whereas others felt that a counselor would be an appropriate liaison (e.g., one counselor disclosed feeling competent in the role, while another unwaveringly did not). In any case, too often the case manager is not knowledgeable in TBI and therefore "the case manager should have specific training regarding TBI in order to make more informed decisions and to better assist a student with re-entry."

When asked opinion-question number 20, “what are the general weaknesses of brain injured students/student athlete’s re-entry transition,” a variety of answers were given in the realm of communication. A concern that was disclosed by one educator is that due to some school nurses having to split their time between schools, the un-trained secretaries are doing the assessing of head injuries, which can then lead to issues of accuracy and follow-up. What can further complicate matters is getting the parents to follow the school nurses recommendations and take their child into the doctor for a full medical evaluation. Improving multidisciplinary care amongst all aspects of concussion management was suggested as a solution to the communication weaknesses seen amongst providers during re-entry and RTP.

In general, how do we continue to increase communication amongst all staff working with students who have brain injuries in order to increase awareness, student advocacy, and healthy recovery? By bringing athletics, academics, and medical staff together for best practices.

Documentation. Documentation was the more difficult component to ascertain due to the highest number of responses that had both ‘yes’ and ‘no’ for their answer. Of the four questions in this domain, there were 21 responses with both ‘yes’ and ‘no’; this was due in part to the conflicting contexts that some educators were imagining when answering these questions. Some answered ‘yes’ if they were considering athletics, and/or worked at the high school level, and/or if the injury was a severe TBI and the student was placed on an IEP or 504 plan. These same individuals also answered ‘no’ if they were making allowances for the

specific educational setting, and/or worked at the elementary level, and/or if the injury was an mTBI and therefore the student was not on an IEP or 504 plans.

The question that had the most ambivalence was with question 7, parts a. and b., asking about vocational and educational transition plans. For example, a common theme with this situation was that some respondents would answer 'yes' that a brain injured student would receive vocational transition planning if they qualified for special education services, but 'no' if the case was a student athlete and they were not receiving special services. Another example is a response would be 'yes' an injured student would receive school transition services from the elementary to middle school or middle school to high school if their injury was severe enough to warrant an IEP or 504 plan, but 'no' if the student/student athlete was only being monitored without official re-entry services.

Moreover, the inconsistency in answers to questions 5-8 was further expounded on in the open-ended/opinion questions. Some educators felt that the strengths of re-entry planning were in the documentation processes that have advanced and improved over recent years. One educator remarked that successful re-entry plans can be based solely on performance - since there are no presuppositions of what a student is going to be able to do or not do, they are given the opportunity to succeed if able to. The team will constantly monitor a student, and if that student is not making progress, the team will re-evaluate to ensure success. In other words, an individualized plan is created that does not expect markers of success by certain dates but rather by the individual's progress. The perseverance of the students themselves to improve and giving them

frequent brain breaks so they can manage symptoms for better recovery is also crucial to the recovery and documentation process.

In regards to weaknesses of re-entry, “battling against educators who are resistant to adapting a lesson plan to fit the student’s needs and/or implementing the re-entry plans” was mentioned. Acclimating back into the school setting is challenged because of not being able to implement appropriate accommodations due to resources not being available, limited supplies, equipment, adaptive devices etc., or not being able to change the schedule to fit the student’s needs and attendance policy. A couple of respondents shared that they were uncertain if 504s were the best plans for the student athlete as they may have had a more severe injury with longer-term effects on academics. A suggested solution to this ordeal is to look into developing a closer tracking mechanism to account for discrepancies between former and current progress and abilities. This information can then be given to parents so they can seek services outside of the schools when their child does not qualify for services under the TBI category or if they are experiencing more long-term effects not accounted for by re-entry services.

According to one educator, timing issues were of greatest concern as it was explained that if the injury is severe, it can take six weeks to set up the 504 and upwards of one year to set up the IEP. When homebound, the school needs to accommodate services in a timelier manner so that services can start the transition from recovery to school re-entry as soon as possible. Facilitating school

re-entry as soon as it is feasible may help reduce the isolating effects from being absent from school for an extended period of time (Schilling & Getch, 2012).

From the perspective of speech-language pathologists (SLP), a common conversation was that SLPs are not being utilized in the school systems for helping with TBI re-entry services, and yet they have the expertise and it is within their scope of practice to be a part of the re-entry team. In rural areas especially there are "so many accidents on the farms and in sports, but unless it is a severe brain injury, the speech-language pathologist does not get the referrals and therefore is unaware of the student's injury." One SLP in a rural setting was not able to contribute to the survey because there had not been any students referred for therapy with a TBI. This person shared that "it's sad, because I know that these injuries are out there (I worked in an outpatient pediatric clinic for 10 years), but I don't get the referrals for related therapy services."

This conundrum speaks directly to question 6 of the survey and the conflicting answers to whether or not an educator would refer a student with a TBI to therapy services if they don't meet standardized assessment criteria. Recall that speech-language therapy is considered a related service mandated by the Idaho State Department of Education and can therefore be utilized as an additional, supportive resource for re-entry planning (Idaho Special Education Manual, 2015). As outlined by the American-Speech-Hearing Association (2010), the SLP serves a critical role in education in that:

The expansion of the number of students with disabilities who are served in the

> schools mean that SLPs must be able to serve those students, including those with severe disabilities. More students with autism, traumatic brain injury, and severe medical conditions may now be part of an SLP's workload (p. 9).

It was determined in the data collected that educators in smaller districts are more likely to refer/provide therapy services, and yet a number of SLPs in these areas claim that they are not receiving the referrals for services. It is the opinion of some respondents (not just SLPs) that there is simply a lack of awareness of the roles and responsibilities, and the kinds of services SLPs can provide in the schools.

