

Adverse Childhood Experiences Scores of Psychology, Criminal Justice, Social Work, and Related Majors vs Other Majors in College

Rachel Held

Liberty University

February 15, 2023

Abstract

Adverse childhood experiences (ACEs) have been identified as a key risk factor for a range of negative life outcomes, including a strong correlation in juvenile delinquency and crime. Despite many works regarding adverse childhood experiences and the ACE test, there have next to none that study the correlation between ACEs and college major. I created a survey using Google Forms that I sent out through social media and social networking sites in order to conduct my own research based on the idea that certain college majors have higher ACE test scores than others. I believe that psychology majors, social work majors, and criminal justice and related majors have higher ACE scores than other college majors and seeing as there are very few that are specific to adverse childhood experiences and what college major someone chooses.

Keywords: adverse childhood experiences, college major, criminal justice, psychology, education, mental health disorders

Adverse Childhood Experiences

There are many different factors that help shape, change, and direct the course of someone's life. Adverse childhood experiences are a common umbrella term for negative experiences that one may face in their childhood. The adverse childhood experiences test (ACE test) is widely regarded and accepted as a baseline test for risk factors. According to the Center for Disease Control (CDC)'s National Center for Injury Prevention and Control there are ten adverse childhood experiences. The ten factors are physical, emotional, and sexual abuse, physical and emotional neglect, household substance abuse, household mental illnesses, separated, divorced or single parent homes, domestic violence toward a family member, and a family member with a history of incarceration.¹ However, some people will widen the ACE test to include close friends and add other risk factors such as death of a family member or socioeconomic class. In a study conducted by Lindsay Thompson, "there is ample evidence that ACEs cause toxic stress and lead to lifelong negative health outcomes."² It is well known that ACEs can cause not only physical health concerns in children later in life, but also mental health concerns.

Literature Review

There are many research papers about adverse childhood experiences and their related subjects and how adverse childhood experiences compare, contrast, and correlate with many different areas of one's life. Damyan Edwards writes in depth about how ACEs affect the physical appearance of the brain³ as did Gold.⁴ While they talked about the physical changes of the brain because of ACEs, Driessen⁵, Sheffield,⁶ Cassiers⁷, and Edwards⁸ explain how ACEs, especially abuse and neglect can lead to different mental health issues like personality disorders. In a study conducted by Pollack⁹ he and his colleagues examine how ACEs lead to worse decision making.

¹ "About the CDC-Kaiser Ace Study Violence prevention injury Center CDC." Centers for Disease Control and Prevention. Last modified April 6, 2021, <https://www.cdc.gov/violenceprevention/aces/about.html>.

² Lindsay A. Thompson, et al., "Specific adverse childhood experiences and their association with other adverse childhood experiences, asthma and emotional, developmental and behavioral problems in childhood," *Pediatric Research* 88, no. 1 (2020): 100-109, <https://doi.org/10.1038/s41390-020-0784-y>

³ Damyan Edwards "Childhood sexual abuse and brain development: A discussion of associated structural changes and negative psychological outcomes." *Child Abuse Rev.*, 27, no. 3 (2018): 198–208, <https://doi-org.ezproxy.liberty.edu/10.1002/car.2514>.

⁴ Andrea L. Gold, et al., "Childhood abuse and reduced cortical thickness in brain regions involved in emotional processing." *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 57, no. 10 (2016): 1154-1164. <https://doi.org/10.1111/jcpp.12630>.

⁵ Martin Driessen, et al., "Magnetic resonance imaging volumes of the hippocampus and the amygdala in women with borderline personality disorder and early traumatization." *Archives of General Psychiatry*, 57, no. 12 (2000): 1115-1122, <https://doi.org/10.1001/archpsyc.57.12.1115>.

⁶ Julia M. Sheffield, et al., "Reduced grey matter volume in psychotic disorder patients with a history of childhood sexual abuse." *Schizophrenia Research*, 143, no. 1 (2013): 185–191. <https://doi.org/10.1016/j.schres.2012.10.032>.

⁷ Laura L. M. Cassiers, et al., "Structural and functional brain abnormalities associated with exposure to different childhood trauma subtypes: A systematic review of neuroimaging findings." *Frontiers in Psychiatry*, 9, no. 329, (2018): 1-17, <https://doi.org/10.3389/fpsy.2018.00329>.

⁸ Damyan Edwards "Childhood sexual abuse and brain development: A discussion of associated structural changes and negative psychological outcomes." *Child Abuse Rev.*, 27, no. 3 (2018): 198–208, <https://doi-org.ezproxy.liberty.edu/10.1002/car.2514>.

⁹ Seth D. Pollack et al., "Early childhood stress exposure, reward pathways, and adult decision making." *Proceedings of the National Academy of Sciences*, 114, no. 51 (2017): 13549-13554, <https://doi.org/10.1073/pnas.1708791114>

Aytur¹⁰, Nelson,¹¹ and Van Duin,¹² all study the impact of ACEs and mental health concerns while Henriques (2018)¹³ compares and contrasts college major and mental health. Many websites such as The World Bank¹⁴, the Center for Disease Control (CDC)¹⁵, World Health Organization (WHO)¹⁶ all say that around eleven million people live in prison at any given time while it is estimated that thirty million are move in and out of prisons annually. The Educate, Inspire, Change website states that over 525 million adults in the world have received a college degree.¹⁷ Two of the essays used in this study were written by college students for their honors theses. (Gonzalez¹⁸ and Conrad).¹⁹ Ways to strengthen resiliency and why it is so important were found through multiple websites written by Jamieson²⁰ and Bauer²¹ Gonzalez²² published his honors thesis on

¹⁰ Semra A. Aytur, et al., “Social-ecological theory, substance misuse, adverse childhood experiences, and adolescent suicidal ideation: Applications for community–academic partnerships.” *Journal of Community Psychology*, 50, no. 1, (2022): 265–284, <https://doi.org/10.1002/jcop.22560>

¹¹ Charles A. Nelson, et al., “Adversity in childhood is linked to mental and physical health throughout life,” *National Library of Medicine*, 28, no. 371, (2020), <https://doi.org/10.1136/bmj.m3048>

¹² Laura Van Duin, et al., “Criminal history and adverse childhood experiences in relation to recidivism and social functioning in multi-problem young adults.” *Criminal Justice and Behavior*, 48, no. 5, (2021): 637-654, <https://doi.org/10.1177/0093854820975455>

¹³ Gregg Henriques, “Major differences in college student mental health,” *Psychology Today*, November 29, 2018, <https://www.psychologytoday.com/us/blog/theory-knowledge/201811/major-differences-in-college-student-mental-health>

¹⁴ “World Bank Education Overview: Higher Education (English).” World Bank Education Overview Washington, D.C.: World Bank Group, October 1, 2018, <http://documents.worldbank.org/curated/en/610121541079963484/World-Bank-Education-Overview-Higher-Education>.

¹⁵ “About the CDC-Kaiser Ace Study Violence prevention injury Center CDC.” Centers for Disease Control and Prevention. Last modified April 6, 2021, <https://www.cdc.gov/violenceprevention/aces/about.html>.

¹⁶ “The WHO Prison Health Framework: A framework for assessment of prison health system performance,” World Health Organization Regional Office for Europe, 2021, <https://apps.who.int/iris/bitstream/handle/10665/344561/9789289055482-eng.pdf?sequence=3&isAllowed=y>

¹⁷ “How Many People of the World Have a College Degree?” Educate, Inspire, Change, April 25, 2019, <https://ducateinspirechange.org/how-many-people-of-the-world-have-a-college-degree/>

¹⁸ A. Gonzalez “Education: the secret to crime reduction?” (Honors thesis, New York University, 2015), 1-43 <https://as.nyu.edu/content/dam/nyu-as/politics/documents/Gonzalez.pdf>.

¹⁹ G. Conrad, “Adverse childhood experience scores of social work students vs. non-social work students at Western Michigan University.” (Honors thesis, Western Michigan University, March 25, 2020), 1-16, Scholar Works at WMU. https://scholarworks.wmich.edu/cgi/viewcontent.cgi?article=4246&context=honors_theses

²⁰ Kerry Jamieson, “Resilience: A powerful weapon in the fight against aces.” Center for Child Counseling, August 2, 2018, <https://www.centerforchildcounseling.org/resilience-a-powerful-weapon-in-the-fight-against-aces/>.

²¹ Nerissa Bauer, “Childhood adversity: Buffering stress & building resilience.” *Healthy Children*, July 26, 2021, <https://www.healthychildren.org/English/healthy-living/emotional-wellness/Building-Resilience/Pages/ACEs-Adverse-Childhood-Experiences.aspx>

²² A. Gonzalez “Education: the secret to crime reduction?” (Honors thesis, New York University, 2015), 1-43 <https://as.nyu.edu/content/dam/nyu-as/politics/documents/Gonzalez.pdf>.

how education can reduce crime. The World Bank²³, Costa²⁴, and Deming (2012)²⁵ also write about how staying in school and pursuing higher education can lead to lower incarceration rates.

Adverse Childhood Experiences and The Mind

Adverse Childhood Experiences and Their Impact on the Brain

Adverse childhood experiences have a significant impact on one's brain function and behavioral patterns. In a 2018 study by Damyan Edwards²⁶, he talks about how ACEs affect the limbic brain regions, such as the hippocampus and amygdala, which can lead to long-term negative impacts. Abuse and neglect, such as childhood sexual abuse (CSA), physical, emotional abuse, physical neglect, and emotional neglect usually has the biggest impact on the brain out of all the ACEs. CSA has been known to reduce cortical thickness in the brain regions that are involved in emotional processing²⁷ as well as loss of gray matter volume in the corpus callosum, the prefrontal cortex, the visual cortex, and hippocampus²⁸. Sexual abuse has been shown to result in a decrease of hippocampal volume which can then lead to psychotic disorders and borderline personality disorders (BPD)^{29,30}. The amygdala, which controls emotional processing, behavioral regulation, fear conditioning, and memory, is usually affected the most which leads to a myriad of psychiatric disorders, post-traumatic stress disorder (PTSD) and other emotional related disorders^{31,32}. Physical abuse has a much higher effect on the frontal lobe than the amygdala, and brain trauma

²³ "World Bank Education Overview: Higher Education (English)." World Bank Education Overview Washington, D.C.: World Bank Group, October 1, 2018, <http://documents.worldbank.org/curated/en/610121541079963484/World-Bank-Education-Overview-Higher-Education>.

²⁴ Rui Costa, et al., "Why education reduces crime." Centre for Economic Policy Research, October 14, 2018, <https://cepr.org/voxeu/columns/why-education-reduces-crime>

²⁵ David J. Deming, "Does school choice reduce crime?" *Education Next*, 12, no. 2, (February 9, 2012), <https://www.educationnext.org/does-school-choice-reduce-crime/>

²⁶ Damyan Edwards "Childhood sexual abuse and brain development: A discussion of associated structural changes and negative psychological outcomes." *Child Abuse Rev.*, 27, no. 3 (2018): 198–208, <https://doi-org.ezproxyiberty.edu/10.1002/car.2514>.

²⁷ Andrea L. Gold, et al., "Childhood abuse and reduced cortical thickness in brain regions involved in emotional processing." *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 57, no. 10 (2016): 1154–1164. <https://doi.org/10.1111/jcpp.12630>.

²⁸ Damyan Edwards "Childhood sexual abuse and brain development: A discussion of associated structural changes and negative psychological outcomes." *Child Abuse Rev.*, 27, no. 3 (2018): 198–208, <https://doi-org.ezproxyiberty.edu/10.1002/car.2514>.

²⁹ Martin Driessen, et al., "Magnetic resonance imaging volumes of the hippocampus and the amygdala in women with borderline personality disorder and early traumatization." *Archives of General Psychiatry*, 57, no. 12 (2000): 1115–1122, <https://doi.org/10.1001/archpsyc.57.12.1115>.

³⁰ Julia M. Sheffield, et al., "Reduced grey matter volume in psychotic disorder patients with a history of childhood sexual abuse." *Schizophrenia Research*, 143, no. 1 (2013): 185–191. <https://doi.org/10.1016/j.schres.2012.10.032>.

³¹ Damyan Edwards "Childhood sexual abuse and brain development: A discussion of associated structural changes and negative psychological outcomes." *Child Abuse Rev.*, 27, no. 3 (2018): 198–208, <https://doi-org.ezproxyiberty.edu/10.1002/car.2514>.

³² Laura L. M. Cassiers, et al., "Structural and functional brain abnormalities associated with exposure to different childhood trauma subtypes: A systematic review of neuroimaging findings." *Frontiers in Psychiatry*, 9, no. 329, (2018): 1–17, <https://doi.org/10.3389/fpsy.2018.00329>.

is common. A study by Thompson in 2020³³ found that abused children were found to have reduced volume in the frontal lobe which can lead to post-traumatic stress syndrome (PTSS). Meanwhile, emotional abuse affects the cortical structures in the brain as well as the amygdala, limbic regions, and the hippocampus, damaging one's learning and memory, emotional processing and temporal, cortical, prefrontal, and lateral regions. All of these have a correlation to conduct disorder, antisocial behavior, and attention-deficit/hyperactivity disorder (ADD/ADHD)³⁴. According to Haslam and Taylor³⁵ in a study recently published in 2022, it was found that emotional neglect tended to lead to negatively affect children's vocabulary and communication skills as well as their attachment, understanding of their internal world, image of relationships, emotional regulation, empathy, and interpersonal functions.

Adverse Childhood Experiences and Their Impact on Decision Making

Seth Pollak, a professor at the University of Wisconsin-Madison found that those who had experienced extreme stress as children were hampered in their ability to make good decisions as adults. ACEs create young adults who are fundamentally unable to correctly consider risks and make healthy decisions. This does not mean that they will always make bad decisions, rather, they have a decreased ability to identify what is riskier and what is healthier. During his research, Pollak found that children who had more ACEs showed less-than-usual brain activity during the period of decision making and more than usual activity after the decision was made. Despite the results, Pollak was adamant that these tests were not related to IQ or intelligence level. Those who made poorer life choices such as avoiding the doctor when ill, were ignoring signs that most people would take as a warning, or rather, they were not fully processing information. While many of the participants were facing issues like criminal records, quite a few were successful and some were found to be studying at good colleges, with one studying at an Ivy League university³⁶.

Adverse Childhood Experiences and Mental Health Concerns

Not only do adverse childhood experiences affect the physical development of the brain, but they also have a strong correlation to mental health issues such as depression, PTSD, and suicidal ideation and attempts. In an article done by Kristin Turney in 2020 showed that children aged 0-17 who experienced three or more ACEs had a much higher probability of having a learning disability, ADD, ADHD, depression, anxiety problems, behavioral or conduct problems, developmental delays, as well as speech and language problems³⁷. Previous research has also linked ACEs to lifelong challenges including an increased risk of violence, victimization, self-

³³ Lindsay A. Thompson, et al., "Specific adverse childhood experiences and their association with other adverse childhood experiences, asthma and emotional, developmental and behavioral problems in childhood," *Pediatric Research* 88, no.1 (2020): 100-109, <https://doi.org/10.1038/s41390-020-0784-y>

³⁴ Laura L. M. Cassiers, et al., "Structural and functional brain abnormalities associated with exposure to different childhood trauma subtypes: A systematic review of neuroimaging findings." *Frontiers in Psychiatry*, 9, no. 329, (2018): 1-17, <https://doi.org/10.3389/fpsy.2018.00329>.

