

Autism Spectrum Disorder, Education, Laws, & Statistics: A Conceptual and Mathematical Verification of Texas Laws With Respect to Autism

Hannah Cooley^{1*}, Jim Owen² and Dawne Welch³

¹Research Student, McNeese State University, Louisiana, USA; ²Licensed Specialist in School Psychology (LSSP), USA; ³Department of Environmental Science, Friendswood High School, USA

ABSTRACT

Autism spectrum disorder is quite prevalent in today's society, and it is important to evaluate how it pertains to students in their educational environment, specifically in the state of Texas. The purpose of this research paper is to critically analyze the concept of autism with respect to education through the utilization of Texas state laws and a complex mathematical and statistical analysis of the data.

Keywords: Autism spectrum disorder; Least restrictive environment; School; Education; Academics; Children; Behavior; Class; Environment; Skills

INTRODUCTION

Autism Spectrum Disorder (ASD) is a major phenomenon in the world today. A prominent study by the Centers for Disease Control and Prevention discovered that from 2000-2002, the prevalence of autism was 1:150. Yet by 2010-2012, 1 in 68 children had been identified with autism. Table 1 explaining the increased prevalence of autism throughout the years. The exact cause of autism is still undetermined, but the reason for an increased prevalence could be that, as with more awareness of the condition, autism is being diagnosed more effectively, or other factors could be the cause. Clearly, the Autism Spectrum Disorder is having a growing effect on many people and their families, and there needs to be more emphasis on protecting the educational rights of these students with ASD so that they can live a successful life. By critically analyzing data and statistics relating to autism, it will be made evident whether or not the state of Texas is improving the educational quality and having a least restrictive environment for students along autism spectrum disorder.

Autism Spectrum Disorder (ASD) is a serious developmental disorder than inhibits normal communication and interaction among others. From 1999-2000, there was 3,876 students age 6-11 and 1,778 students age 12-17 with autism in Texas. From 2013-2014, there was 21,609 students age 6-11 and 15,732 students age

12-17 with autism in Texas [1]. The complete Texas State Autism profile (Tables 2 and 3).

1 in 42 boys and 1 in 189 girls are affected by autism. Clearly, there is a trend that more males are diagnosed with autism than females. The ratio of males diagnosed with autism to females range from 2:1 to 16:1. Females may be more difficult to diagnose than males, because autism is exhibited differently in women and girls. Females who are on the autism spectrum have similar interests to that of other girls, such as horses, fairy tales, and celebrities. The diagnostic criteria for autism spectrum disorder include repetitive behaviour and special interests. Because the interests of girls with autism are similar to that of other girls, the presence of autism in girls is more difficult to diagnose than in boys. Therefore, diagnosis questions should be altered to better identify females with autism that would otherwise be overlooked. Although females are less likely to develop autism, their condition will often be more severe when it does occur. There is also information of genetic explanations along with theories that explain the gender/autism association. Girls inherit X chromosomes from both their mother and father, but boys, however, inherit only one, from their mother. One hypothesis is that the X chromosome that girls inherit from their fathers may contain a gene that protects them from autism, which makes girls less likely of developing autism spectrum disorder. However, it is also possible that several genes on different chromosomes may be associated with autism [2].

Correspondence to: Hannah Cooley, Research Student, McNeese State University, USA, Tel: +2814680433; E-mail: msu-hcooley4@student.mcneese.edu

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Table 1: Identified prevalence of autism spectrum disorder.

Surveillance year	Birth Year	Number of ADDM sites Reporting	Prevalence per 1000 children (Range)	This is about 1 in X children
2000	1992	6	6.7 (4.5-9.9)	1 in 150
2002	1994	14	6.6 (3.3-10.6)	1 in 150
2004	1996	8	8 (4.6-9.8)	1 in 125
2006	1998	11	9 (4.2-12.1)	1 in 110
2008	2000	14	11.3 (4.8-21.2)	1 in 88
2010	2002	11	14.7 (5.7-21.9)	1 in 68
2012	2004	11	14.6 (8.2-24.6)	1 in 68
ADDM Network 2000-2012				
Combining data from all sites				

Table 2: Children with autism in Texas for 1999-2000 and 2014-2015 (Child count by age group).

