International Journal of Psychological Studies; Vol. 16, No. 1; 2024
ISSN 1918-7211 E-ISSN 1918-722X
Published by Canadian Center of Science and Education

Mind Behind the Stressed Navigating Through the Nature, Nurture, and Stress Response of Early Life

Serena Ali[1]

[1] Arnold O. Beckman High School, Polygence Research, Irvine, California, USA

Correspondence: Serena Ali, Arnold O. Beckman High School, Polygence Research, Irvine, California, USA. E-mail: happyserena143@gmail.com

Received: December 25, 2023 Accepted: January 27, 2024 Online Published: January 29, 2024

doi:10.5539/ijps.v16n1p37 URL: https://doi.org/10.5539/ijps.v16n1p37

Abstract

This paper analyzes the connections between early life stress (ELS) and criminality in adults. Nature is the concept of how genetics influence an individual's personality. ELS over time can eventually lead to structural changes of the brain, chemical imbalances linked to mental illness such as depression, and aggressive behavior that can possibly bloom into adult criminal behavior (Thijssen, Ringoot, Wildeboer, et.al, 2015). Empirical evidence and scientific studies suggest that ELS combined with either nature and/or nurture aspects are factors that can predict or be used as a way to explain a child's future health and behavior (Thijssen, Ringoot, Wildeboer, et.al, 2015). This paper also analyzes evidence linking ELS to a child's future behavior (e.g., Kaufman and Zigler, 1987). Case studies and historical examples of crime (e.g., rape, murder, and battery) can illustrate the condition of ELS coupled with nature and/or nurture through the study of cases such as Richard Ramirez, Richard Chase, Jeffery Dahmer, and Aileen Wuornos. In the aforementioned cases, there is evidence that can possibly show the connection between ELS, coupled with the nature and nurture aspects, and criminal behavior.

Keywords: serial killers, stress, trauma

1. Introduction

The infamous serial BTK killer Dennis Rader once said "When this monster enters my brain, I will never know. But it's here to stay…maybe you can stop him…I can't…He has already chosen his next victim" (Simon, 2019, March 4). How is it possible for an adult like Dennis Rader to repeatedly partake in criminal behavior such as killing, torturing, or shooting another person? This paper attempts to provide one possible answer based on the theory of ELS coupled with nature and/or nurture aspects and the connection to criminal behavior. The analysis in this article will discuss how nature and/or nurture aspects of a child's early life can be identified and how either aspect could have a cumulative effect of trauma on that child, leading the child to suffer from ELS. In addition, either nature and/or nurture can further provide a catalyst in worsening the effects of ELS (Teicher et al., 2006). The effects of ELS coupled with either nature and/or nurture can lead to physiological changes in the brain structure, which in some cases can lead to criminal behavior (Teicher et al., 2006). Although there are many factors to consider when examining the question of why a person partakes in criminal behavior, ELS coupled with nature or nurture should be considered as one possible explanation. Finally, this paper will discuss how the nature aspect discussed above is a broad theory in the genetic sector of the nature aspect. As evident in the cases analyzed in this paper, the nature aspect almost always has a social factor as well. The nature theory for future risk of criminal behavior is based on both the genetic component coupled with social factors, such as emotional neglect, lack of treatment for mental illness, and self-isolation.

2. Literature Review

Stated in Neurobiological and Systemic Effects of Chronic Stress, neurobiological and neuroendocrine studies have spotlighted the impact of chronic stress development on the brain (McEwen, 2017). As stated in Teicher, "the main explanation of alterations states that ELS intervenes with synaptic overproduction and neurogenesis waves" (Teicher et al., 2006). This means that based on research, ELS can change the development of the brain. As stated in Dialogues of Clinical Neuroscience, "Early life is a critical period of plasticity for brain development and is highly sensitive to adverse experiences such as stress exposure. Indeed the consequences of stress on mental health are more severe when experienced early in life. Early life stress (ELS), including child maltreatment, parent neglect, undernutrition, or sexual abuse, increases the risk for depression and other stress-related disorders later in life by two-to fourfold" (Torres-Berrio, 2019).