³⁵ Zoe Haslam and Emily P. Taylor, "The relationship between child neglect and adolescent interpersonal functioning: A systematic review," *Child Abuse and Neglect*, 125, (2022): 1-13, <https://doi.org/10.1016/j.chiabu.2022.105510>.

³⁶ Seth D. Pollack et al., "Early childhood stress exposure, reward pathways, and adult decision making." *Proceedings of the National Academy of Sciences*, 114, no. 51 (2017): 13549-13554, <https://doi.org/10.1073/pnas.1708791114>

³⁷ Kristin Turney, "Cumulative adverse childhood experiences and children's health," *Children and Youth Services Review*, 119, (2020): 1-14, <https://doi.org/10.1016/j.chilyouth.2020.105538>

harm, eating disorders, and substance abuse^{38,39}. The World Health Organization (WHO) conducted a World Mental Health Survey and concluded that ACEs account for 29.8% of all psychiatric disorders⁴⁰. In the same article, emotional abuse was considered the strongest predictor of a lifetime of depressive disorders and suicide attempts⁴¹.

Mental Health Concerns in College Students

The mental health crisis has been at an all-time high in recent years, especially in high school and college aged people. Between 60% and 75% of students have been diagnosed with at least one mental health issue according to an article encompassing 373 college campuses. With higher rates of mental health concerns on college campuses, more professionals, counselors, and therapists are needed⁴². In a different study done at the Center for Collegiate Mental Health at Penn State University,⁴³ campus counseling saw over a 30% - 40% increase. Gregg Henriques, a professor at James-Madison University talked about a study done comparing certain majors and their mental health. Overall, around 34% of students had mental health concerns with art and design majors leading the study with 45% of students had mental health issues. Undecided majors came next with around 41.7%, as well as the humanities at 39.5%. 38% of pre-med students were found to have mental health issues along with multidisciplinary while social work majors were the next highest at 37%. After them came natural sciences and pre-law majors with 36%, social science majors at 34%, and then engineering majors. Business, nursing, and public health majors had the lowest percentage of mental health issues in their respective fields ranging from 28% - 29%⁴⁴.

Adverse Childhood Experiences and Criminality versus Education

It is common for people to immediately think about poor life decisions and criminality when talking about adverse childhood experiences. However, many people who have had adverse childhood experiences will not end up committing crimes or going to prison. Only about 11.5 million people out of the 7.8 billion people⁴⁵. On a worldwide level, there are around eleven million people in prison out of the seven and half billion alive. Around 64% of the adult population will experience at least one adverse childhood experience before they turn eighteen yet over 97% of people who have been incarcerated or are currently in prison have experienced at least one adverse

³⁸ Semra A. Aytur, et al., "Social-ecological theory, substance misuse, adverse childhood experiences, and adolescent suicidal ideation: Applications for community-academic partnerships." *Journal of Community Psychology*, 50, no. 1, (2022): 265-284, <https://doi.org/10.1002/jcop.22560>

³⁹ Charles A. Nelson, et al., "Adversity in childhood is linked to mental and physical health throughout life," *National Library of Medicine*, 28, no. 371, (2020), <https://doi.org/10.1136/bmj.m3048>

⁴⁰ Laura Van Duin, et al., "The role of adverse childhood experiences and mental health care use in psychological dysfunction of male multi-problem young adults," *European Child and Adolescent Psychiatry*, 28, no. 8, (2019): 1065-1078, <https://doi.org/10.007/s00787-018-1263-4>

⁴¹ Ibid.

⁴² Zara Abrams, "Student mental health is in crisis. Campuses are rethinking their approach." *American Psychological Association*, 53, no. 7, (2022): 60, <https://www.apa.org/monitor/2022/10/mental-health-campus-care>

⁴³ "Annual collegiate mental health report examines trends and policy implications," Center for Collegiate Mental Health at Penn State University, January 16, 2019, <https://www.psu.edu/news/academics/story/annual-collegiate-mental-health-report-examines-trends-and-policy-implications/>

⁴⁴ Gregg Henriques, "Major differences in college student mental health," *Psychology Today*, November 29, 2018, <https://www.psychologytoday.com/us/blog/theory-knowledge/201811/major-differences-in-college-student-mental-health>

⁴⁵ Helen Fair and Roy Walmsley, "World Prison Population List: 13th Edition," *World Prison Brief*, 2021, <https://www.prisonstudies.org>

childhood experience. Nearly half of the prison population had experienced four or more adverse childhood experiences versus the 16% of the non-incarcerated population according to the CDC⁴⁶.

What is not talked about enough is that only around .001% of the world will end up in prison. About 40% of people will go to college for a higher education and over 220 million people worldwide have gone to pursue a tertiary education⁴⁷. A professor at Texas State University conducted a research study that examined the effects of childhood adversity in college aged students. Out of the 400 students she surveyed, 22.8% had experienced four or more ACEs⁴⁸. In a research study done by David Deming about school choice he states that “criminal offenders often have low levels of education, only 35% of inmates in U.S. correctional facilities have earned a high school diploma, compared to 82% of the general population.”⁴⁹

It is shown that most people will not go to prison in their lives despite most people experiencing some form of adverse childhood experience. Yet almost all students in college experienced at least one ACE, (96.4% from self-reports, 89.5% from parent reports, and 95.4% from school files) while more than half experienced four adverse childhood experiences or more (74.5% self-reports, 62.7% parent reports, 59.9% school files)⁵⁰.

Methodology

Survey

I created a survey on Google Forms with thirteen different questions asking about adverse childhood experiences, gender, and college major(s) as well as minor(s). The survey was completely anonymous and did not collect emails or personal information. I used the original Adverse Childhood Experience Score test found at Kaiser Permanente as my baseline test, but I expanded the ACE test with different wording. The biggest thing I changed was the wording of the original ACE test from specifically just family members to close friends as well because I believe that peers also have a large impact on people (sometimes more than family), especially those who are younger than eighteen. There are many risk factors that people add to adverse childhood experience tests such as racial discrimination, socioeconomic class, neighborhood violence, environment, and sexual orientation. However, I only used the original ten ACE questions, but later I added on death of a close friend or family member after about two hundred responses. I explained each experience in the beginning of the survey for those who may have been unsure what the adverse childhood experience meant or was asking. Each participant would answer yes or no to each ACE or unsure and then explain why they chose that answer. I would then look

⁴⁶ “About the CDC-Kaiser Ace Study Violence prevention injury Center CDC.” Centers for Disease Control and Prevention. Last modified April 6, 2021, <https://www.cdc.gov/violenceprevention/aces/about.html>

⁴⁷ “World Bank Education Overview: Higher Education (English).” World Bank Education Overview Washington, D.C.: World Bank Group, October 1, 2018, <http://documents.worldbank.org/curated/en/610121541079963484/World-Bank-Education-Overview-Higher-Education>.

⁴⁸ Toni Watt, “Effects of childhood adversity linger during college years,” *The Conversation*, July 21, 2021, <https://theconversation.com/effects-of-childhood-adversity-linger-during-college-years-163157#:~:text=We%20found%20that%20a%20little,the%20risk%20of%20poor%20outcome>.

⁴⁹ David J. Deming, “Does school choice reduce crime?” *Education Next*, 12, no. 2, (February 9, 2012), <https://www.educationnext.org/does-school-choice-reduce-crime/>

⁵⁰ Evelyn C. P. Offerman, et al., “Prevalence of Adverse Childhood Experiences in Students with Emotional and Behavioral Disorders in Special Education Schools from a Multi-Informant Perspective.” *International journal of environmental research and public health*, 19, no. 6, (2022): 3411, <https://doi.org/10.3390/ijerph19063411>.

over their answers and if they said unsure, I would decide yes or no to the best of my ability and if I could not come to a conclusion, it stayed as unsure. From there I moved the answers from Google Forms to Google Sheets and conducted the calculations of my research there.

I posted the link to the Google Form on my social media platforms (Instagram and Snapchat), a subreddit for the social networking site (SNS) Reddit called r/SampleSize as well as flyers that I put up around my school. With help from my sister and a couple friends in different colleges, I was able to expand the survey to more than just Liberty University. The survey proved to be more successful than I first thought it would be.

I defined each adverse childhood by the CDC-Kaiser standard along with the differences I added for people who needed clarification or were unsure if they experienced certain negative childhood scenarios below:

Physical Abuse

I classified physical abuse as non-accidental harm, including injuries like bruises, lesions, or fractures. People cause these injuries by hitting, punching, kicking, shaking, beating, burning, throwing, or stabbing.

Emotional Abuse

Emotional abuse was defined as behavior that interferes with a child's mental health. This type of abuse includes verbal abuse, mental abuse, and psychological maltreatment. (Including but not limited to belittling, rejecting, blaming, threatening, isolating, restricting from social contact, denying an emotional response, ignoring for an extended period).

Sexual Abuse

Sexual abuse was classified as sexual behavior (assault, molestation, etc.,) with a child or the sexual exploitation of a child. This abuse also includes indecent exposure (both the parent and watching porn in front of a child) and using a child in prostitution or pornography.

Physical Neglect

Physical neglect is failing to provide for the child's basic needs. This neglect includes not providing food, clothing, shelter, or medical attention. It also includes a lack of supervision. The most difficult part of this ACE was that some parents did not mean to neglect a child (as well as with emotional neglect) but due to other circumstances could not always provide for their child. Despite it being unintentional, I still counted it.

Emotional Neglect

Emotional neglect is the failure to meet a child's emotional needs. Emotional neglect includes failing to provide social support or needed mental health treatment. This includes when a child's needs are ignored. (An example would be if a baby cried, and no one tended to the child.) Like physical neglect, some parents were unable to care for the emotional needs of their children however unintentional.

Mental Health Issues in Family or Friends

Mental health issues in family and friends were at first not defined, but later I classified it by mental health issues that were either left undiagnosed, untreated, or had a specific impact on the respondent. (For example, your friend or parent would threaten to kill themselves despite being on medication).

Past Incarceration of Family or Friends

Past or present incarceration of a family member or friend is self-explanatory. However, I did add that juvenile detention and single night stays could count depending on the situation. (For example, my mom was put in jail for going to a party that had alcohol even though she did not partake in drinking. I would not consider this past incarceration.)

Domestic Violence

Domestic violence is usually stereotyped as male-on-female with physical contact and yelling. I classified it as emotional or verbal abuse, physical abuse, sexual abuse, and neglect between parents or guardians, or other family members such as a grandparent and grandchild, mother on child, father on mother, or uncle or aunt on child.

Substance Abuse

Substance abuse was defined as continuous use of alcohol, marijuana, cigarettes, or any hard drugs by a close family member, parent, guardian, sibling, or yourself.

Household Disruption

Household disruption was at first just divorce or separation of parents. It was probably the hardest of all the adverse childhood experiences to decide whether the situation should have been considered household disruption. Household disruption was classified as divorce of parents, separation (including a guardian or parent leaving for a day more without explanation), foster care, orphanages, group homes, or a single parent household. Depending on surrounding circumstances, I would not include work leave or military service as household disruption.

Death of a Family Member or Friend

This was also a self-explanatory ACE, encompassing a close family member, parents, sibling, or close friend who died before the respondent turned eighteen.

Participants

The survey I put out surprised me in many ways. I thought I would receive only a hundred or so responses, but I received 719 responses. 55.3% of the respondents were female, 36.6% were male, and 3.9% preferred not to say, and 4.2% identified as transgender or another gender. The participants were mainly people I knew from college or high school. However, because the survey was anonymous, I do not know exactly where each participant responded from (flyer vs social media). There were no other demographic factors that I had put in the survey (such as socioeconomic status, environment they grew up in, race/ethnicity, or sexuality.) The only other question that was not related specifically to the ACE test was the question “what college major(s) are you currently studying, previously studied, or plan to study?”

Procedure

I had the survey open from August 25, 2022, until October 1, 2022, and during that time over seven hundred responses were recorded. Throughout the month of September, I would analyze data collected and begin consolidating majors. At first, I had consolidated the majors into criminal justice, psychology, criminal psychology, social work, health/medical, sociology, government, science, hard sciences, arts, cinema arts, communications, engineering, economics, education, international relations, computer science, music, business, global studies, criminology, biopsychology, philosophy, marketing, religion, language, and other. However, they were not consolidated enough so my teacher advised me to consolidate them even more and gave me some examples.

I was able to consolidate the majors into eight different overarching umbrella terms. I decided on arts which included cinema, film, painting, drawing, music, graphic design, interior design, architecture design and fashion design. I consolidated hard sciences and sciences, encompassing anything that had to do with biology, physics, chemistry, forensics, physical or occupational therapy, nursing, kinesiology, and health related majors. Government was the next consolidated grouping of majors which included government, political science, law, and interdisciplinary studies. After government comes business majors which encompass a lot of different majors such as business, administration, finance, economics, accounting, management, and hospitality. Engineering majors were grouped with computer science, IT, and math majors. Any major that had to do with engineering was a part of this consolidation including civil engineering and chemical engineering. The humanities, which I also grouped with liberal arts and classical studies, has the most majors in the consolidation process. History, literature, writing, communications, journalism, philosophy, archaeology, religion and education were grouped for this project. Lastly, comes the majors I believe would have more ACEs than others. Despite criminal justice being considered an interdisciplinary study, I grouped it with the behavioral sciences along with social work, psychology, sociology, criminology, and criminal psychology.

I created many charts comparing ACEs and gender, ACEs and how many people answered yes, no, or unsure, ACEs by each of the five majors in the behavioral sciences, as well as ACEs across each consolidated major. Using information from Baglivio & Epps and Craig & Zettler I counted if each respondent has four or more adverse childhood experiences because the authors had said that those who scored a four or higher on the ACE test are twelve times more likely to sustain physical ailments, mental health issues, and an increased likelihood of sexual promiscuity at an earlier age, premature deaths, chromosomal damage, changes in the brain, and increase the odds of smoking, drinking, drug use, incarceration, reduced education, unemployment, and involvement in violence and suicide attempts.