Education. The most common concern made in regards to general weaknesses to re-entry found in previous research and this study was in the lack of training and knowledge educators feel in TBI management for their students. When answering opinion-question number 20, the overwhelmingly strong consensus of not knowing what the initial identification of signs and symptoms for TBI, and the subsequent prognosis and treatment planning for re-entry, was expressed to the investigator. Some educators feel they are in the “baby steps” of recognizing signs and symptoms of TBI as this type of injury has been taken for granted. Basically, “mild TBIs are not given much thought.” Common struggles are with acknowledging that brain injuries are unique and subsequent diagnosis and distinguishing between short and long-term effects for monitoring “can get tricky.” One respondent made mention that, “it is confusing to have different directives for treatment from various physicians for similar concussive symptoms.”

For a number of respondents, the biggest problem with TBI re-entry services are the students who don't want to be out of sports for too long so they will keep their symptoms to themselves (e.g., if dizzy or headaches, they won't self-report). As previously noted, educators are not able to provide best care if the family involvement is not there. According to some educators, parents who push their child to get back into athletics will often encourage their child to not report their injury symptoms. Consequently, the student "slips through the cracks" if they, or their parents, don't notify the school of these sports-related issues or of an outside injury; but then again, if educators are not knowledgeable in looking for the signs and symptoms, then the student is on his or her own.

Educators want to be able to learn from experts who can answer questions about TBI (e.g., signs and symptoms to look out for, prognosis, etc.) as well as teach how and what steps to follow for re-entry. Parents and general education teachers need more training and knowledge, too, as they are uninformed about how badly the brain can be injured (e.g., working memory & short term memory loss) and how it affects academics. According to one educator, there is "not a big push with the younger, elementary school-ages to make accommodations or look for signs and symptoms." Several comments were made in regards to the psychosocial aspects that are apparently neglected. Many students with TBI need ongoing counseling and guidance, as depression, frustration, confusion, and decreased socialization skills are common following a TBI (Schilling & Getch, 2012). As one educator pointed out, "self-esteem drops a lot with brain injured students, so counseling should be made more of a consideration for involvement

to help the student cope better with their injury and build self-confidence during recovery so they won't isolate." In addition, it is suggested that educators working closely with parents need to be more sensitive due to the grieving process the parent is going through.

To better intensify the understanding of the effects of all severities of TBI, as well as increase training for school staff and the development of appropriate programming, the Brain Injury Research Center of Mount Sinai (BIRC-MS) in collaboration with the National Institute on Disability and Rehabilitation Research and the Brain Injury Association of America make several recommendations (Gordon, et al., 2013). The first is to develop and disseminate guidelines to schools focused on appropriate educational interventions and accommodations, as well as behavioral and educational strategies (p. 9). With respect to Idaho, this has already been accomplished with the 1995 publication of *Traumatic Brain Injury: A Guidebook for Idaho Educators*.

The second is to coordinate resources to train educators, including special educators, in identifying TBI-related disabilities and behaviors that impede educational success, and in instituting educational practices to ensure good academic outcomes (p. 9). Some suggestions were made by survey respondents when answering opinion-question number 17 that could apply for Idaho educators. Nearly all of the respondents declared that they would want trainings to be conducted by medical professionals specializing in brain injury, like physicians, athletic directors, and nurses, who can then present collaboratively with a speech-language pathologist, physical therapist, occupational therapist,

counselor and special education teacher for the re-entry training. For Idaho residents, an example from the medical angle would be to have representatives from the St. Alphonsus Brain Injury Program and/or the St. Luke's Sports Medicine and Concussion team along with the Brain Injury Alliance to distribute information to educators for increased awareness and self-advocacy. Sponsorship of said workshops or trainings could be the school district in partnership with a medical facility (8 respondents agreed) or the State Department of Education (3 respondents agreed). The majority of those surveyed were not sure who would sponsor these trainings, but cost would definitely be a factor and possibly prohibit such projects from evolving since "money for training is extremely limited."

A resource unbeknownst to the principle investigator, but was mentioned by an educator, was to bring back the regional consultants from Idaho State University in Region 6 & 7 - this program is apparently no longer in service, but was of great use to those educators in the east and southeast regions of Idaho. Another proposal would be to have a designated employee within the State Department of Education who could have a special emphasis on TBI re-entry services. Educators would benefit from having a liaison at the state level to be able to turn to and ask questions about TBI and re-entry programming.

Thirdly, make readily available on-line trainings and resources to assist educators, both regular and special educators, to assist them as situations arise. Additionally, develop multimedia approaches (e.g., live chat, apps) in keeping with the technology with which younger educators are familiar (p. 9). Again, in

response to opinion-question number 17, an idea to develop a similar academic training program like athletics have with the *Concussion in Sports* online program sponsored by the National Federation of High Schools (nfhslearn.com). One educator commented that, "It's a factor for athletics to have all of the concussion management training, but we need it in the classrooms as well." What would be helpful in an academic resource are real-life examples of actual stories of apparent mild to moderate injuries that had serious cognitive set-backs (e.g., like in-game collisions turning into severe injuries post-game and how treatment was managed). This online training would be every two years, following a similar model as First Aid re-certification, in order to keep consistency in information being presented across Idaho and for tracking data.