Variables	1999-2000	2014-2015
Age 3-5	1,108	7,464
Age 6-21	6,023	43,866
Age 3-21	7,131	51,330

Table 3: Children with disabilities in Texas for 1999-2000 and 2014-2015 (Child count by age group).

Variables	1999-2000	2014-2015
Age 3-5	36,442	42,654
Age 6-11	2,10,873	1,86,969
Age 12-17	2,23,824	1,96,829
Age 18-21	20,503	25,171
Age 6-21	4,55,200	4,08,969
Age 3-21	4,91,642	4,51,623

Neurological differences are not caused by nature or the toxic environment; rather, they are caused by natural alterations in the human genome [3]. Clearly, while more males are diagnosed with autism than females, it is important to realize that according to hypothesis, females are genetically protected from autism, making the occurrence of autism in females drastically lower than that of males [2].

METHODOLOGY

A study conducted by researchers at the University of Washington Medicine, UW Bothell, and Seattle Children's Research Institute discovered that exposure to ultrasound in the first trimester of pregnancy is likely to increase the severity and symptoms of autism in children with abnormal genetic conditions and/or autism spectrum disorder. This study focused on how the symptoms of autism spectrum disorder varied in children, and not how autism is caused. The data was gathered from 2,644 families throughout 12 research sites in the U.S. Seven percent of the children in this study had genetic conditions linked with autism. As a result, the U.S. FDA (Food and Drug Administration) suggested that the use of ultrasounds for diagnostic purposes be used only for necessary medical evaluations. However, the data conducted for the effect of ultrasounds on the second and third trimesters showed no correlation to increased autism severity. The research team explained how autism in children can be exhibited in various ways by using the following terms: some children may have a genetic susceptibility to autism spectrum disorder, outside stressors may cause variability, and the timing of the outside stressor on the child may also have an effect on the symptom variability of

autism. One of the outside stressors that this study focused on was ultrasound. An ultrasound is a medical imaging procedure that is used to examine the fetus in a pregnant woman. It is safer to get an ultrasound after the first trimester of pregnancy to avoid the potential effects of increasing the autism severity. There is still not a definite association between autism and ultrasounds, but there is indeed a possibility. As with any medical procedure, there are dangerous risks but also valuable benefits. Another study discovered that the in-utero exposure to ultrasound created autism-like symptoms in mice [4]. Clearly, there is likely potential that ultrasounds may cause autism-like symptoms and/or increase the severity of autism symptoms. However, because research is limited and a definitive conclusion is yet to be made, this research has shown that it is best to avoid diagnostic ultrasounds before the first trimester of pregnancy unless it is needed for an essential medical evaluation.

The relationship between vaccines and autism spectrum disorder has caused much debate and misunderstanding. Some people believed that an autism diagnosis may have been caused by vaccines. However, that has been proven to be false. A vaccine ingredient called Thimerosal is used to prevent the contamination of vaccines, but it has been proven to be safe. Thimerosal is a mercury-based preservative and has no causal link to Autism Spectrum Disorder, as it has been specifically proven by scientific research conducted by the Centers for Disease Control and Prevention [5]. Some people believed that mercury could cause autism primarily due to the fact that mercury is a heavy metal, and it can cause neurological disorders. According to scientific research, both Thimerosal and vaccines have been verified for their safety. Studies have also proven

that there is no association between Autism Spectrum Disorder and the measles, mumps, and rubella (MMR) vaccine [6]. In fact, there has been no link found between any vaccine ingredient and Autism Spectrum Disorder, which clarifies the fact that vaccines are indeed safe to use for the prevention of certain diseases [7]. Multiple studies have been conducted, including a report from 2015 that analyzed the health records of 95,727 children, including 15,000 2 to 5 year olds who were unvaccinated, and 2,000 children at risk for developing autism. The study revealed that there is no increased risk for developing autism by immunization at ages 2 through 5, and there is also no association between the MMR vaccine and autism spectrum disorder [8].