Research in psychiatry has shown that stress in childhood can increase the risk of major depressive disorder (MDD) and is associated with altered brain structure (Saleh et al., 2016b). As stated in the research article by Frontiers in Psychiatry titled "Relationship between Depression and Subtypes of ELS in Adult Psychiatric Patients," 70% of patients with emotional abuse were found to have 4.38 times of occurrence of depression. In addition to depression, ELS can also cause structural changes in the brain. As stated in the article by Holmes titled How Emotional Abuse in Childhood Changes the Brain, "childhood emotional abuse can result in permanent changes to the development of the human brain." One such change can decrease the size of the corpus callosum and the hippocampus. As stated in Dialogues of Clinical Neurosciences, the mesocorticolimbic system of the brain is comprised of the prefrontal cortex, ventral tegmental area, nucleus accumbens, hippocampus and amygdala, which are regions of the brain involved in the regulation of cognitive function, emotion and mood and is very sensitive to the effects of stress during early life (Torres-Berrio, 2019). In general, trauma at a young age can lead to ELS, which links to subsequent brain development (Pechtel, & Pizzagalli, 2010). The effects of ELS coupled with nature and/or nurture aspects such as DNA, or environment could further create additional stress thereby further exasperating ELS which can affect subsequent brain development (Pechtel, & Pizzagalli, 2010).

School and outside environments can also add to stress and corrupt the development of the brain, especially in the case of the nature aspect (Collins et al., 2000). For example, a child raised in an impoverished household may have different outcomes in education, occupation, and mental health, given the interactions of nature and nurture over time (Collins et al., 2000). In addition, there is empirical evidence that "children growing up in impoverished communities with high crime and poverty may be at increased risk for both internalizing and externalizing symptomatology" (Pechtel & Pizzagalli, 2010). Symptomatology is defined as the collective symptoms of a patient. A recent study published in March 2021 found that growing up in a disadvantaged neighborhood can alter brain functions such as memory, planning, and goal setting. Fifty percent of these brain alterations are associated with decreased cognitive function in children due to the environment (Rakesh, 2021). As stated in Encyclopedia of Life Science, "Criminal behavior is the multifactorial product of an interaction between our genes and our environment" (Jennifer Bostock, 2005).

To further examine the relationship between ELS, nature and nurture aspects and their possible connection to criminal behavior, cases of notorious serial killers including Richard Ramirez, Jeffery Dahmer, Richard Chase, and Aileen Wuornos are analyzed. While a lot of research has looked at ELS, little work has connected it to criminal behavior. By looking at these case studies, one could further understand the interplay of ELS coupled with nature and/or nurture factors and the possible connection to criminal behavior.

2.1 Richard Ramirez, the "Nurture" Example

An example of a real-life scenario that possibly shows ELS coupled with the nurture aspect is demonstrated in the notorious case of serial killer Richard Ramirez, nicknamed "The Night Stalker." This case highlights the association between ELS caused by stress due to the nurture aspect and later how ELS coupled with nurture possibly led to adult criminal behavior. Richard Ramirez, whose full name is Ricardo Leyva Munoz Ramirez, was born on February 29, 1960, in El Paso, Texas. When Ramirez was 12 years old, a cousin showed him pictures of Vietnamese women whom he raped and killed, and in that same year, he witnessed this cousin shooting his wife (The Editors of Encyclopedia Britannica., 2017). In addition, Ramirez's father, Julian, who was an ex-cop with anger issues and allegedly physically beat the whole family, including Ramirez, who constantly avoided contact with his father. Ramirez's mother was neither physically nor emotionally abusive. However, she did nothing to protect herself and her children as her spouse continued to beat his family over the span of many years (Uprety, 2022b). These instances are examples of the nurture aspect discussed above since Richard's environment likely shaped his early childhood social development. The nurture aspect here likely led to ELS for Ramirez and later one contributed to worsening the effects of ELS because rather than being raised in