Idaho State Guideline Manual

Since the majority of the surveyed educators in Idaho were not familiar with or did not have a copy of the *Traumatic Brain Injury: A Guidebook for Idaho Educators* (1995), it would behoove the Idaho State Department of Education to consider making the manual available to those educators interested in obtaining a copy. It was noted in the general comments of some survey respondents that there is a need for education and consistency across Idaho with solid guidelines for all educators to follow for TBI policy placement. One educator stated that, "The flood of different policies and procedures has overwhelmed everyone in academics and special education," exemplifying the growing frustration that there has been a lot of change and some educators feel lost in the wave of information. Another common thought is that there needs to be a better

system in place for the students with concussions that are mandated from legislation for procedures in identifying and monitoring the child. Just as Stone (1996) found, it is perplexing to know that there is an actual manual that was published with this purpose in mind, and yet only 2 out of 30 interviewed educators regularly use the manual for re-entry planning (only 3 out of 18 educators in Stone's study confirmed their knowledge and use of the manual).

In 1995, the guideline manual presented a structure for a re-entry program which inherently addressed the areas of communication, education, and documentation. There is a wealth of information that an educator in Idaho could use to help with re-entry services; an obvious concern, however, is whether or not the information presented in this manual is still relevant in today's school environments. Several respondents recognize a need for uniformity across the state with TBI re-entry planning, so a thorough review of this manual for modern applicability would be warranted before dissemination. As this study has shown, changes in legislation since 1995, when the Idaho State Department of Education first distributed the manual, have ramped up the need for better identification, rehabilitation, evaluation, health care planning, and placement options for TBI re-entry programs and RTP plans. Since the initial, extensive investment of research, time, and money has already been exploited to create a useful resource, it would possibly be a productive and cost-effective project to simply update the *TBI Guidebook* (1995) and make it available as an online resource. There are a plethora of new materials, suggested steps, and various cognitive, behavioral, and social support resources that would need to be reviewed and potentially

incorporated into the updated version. One such document is the *Idaho Concussion Management Implementation Guide for School & Sport Administrators* (2012) that is a "template for creating and implementing written concussion management policy, as required by Idaho Law (p. 2)." Coupled with an online training program instructing how to implement these guidelines into an IEP or 504 plans, or just support services, and this has the potential to resolve the major dilemma of incorporating policy and procedure into the folds of TBI re-entry services in the academic setting.

It is the opinion of the principle investigator that much of the *TBI Guidebook* (1995) would still be considered relevant for Idaho educators to use for practical re-entry planning in 2015, but it is beyond the latitude of this report to comprehensively present these interpretations. Future research is warranted to scrutinize the relevance of the *Guidebook* and then synthesize more recent research findings to determine applicability.

Summary

Following suit with previous findings, it should be made clear that this study does not imply that all students suffering from milder forms of TBI need to have extensive re-entry programs or modifications made to educational placements. Rather, it is simply trying to answer the research questions of whether or not there has been an improvement in recognizing mTBIs and how this has affected policy and procedures for school re-entry programs since the previous study was conducted. Given the evidence from those Idaho educators surveyed and the data gathered and compiled from the Idaho Trauma Registry,

Idaho Child Count and Census, and the CDC it is determined that with the increases in the number of Idaho children being medically seen for head trauma's and the number of children in the TBI category for special education, there is also consensus amongst educators (83%) that there have been advances in identifying mTBIs since starting their careers in schools. Unfortunately, it was found that the *Guidebook* (1995) has not contributed to any policy or procedural development changes as the majority of educators are not utilizing this resource for re-entry planning services. Finally, it was determined that smaller districts and school sizes have maintained their level of re-entry services by providing more services and having more policies set in place for the re-entry programs of students diagnosed with a TBI.

Future Research

There are certainly limitations to this study, as it is considered Level III quality, in the lower-level and early stages of research and therefore least credible of evidence, according to ASHA. Thus, broad overviews of potential changes for future research are presented.

The main limitation that stood out to the researcher was teasing out the difference between services for TBI students (more severe cases) versus services for mTBI (less severe cases). One educator, who held multiple higher education degrees and roles in her district, stated that she "Didn't want to interchange the terms concussion and TBI as if they are the same and therefore receive the same kinds of services." This statement speaks to a common theme discovered in the

interview process for multiple educators. In short, a survey designed specifically to assess mild and moderate TBI re-entry services might eliminate this confusion.

An interesting review that would be useful for comparison is to look at other states and determine if this finding is the same across both similar-sized states with mostly rural populace as well as larger populated states with heavier urban settings. In order to have a measure of reliability, one would need to extrapolate annual reports and compare to centralized data systems. One could also review a state that has been a leader in the development of educational policy and procedure, like Pennsylvania, to incorporate into the discussion of how legislation for TBI reform has affected school re-entry services.

While it was not an official question in the survey, it was agreed upon by several SLP's that their services are being underutilized when it comes to treatment plans for students, and especially with the student athletes suffering from the cognitive short and long-term effects of mTBI. "Getting buy-in from other educators that SLPs are experts and TBIs of all severities are to be considered serious for accommodations," was a shared remark made by participants. In the context of mTBI, it is not suggested that SLP's should be managers of concussions, or be involved with every concussion, rather that they be considered to assist with re-entry services.

An issue is that the majority of educators working in urban cluster and rural areas of Idaho do not have immediate access to specialists in sports medicine or brain injury medical units and are therefore left to their own devices to design and implement TBI re-entry services for school-aged children; hence

the need for collaboration of disciplines to deliver best care in the health and recovery of the student. As a solution, this study may have benefited from examining the availability of SLPs to Idaho schools in order to address this concern. It is possible that some school districts do not have a full-time SLP, and that the SLPs that are available to schools are shared with numerous other schools (i.e., there is only 1-2 available for an entire district/region of schools).