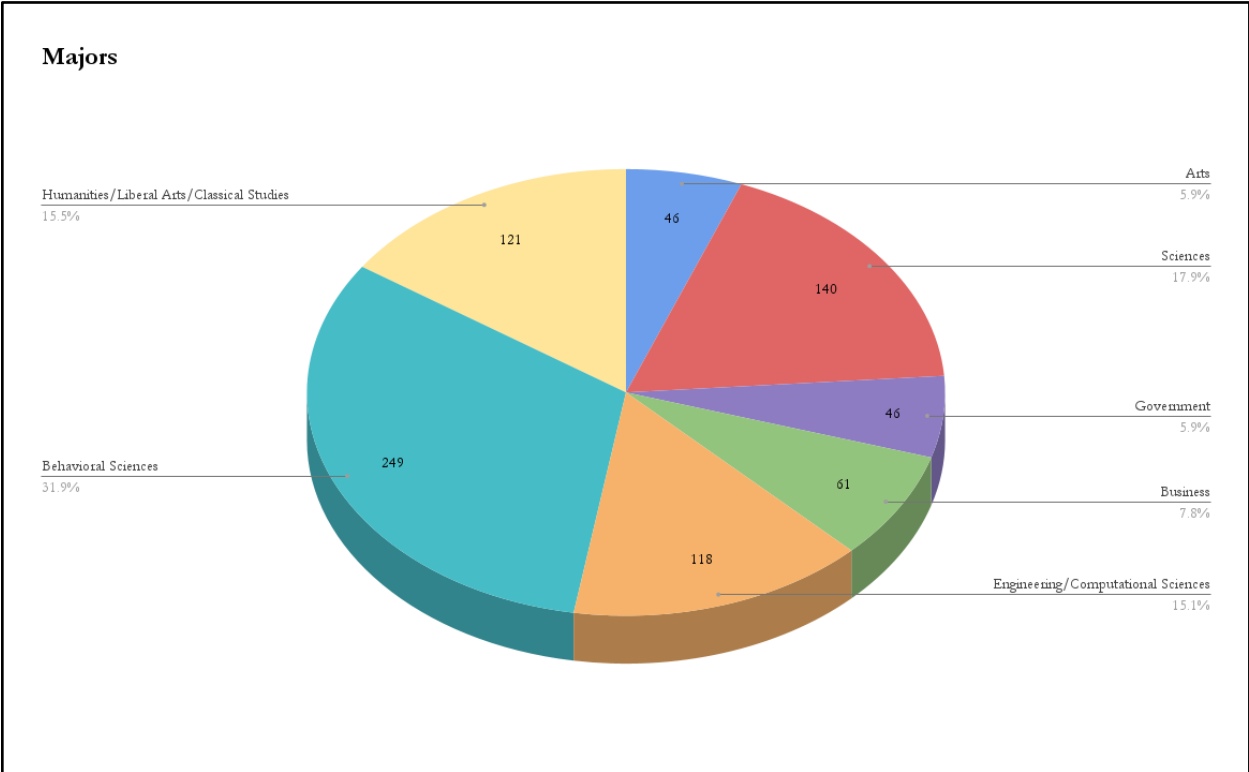
Results

College Majors

Consolidated Majors	Number of Respondents in the Major*
Arts	46
Sciences	140
Government	46

Business	61
Engineering and Computational Sciences	118
Behavioral Sciences	248
Humanities/Liberal Arts/Classical Studies	121
Total	780

**Including double majors/multiple degrees*

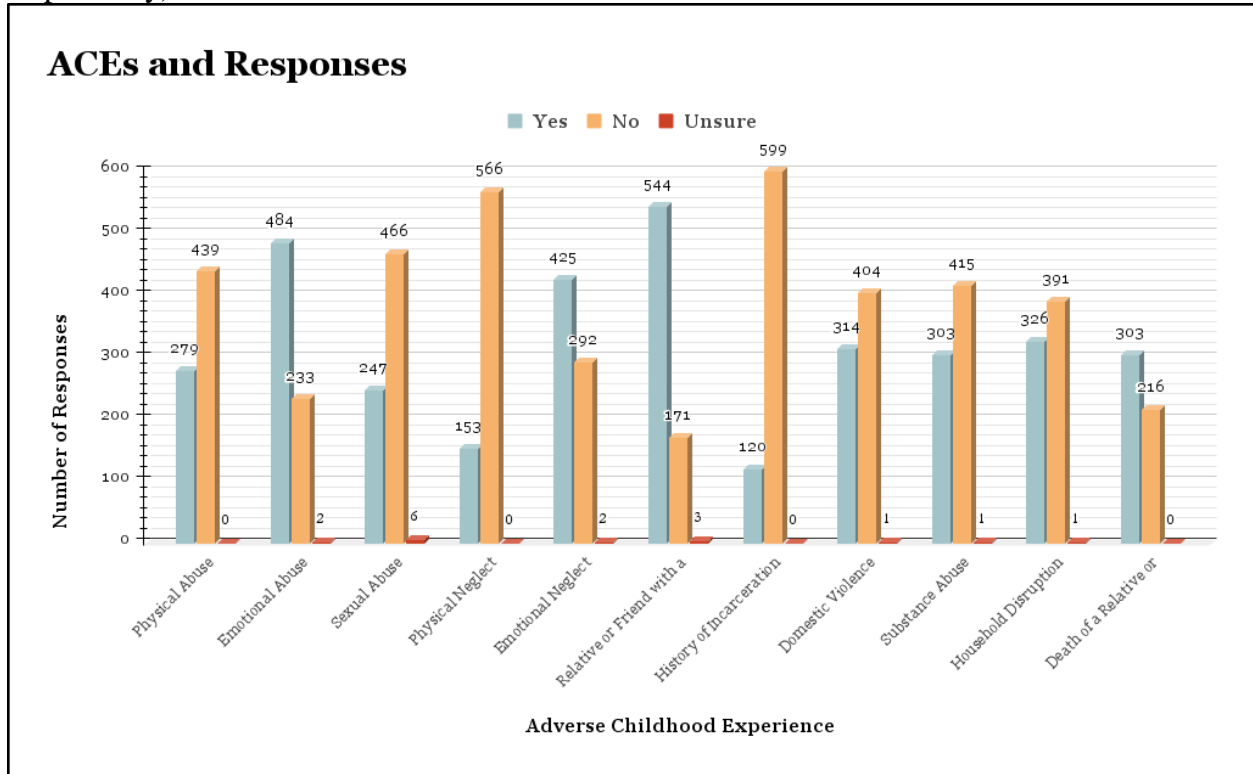


Out of 780 majors (including double majors), 249 fell under the behavioral sciences (31.9%) followed by the science majors with 140 respondents (17.9%) then humanities and liberal arts with 121 respondents (15.5%) and engineering majors (15.1%). Following the first four largest pool of respondents are business majors (7.8%), and then arts and government majors were tied with 46 responders each (5.9%). Each of the majors had more respondents who had experienced four or more ACEs. The only major where the number of respondents was equal to the number of ACEs they experienced, were the hard sciences majors with 36 responders having four or more ACEs and 36 having less than four.

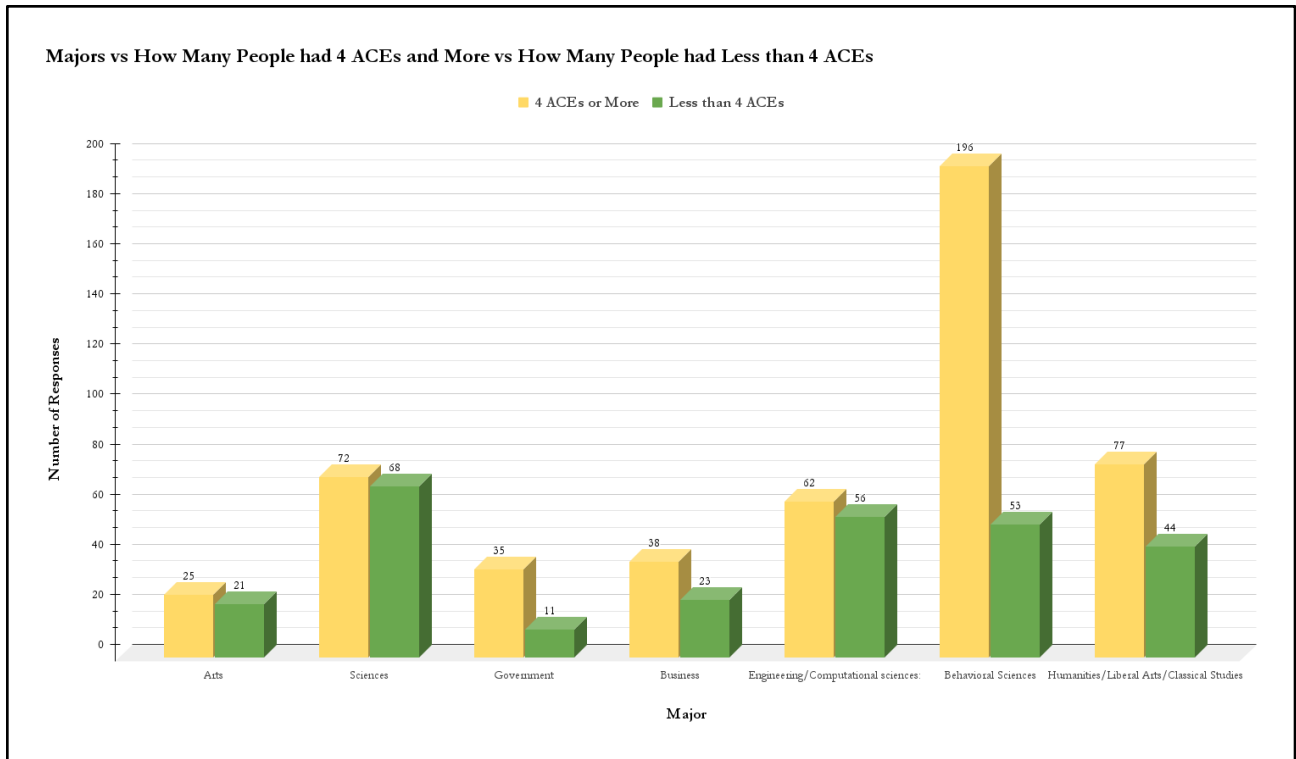
Adverse Childhood Experiences versus Responses

Out of the eleven adverse childhood experiences, mental health was the ACE that most respondents responded yes to with 544 yeses (75.7%). Emotional abuse and neglect were the next highest ACEs (67.3% and 59.1% respectively), followed by household disruption (divorced or

separated parents, growing up in foster care or a group home, or a single parent home) (45.3%), witnessing domestic violence (43.7%), and a family member or friend with a substance abuse disorder (42.1%). Physical neglect and a family member or close friend with a history of incarceration were the rarest of the ACEs to have been experienced (21.3% and 16.7% respectively).



When analyzing the number of ACEs people had experienced, the majority of respondents had experienced four ACEs with 85 out of 719 having any four of the ACEs. 82 respondents experienced seven ACEs followed by five ACEs, 3 ACEs, 1 ACE, 8 ACEs and 6 ACEs. While the CDC claims that over 61% of adults that they surveyed had at least one adverse childhood experience while 16% of adults experienced four or more adverse childhood experiences. However, in the survey that I conducted, over 75% of the respondents had four or more ACEs and 93.7% of respondents had experienced at least one adverse childhood experience.

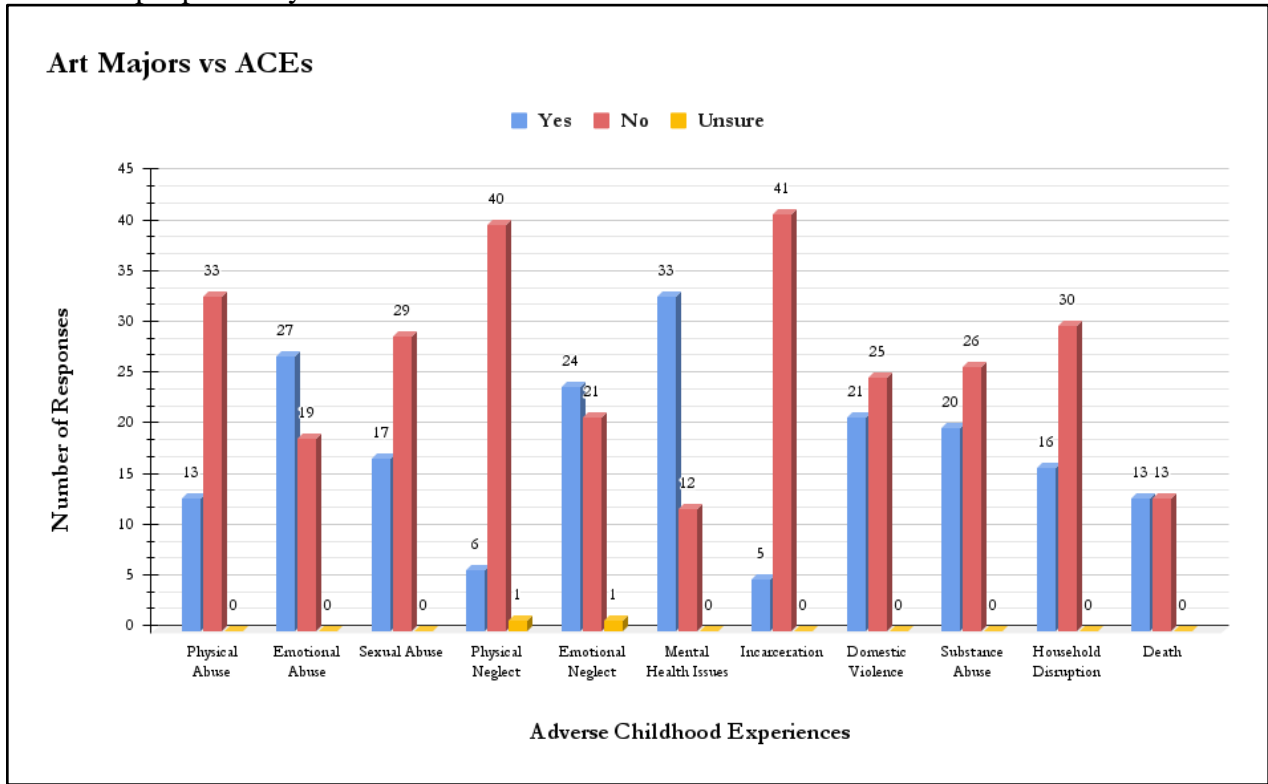


Adverse Childhood Experiences versus Majors

Adverse Childhood Experiences versus Art Majors

Art majors followed the trend of the top three experienced ACEs being mental health issues in their family or friends, emotional abuse, and emotional neglect. They were the only three ACEs