Although there has been no individual cause discovered for the autism spectrum disorder, abnormalities in brain structure or function are believed to be one of the causes. Brain scans with neurotypical children differ from the brain scans of children with autism, because the disorder changes the the shape and structure of the brain. Heredity, genetics, and other medical problems are among the causes that are accepted by researchers, since they have not discovered the exact cause of the autism spectrum disorder. There is a theory that the autism spectrum disorder has a genetic basis. Autism or related disabilities often run in families, passed down from generation to generation. This means that many people with autism may have a genetic component in their body that makes them more susceptible to autism. There has not been an individual gene that has been identified as the single cause of autism, but there are researchers that are working to find irregular segments of the genetic code from children with autism, to see if there is an autism-causing gene that they inherited. Also, some children may just be born with a susceptibility to autism. In addition, children with autism have excessive synapses in their brain. The reason is due to a decrease in the normal ‘pruning’ process. Synapses are the points where neurons connect and communicate, and when there is an excess amount, than that will affect how the brain functions. Researchers have also discovered that a cluster of unstable genes may interfere with the normal development of the brain, and therefore, cause autism spectrum disorder [9].

Other factors that may contribute to autism are complications during pregnancy and/or delivery, or environmental factors such as exposure to certain chemicals, metabolic imbalances, or viral infections. If a mother takes certain medications during her pregnancy, the baby may be more at risk for developing the autism spectrum disorder. Also, autism occurs more often in people who have certain medical conditions such as the Fragile X Syndrome, Tuberous Sclerosis, Untreated Phenylketonuria (PKU), or Congenital Rubella Syndrome. Clearly, autism tends to occur more often in people with certain characteristics, such as having a certain medical condition or being born into a family where autism has frequently occurred with other family members. Some causes of autism are still being studied, but other causes, such as the abnormalities in brain structure and function, are widely accepted by many people as a cause of autism [9].

Asperger’s Syndrome

Asperger’s Syndrome is a subtype of autism and is on the higher-functioning end of the autism spectrum disorder. Asperger’s Syndrome and High Functioning Autism (HFA) are often referred to as the same diagnosis. Some of the clinical features of Asperger’s Syndrome are are a lack of empathy, social isolation

with few genuine friends and lack of social skills, odd interests, often unable to correctly read people’s body language, and distinct social, linguistic, and cognitive abilities. People with Asperger’s Syndrome perceive the world differently than others. They also feel the sensations of light, sound, smell, and touch differently. Some aspects are advantageous, while other aspects pose challenges. Some people with Asperger’s Syndrome need help adapting to the world, but there are practical solutions for helping to overcome them [10]. It took a woman named Jeannie 38 years to discover the reason why she had some problems, and the reason was Asperger’s Syndrome. Jeannie was able to function in the real world, but she still suffered from several challenges and issues that are associated with Asperger’s Syndrome. She explained how college was difficult for her because she would often get lost in minor details, and would go back and read the entire passage all over again. Jeannie eventually dropped out of college and entered into the workforce [11]. In general, people with Asperger’s Syndrome can function very well in society and their disorder can almost be unnoticed. There may be more challenges and difficulties, but there are always ways to overcome those issues and be successful despite the obstacles.

Laws

There are many students in this world who have autism, and it is of utmost importance to recognize the laws that protect these students so that they can have a least restrictive environment with their education. All people with autism deserve to learn in a free and constructive environment that best suits their unique and individual needs. The laws that protect these students with autism will be discussed, and will also be evaluated to see if they are correctly being enforced and whether or not they are positively benefiting these students as they should be. Education is a very valuable aspect in society, and these laws are designed to provide these students with the good education that they deserve so that they can be successful in life.