Only one respondent explicitly mentioned peer training as an area of weakness since it is "never addressed", and yet the majority of respondents (21/30) agreed that peer training is not conducted. By involving peers in the re-entry process, it may help other students realize the role they play in facilitating successful re-entry experience (Schilling & Getch, 2012). Stone (1996) had also basically determined that no districts chose to educate faculty, staff, and classmates who were involved directly with the student which lends to a potential area of future research since there appears to still be a need in determining the importance of a student's maintaining friends and social group involvement post-TBI.

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Appendix A: Interview Questionnaire

To start the interview off, I need to gather some basic demographic information about you. This will be reported anonymously so your personal identification will be de-identified for data collection. Are you ready?

Participant Name: _____ ***De-identification Code:** _____

School District: _____ ***De-identification Code:** _____

Name of School: _____ ***De-identification Code:** _____

Job Title/Credentials: _____ # of years employed with SD:___

Using a cell phone or land-line? Driving a car while on the cell phone? Yes No
{If yes, have respondent pull over or reschedule interview} Pulled car over or rescheduled?

[Transition] Now I would like to ask you a couple of questions about your professional experience with students who have acquired brain injuries.

How many students/student athletes with traumatic brain injuries have you worked with in the **past three years** (approximately)? _____

What were the etiologies of their TBI?_____

How many of those traumatic brain injuries were mild TBI's (e.g., concussion) (approximately)? _____

What educational setting are the brain injured students/student athletes in, of whom you work specifically with (e.g. special education, regular class, reduced day, sports team, etc.)? _____

[Transition] This last question is in regards to re-entry services for these students.

What other educators do you work with on a regular basis to ensure re-entry services are provided for brain injured students/student athletes:_____

***Data collection codes:**

ENROLLMENT COUNT (2013-2014)	District _____ **De-identification Code:** _____ Student Body Count _____ School Size: Small (<5,000) Large (>5,000) Total Disability_____
GEOGRAPHICAL AREA	○ **Urbanized Area-UA, Metro** ○ **Urban Cluster-UC, Micro** ○ **Rural-R, Micro**
REGION/DISTRICT	○ **District/Region 1 – Panhandle** ○ **District/Region 2 – North Central** ○ **District/Region 3 – Southwest** ○ **District/Region 4 – Central** ○ **District/Region 5 – South Central** ○ **District/Region 6 – Southeastern** ○ **District/Region 7 – Eastern**

Instructions: *Again, I want to assure you that all identifying information regarding yourself, the school, and the school district will be kept confidential and anonymous. Any reference to the information you give me will be done with identifier numbers (i.e., E1, E2) rather than any names. Because this is a research study, it is important that each interview be conducted in the same manner. As a result, I will ask you a series of 21 questions, starting with 16 yes-no-unsure questions regarding the re-entry of students/student-athletes back into the educational setting. In order to remain in compliance with HIPPA regulations, the questions are not targeted to any specific student/student athlete. The questions have been developed to elicit a general response, not specific to individual students/student athletes. Please limit your answers to only yes-no-unsure for these questions. The final five questions are opinion statements and require more lengthy answers beyond yes-no-unsure responses. Please limit your discussion to the final five stated questions. Do you have any questions before I begin?*

First we will begin with the Yes-No-Unsure questions. There are 16 of these. Are you ready?

I will first be asking you about a wide variety of situations and policies regarding communication prior to, during, and following a student's re-entry:

1) Is there a designated individual at your facility who serves as liaison and coordinator of networking for brain injured students/student athletes?

YES NO UNSURE

2) Are there established school policies and procedures for exchanging information and communicating with other agencies (i.e. hospitals, private therapists) for brain injured students/student athletes?

YES NO UNSURE

3) Is there a preliminary meeting between educators, family, and rehabilitation/medical team to discuss plans for brain injured students/student athletes prior to his/her return?

YES NO UNSURE

4) Is there a plan for exchange of information between family, educators, and other professionals to inform of changes in status or performance or plans (e.g., individualized education plan (IEP), classroom placement, schedules) for brain injured students/student athletes?

YES NO UNSURE

Next I will be asking about the documentation of student's progress and goals within the educational settings:

5) Is there a record in the brain injured students/student athletes file of treatment history and progress (i.e. medical and/or rehabilitation records)?

YES NO UNSURE

6) Does a student diagnosed with a brain injury qualify to receive therapy services if they don't meet standardized assessment criteria (i.e. will a student diagnosed with a brain injury who does NOT fall below the threshold of 1.5-2.0 standard deviations below the mean on a standardized assessment be eligible to receive services in the schools)?

YES NO UNSURE

*7) In general, does a vocational or educational transition plan exist for either of the following:

a. a brain injured student/student athlete who needs job or college preparation

YES NO UNSURE

b. a brain injured student/student athlete who needs school transition services from either elementary to middle school or middle school to high school

YES NO UNSURE

8) Does a health care plan (i.e. document containing emergency procedures relating to disability (e.g. seizures or medications) as well as possible school emergency situations (e.g. natural disasters)) exist for brain injured students/student athletes?

YES NO UNSURE

9) Is ongoing communication about brain injured students/student athlete's performance maintained between family, educators, and other professionals?

YES NO UNSURE

10) Was TBI training (e.g. presentation, workshop, and/or seminar) conducted for faculty and staff who are involved directly with brain injured students/student athletes either as educators or support personnel (i.e. teachers, aids, secretary) completed in the **past three years**?

YES NO UNSURE

11) Is peer training conducted for friends and/or classmates prior to the return of the brain injured students/student athletes to school (e.g. education about the accident/injury, effects of TBI, rehabilitation process, differences in abilities and behaviors)?

YES NO UNSURE

12) Does a mechanism exist in which the re-entry of brain injured students/student athletes is evaluated to determine overall successfulness?