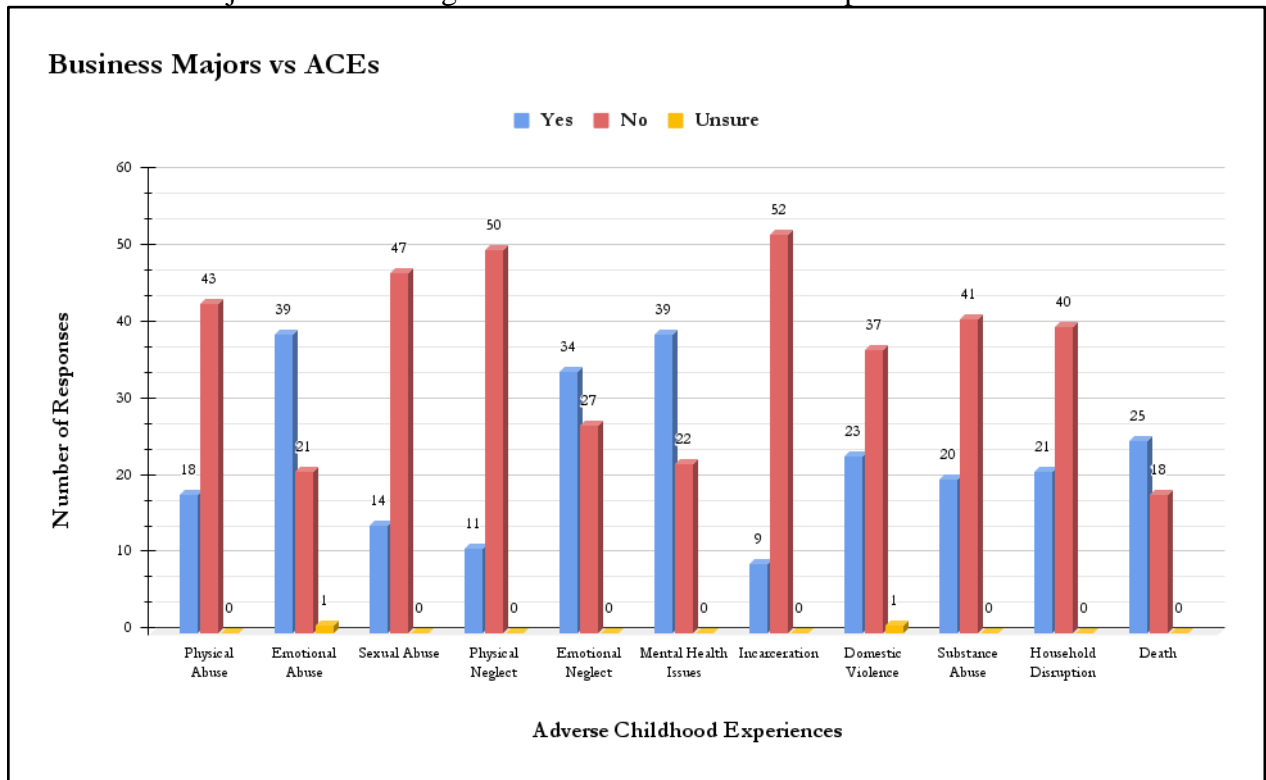
that more people said yes than no.



Adverse Childhood Experiences versus Business Majors

Business majors also followed the trend of mental health issues, emotional abuse, and emotional neglect as the top three ACEs. However, they also have had more people experience

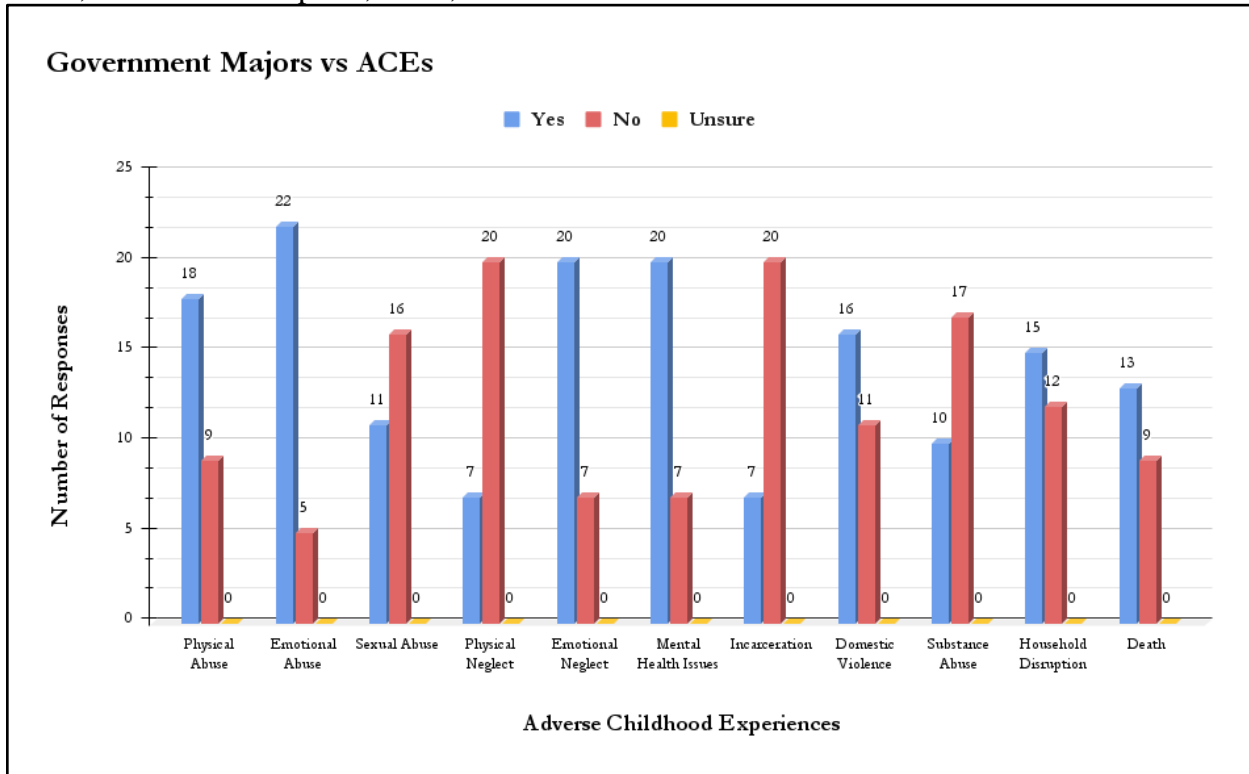
death than art majors but following within the trend of overall responses.



Adverse Childhood Experiences versus Government Majors

With government majors like the overall trend mental health issues, emotional abuse and neglect took the top three spots. However, the majority of respondents also experienced physical

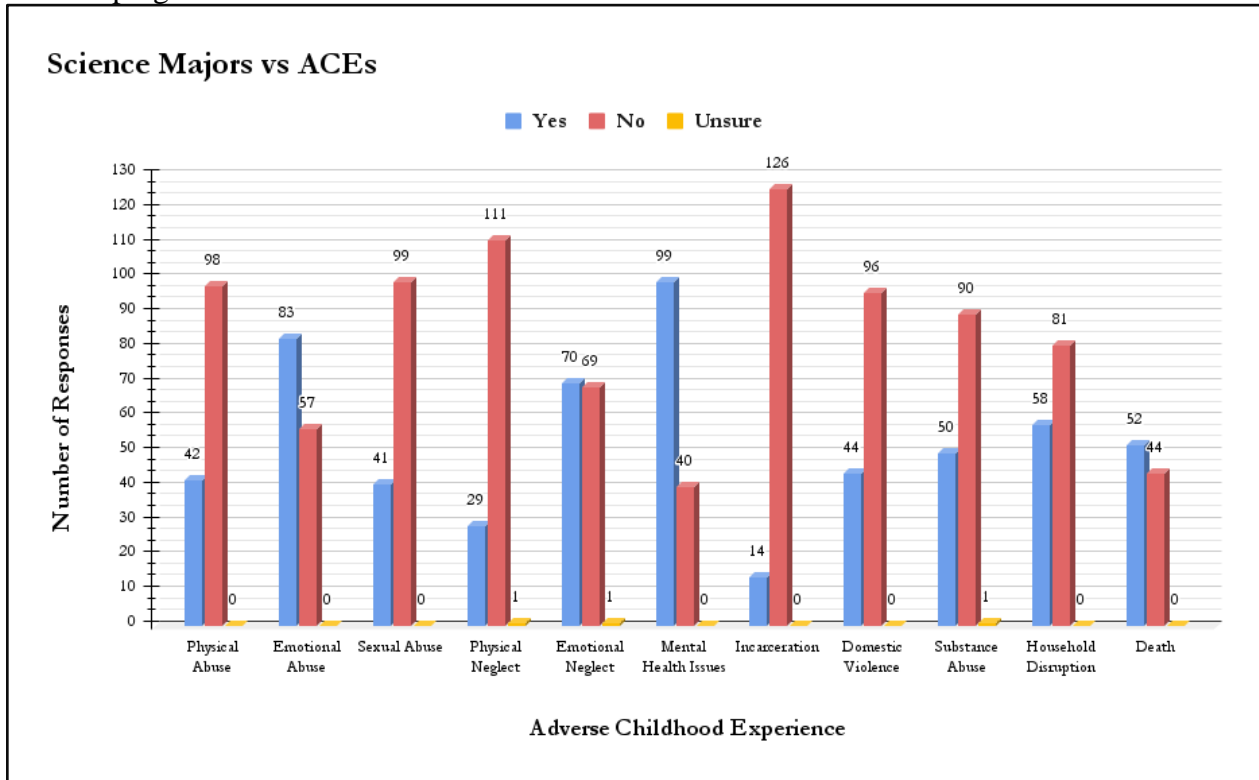
abuse, household disruption, death, and domestic violence.



Adverse Childhood Experiences versus Science Majors

Science majors were varied but once again, mental health issues, emotional abuse, emotional neglect, and death were the top four percentage wise, followed by household disruption. I expected the science majors to have more ACEs, but the only ones that had more yeses than noes were mental health issues, emotional abuse, emotional neglect, and death which

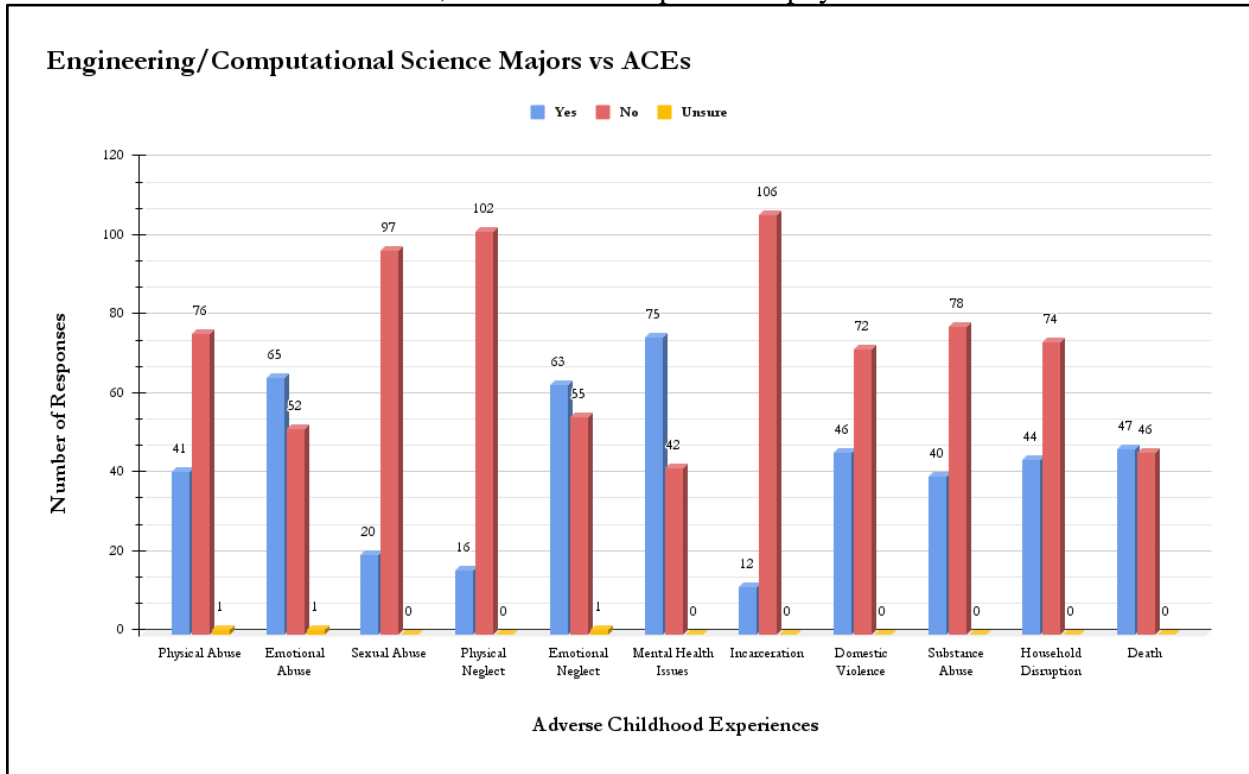
is in keeping with the overall answers.



Adverse Childhood Experiences versus Engineering and Computational Science Majors

Engineering and computational science majors had fairly low yeses on almost all the ACEs, including the ones that had more yeses than noes. The most ACEs were for the mental health issues followed once again by emotional abuse and neglect, death of a family member or

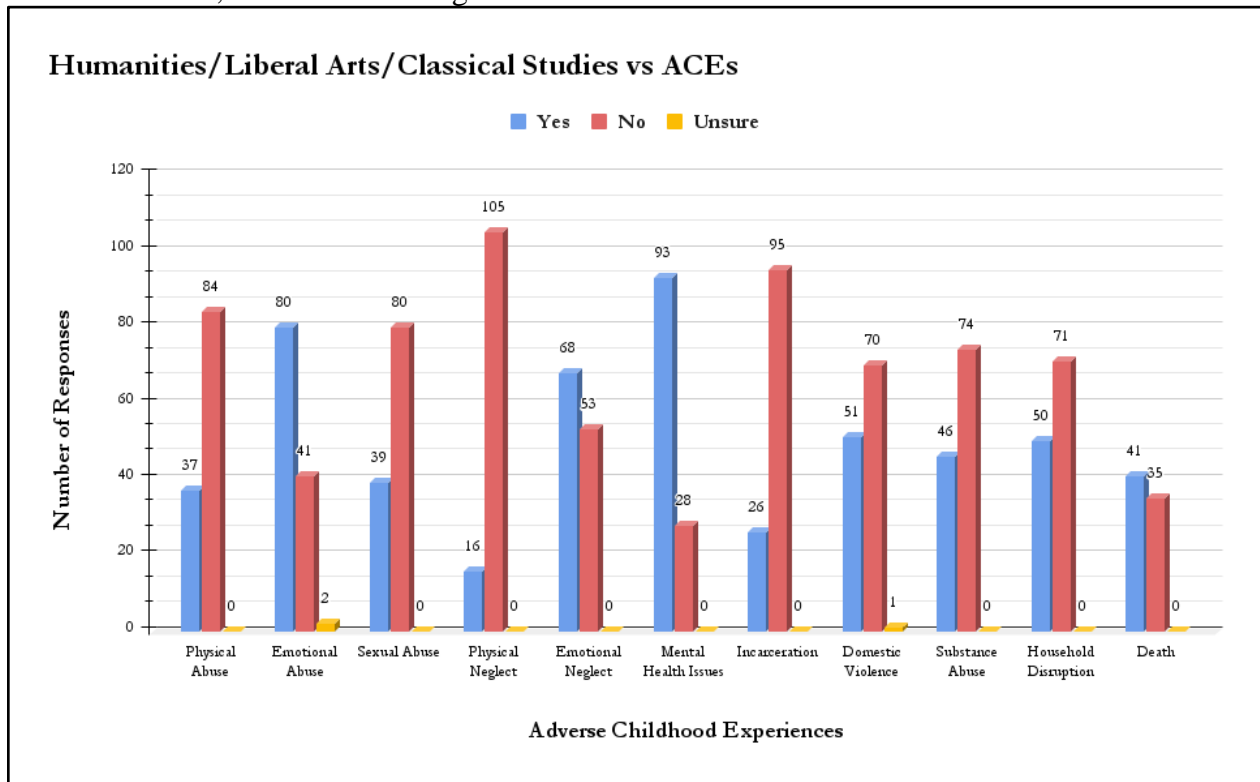
friend and then domestic violence, household disruption and physical abuse.