Every child with autism or any other special need has a right to a free and appropriate education. The Individuals with Disabilities Education Act (IDEA) commands that all states give all eligible (students with a disability) children a free and appropriate public education (FAPE) that is designed to fit their different and unique needs. The Individuals with Disabilities Education Act was originally ratified in the year 1975. When the IDEA was amended in 2004, it was actually renamed The Individuals with Disabilities Education Improvement Act (IDEIA). Despite the name change, people still refer to it as the IDEA. The IDEA authorizes special education and early intervention services to children who have assorted disabilities, including that of autism. The rights given to children by the IDEA also generally apply to any form of autism on the spectrum. The legislation of the IDEA created a role for parents in their child’s education. The parent(s) are authorized to be as equal as the school district when making decisions on the the plan of education for the child(ren). This allows parents to have an important part in the decision-making and life in general of their children. Parents have the duty of monitoring their child’s individual education program and making sure that their legal rights are being enforced within their education [12].

A second law is the Family Educational Rights and Privacy Act (FERPA), which protects the privacy of the student’s educational records and has regulations regarding the release of that information. This law applies to all schools that receive funding

through any program managed by the United States Department of Education (USED). FERPA gives parents the right to inspect their child's educational record and report any errors. If the student or parent would like to view their educational record, than the school must carry out their request before 45 days pass. In addition, the school may not delay the educational record viewing request before any IEP meeting. If a family suspects that their rights with FERPA have been violated, than a complaint may be filed with the U.S. Department of Education. Section 504 of the Rehabilitation Act protects the civil rights of people with disabilities and prohibits agencies that receive federal funds to discriminate against these people [13,14].

The IDEA gives all children with disabilities a "free and appropriate public education" (FAPE). The word "appropriate" means that the education program should be designed specifically for the unique needs of the child and be placed where he/she can make good educational progress. School districts are not required to provide the most optimal education programs, but rather the most appropriate education programs for the students, despite what teachers, parents, or therapists may otherwise think. Parents should work with the school district to determine what is appropriate for their child and make sure that their child is provided with the services that he/she is entitled to [12].

The IDEA also entitles students to a "least restrictive environment", which means that the child should have a fair opportunity to learn and interact with general education students and the student should also have an opportunity to learn the general education curriculum. This is called "mainstreaming" because mainstreaming means moving a child from self-contained classrooms to a regular general education classroom. In this case, regular classrooms are the mainstream. Providing the least restrictive environment for students within a general education classroom can be achieved by using an aid that is specially trained to help and work with students with autism spectrum disorder. The least restrictive environment option is important for students, but it should only be used when it is beneficial to the student's educational needs. There are other options of education available that may benefit the student more. These options include inclusion rooms, the Quest room (Life Skills), special education programs, a school for children with special needs, or home schooling programs. The student should only be placed in a least restrictive environment such as the Life Skills (Quest) room if the child would perform better academically in that classroom, or if a certain concept or skill (like clockwork) is not taught in a least restrictive class. However, students should not be isolated in a restricted classroom, and they should always have the chance to participate in the general education environment along with their peers [15]. Clearly, there are several plans of education programs available for children with autism, and it is important to evaluate the performance of the child in each program to determine which plan best benefits the child while still providing the least restrictive environment.