YES NO UNSURE

If yes, what is it:_____

The next questions I will be asking about are about the education you have personally received regarding traumatic brain injuries and re-entry services:

13) Do you have a copy of the *Traumatic Brain Injury: A Guidebook for Idaho Educators* manual distributed to school districts by the Idaho Department of Education in October 1995?

YES NO UNSURE

14 a) [If answers yes to question 13] Have you used the *Guidebook* either as a reference or to set up any portion of a re-entry program?

YES NO UNSURE

*14 b) [If answers no to question 13] What other means of reference do you use to set up any portion of a re-entry program?

_____
_____
_____

*15) In your experience, have there been improvements in identifying students/student athletes suffering from milder forms of traumatic brain injury (i.e. concussions)?

YES NO UNSURE

*16 a) [If answers yes to question 15] Are these improvements related to TBI training and/or better education in recognizing signs and symptoms of mild TBI you have personally received?

YES NO UNSURE

*16 b) [If answers no to question 15] Would it be beneficial to have more thorough TBI training and/or better education in recognizing the signs and symptoms of mild TBI?

YES NO UNSURE

In your opinion, how frequent would this training need to be for you to feel skilled in recognizing the signs and symptoms of mTBI (e.g., once or twice a year, once every two years, etc.)?

_____

Finally, we will end the survey with the opinion/open-ended questions. There are 5 of these. Are you ready?

17) If TBI training is provided for the re-entry of injured students/student athletes, who is the sponsor (e.g. the school district, state department of education, medical facility) and who presented the information (e.g. special educators who have worked with TBI, rehabilitation therapists, counselor or social worker)?

_____
_____
_____
_____

18) On a scale of 1-7 (1 being ineffective, 7 being completely effective), how would you rate the general re-entry transition of brain injured students/student athletes?

1 2 3 4 5 6 7
(ineffective) (moderately effective) (completely effective)

*19) In your opinion, what are the general strengths of brain injured students/student athlete's re-entry transition (i.e. what parts of the plan work best for the student and faculty)?

_____
_____
_____
_____

*20) In your opinion, what are the general weaknesses of brain injured students/student athlete's re-entry transition (i.e. what changes would you like to see in future transitions)?

_____
_____
_____
_____

21) Do you have any comments and/or suggestions?

_____
_____
_____
_____

Thank you for your time and participation in the study. Would you like to have a copy of the results sent to you upon completion of the study? If so, to what address would you like them sent?

_____
_____

*New questions added and/or altered to original survey for current research. All questions were altered from asking about a specific student to asking about brain injured students/student athletes in general. See Appendix B for comparison.

Appendix B: Stone's (1996) Original Interview Questionnaire

Instructions: First, I want to assure you that all identifying information regarding yourself, the school, and the school district will be kept confidential. Any reference to the information you give me will be done with identifier numbers (i.e., E1, E2) rather than any names. Because this is a research study, it is important that each interview be conducted in the same manner. As a result, I will ask you a series of 14 yes/no questions regarding the re-entry of _____ back into the educational setting. Please limit your answers to only yes or no for these questions. The final nine questions are opinion statements and require more lengthy answers beyond yes/no responses. Please limit discussion to the stated question. Do you have any questions before I begin?

1) Is there a designated individual at your facility who serves as liaison and coordinator of networking for (student's name)?

2) Are there established school policies and procedures for exchanging information and communicating with other agencies (i.e. hospitals, private therapists) for (student's name)?

3) Was there a preliminary meeting between educators, family, and rehabilitation/medical team to discuss plans for (student's name) prior to his/her return?

4) Is there a plan for exchange of information between family, educators, and other professionals to inform of changes in status or performance or plans (e.g., individualized education plan (IEP), classroom placement, schedules) for (student's name)?

5) Is there a record in (student's name) file of treatment history and progress (i.e. medical and/or rehabilitation records)?

6) Has an individualized education plan (IEP) been prepared for (student's name)?

7) Does a vocational or educational transition plan exist (i.e. job or college preparation, school transition from elementary to middle school, etc.) for (student's name)? (If applicable)

8) Does a health care plan (i.e. document containing emergency procedures relating to disability (e.g. seizures or medications) as well as possible school emergency situations (e.g. natural disasters)) exist for (student's name)?

9) Is ongoing communication about (student's name) performance maintained between family, educators, and other professionals?

10) Was TBI training (e.g. presentation, workshop, seminar) conducted for faculty and staff who are involved directly with (student's name) either as educators or support personnel (i.e. teachers, aids, secretary)?

11) Was peer training conducted for friends and/or classmates prior to the return of (student's name) to school? (e.g. education about the accident/injury, effects of TBI, rehabilitation process, differences in abilities and behaviors)

12) Does a mechanism exist in which the re-entry of (student's name) is evaluated to determine overall successfulness?

13) Do you have a copy of the Traumatic Brain Injury: A Guidebook for Idaho Educators manual distributed to school districts by the Idaho Department of Education in October 1995?

14) If yes to the previous question, have you used the Guidebook either as a reference or to set up any portion of a re-entry program?

*15) If no to question 13, what other means of reference do you use to set up any portion of a re-entry program?

16) If TBI training was provided for the re-entry of (student's name), who was the sponsor (e.g. the school district, state department of education, medical facility) and who presented the information (e.g. special educators who have worked with TBI, rehabilitation therapists, counselor or social worker)?

*17) In your experience, has there been improvements in identifying students suffering from milder forms of traumatic brain injury?

*18) If yes, are these improvements related to TBI training and/or better education you have personally received.

*19) If no to question 17, what would it be beneficial to have more thorough TBI training and/or better education? How frequent would this training need to be?