Adverse Childhood Experiences versus Humanities, Liberal Arts, and Classical Studies Majors

Studies show that humanities, arts, and classical studies usually have higher rates of mental health issues so I thought that they would have higher adverse childhood experiences. However, just like the overall scores, the most common ACEs were mental health issues,

emotional abuse, and emotional neglect.

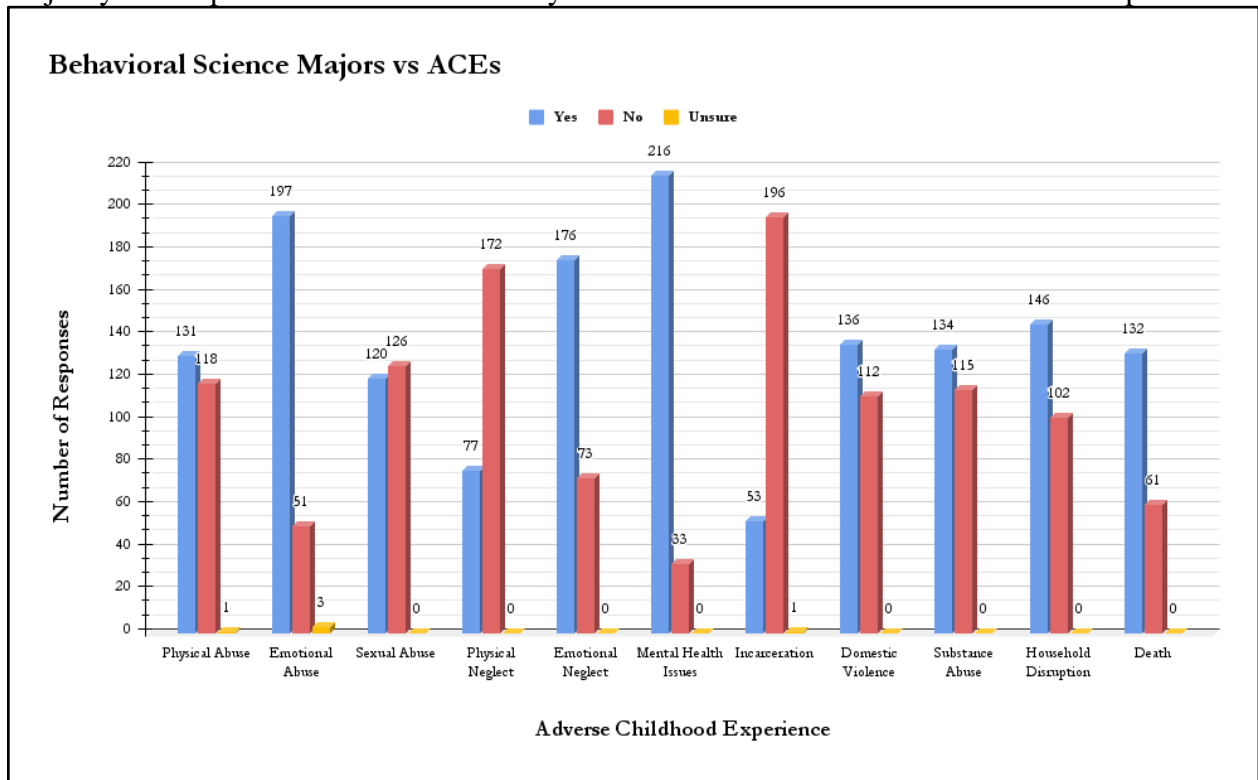


Adverse Childhood Experiences versus Behavioral Science Majors

There was a significant difference between how many people in the behavioral science majors experienced four or more ACEs compared to those in other majors such as the sciences and arts. 195 out of the 248 behavioral science majors (78.6%) experienced four or more ACEs which was by far the largest difference by a large margin. The next highest major that had 63.6% of the respondents experience four or more ACEs was the humanities and liberal arts. The hard sciences came in last with exactly 50% experiencing more than four ACEs.

Out of the behavioral sciences, psychology had the most answers followed by criminal justice, social work, criminology, and then criminal psychology. Each of these majors had a

majority of respondents who answered yes to four or more adverse childhood experiences.



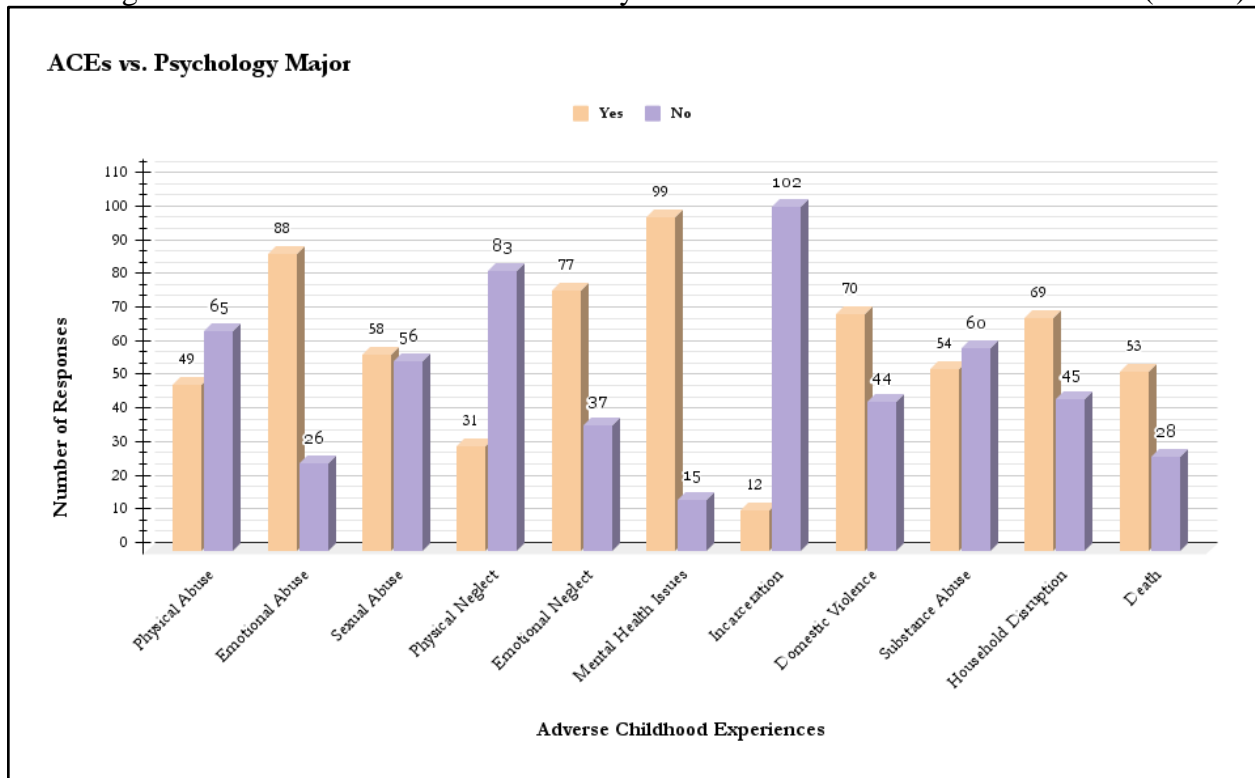
Adverse Childhood Experiences versus Psychology

Out of every major received before consolidating them, psychology had the most answers and one of the higher percentages of respondents with more than four ACEs. 95 out of the 114 (83.3%) respondents who were specifically a psychology major had four or more ACEs. Most of the responders had a family member or close friend who had mental health issues with 99 out of 114 (86.8%) answered yes to the question. Emotional abuse (77.2%) and neglect (67.5%) came in second and third followed by domestic violence (61.4%) and household disruption (60.5%). In fashion with the overall results, the adverse childhood experience that they responded no to the most was incarceration of a friend or family member with only 12 out of 114 respondents

answering

yes

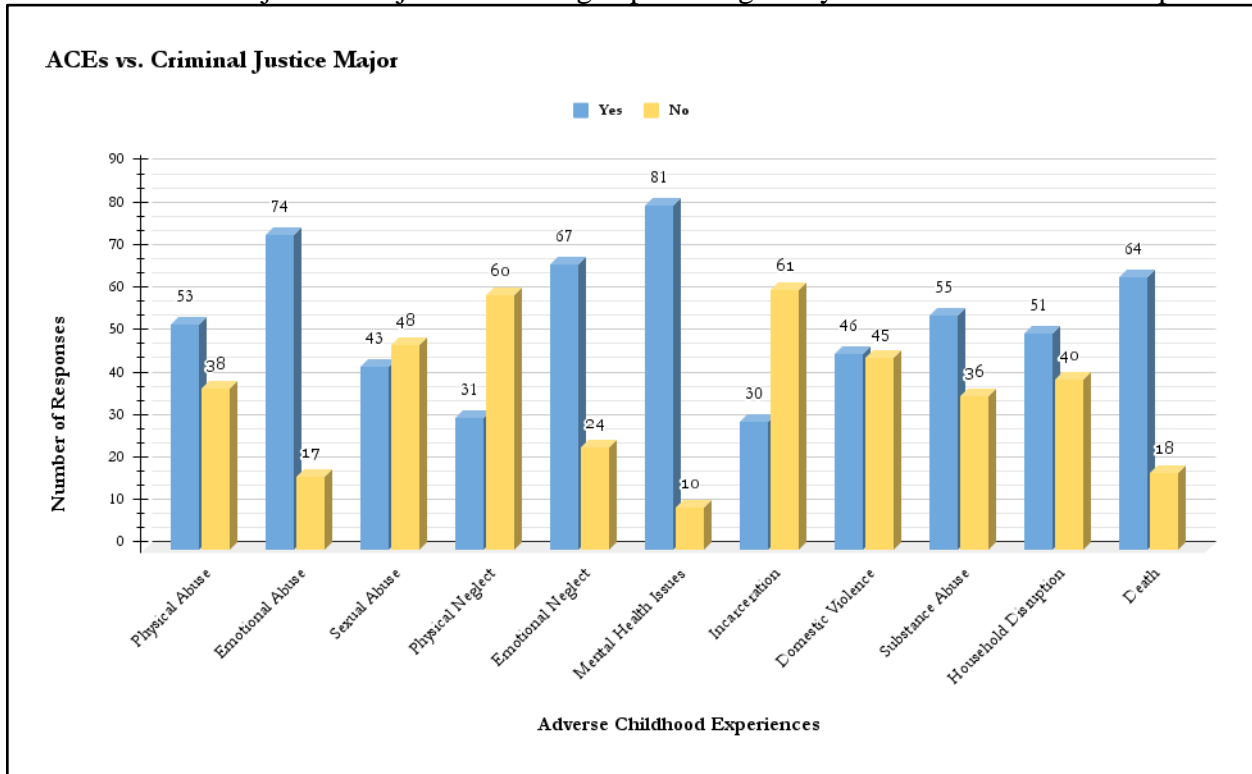
(10.5%).



Adverse Childhood Experiences versus Criminal Justice

75 out of the 92 (81.5%) respondents who had criminal justice as a specific major had four or more ACEs. Most of the respondents answered in keeping with the overall trend of mental health issues, emotional abuse and emotional neglect, however a lot of the respondents had been physically abused, experienced and many of them experienced a friend or family member who ended up in incarceration whether it be jail, prison, or a juvenile detention center. The last four

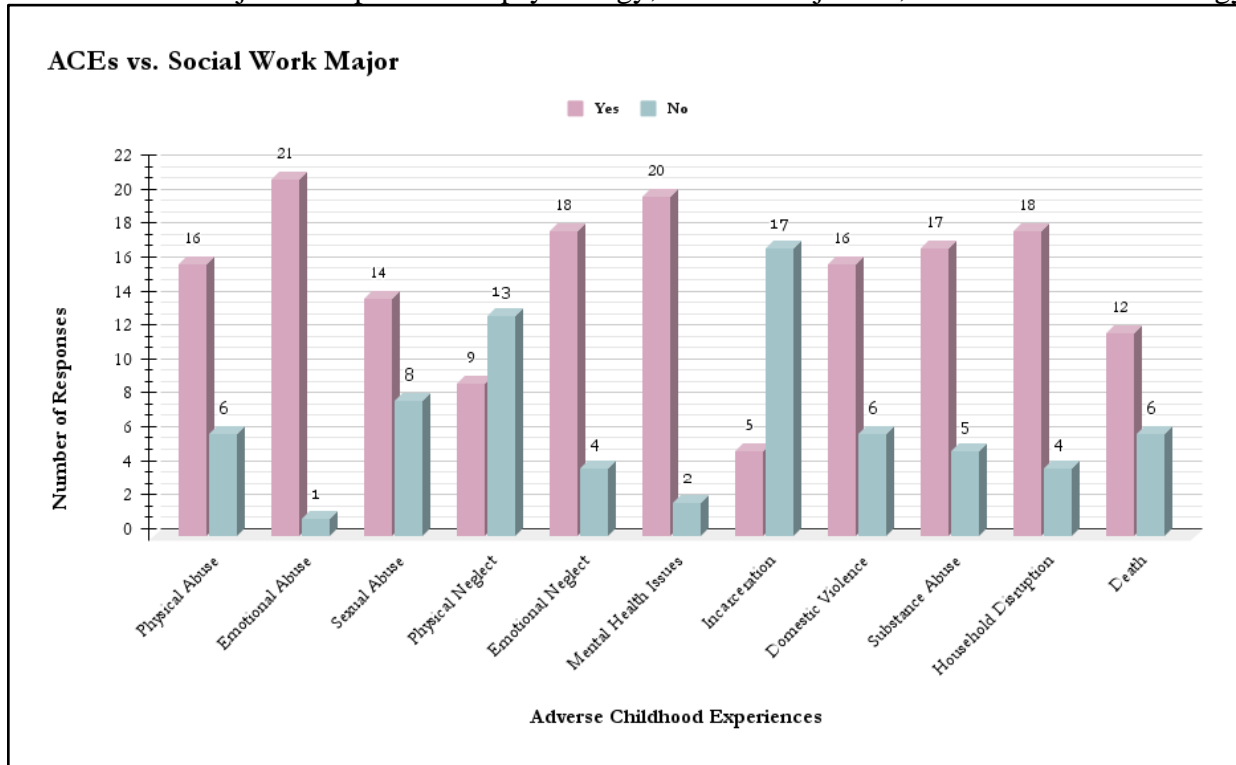
ACEs for criminal justice majors had a larger percentage of yeses than the overall responses.