a loving, non-violent household in his early adolescence, Ramirez experienced continuous physical and psychological abuse. Through this nurture aspect of Richard's early childhood, he likely endured a cumulative effect of trauma, which likely led him to suffer from ELS (Raga, 2021). As he grew older, Ramirez began committing crimes such as burglary and grand theft auto (The Editors of Encyclopedia Britannica., 2017). He later dropped out of high school to his parents' dismay and moved to Los Angeles (The Editors of Encyclopedia Britannica., 2017). He committed his first significant crime in June of 1984 by raping and stabbing a 79-year-old woman (The Editors of Encyclopedia Britannica., 2017). Eight months later, Ramirez began his career as the notorious "Night Stalker" (The Editors of Encyclopedia Britannica., 2017). Ramirez would go down a spiral causing his crimes to become grislier (The Editors of Encyclopedia Britannica., 2017). This likely shows that the nurture aspect further worsened Ramirez's ELS in his teenage years. As a result of the worsened ELS, Ramirez developed a personality disorder and committed 12 more murders and many other crimes, such as rape, satanic rituals, and burglary (The Editors of Encyclopedia Britannica., 2017). As discussed above, through the nurture aspect of Richard's early childhood, he likely endured a cumulative effect of trauma, which likely led him to suffer from ELS response (Raga, 2021). ELS may have led Richard to discontinuing brain growth (Epstein, 1986). As stated in the article, "How Emotional Abuse in Childhood Changes the Brain," childhood emotional abuse can result in permanent changes to the human brain, such as a reduction in the size of the corpus callosum and the hippocampus. In addition, ELS coupled with the nurture aspect likely played a role in his adult life because there was no one in Richard's life to give him the love or safe environment he needed as an adult. Although there are likely many different explanations as to why Richard Ramirez became a serial killer, one explanation is because of ELS coupled with the nurture aspect of his early childhood. The trauma in his early childhood likely led him to suffer from continued ELS, which in turn likely led to the discontinuation of brain growth.

As discussed in "Can Genes and Brain Abnormalities Create Killers?", not all brain abnormalities lead a person to kill. However, there is a link between brain abnormalities and killing behavior in relation to abnormalities or discontinued growth in certain areas of the brain.

2.2 Jeffery Dahmer, the "Nature and Nurture" Example

The principle of nature involves understanding how inherited processes define and guide the brain development, behavior, and the neurobehavioral system (Collins et al., 2000). In the Collins article it states that certain characteristics that the parent is born with can pass on to the child via genetics and possibly put them at risk of developing behavior and psychological problems (Collins et al., 2000). The passing of certain behavioral characteristics from parent to offspring is discussed in Dialogues Clin Neurosci. In the article it is stated that certain behavioral characteristics such as bipolar disorder have a strong genetic component. As disclosed in Understanding the different causes of bipolar disorder, if one parent suffers from bipolar disorder, there's a 10% chance it could pass down to his or her offspring. The percentage goes up to 40% if both parents are diagnosed with bipolar disorder. This means that if both parents are diagnosed with bipolar disorder, there is a 40% chance that their offspring will also have bipolarism due to the parent's genetics being passed on to their offspring. In some cases, genetics can be inherited not by the parents but the generation before such as grandparents or even further up the family tree. It should be noted that similar to the nurture aspect, nature, which can be inherited behavior genetics, can lead to a cumulative effect of trauma on that child, which can lead the child to suffer from ELS. ELS due to nature can also lead to adult criminal behavior (Reavis, 2013). The nature aspect, which includes genetics, can be inherited by a person from family members. In some cases, social factors such as isolation may combine with genetics to produce ELS. The social factors are likely in the category of the nurture aspect. This is an example of ELS coupled with both nature and nurture aspects. Sometimes this combination can result in a person with a mental health genetic disposition who suffers from ELS growing up and commits crimes as an adult. These aspects will be analyzed in the subsequent paragraphs.

A possible case example of ELS coupled with both nature and nurture aspects is demonstrated in the case of "The Milwaukee Monster", also known as Jeffery Dahmer. This case exemplifies the nature aspect as it pertains to genetics and how his mother, Joyce Dahmer, reportedly had mental illnesses such as dysphoria and anxiety before and after she gave birth to Jeffery Dahmer. His father, Lionel Dahmer, was quoted as saying that he always dreamed of committing murder as a child and was obsessed with fire and bombs (The Roanoke Times, 1994). It is possible that Dahmer was predisposed to his family's mental disease due to their genetics. The genetic disposition from the nature aspect likely led Dahmer to initially suffer from ELS. However, in addition to the nature aspect, Dahmer experienced long periods of isolation, which is a nurture aspect, which likely further worsened the effects of Dahmer's ELS. Dahmer did not engage in socialization throughout school and was reserved (Casey et al., 2004). This is likely because Dahmer was also suffering from a mental disease he