20) What educational setting is (student's name) in? (e.g. special education, regular class, reduced day, etc.)

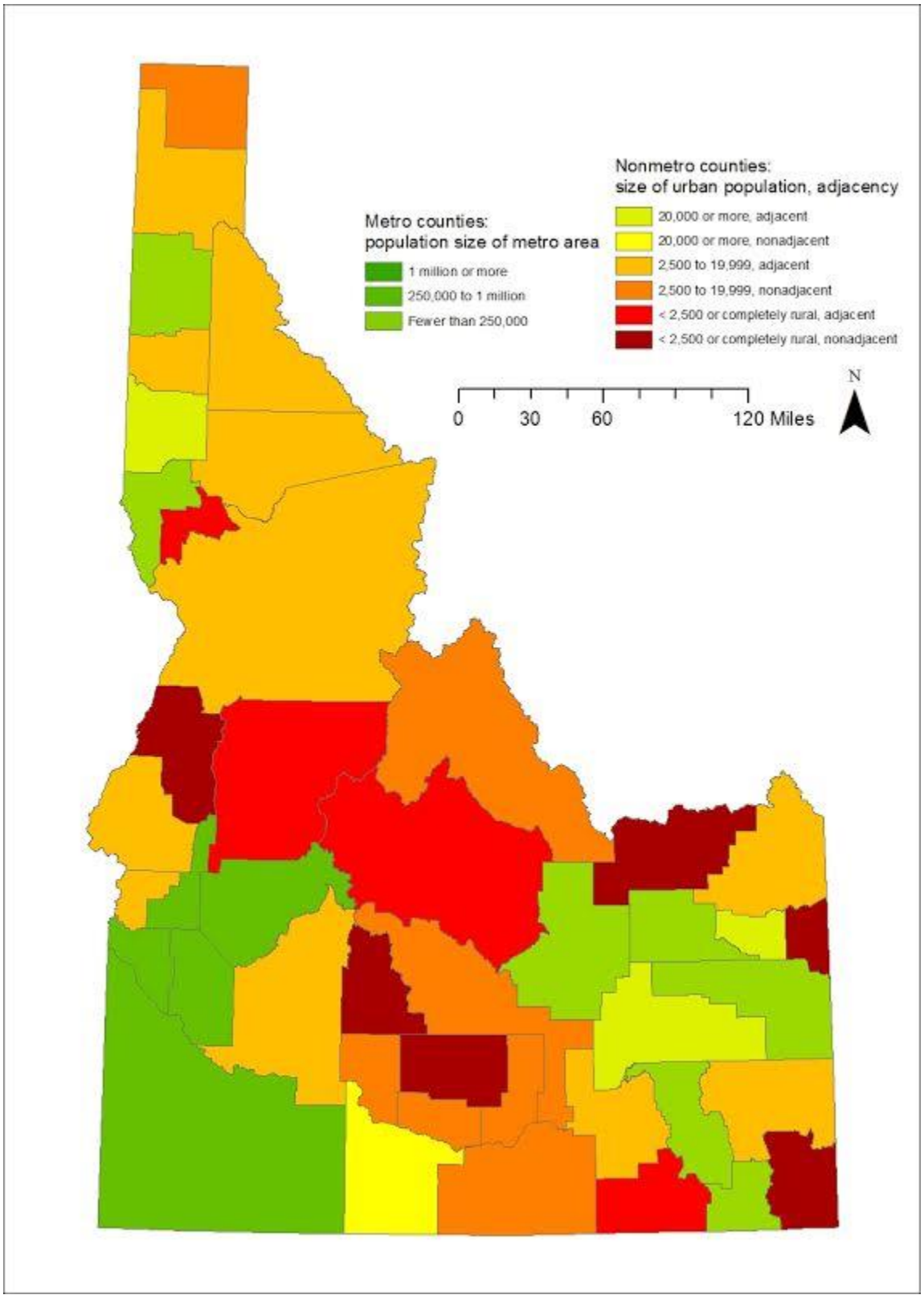
21) On a scale of 1-7 (1 being ineffective, 7 being completely effective), how would you rate the re-entry transition of (student's name)?