Adverse Childhood Experiences versus Social Work

The social work major only had 22 responses, however each person had four or more ACEs with the average being 7.5 and three people having only four ACEs while four people had 10 ACEs and two responders had 11 ACEs. Emotional abuse was the leading ACE with everyone but one person responding yes to the question. In keeping with the overall responses, mental health issues in family members or friends and emotional neglect were a strong second and third. However, domestic violence, substance abuse, and household disruption were much more common in the

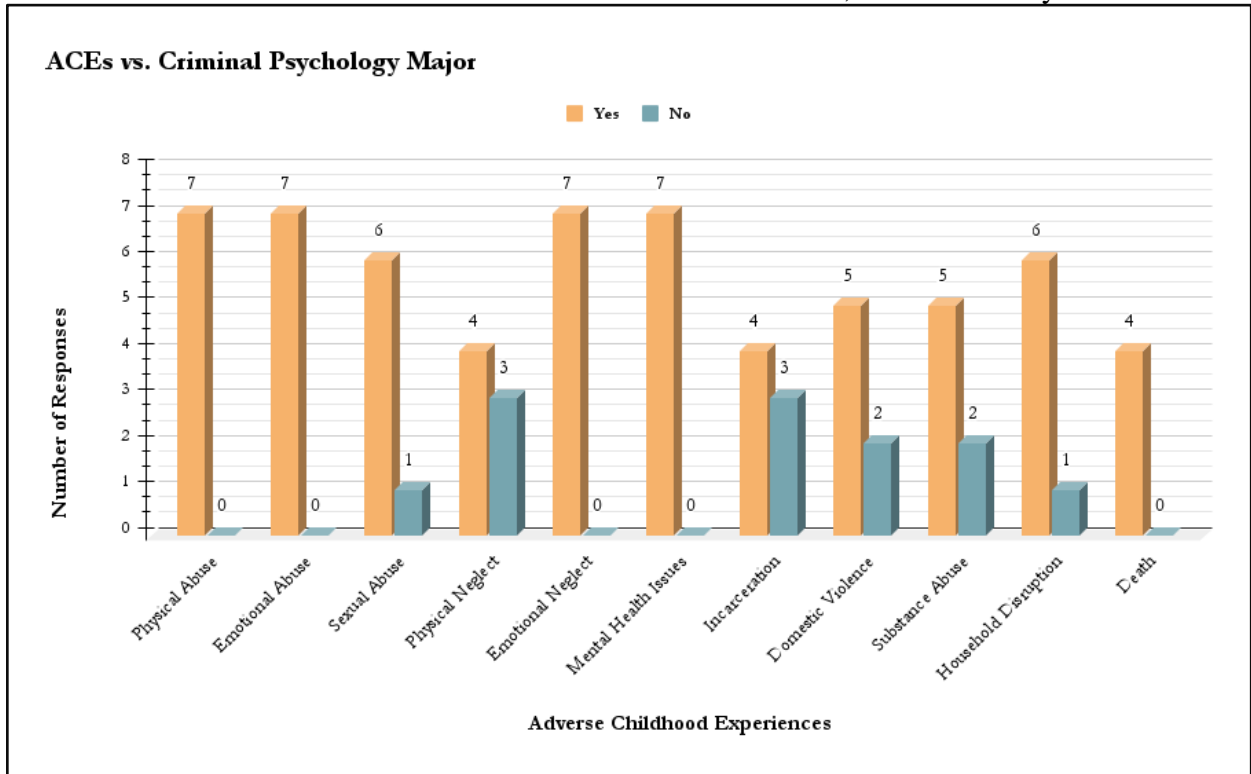
social work major compared to psychology, criminal justice, and even criminology.



Adverse Childhood Experiences versus Criminal Psychology

Despite being the smallest major within the behavioral sciences and can be considered a part of psychology or criminology, criminal psychology had some of the most interesting answers. With only seven respondents out of the 719, criminal psychology majors had the highest cumulative ACE score with the average being 8.8 out of 11 ACEs. Each criminal psychology major experienced physical and emotional abuse, emotional neglect, and a family member or friend with mental health issues that directly impacted them. The ACEs that had the least amount of yes responses were physical neglect and incarceration of a friend or family, and death, however because of my error of adding death of a friend or family member as a question later, there were

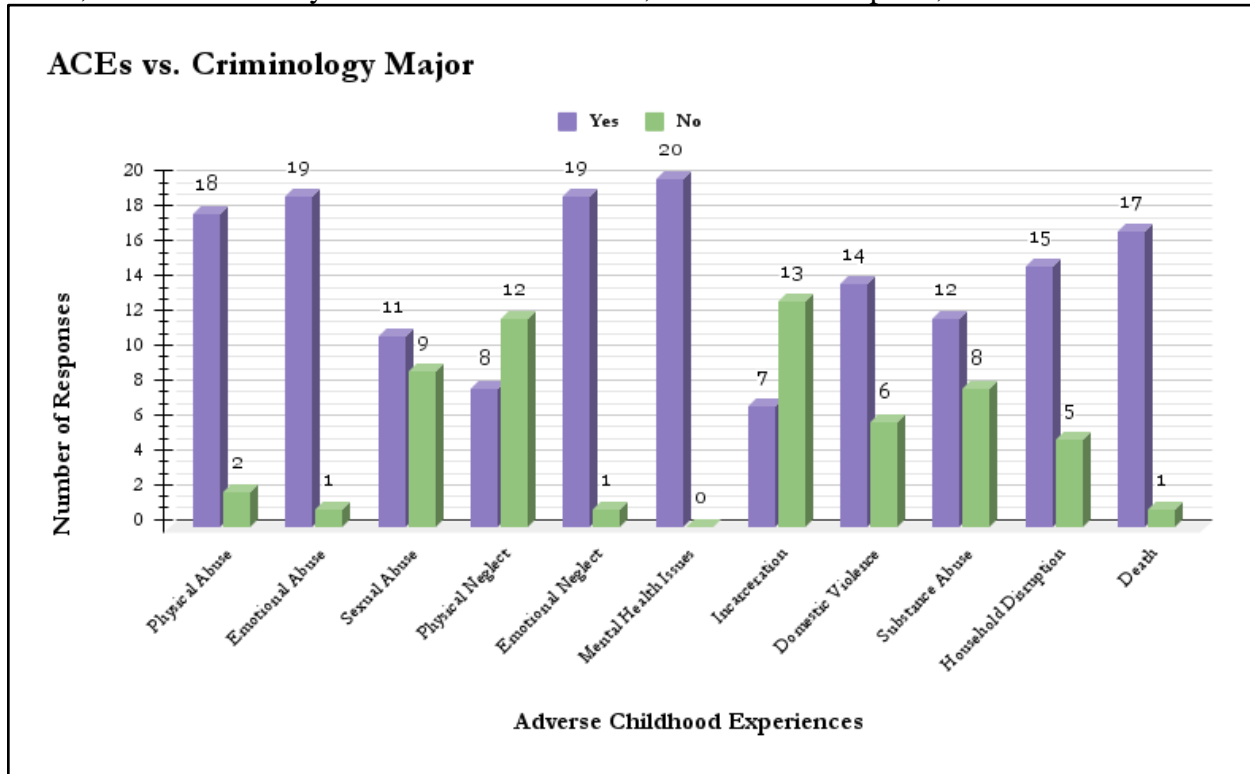
no noes for that ACE, only n/a.



Adverse Childhood Experiences versus Criminology

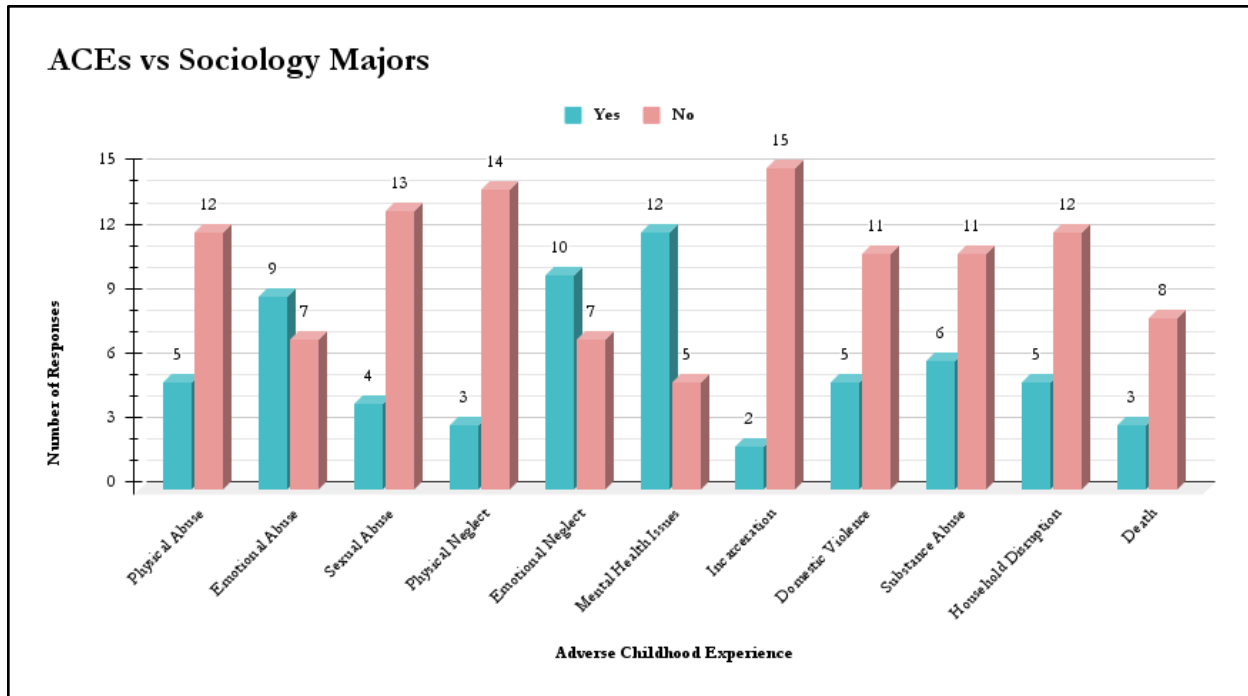
Criminology had only twenty respondents but like criminal psychology, they had a lot of ACEs with the average score being 8 out of 11 ACEs. They had one of the largest ranges from 1 to 10 ACEs as well within the behavioral sciences. Criminology majors had very high percentages of mental health issues in their family of friends, emotional abuse and neglect, as well as physical

abuse, death of a family member of close friend, household disruption, and domestic violence.



Adverse Childhood Experiences versus Sociology

Sociology was the only behavioral science major that did not follow the trend of four or more ACEs. In keeping with the overall trend, mental health issues, emotional neglect, and emotional abuse all had more yeses than noes. Besides those three, the yes responses to every other ACE were exceptionally low compared to the other behavioral science majors.

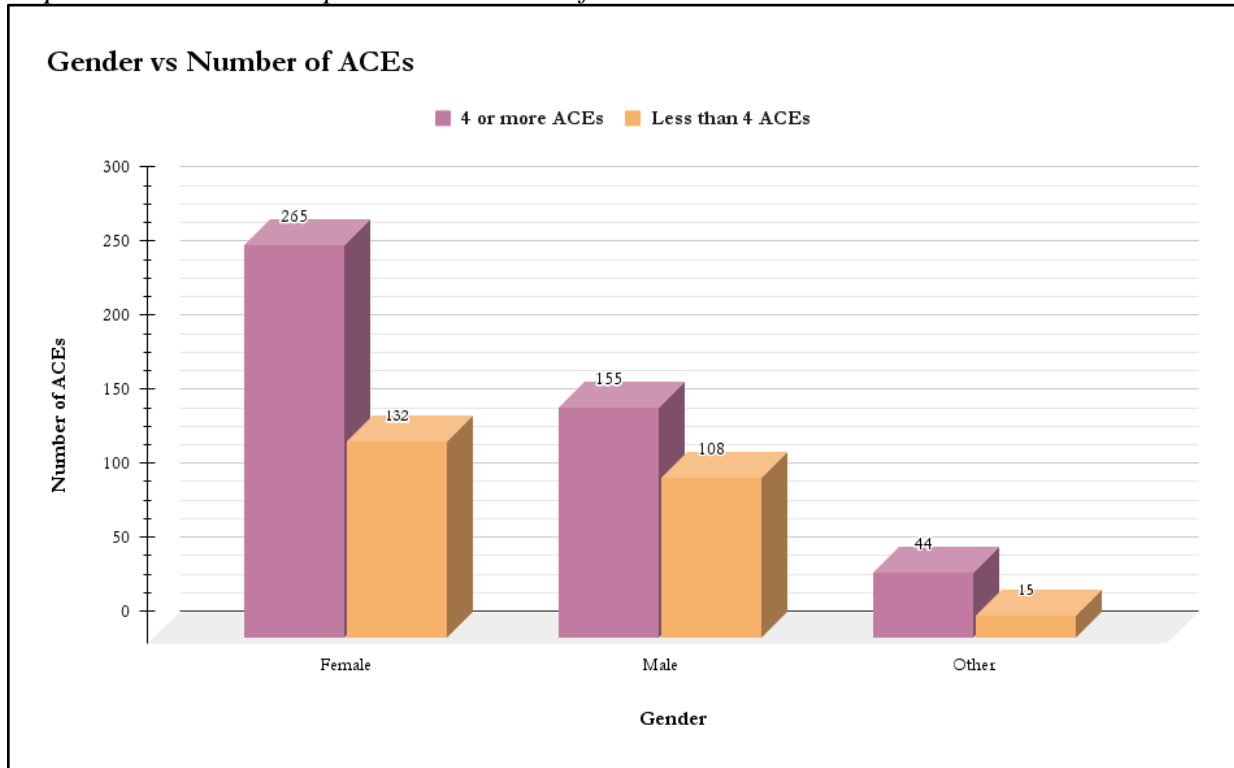


Adverse Childhood Experiences versus Gender

Adverse Childhood Experiences versus Specific Gender

Female participants made up 55.3% of all respondents while males made up 36.6% and those who preferred not to say or identified differently than male or female, made up 8.1% of the respondent population. Each of the three responses (female, male, other/prefer not to say) had well over fifty percent of four or more ACEs. Percentage wise, those who identified as other or preferred not to say had the highest ACE count of four or more with 74.6% responding yes to four or more adverse childhood experiences. The female population was next with 66.8% having four or more ACEs and the male population despite having the lowest percentage, still had 59% of

responders experience four or more ACEs.