inherited from his family. Jeffrey Dahmer exhibited signs of extreme shyness and was diagnosed with Asperger's Syndrome, Paraphilia, Schizotypal personality disorder, depression and compulsive obsession with fire and bombs at a young age (Casey et al., 2004). The trauma on Dahmer because of his inherited mental disease likely led him to suffer from ELS. In Dahmer's case he also suffered from social factors such as isolation which is a nurture aspect. This combination of ELS coupled with nature and nurture likely led Dahmer to become the violent person he became as an adult. This was evident since Dahmer began to exhibit signs of unusual behavior, such as playing with the bones of small animals under the crawl space in his home (Casey et al., 2004). He found pleasure in the bones' noise when they fell together (Casey et al., 2004) As Dahmer failed out of high school, he began to kill small animals (Casey et al., 2004). Dahmer's first homicide occurred three weeks after his high school graduation. He violently beat Steven Hicks with a 10lb dumbbell to death (Casey et al., 2004). Thereafter, Dahmer continued to dissect, dissolve, and dismember Hicks' remains and hide them in his backyard. Nine years later, Dahmer committed a series of grisly murders by rape, torture, cannibalism, and dissection of his victims (Casey et al., 2004). On January 30, 1992, Dahmer was convicted of 15 murder charges, and sentenced to 957 years in prison (Sullivan, C., 2022). Dahmer died on November 28, 1994, on the way to the hospital from an attack by his cellmates (Sullivan, 2022). Dahmer's case is an example of ELS caused because of the nature aspect and later worsened by the nurture aspect.

The combination of ELS caused by the nature aspect coupled with subsequent nurture aspects such as social isolation can result in a person like Dahmer who grows up and commits crimes as an adult.

Not every case of the nature factor in the behavioral development of a child, such as inherited behavioral genetics, leads to a person becoming a serial killer. Dahmer is an example of an extreme case. Behavioral genetics coupled with social factors, as well as lack of medical treatment can lead to ELS, which can possibly cause a person to become violent and commit crimes as an adult (Npr., 2010). This could mean that even if a person suffers from a genetic disposition to mental health issues, if the person is nurtured, it could help reduce ELS effects suffered by that person. Perhaps if Dhamer was taken to a physician to seek medical treatment for his mental health issues and was also nurtured by loving parents who cared for him, his adult life may have been different even if he was genetically predisposed to his mother's mental health issues. In nature aspect cases discussed in this paper, there is always a social factor. As stated in the article Psychiatric Illness and Criminality, there is a link between certain psychiatric conditions and propensity to commit crime. In the article it states that certain psychiatric conditions do increase a person's risk of committing a crime. The article further suggests that patients with mental illness may be more prone to violence if they do not receive adequate treatment. The adequate treatment is an example of the nurture aspect. In addition, his parents divorced, which also led to worsening of his already damaged psychological state (Sullivan, 2022). The divorce of his parents possibly took away from the needed nurture aspect he needed as a child. As stated above, when dealing with the nature aspect, the genetic component as well as the social aspect or the nurture aspect, combined with ELS could lead the child to later commit crimes as an adult.

2.3 Richard Chase, the "Nurture" Example

Another example of the nurture aspect is demonstrated in the case of serial killer Richard Chase. Similar to Richard Ramirez, Chase exemplifies how a broken environment, or the nurture aspect of a child can lead to ELS which could later turn the person into a violent adult. Chase was a native of Sacramento, California, and was born on May 23, 1950, to Richard Chase Sr and Beatrice Chase (Crime Museum, LLC., 2021). During 1977-1978 he killed his victims and drank his victims' blood, earning him the nickname "The Vampire of Sacramento." In the 50s, the whole "nuclear" family idea was strong in place, where the male figures, such as the father, were the most powerful in the family. Chase was force-fed by his father at two years of age until he vomited (Crime Museum, LLC., 2021). Later on, Pamela Chase, Richard Chase's sister, would recall her father repeatedly shaking or throwing his son against the wall (Crime Museum, LLC., 2021). It is possible that the ELS caused by Chase's abusive parent, led to Chase's mental illness, or changes in the size of his cortex and amygdala of the brain (Thijssen, Ringoot, Wildeboer, et.al, 2015). These chemical imbalances and/or structural changes could lead to aggressive behavior, which was later displayed by Chase, in environments where said problems were not given adequate medication and/or support (Thijssen, Ringoot, Wildeboer, et.al, 2015).