Services and programs are provided for disabled children and their families to lessen the effects that their disability has on their academic future. States are provided with government grants from the IDEA to establish early intervention programs. Children age three or younger who have developmental delays or other conditions that may create a developmental delay are eligible to receive the benefit of complementary early intervention services (EI). The Early Intervention Services may not be the same in every

state or region, but in general they should work with every child's individual needs. The Individual Family Service Plan (IFSP) is a written document that describes a child's needs including the specific services that will be given to the child and the family, and should be created by carefully evaluating the child. This document should explain the current level of functioning of the child, along with the specific goals set for the child to later achieve. The early intervention services decrease the negative effects that disabilities have on the development and academic progression in children. Examples of the services provided for the child through early intervention services include: occupational and physical therapy, psychological evaluation, language and speech instruction, Home Instruction, and Applied Behavior Analysis (ABA). For example, in home instruction a teacher may travel to the home of the child, where he/she helps both the child and their family. The child and family will get individualized guidance to conquer common problems, such as creating a chart that helps the student remember the steps to taking a shower. The teacher fills the gap between the medical field and the educational field. Evidently, the counseling services are designed so that the family learns how to encourage and support their child's skills, and to empower the student to be successful in everything that they do. The early intervention services are created to help benefit both the child and the family during the child's first few years of life which are very critical to the child's success in life and in education. Although the early intervention services stop at the age of 3, the special education services begin. The school district's special education department will provide the special education services to eligible children. Unlike how the early intervention services focus on the general development of the child, the special education services give the child an education no matter what sort of disability or special needs they may have. The Individualized Education Program (IEP) addresses the needs of the child and how their needs will be fulfilled. The Individualized Education Program sets goals for the child and how to meet the goals, and it includes a description of the child's strengths and what he/she needs to improve on. The IEP also focuses on ways that the needs of the child will be fulfilled within the school district [12].

If children's performance of skills seems to degenerate after school breaks or vacations, they may be eligible for Extended School Year Services (ESY). The ESY services will occur during the long breaks from school such as the summer. However, the services are made to prevent the degeneration of skills and not to teach the child new skills. The family has an important role in this process as they can set goals for their child, work with specialists to evaluate the child's development, and also support and encourage their child at home as well. As the child grows academically, he or she will need an adjusted education plan. That is why the IEP (Individualized Education Program) is reviewed at least once a year. This document will continue to adapt to the child's academic progress [12].

Classroom placement

In There are four common education settings that a child will be placed into: General Education/Mainstream, Inclusion, Resource, and Quest/Life Skills. General education is the least restrictive of all the settings, as it is a general education learning environment. Inclusion is also considered least restrictive, as it is a setting where a student may have some general education classes, but may also be in some inclusion classes. The Resource Class is taught by a special education teacher. It is academically a step above the Life Skills room, but it is only used for learning disabilities, and not for

learning life skills. The most restrictive setting is Quest/Life Skills, because it is where students are away from their general education peers. In the Life Skills room, students are taught common skills that a general student should already know, such as clock reading, washing clothes, and tying shoes. To determine the appropriate placement for a child, there must be two steps taken. First, evaluate and reevaluate to find the child's level of functioning and needs. This should be done by a school or independent professional and should include the child's recommended services and treatments. Teachers and school professionals work with the parents to create a detailed Individualized Education Program (IEP) and placement options using the Least Restrictive Environment (LRE) in mind. The placement options should start with the general or inclusive education environment and the child will also have the opportunity to get support services. Students with disabilities do not have to start in a more restrictive environment and earn the ability to move to a less restrictive setting. Instead, they start in the least restrictive environment and go to a more restrictive environment only if absolutely necessary and if it will benefit the child's progress and success. Whichever environment the child is placed in shall give the child an appropriate education [15].

Schools should provide training to parents that focus on the IEP-related interpersonal skills, communication, and structured environments in all different kinds of settings so they can teach their child skills and techniques outside of school. Teachers can consider different communication strategies to enhance effective communication in different environments. There are several social skills strategies teachers can use such as using trained peer facilitators or video modeling. Also, schools themselves are responsible for training teachers and professionals to effectively effectuate programs for students with autism [16]. Some of the special education services that students are entitled to as follows: Audiology, speech pathology, counseling, occupational and physical therapy, psychological services, recreation, school health services, and counseling and training for the child's parents. These services are designed to benefit the child's education and further the progression of his or her education [14].