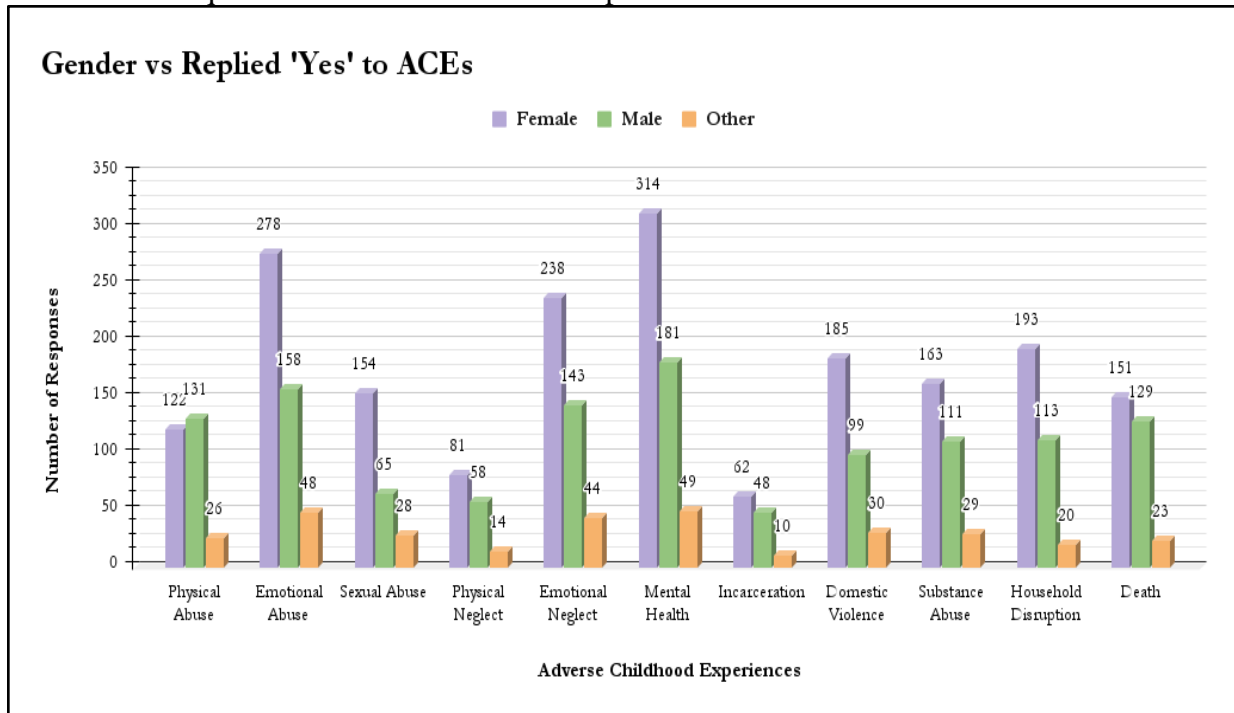
Specific Adverse Childhood Experiences versus Gender

Most of the adverse childhood experiences were experienced by females and those who answered other. The CDC states that women are more likely to experience ACEs than men and this study proved that true. Those who answered other for the gender question had the highest percentage of ACEs for seven of the eleven ACEs compared to their female and male counterparts. More males than other or females had experienced physical abuse and a family member or friend who has a history of incarceration or died. Females had experienced more household disruption than either males or those who answered other, but still had high percentages throughout.

Adverse Childhood Experience	Female (Yes)	Male (Yes)	Other (Yes)
<i>Physical Abuse</i>	30.73%	49.81%	44.83%
<i>Emotional Abuse</i>	70.20%	60.31%	81.36%
<i>Sexual Abuse</i>	39.29%	24.81%	47.46%
<i>Physical Neglect</i>	20.40%	22.05%	23.73%
<i>Emotional Neglect</i>	60.10%	54.58%	74.58%
<i>Mental Health Issues</i>	79.29%	69.35%	84.48%
<i>Incarceration</i>	15.62%	18.25%	16.95%

<i>Domestic Violence</i>	46.60%	37.79%	50.85%
<i>Substance Abuse</i>	41.06%	42.21%	50.00%
<i>Household Disruption</i>	48.74%	42.97%	34.48%
<i>Death</i>	58.53%	58.90%	54.76%

The national averages of children who experience each of these ACEs are lower than the averages from this specific survey. The average for this study showed that there was a 20.8% difference between the national average and the respondents of this survey for physical abuse, at least a 12% difference in emotional abuse, a 25% difference in sexual abuse, and at least a 6% difference between neglect (either physical or emotional neglect). Mental health issues were the largest difference in estimated national average compared to this survey with over a 50% increase when looking at the 719 respondents in this study. There was around a 20-30% difference between the national average and people who experienced domestic violence or intimate partner violence, a 22% difference in kids who had a parent who was addicted to drugs or alcohol, and a 22% difference in household disruption. There was a 4% difference for those who had a family member go to prison, and around a 35% difference between those who experienced the death of a family member or friend. This could be because I expanded the incarceration and death of a family member questions to encompass close friends as well.



Physical Abuse

According to an article done by Thompson et al., males were more likely to experience physical abuse in their childhood than women. More males in this study experienced physical abuse (49.8%) than females (30.7%) and those who answered other (44.8%) The national average

for children who were abused physically is eighteen percent (18%). Meanwhile, this study concluded that 38.8% of the respondents were physically abused before they turned eighteen.

Emotional Abuse

In this study, those who answered other to the gender question had experienced more emotional abuse (81.36%) than females (70.2%) and males (60.3%). The United States national average for emotionally or psychologically abused children is around 16% according to multiple studies, but a recent NBC story stated that over 55% of children in the US said they had been emotionally abused as a child. However, in this survey that I conducted, 67.32% of the respondents answered yes.

Sexual Abuse and Assault

Sexual abuse was the highest among those who answered other as well at 47.46% followed by females at 39.29%, and males at 24.81%. The national average for sexually abused children is about 9%. However, in this survey 34.35% of respondents were sexually abused, assaulted, or witnessed inappropriate behavior before they turned eighteen.

Physical Neglect

Physical neglect answers were close between the three with those who answered other for gender coming in first at 23.73%, males at 22.05%, and females at 20.4%. Physical neglect was the second to lowest adverse childhood experience that respondents answered yes to (the first being a family member or friend who were incarcerated) with only 21.28% answering yes. The only national averages found for neglect do not specify whether it is physical or emotional, but neglect is widely considered one of the most experienced ACEs.

Emotional Neglect

Emotional neglect was another adverse childhood experience that was widely experienced across all three gender answers with 74.58% of those who answered other experiencing it, followed by females with 60.1%, and males with 54.58%. 74.9% of children in America experienced neglect of some type before turning eighteen which is more than this survey where 59.11% of people answered yes. If you consolidate both physical and emotional neglect to just neglect, 80.4% of the respondents in this survey answered yes.

Mental Issues in Family and Friends

The highest adverse childhood experience experienced by all three gender answers was mental health issues that affected the respondent. Those who answered other for gender had experienced this ACE the most at 84.48%, females coming in second with 79.29% and males at 69.35%. One study done by Reupert et al., claimed that up to 25% of people had lived with a mentally ill parent before they turned eighteen. However, mental health issues in parents and friends were by far the most common ACE respondents had experienced at 75.66% of people answering yes.⁵¹

Family and Friends with a History of Incarceration

⁵¹ Andrea E. Reupert, et al., "Children whose parents have a mental illness: prevalence, need and treatment." *The Medical Journal of Australia*, 199, no. 3, (2013): 7-9, <https://doi.org/10.5694/mja11.11200>.

The lowest ACE was a family member or friend with a history of incarceration. 18.25% of males had experienced this ACE and then 'other' (16.95%) and females at 15.62%. Nationally, 1 out of 28 children (3.5%) have a parent in prison currently and over 10 million kids (around 12.5%) have had a parent go to jail compared to the 120 (16.69%) respondents answered yes to the adverse childhood experience.

Domestic Violence

50.85% of those who answered experienced domestic violence between family members before turning eighteen. Females came next at 46.6% and males at 37.79%. According to Resource Center on Domestic Violence: Child Protection and Custody (RCDV: CPC)⁵², somewhere between 10 and 20 percent of children witness domestic violence compared to the 43.67% of respondents in this study.

Family and Friends with Substance Abuse Issues

Substance abuse was experienced by 50% of those who answered other, 42.21% of males, and 41.06% of females. Around one out five kids (about 20%) have at least one parent who is addicted to drugs or alcohol. However, 42.14% of the respondents in this survey answered yes to this adverse childhood experience.

Household Disruption

Household disruption was experienced the most by females at 48.74%, males at 42.97% and then other at 34.48%. 23% of kids younger than eighteen will live in a single parent home and 45% of respondents in this survey answered yes to this ACE. However, this could also be because I included foster care, group homes, divorce, separation of parents and having lived in an orphanage.

Death of a Family Member or Friend

Death of a family member or friend was very close, probably the closest percentage wise of the ACEs. However, I did not add this onto the survey until about 200 people responded. Males experienced this ACE the most out of 519 with 58.9% responding yes. Females came in a very close second at 58.53% and then other had the lowest out of the three at 54.76%. The national average for children who experience the death of a family member (parent or sibling) before they turn 18 is between 5% and 8%⁵³. However, in this study, even with the late addition of this ACE 42.14% of respondents said they experienced the death of a close family member or friend before they turned eighteen.

Chi Squared and Significance

At first, I was having trouble with chi squared and significance because I was unsure if chi squared was the best option. I looked at regression analysis and t-tests with the help of my teachers, but we ended up deciding that chi squared was the best and easiest option of the three. I started

⁵² "Rates of child abuse and child exposure to domestic violence," Resource Center on Domestic Violence: Child Protection and Custody, <https://www.rcdvcpc.org/rates-of-child-abuse-and-child-exposure-to-domestic-violence.html>.

⁵³ "Childhood Bereavement Estimation Model," Judi's House/JAG Institute for Grieving Children and Families, last modified 2022, <https://judishouse.org/research-tools/cbem/>

with how many respondents in each major experienced four or more ACEs or less than four ACEs. These are the observed values for the chi squared.

Observed Values

Major	4+ ACEs	Less than 4 ACEs	Total
<i>Arts</i>	25	21	46
<i>Sciences</i>	72	68	140
<i>Government</i>	35	11	46
<i>Business</i>	38	23	61
<i>Engineering/Computational Sciences</i>	62	56	118
<i>Behavioral Sciences</i>	196	53	249
<i>Humanities/Liberal Arts/Classical Studies</i>	77	44	121
Total	505	276	781

From these values I found the expected values by multiplying the total of each major by the total of the 4+ ACEs column and then divided by the overall total. For example, the expected value for arts majors would be $(46*505)/781$ and the expected value for the science majors would be $(140*505)/781$ and so forth.

Expected Values

Major	4+ ACEs	Less than 4 ACEs	Total
<i>Arts</i>	30	16	46
<i>Sciences</i>	91	49	140
<i>Government</i>	30	16	46
<i>Business</i>	39	22	61
<i>Engineering/Computational Sciences</i>	76	42	118
<i>Behavioral Sciences</i>	161	88	249
<i>Humanities/Liberal Arts/Classical Studies</i>	78	43	121
Total	505	276	781

Now that I know both the observed and expected value, I can perform the chi squared test where you take the observed value minus the expected value squared then divided by the expected value, $(O-E)^2/E$.

Chi Squared $((O-E)^2/E)$ Values

Major	4+ ACEs	Less than 4 ACEs
<i>Arts</i>	0.76	1.38
<i>Sciences</i>	3.79	6.94
<i>Government</i>	0.93	1.70
<i>Business</i>	0.05	0.10
<i>Engineering/Computational Sciences</i>	2.68	4.90
<i>Behavioral Sciences</i>	7.61	13.92
<i>Humanities/Liberal Arts/Classical Studies</i>	0.02	0.04
Total	15.86	-

The chi squared value equals 15.86 with six degrees of freedom which means that the two-tailed P value equals 0.0145. By conventional criteria, this difference is considered to be statistically significant. The P value answers this question: If the theory that generated the expected values were correct, what is the probability of observing such a large discrepancy (or larger) between observed and expected values? A small P value is evidence that the data are not sampled from the distribution you expected. Not only did I perform the chi squared test, two of my professors did, a math tutor did, and I also put it through two chi squared calculators online.

Discussion

While this study was only done with 719 people, the results are significant enough to claim that the amount of adverse childhood experiences play a role in the college major one chooses. People in the behavioral sciences, especially majors that are a part of criminal justice or psychology have a significantly higher rate of ACEs in their life.

Ways to Combat Adverse Childhood Experiences

Adverse childhood experiences are risk factors for criminality and unhealthier life outcomes. Having any adverse childhood experience does not mean that every person will go to jail or commit a crime. There are many ways to prevent this including building resiliency and having children go into higher education and finish at least high school. There is no way to stop ACEs from happening, but there are ways to combat the effects they have later in life.

Resiliency in Children

Resiliency is the overarching umbrella term for the ability to bounce back from life's difficulties. Resiliency is something that everyone can learn although some people have a more natural resiliency than others. However, researchers have discovered that resiliency is like a muscle and the more someone uses it, the easier it is for them to combat adversity. One publication done by the Scottish government listed a few ways to build resiliency in children, families, and adults alike⁵⁴. Even if a child does not have supportive families, facilitating supportive adult-child relationships with other adult figures like teachers, the parents of friends, or neighborhood adults is one way of helping build resiliency. Another way of building resiliency is to help children build a sense of self-efficacy, control, esteem, and love and to teach them that what is happening to them is not their fault. Adults can also provide opportunities to strengthen coping skills and mechanisms and provide sources like faith and cultural traditions. Resiliency happens at an internal and external level, stemming from self, family, and community. Even if a child's parents and family or home life is unconventional, if they have a good support system at school, in their community, and a health social life, they are building resiliency⁵⁵.

There is a lot that school systems and communities can do to help children who suffer from ACEs as well rather than leaving it on the child to build resiliency alone. Educating oneself on these issues is a huge step in the right direction, just understanding some of the things that a child may go through is more helpful than being ignorant or not wanting to learn. Advocation is another thing that people can do at both the community and state and even federal level. Advocating for better resources, counselors, medical attention/health services, and professional help can help these children understand both ACEs and how to build resiliency and give them positive relationships⁵⁶.