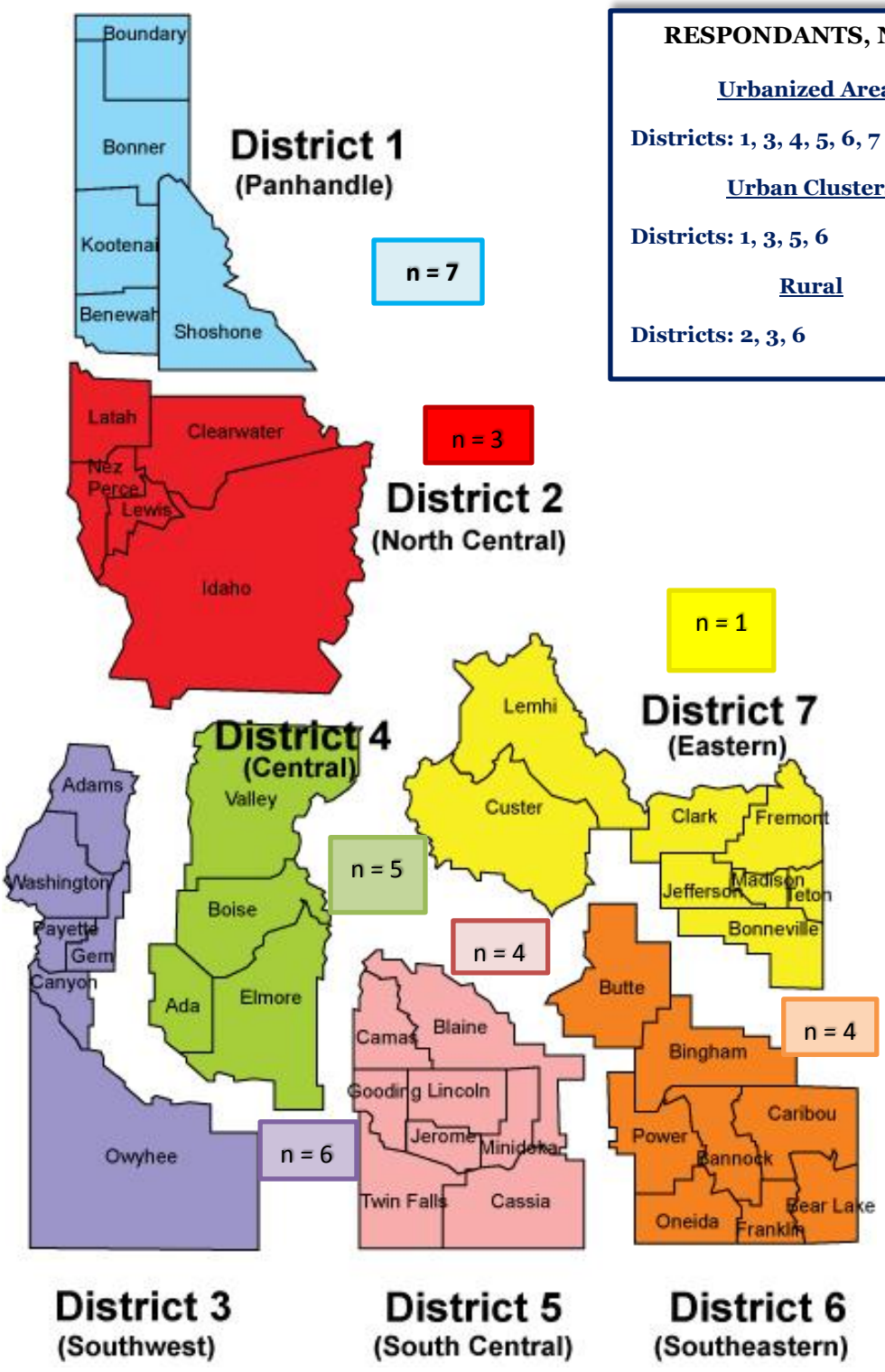
22) In your opinion, what were the strengths of (student's name) transition?

23) What changes would you like to see in future transitions?

24) Comments and/or suggestions?

Appendix C: Idaho Maps




RESPONDANTS, N = 30
Urbanized Areas
Districts: 1, 3, 4, 5, 6, 7 n = 12
Urban Clusters
Districts: 1, 3, 5, 6 n = 11
Rural
Districts: 2, 3, 6 n = 7
Boundary
Bonner
Kootenai
Benewah
Shoshone
District 1
(Panhandle)
n = 7
Latah
Clearwater
Nez Perce
Lewis
Idaho
n = 3
District 2
(North Central)
n = 1
Lemhi
Custer
District 7
(Eastern)
Clark
Fremont
Jefferson
Madison
Teton
Bonneville
District 4
(Central)
Adams
Valley
Washington
Boise
Payette
Gem
Canyon
Ada
Elmore
n = 5
n = 4
Butte
Camas
Blaine
Bingham
n = 4
Gooding
Lincoln
Caribou
Power
Jerome
Minidoka
Bannock
Owyhee
n = 6
Twin Falls
Cassia
Oneida
Bear Lake
Franklin
District 3
(Southwest)
District 5
(South Central)
District 6
(Southeastern)

Appendix D: Email Scripts for Recruitment

Email to Administrator of School District

To: [Administrator]
From: wenisar2@isu.edu
Subject: Idaho State University - Recruiting for Traumatic Brain Injury Research

Hello [administrator name],

I am writing on behalf of Idaho State University imploring you to help me with my master's thesis research. I am a second year graduate student in the Speech Language Pathology program, and I am conducting a telephone survey across the state within the public school system. I am interested in questioning faculty from your school district regarding their professional experiences in working with students who have acquired brain injuries. I am comparing results from a similar survey conducted in 1996 to current results, given faculty participation. It is my guess that many changes have been made in the state of Idaho regarding school re-entry programs for students and student athletes suffering from acquired brain injuries since the original survey was conducted in 1996. This is important to verify as the incidence of traumatic brain injuries (specifically concussions) increases, so too has increased awareness and improved recognition of symptoms. Ultimately, results from this survey should validate the continued need for training and interdisciplinary teamwork for speech language pathologists and other professionals within the communities who work with this special population.

My goal is to recruit a total of 36 participants across the state of Idaho, ranging in key educator professions such as speech-language pathologists, teachers, counselors, coaches, athletic trainers, and school nurses. Your region and school district, [school district number], were randomly selected to generate participants. The following schools were also randomly selected and I will be contacting faculty from each school for recruitment: [list of the schools]

From each school, I will only need to interview one faculty member in order to meet my minimum sample population. **What would be of great help is if you could assist my initiating contact with faculty (e.g. speech language pathologists, counselors, athletic trainers) by providing names, titles, and an email from each school. Or, if this proves to be too cumbersome of a task, a contact person that I may reach in order to obtain names of faculty that could be reached.** For your convenience, I have attached a copy of the recruitment e-mail that I will be sending to each of the participants, as well as the consent form they each will receive for signature.

If you should have any questions or concerns regarding this study and my research, please feel free to call me at 208-660-9717. Thank you very much for your time and consideration.