As Chase grew up, he was not only physically abused but emotionally abused as well. This is an example of the nurture aspect and was likely the catalyst that led Chase to suffer from ELS as a child. Additionally, the continued abuse is an example of how the nurture aspect can further worsen the effects of ELS. On the outside, the Chases seemed like a picture-perfect family, but as Beatrice and Richard Sr.'s marriage began to crumble, they became negligent in caring for their children. They had not noticed that Chase had already started to exhibit the stages of the "Macdonald triad," which is actions of "nocturnal enuresis, cruelty to animals, fire setting, and

parental abuse" (Parfitt, & Alleyne, 2018b). Since the delicate growth of Chase's brain had likely been stunted by ELS coupled with the nurture aspect, it directly sent Chase down a path similar to Richard Ramirez's path of criminal behavior. As he grew older, Chase began to drink and abuse drugs such as LSD and marijuana (Crime Museum, LLC., 2021). Chase became a patient in many mental institutions and claimed that his blood was turning into powder. Chase was found with blood on his face many times, which he tried to cover up as a "shaving accident" (Crime Museum, LLC., 2021). In 1977, Chase disemboweled and drank the blood of a pregnant 22-year-old Terry Wallis (Crime Museum, LLC., 2021). In 1979, Chase was on trial for six counts of murder. Richard Chase received a death sentence because his defense lawyer attempted to accuse him of second-degree murder instead of first. His inmates constantly taunted Richard to kill himself (Crime Museum, LLC., 2021). Before his penalty, Chase was offered medicine, and instead of taking it, he stored it until he had enough to overdose (Crime Museum, LLC., 2021). Chase died at 30 on December 26, 1980 (Crime Museum, LLC., 2021). The two ELS coupled with the nurture aspect examples, Richard Ramirez and Richard Chase, both demonstrate the drastic effects of the ELS coupled with the nurture aspect. In both cases, the nurture aspect had a cumulative effect of trauma on both subjects, which likely led both Ramirez and Chase to suffer from ELS, which eventually likely led them to commit crimes as adults.

2.4 Aileen Wuornos, the "Nature and Nurture" Example

Another example of the nature and nurture aspect is demonstrated in the case of the "Damsel of Death", serial killer Aileen Wuornos. Wuornos's father, Leo Pittman, was diagnosed with schizophrenia and was serving a life sentence during Wuornos's childhood for kidnapping and raping a young girl (Kettler., 2023). There is speculation that Wuornos's mother also suffered from mental health issues. As stated in the article "Is Schizophrenia Genetic?" There is a 79% chance of developing schizophrenia due to genetics. Therefore, according to research there is a strong likelihood that mental disease such as schizophrenia can be passed from parent or family such as grandparents to child genetically. Wuornos was diagnosed with borderline personality disorder and antisocial personality disorder, which she likely inherited from her family. However, as discussed above, mental disorders coupled with other detrimental factors can have a cumulative stress effect, which can likely lead to ELS. This was the case for Wuornos since she learned that her father had committed suicide in prison. Also, Wuornos lived with her grandfather who did not provide love or care for Wuornos. Her grandfather was an alcoholic that had sexually and physically abused her when she was a child. This means that Wuornos did not receive the needed nurture aspect she was longing for but rather she, similar to Dhamer, endured social isolation, which is an example of the nurture aspect. Wuornos likely suffered from ELS due to the nature aspect since she had inherited her family psychological disorders. In addition, she suffered from the nurture aspect due to her traumatic childhood due to the isolation, neglect and abuse she suffered at the hands of her grandfather. The ELS coupled with nature and nurture aspects likely all played a role in her becoming an adult with aggressive behavior and mental illness. In addition, since she was not treated with care and nurture, this likely led to her becoming a serial killer as an adult, killing seven men in cold blood (Kettler, 2023). Wuornos was executed on October 9, 2002, by lethal injection after spending 10 years on death row (Aileen Wuornos, 2023).

3. Conclusion

The cases of Richard Ramirez, Jeffery Dahmer, Richard Chase, and Aileen Wuornos each demonstrate the contributions of ELS coupled with nature and/or nurture. In each case whether it was nature and/or nurture, the subject's brain was exposed to an accumulation of stress due to either nature and/or nurture and the end result of a continuous exposure to stress leads the person to experience ELS. Long term ELS in each of the cases listed above likely led each of the people to commit major crimes. Although there is not a single formula that can definitively and concretely be used to predict the next serial killer, factors such as a child's environment, history of abuse or violence in the child's life, continued childhood stress, mental illness in the family and family genetics can be factors that can be used to better understand or even predict the likelihood of future criminal behavior in the child's adult years.

References

Bostock, J., & Adshead, G. (2016). *Criminal Responsibility and Genetics*. In eLS, John Wiley & Sons, Ltd (Ed.). https://doi.org/10.1002/9780470015902.a0005194.pub2

Carlo. (2006). *The night stalker: The life and crimes of Richard Ramirez*. Pinnacle Books.