Refer to appendix C to view the number of students, per grade, identified with autism in the Friendswood Independent School District. The grades begin with EE (Early Childhood Education), which is applicable to the Child Find Law and is a part of the federal law called IDEA. The Child Find Law explains that schools are required to find children with disabilities by the age of 3, so they can get services for their disabilities in order to succeed in school. In the report, there are 86 total students in FISD that are identified with autism. The "10" in front of the word "Autism" on the right column is the special education code for autism. The PEIMS clerk compiled this data from all of the special education records from FISD. These statistics are genuine and accurately describe the prevalence of autism [17].

Not every teacher or school is supportive of programs that benefit students with autism, but they are required to comply with the law. A study discovered that the general student body seemed to be more inclusive of the programs for students with ASD than the faculty were. After all, it is important to allow a student with autism spectrum disorder to experience a general education classroom first to see how well that environment fits the student. The Least Restrictive Environment Law explains that students with autism spectrum disorder and other disabilities should have

the opportunity to learn in the least restrictive environment as possible. However, the study revealed that the faculty was not supportive of these programs. The students believed the faculty was inconsiderate, and that they should be more aware and inclusive of these students and their needs. Educational programs are important for students with autism, as they are developed to help the students succeed in postsecondary education, considering most postsecondary education facilities and courses are tailored mainly to general education students. In addition, postsecondary education for students with autism spectrum disorder is relatively new. About 2 out of every 10 students with autism graduate from postsecondary schooling. Clearly, educational programs are essential for increasing the graduation rate of students with autism. Educational programs will help students with ASD to succeed academically despite the challenges and individual needs of their disability [18]. There are laws designed specifically to protect students with autism from this situation, especially since they are entitled to disability services. Although some teachers may be less inclusive for disabled students, they are required to comply with the Least Restrictive Law. No matter what educational level a student is labeled as, every child should learn in the least restrictive environment as possible so that they can achieve their full potential [19].

For a student with autism, the transition from high school to college may be difficult. Students with autism spectrum disorder have huge potential, however only one-third of them meet the academic standards to attend college. Higher education often fails to see the potential of these students because of academic barriers made for general education students. Several colleges and universities have transition support educational programs, but most only cater to students without disabilities. The transition from high school to college for students with autism spectrum disorder can be difficult as it poses more challenges and barriers to overcome than it is for general education students. However, there are courses designed especially for students with autism at some colleges and universities. These courses help students with autism make the transition to higher education more easily, and can benefit them by providing learning experiences, tutoring, and academic support. For students on the autism spectrum, transition courses can not only guide them to academic success, but positively shape their education and future [20]. The American educational system needs to be reexamined and society needs to cooperate with these different forms of human intelligence [3].

At Friendswood High School, both of the Quest Rooms were observed and analyzed for a research project. In the first Quest Room, the students were learning how to write the times of clocks and how to draw the hands of the clock. The children interacted with each other very well. They knew each other's names and clapped their hands to reward their peers for getting a correct answer. In the Bistro Quest Room, some students had autism while others had intellectual disabilities or both. Skills were taught one-on-one by professionals. There, the students were taught several different life skills such as dishwashing, laundry, and working with technology. They help the students become more independent by teaching them how to cook, fold socks, and water plants. The Quest room professionals teach the students social and academic skills as well. In students with autism, sensory overload is common. Therefore, there is also a sensory room, where students can relax. Some students are hypersensitive and sensitive to sound. Repetitive rocking, spinning, or flapping of the hands is a sign