Kindest regards,

Sara Wenig
Clinical Graduate Student
Speech-Language Pathology – Idaho State University

Recruitment E-mails for Participants

Initial E-mail

To: [Participant]
From: wenisar2@isu.edu
Subject: Idaho State University - Are you interested in participating in TBI research?

Dear [participant name],

Hello. I am a second year graduate student from Idaho State University in the Speech & Language Pathology program, and I am conducting a telephone survey for my master's thesis research. I have received permission from your school administrator, [administrator name], to contact you regarding this survey. I am comparing results from a similar survey conducted in 1996 to current results, given your participation. It is my guess that many changes have been made in the state of Idaho regarding school re-entry programs for students and student athletes suffering from acquired brain injuries since the original survey was conducted in 1996. This is important to verify as the incidence of traumatic brain injuries (specifically concussions) increases, so too has increased awareness and improved recognition of symptoms. Ultimately, results from this survey should validate the continued need for training and interdisciplinary teamwork for speech language pathologists and other professionals within the communities who work with this special population.

This survey should only take up 10-15 minutes of your time. **If you are interested in participating, qualifications are simply that you are employed by the school district and have had experience working with students diagnosed with a brain injury within the past 8 years.** Please review and manually/electronically sign the attached consent form to be scanned and emailed back to me. Once I receive your consent, I will be contacting you with a follow-up email to schedule the telephone survey. If you are not interested,

please let me know as your denial will allow for me to try other faculty listed by your school.

Thank you very much for your time and consideration in participating.

Kindest regards,

Sara Wenig
Clinical Graduate Student
Speech-Language Pathology – Idaho State University

Follow-up E-mail (should they not respond)

To: [Participant]
From: wenisar2@isu.edu
Subject: Idaho State University-Would you like to participate in TBI research?

Dear [participant name],

Hello. I attempted to contact you recently in regards to my research I am conducting for Idaho State University. Since I have not received a reply from you as of yet, I am attempting to contact you one more time to implore you for your help.

I am a second year graduate student in the Speech & Language Pathology program, and I am conducting a telephone survey for my master's thesis research. I have spoken with your school administrator, [administrator name], and he/she has given me permission to contact you regarding this survey. I am comparing results from a similar survey conducted in 1996 to current results, given your participation. It is my guess that many changes have been made in the state of Idaho regarding school re-entry programs for students and student athletes suffering from acquired brain injuries since the original survey was conducted in 1996. This is important to verify as the incidence of traumatic brain injuries (specifically concussions) increases, so too has increased awareness and improved recognition of symptoms. Ultimately, results from this survey should validate the continued need for training and interdisciplinary teamwork for speech language pathologists and other professionals within the communities who work with this special population.

This survey should only take up 10-15 minutes of your time. **If you are interested in participating, qualifications are simply that you are employed by the school district and have had experience working with students diagnosed with a brain injury within the past 8 years.** If you are interested in participating, please review and manually/electronically sign the attached consent form to be scanned and emailed back to me. Once I receive your consent, I will be contacting you with a follow-up email to schedule the telephone

survey. If you are not interested, please let me know as your denial will allow for me to try other faculty listed by your school.

Thank you very much for your time and consideration in participating.

Kindest regards,

Sara Wenig
Clinical Graduate Student
Speech-Language Pathology – Idaho State University

Follow-up E-mail (should they consent)

To: [Participant]
From: wenisar2@isu.edu
Subject: ISU - Scheduling for the TBI Survey

Dear [participant name],

Hello! Thank you so much for responding to my recruitment emails. I have received your signed consent form for participation in the telephone survey for my master's thesis research, *TBI Re-entry Services for School-Aged Children in Idaho*. It is with your special expertise and knowledge of this population that I hope to gain and produce data that will ultimately benefit your community of interdisciplinary team members who work with this special population.

At your convenience, I would like to schedule a date and time to call and ask you a series of questions that may take 10-15 minutes, depending on your answers. I am available to call you at all times of the day during the week and on weekends should it prove to be too cumbersome to try and reach you during work hours. Either way, please feel free to respond to this message with dates, times, and phone numbers where you can best be reached. Or, if it easier to schedule by phone, I would be happy to try and reach you so that we can set something up.

Thank you again for your time and consideration in participating in this research.

Kindest regards,

Sara Wenig
Clinical Graduate Student
Speech-Language Pathology – Idaho State University

Follow-up E-mail

To: [Participant]
From: wenisar2@isu.edu

Subject: ISU-Scheduled Telephone Survey

Dear [participant name],

Thank you for your response with the dates and times of availability for the telephone survey regarding my thesis *Acquired Brain Injury Re-entry Services for School-Aged Children in Idaho*. I have scheduled to call you at the phone number you provided on **[date and time].** Again, this interview should only require 10-15 minutes of your time. Should you need to reschedule, please feel free to email me at your earliest convenience with an updated date and time.

I have attached a copy of the questionnaire and the instructions for your review prior to our interview.

Thank you again for taking the time to participate in this important survey for Idaho State University.

Kindest regards,

Sara Wenig
Clinical Graduate Student
Speech-Language Pathology – Idaho State University

Final E-mail

To: [Participant]
From: wenisar2@isu.edu
Subject: ISU Thanks You for Your Participation!

Dear [participant name],

I wanted to send my sincere appreciation for taking the time out of your busy schedule to participate in the recent telephone survey for Idaho State University. Your contribution has greatly added to the knowledge-base for discovering what re-entry systems are effective and which need improvements within the public and charter school systems in the state of Idaho for children suffering from TBI's.

It was a pleasure speaking with you and I thank you again for your contribution.

Kindest regards,

Sara Wenig
Clinical Graduate Student
Speech-Language Pathology – Idaho State University