Higher Education and Reduced Crime Rates

In 2018, Costa,⁵⁷ coauthored a paper about compulsory school leaving (CSL) laws that force people to stay in school longer than some may choose voluntarily. CSL laws have been shown to simultaneously boost education while reducing crime. The authors analyzed CSL laws from 1980 to 2012 by looking at short and long-term responses of arrest rates for those affected by an increase in the school leaving age. They found that for individuals 15 to 24 CSL laws reduced the arrest rate by 6%. According to a graph they made that compares arrest rates before and after CSL laws were put in place, crime reduction was most prevalent during the ages of 15 to 18, the crucial time children are in school. What is most important about their study is that arrest rates continued to drop years after. Costa⁵⁸ points out that the reason crime continues to go down even as people graduate from high school is because keeping teens in school can prevent some individuals from crime as well as lead to more students choosing to further their education in a

⁵⁴ "What have ACEs got to do with Justice?" Justice Analytical Services, The Scottish Government, May 2018, <https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2018/05/understanding-childhood-adversity-resilience-crime/documents/00535550-pdf/00535550-pdf/govscot%3Adocument/00535550.pdf>

⁵⁵ Nerissa Bauer, "Childhood adversity: Buffering stress & building resilience." Healthy Children, July 26, 2021, <https://www.healthychildren.org/English/healthy-living/emotional-wellness/Building-Resilience/Pages/ACEs-Adverse-Childhood-Experiences.aspx>

⁵⁶ Kerry Jamieson, "Resilience: A powerful weapon in the fight against aces." Center for Child Counseling, August 2, 2018, <https://www.centerforchildcounseling.org/resilience-a-powerful-weapon-in-the-fight-against-aces/>.

⁵⁷ Rui Costa, et al., "Why education reduces crime." Centre for Economic Policy Research, October 14, 2018, <https://cepr.org/voxeu/columns/why-education-reduces-crime>

⁵⁸ Ibid.

postsecondary school⁵⁹. Another study done by a student at NYU in 2015 showed that obtaining a college degree does decrease violent crime rates across different countries, albeit minimally⁶⁰.

Limitations

Some of the biggest limitations I had during my study are the late addition of death of a family member or friend, risk factors that could be counted as an adverse childhood experience but are not considered one. Some of these are environmental like gangs and neighborhood or where one grew up and socioeconomic status, as well as exposure. Many children have good families but live in a place where they see violence and crime. Other risk factors considered biological are race, ethnicity, sexual orientation, gender, and mental or physical disabilities. Many people of color have a higher ACE score as well as a higher rate of crime compared to their white counterparts.

Another thing I would do differently is put a few questions regarding secondhand ACE experience. Perhaps one child only experienced one or two ACEs but had a close friend who experienced eight or nine and that is what pushed them to decide on a psychology or criminal justice major. Mental health issues could also be considered a predisposed risk factor since some, such as bipolar disorder, depression, ADHD, or schizophrenia, can be genetic.

Future Research

I would like to do this study again with the different limitations in place as well as a longer period of time, and a bigger pool instead of just mainly my college, Liberty University. I would love to have this survey done at other universities and expand from just college majors to careers as well. I think that it would be interesting to see how the data changes and if it becomes more in keeping with what the CDC says is the average for adults and children with ACEs (16% experiencing four or more).

In the future, I would also like to add how environments such as the city, suburbs, and country would correlate with ACEs and race/ethnicity, gender, and socioeconomic status. I also think that it would be interesting to analyze if certain women who suffered from ACEs are more likely to go into certain majors or choose education over criminality compared to men.

One other thing I would like to look deeper into is if there is a correlation between specific adverse childhood experiences and college major. Are students who experienced more household disruption more likely to go into majors like social work? Is the correlation between criminal justice majors and incarceration significant?

Biblical Worldview

The Bible addresses the subject of children and how important they are to God multiple times. Parents have an obligation and duty to raise their children and to love and provide for them. The Bible clearly states in 1 Timothy 5:8 that “Anyone who does not provide for their relatives, and especially for their own household, has denied the faith and is worse than an unbeliever” (*New International Version*, 2011, 1 Timothy 5:8). God is saying that anyone who does not take care of, love, or nourish their relatives, especially their immediate family are worse than those who reject God. Another passage that talks about how important children are to God is found in Matthew 18:

⁵⁹ Ibid.

⁶⁰ A. Gonzalez “Education: the secret to crime reduction?” (Honors thesis, New York University, 2015), 1-43. <https://as.nyu.edu/content/dam/nyu-as/politics/documents/Gonzalez.pdf>.

1-6. Jesus' disciples ask him who is considered the greatest in the kingdom of heaven and Jesus responds with, "Truly I tell you, unless you change and become like little children, you will never enter the kingdom of heaven. Therefore, whoever takes the lowly position of this child is the greatest in the kingdom of heaven." Jesus continues by saying that anyone who welcomes a child in his name will welcome Jesus but those who cause the child to sin, or stumble would be better off drowning in the depths of the sea (*New International Version*, 2011, Matthew 18:1-6).

Conclusion

Adverse childhood experiences are predictors and risk factors for many things in life, including criminality. However, many people will choose education over crime. ACEs can hurt the way a person thinks and the way they make decisions which can lead to risky behavior. If dealt with correctly though and given the proper time, attention, and care, ACEs can instead help steer people into different majors and professions. In this study, adverse childhood experiences seemed to be a predictor for the major that people choose to go into. Respondents who had higher adverse childhood experiences score usually went into majors such as psychology, sociology, social work, criminal justice, or criminology. Government majors are also more likely to have a higher ACE score than majors like business or the sciences.

The good thing about knowing about ACEs is that it is easy to be able to help others work through theirs. Teaching resiliency and instilling values and demonstrating positive role models to kids who have ACEs can keep them from turning to risky behavior. It helps create a healthy outlet to the problems they face in childhood and sets them up for better success in the future. Education is a healthy way to try and work through difficult life events rather than turn to crime and delinquency. At times it can be a harder path, but it is far more rewarding and it's better to try and solve or help fix the problem rather than become someone who feeds into the issue.

Bibliography

- “About the CDC-Kaiser Ace Study Violence prevention injury Center CDC.” Centers for Disease Control and Prevention. Last modified April 6, 2021, <https://www.cdc.gov/violenceprevention/aces/about.html>
- Abrams, Zara. 2022 “Student mental health is in crisis. Campuses are rethinking their approach.” *American Psychological Association* 53, no. 7, (October): 60. <https://www.apa.org/monitor/2022/10/mental-health-campus-care>
- “Annual collegiate mental health report examines trends and policy implications.” Center for Collegiate Mental Health at Penn State University. Last modified January 16, 2019. <https://www.psu.edu/news/academics/story/annual-collegiate-mental-health-report-examines-trends-and-policy-implications/>
- Aytur, Semra A., Sydney Carlino, Felicity Bernard, Kelsi West, Victoria Dobrzycki, and Riana Malik. 2022. “Social-ecological theory, substance misuse, adverse childhood experiences, and adolescent suicidal ideation: Applications for community–academic partnerships.” *Journal of Community Psychology* 50, no. 1, (January): 265–284, <https://doi.org/10.1002/jcop.22560>
- Bauer, Nerissa. “Childhood adversity: Buffering stress & building resilience.” HealthyChildren,. Last modified July 26, 2021. <https://www.healthychildren.org/English/healthy-living/emotional-wellness/Building-Resilience/Pages/ACEs-Adverse-Childhood-Experiences.aspx>
- Cassiers, Laura L. M., Bernard G. C. Sabbe, Lianne Schmaal, Dick J. Veltman, Brenda W. J. H. Penninx, and Filip Van Den Eede. 2018. “Structural and functional brain abnormalities associated with exposure to different childhood trauma subtypes: A systematic review of neuroimaging findings.” *Frontiers in Psychiatry* 9, no. 329, (August): 1-17, <https://doi.org/10.3389/fpsy.2018.00329>.
- “Childhood Bereavement Estimation Model,” Judi’s House/JAG Institute For Grieving Children and Families. Last modified 2022. <https://judishouse.org/research-tools/cbem>
- Conrad, Grace. “Adverse childhood experience scores of social work students vs. non-social work students at Western Michigan University.” Honors thesis, Western Michigan University, March 25, 2020. https://scholarworks.wmich.edu/cgi/viewcontent.cgi?article=4246&context=honors_theses
- Costa, Rui, Machin, Stephen, and Bell, Brian. “Why education reduces crime.” Centre for Economic Policy Research. Last modified October 14, 2018. <https://cepr.org/voxeu/columns/why-education-reduces-crime>
- Damyán Edwards. 2018. “Childhood sexual abuse and brain development: A discussion of associated structural changes and negative psychological outcomes.” *Child Abuse Rev.* 27, no. 3 (June): 198–208, <https://doi-org.ezproxy.liberty.edu/10.1002/car.2514>
- Deming, David J. 2012. “Does school choice reduce crime?” *Education Next* 12, no. 2, (February) <https://www.educationnext.org/does-school-choice-reduce-crime/>
- Driessen, Martin, Jörg Herrmann, Kerstin Stahl, Martin Zwaan, Szilvia Meier, Andreas Hill, Marita Osterheider, and Dirk Petersen. 2000. “Magnetic resonance imaging volumes of the hippocampus and the amygdala in women with borderline personality disorder and

- early traumatization.” *Archives of General Psychiatry* 57, no. 12 (December): 1115-1122, <https://doi.org/10.1001/archpsyc.57.12.1115>.
- Fair, Helen and Walmsley, Roy. “World Prison Population List: 13th Edition.” World Prison Brief. Last modified 2021. <https://www.prisonstudies.org>
- Gold, Andrea L., Margaret A. Sheridan, Matthew Peverill, Daniel S. Busso, Hilary K. Lambert, Sonia Alves, Daniel S. Pine, and Katie A. McLaughlin. 2016. “Childhood abuse and reduced cortical thickness in brain regions involved in emotional processing.” *Journal of child Psychology and Psychiatry, and Allied Disciplines*, 57, no. 10 (September): 1154-1164. <https://doi.org/10.1111/jcpp.12630>.
- Gonzalez, Alma. “Education: the secret to crime reduction?” Honors thesis, New York University, Spring 2015. <https://as.nyu.edu/content/dam/nyu-as/politics/documents/Gonzalez.pdf>.
- Haslam, Zoe and Taylor, Emily P. 2022 “The relationship between child neglect and adolescent interpersonal functioning: A systematic review.” *Child Abuse and Neglect* 125, (March): 1-13. <https://doi.org/10.1016/j.chiabu.2022.105510>
- “How Many People of the World Have a College Degree?” Educate, Inspire, Change. Last modified April 25, 2019. <https://educateinspirechange.org/how-many-people-of-the-world-have-a-college-degree/>
- Henriques, Gregg. 2018. “Major differences in college student mental health.” *Psychology Today*. Last modified November 29, 2018. <https://www.psychologytoday.com/us/blog/theory-knowledge/201811/major-differences-in-college-student-mental-health>
- Jamieson, Kerry. “Resilience: A powerful weapon in the fight against aces.” Center for Child Counseling. Last modified August 2, 2018. <https://www.centerforchildcounseling.org/resilience-a-powerful-weapon-in-the-fight-against-aces/>
- Nelson, Charles A., Richard D. Scott, Zulfiqar A. Bhutta, Nadine B. Harris, Andrea Danese, and Muthanna Samara. 2020. “Adversity in childhood is linked to mental and physical health throughout life.” *National Library of Medicine* 28, no. 371, (October), <https://doi.org/10.1136/bmj.m3048>
- Offerman, Evelyne C. P., Michiel W. Asselman, Floor Bolling, Petra Helmond, Geert-Jan J. M. Stams, and Ramón J. L. Lindauer. 2022. “Prevalence of Adverse Childhood Experiences in Students with Emotional and Behavioral Disorders in Special Education Schools from a Multi-Informant Perspective.” *International journal of environmental research and public health* 19, no. 6, (March): 3411. <https://doi.org/10.3390/ijerph19063411>
- Pollack, Seth D., Rasmus M. Birn, Barbara J. Roeber. 2017. “Early childhood stress exposure, reward pathways, and adult decision making.” *Proceedings of the National Academy of Sciences* 114, no. 51 (December): 13549-13554, <https://doi.org/10.1073/pnas.1708791114>
- “Rates of child abuse and child exposure to domestic violence,” Resource Center on Domestic Violence: Child Protection and Custody. (n.d). <https://www.rcdvepc.org/rates-of-child-abuse-and-child-exposure-to-domestic-violence.html>.
- Reupert, Andrea E., Darryl Maybery, and Nicholas M. Kowalenko. 2013. “Children whose parents have a mental illness: prevalence, need and treatment.” *The Medical Journal of Australia* 199, no. 3, (October): 7-9. <https://doi.org/10.5694/mja11.11200>.

- Sheffield, Julia M., Lisa E. Williams, Neil D. Woodward, and Stephen Heckers. 2013 “Reduced grey matter volume in psychotic disorder patients with a history of childhood sexual abuse.” *Schizophrenia Research* 143, no. 1 (January): 185–191.
<https://doi.org/10.1016/j.schres.2012.10.032>.
- “The WHO Prison Health Framework: A framework for assessment of prison health system performance.” World Health Organization Regional Office for Europe. Last modified 2021. <https://apps.who.int/iris/bitstream/handle/10665/344561/9789289055482-eng.pdf?sequence=3&isAllowed=y>
- Thompson, Lindsay A., Stephanie L. Filipp, Jasmine A. Mack, Rebeccah E. Mercado, Andrew Barnes, Melissa Bright, Elizabeth A. Shenkman, and Matthew J. Gurka. 2020 “Specific adverse childhood experiences and their association with other adverse childhood experiences, asthma and emotional, developmental and behavioral problems in childhood.” *Pediatric Research* 88, no.1 (February): 100-109,
<https://doi.org/10.1038/s41390-020-0784-y>
- Turney, Kristin. 2020. “Cumulative adverse childhood experiences and children’s health.” *Children and Youth Services Review* 119, (December): 1-14.
<https://doi.org/10.1016/j.childyouth.2020.105538>
- Van Duin, Laura, Floor Bevaart, Josjan Zijlmans, Marie-Jollette A. Luijks, Theo A. H. Doreleijers, André I. Wierdsma, Albertine J. Oldehinkel, Reshmi Marhe, and Arne Popma. 2019. “The role of adverse childhood experiences and mental health care use in psychological dysfunction of male multi-problem young adults.” *European Child and Adolescent Psychiatry* 28, no. 8, (January): 1065-1078, <https://doi.org/10.1007/s00787-018-1263-4>
- Van Duin, Laura, Michiel De Vries Robbé, Reshmi Marhe, Floor Bevaart, Josjan Zijlmans, Marie-Jollette A. Luijks, Theo A. H. Doreleijers, and Arne Popma. 2021 “Criminal history and adverse childhood experiences in relation to recidivism and social functioning in multi-problem young adults.” *Criminal Justice and Behavior* 48, no. 5, (January): 637-654, <https://doi.org/10.1177/0093854820975455>
- Watt, Toni. “Effects of childhood adversity linger during college years,” *The Conversation*. Last Modified July 21, 2021. <https://theconversation.com/effects-of-childhood-adversity-linger-during-college-years-163157>
- “What have ACEs got to do with Justice?” Justice Analytical Services, The Scottish Government. Last modified May 2018.
<https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2018/05/understanding-childhood-adversity-resilience-crime/documents/00535550-pdf/00535550-pdf/govscot%3Adocument/00535550.pdf>
- “World Bank Education Overview: Higher Education (English).” World Bank Education Overview Washington, D.C.: World Bank Group, October 1, 2018,
<http://documents.worldbank.org/curated/en/610121541079963484/World-Bank-Education-Overview-Higher-Education>.