of self-stimulatory behavior. A student would do this in order to regulate what's going in his or her environment if there is a lot of activity in the room. All of the students in both of the Quest rooms were in the least restrictive environment as possible, because they cannot get help learning how to tell time or how to do laundry in a general education classroom. Some students in the Quest rooms may be in general education classes, but also be in some inclusion classes as well. When this happens, the student is tested on different objectives than the general student body. The student will pass/fail only by a certain set of IEP goals/objectives completed. The IEP describes the learning goals and what needs to be accomplished by the end of the year. The goals for each student are based on Ncounseling and assessment. First, the IEP must be created. The, the child's placement must be determined. The LSSP works with other professionals to write the IEP. However, the placement is determined by the Texas ART (Admission Review Dismissal) committee. The ARD is comprised of 1 special education teacher, 1 general education teacher, 1 administrator, and 1 parent. The ARD committee collectively determines the placement and makes all decisions regarding modifications or accommodations for the student. There is also a Resource Class, which is taught by a special education teacher. It is academically a step above the Quest room, and it is used for learning disabilities, not life skills. In all of the classes, the goals progressively become more and more difficult throughout the year, so the students are always growing intellectually. Placement is evaluated every year, but it may be evaluated more than once a year. The focus on placement is the least restrictive environment, so the students can academically progress and have a successful education that fits their individual needs.

There has been no definitive cause for autism yet discovered, but scientific studies have found evidence of several causes that may cause autism. The prevalence of autism is increasing, and there are certain laws that protect the rights of the students regarding their least restrictive environment and education. The transition from high school to postsecondary education has been made simpler with special programs and courses designed especially for students with autism. Clearly, there has been great progress in supporting students with autism with their education. Students with autism should not be isolated in Quest rooms unless absolutely necessary because they have big potential and deserve to learn in the least restrictive environment where they can succeed personally and academically.

DATA/ DATA ANALYSIS

To determine whether or not the state of Texas is doing a Least Restrictive Environment for students with autism spectrum disorder, the statistical analysis called the "Two Proportion Z-Test" was used. The "Two Proportion Z-Test" is a hypothesis test that is used to test the difference between two population proportions p_1 and p_2 , when a sample is selected at random from each population [21]. The Texas Education Agency data files of 1990-1991 and 2015-2016 were compared, because 1990 was when the Least Restrictive Environment Law was put into effect. Although 1990 had overall less students in the data and 2016 had more students in the data, the Two Proportion Z-Test uses proportions to analyze the data, which solves that disparity. The proportion is a simply a percentage, so that although the total numbers of students may be different, the proportion of students can be identified. A

proportion is the name given to a statement to declare that two ratios are equal. In this statistical analysis, the proportion is what will be verified to see whether or not the hypothesis turned out to be true. The hypothesis for all three calculations was that more students would be placed in the Least Restrictive Environment, and this test will determine whether that proposition was correct or not. The first calculation was performed using only the Mainstream data. Part of the statistical analysis was calculated longhand, and some was performed using a calculator. For the Mainstream Only analysis, the variables are as follows:

$$n_1 \text{ (sample size in 2016)}=54,347$$

$$n_2 \text{ (sample size in 1990)}=1,342$$

$$x_1 \text{ (number of students in 2016 Mainstream)}=10,563$$

$$x_2 \text{ (number of students in 1990 Mainstream)}=8$$

$$p^{\wedge} = \frac{x_1 + x_2}{n_1 + n_2}$$

$$= 0.190$$

$$q^{\wedge} = 1 - p^{\wedge}$$

$$= 1 - 0.190$$

$$= 0.81$$

$$p_1^{\wedge} = \frac{x_1}{n_1}$$

$$\frac{10563}{54347}$$

$$= 0.194$$

$$p_2^{\wedge} = \frac{x_2}{n_2}$$

$$= \frac{8}{1342}$$

$$= 0.006$$

$$P \text{ (Pooled Proportion)} =$$

$$\frac{x_1 + x_2}{n_1 + n_2} = \frac{10,563 + 8}{54,347 + 1,342} = 0.19$$

$$\text{Significance Level } \alpha = 0.05 \text{ (5\%)}$$

The formula for the "Two Proportion Z-Test" is as follows:

$$z = \frac{(p_1^{\wedge} - p_2^{\wedge})}{\sqrt{p(1-p)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$z = \frac{(0.194 - 0.006)}{\sqrt{0.19(1-0.19)\left(\frac{1}{54347} + \frac{1}{1342}\right)}}$$

$$z = 17.343$$

Another "Two Proportion Z-Test" formula that yields the same answer is as follows:

$$z = \frac{(p1^{\wedge} - p2^{\wedge}) - 0}{\sqrt{p^{\wedge}q^{\wedge} \times \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

$$z = \frac{(0.194 - 0.006) - 0}{\sqrt{(0.19)(0.81) \times \left(\frac{1}{54347} + \frac{1}{1342} \right)}}$$

$$z = 17.343$$

Right tailed tests have a greater than (>) symbol in the alternative hypothesis statement, Therefore this test is right tailed.

The critical value for a right tailed test when the significance level is at 5% is $Z_c = 1.64$.

The rejection region is $R: \{z: z > 1.64\}$

Since $z = 17.343 > Z_c = 1.64$, then the null hypothesis (H_0) is rejected in favor of the alternative hypothesis. The same concept can be shown with a different method called the P-Value Approach. In this method, the null hypothesis is rejected if $P \leq \alpha$. The P-value is 0. Therefore, since $0 \leq 0.05$, then the null hypothesis is rejected and the alternative hypothesis is accepted.

To find the alternative hypothesis (H_a), the values for p_{2016} and p_{1990} must be found. $P_{2016} = 10,563/54,347$ which equals 0.194. $P_{1990} = 8/1,342$ which equals 0.006. The null hypothesis is $H_0: P_1 = P_2$. The alternative hypothesis is $H_a: P_1 > P_2$. Therefore, since $0.194 (p_{2016}) > 0.006 (p_{1990})$, there are more students in Mainstream 2016 than there were in mainstream 1990.

The same principle was applied to using just Mainstream, Inclusion, and Resource, and the result was that more students were placed in those least restrictive classes in 2016 than in 1990. Also, the calculation was conducted using only the Life Skills data and the result was that there were more students in Life Skills classes in 1990 than there were in 2016. As a whole, the "Two Proportion Z-Test" has revealed that proportionally, more students have been placed in the least restrictive classes in 2016 than 1990. Furthermore, Texas is improving the educational quality and doing a Least Restrictive Environment for students with autism spectrum disorder. Since 1990, the LRE law has made a significant impact in the educational quality for these students, and it will continue to do so.

DISCUSSION

According to the "Texas 1990-1991 vs. Texas 2015-2016 Categorized" graph, there are more students placed in the 2016 least restrictive environment than there are for the 2016 most restrictive environment. General Education (Mainstream), Inclusion, and Resource are all least restrictive classes and their total is 28,701 for 2016. The total of 2016 Life Skills/Most Restrictive is 20,130, which is significantly less than that of least restrictive classes. In 1990, the only noteworthy value is that of 775 for Life Skills. The LRE law has changed the way Texas places students with autism in certain classrooms. These results reveal the power of the LRE law and the positive impact it has made in the educational experience of the students.

As the prevalence of autism is increasing, it is critical for students to have a least restrictive learning environment so they can succeed without further limiting their potential. In the state of Texas,

0.97% of students have been identified on the autism spectrum. Whereas, within the Friendswood Independent School District, 1.48% of the students have been identified as such, and 1.34% of the student body at Friendswood High School, itself [22]. Some individuals may move to FISD for their exceptional programs for students with autism, which explains why there is a higher percentage of students with autism in FISD compared to Texas [23].

CONCLUSION

As shown by the data, both FISD and Texas strive to make all students a top priority and ensure that every single one of them is placed in the least restrictive environment as possible. After all, students with autism are just like any other student when it comes to educational rights, and they deserve the same respect. High quality education is essential, and with the LRE law, students of autism will learn in an environment that is aligned with their individual needs and one that will propel them further in their goals and future careers.

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