Casey, V., Clagett, L., Allen, B., & Williams, L. (2004). *Jeffrey Dahmer*. https://www.serialkillercalendar.com/images-serial-killers/male.D/images/dahmer-jeffrey/docs/jeffrey-dahmer-info.pdf

Collins et al. (2000). *Contemporary research on parenting*. The case for nature and nurture. (2000, February 1). PubMed. https://pubmed.ncbi.nlm.nih.gov/10717969/

Crime Museum, LLC. (2021, August 13). *Richard Trenton Chase - Crime Museum*. Crime Museum. https://www.crimemuseum.org/crime-library/serial-killers/richard-trenton-chase

Epstein, H. (1986). *Stages in human brain development, Developmental Brain Research, 30*(1), 114-119. https://doi.org/10.1016/0165-3806(86)90139-2

Fouche. (2014, August 1). *Richard Trenton Chase: a psychobiography of the "Dracula Killer".* https://scholar.ufs.ac.za/handle/11660/9764

Ghiasi N, Azhar Y, & Singh J. (2023). *Psychiatric Illness and Criminality*. Mar 30. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–. PMID: 30725749.

Holmes, L. (2021). *How Emotional Abuse in Childhood Changes the Brain*. https://www.verywellmind.com/childhood-abuse-changes-the-brain-2330401#:~:text=The%20most%20obvious%20changes%20were,mental%20health%20issues%20later%20on

Jenkins. (2023, May 17). *Jeffrey Dahmer*. Encyclopedia Britannica. Biography. https://www.britannica.com/biography/Jeffrey-Dahmer

Kaufman, J., & Zigler, E. (1987). Do Abused Children Become Abusive Parents. *American Journal of Orthopsychiatry, 57*, 186-192. https://doi.org/10.1111/j.1939-0025.1987.tb03528.x

Kettler, S. (2023, December 19). *Aileen Wuornos, Biography*. https://www.biography.com/crime/aileen-wuornos

McEwen B. S. (2017). Neurobiological and Systemic Effects of Chronic Stress. *Chronic stress (Thousand Oaks, Calif.), 1*, 2470547017692328. https://doi.org/10.1177/2470547017692328

Npr. (2010, July 6). *Can Genes and Brain Abnormalities Create Killers*? https://www.npr.org/2010/07/06/128339306/can-genes-and-brain-abnormalities-create-killers

Parfitt, C., & Alleyne, E. (2018b). Not the Sum of Its Parts: A Critical Review of the MacDonald. *Triad. Trauma, Violence, & Abuse, 21*(2), 300-310. https://doi.org/10.1177/1524838018764164

Pechtel, P., & Pizzagalli, D.A. (2010). Effects of early life stress on cognitive and affective function: an integrated review of human literature. *Psychopharmacology, 214*(1), 55-70. https://doi.org/10.1007/s00213-010-2009-2

Raga, P., & Raga, P. (2021). *Richard Ramirez's Siblings: Family & Childhood of the "Night Stalker."* https://www.distractify.com/p/richard-ramirez-siblings

Rakesh, D., Zalesky, A., & Whittle, S. (2022). Assessment of parent income and education, neighborhood disadvantage, and child brain structure. *JAMA Network Open, 5*(8). https://doi.org/10.1001/jamanetworkopen.2022.26208

Reavis, J. (2013). *Adverse childhood experiences and adult criminality: how long must we live before we possess our own lives*? https://doi.org/10.7812/TPP/12-072

Saleh et al. (2016b). Effects of early life stress on depression, cognitive performance and brain morphology. *Psychological Medicine, 47*(1), 171-181. https://doi.org/10.1017/S0033291716002403

Saloman, L. (2022, November 29). *Is Schizophrenia Genetic*? Psycom.net. https://www.psycom.net/schizophrenia/schizophrenia-signs-causes/is-schizophrenia-genetic

Simon. (2019, March 4). *Monster returns to taunt - Los Angeles Times*. Los Angeles Times. https://www.latimes.com/archives/la-xpm-2004-apr-23-na-btk23-story.html

Sullivan. (2022). *Jeffrey Dahmer Biography: The Cannibal Killer.* Biographic. https://biographics.org/jeffrey-dahmer-biography-the-cannibal-killer/

Teicher, M. H., Tomoda, A., & Andersen, S. L. (2006). Neurobiological consequences of early stress and childhood maltreatment: are results from human and animal studies comparable?. *Annals of the New York Academy of Sciences, 1071*, 313-323. https://doi.org/10.1196/annals.1364.024

The Editors of Encyclopedia Britannica. (2017, September 20). Richard Ramirez | Biography, Night Stalker, Death, Childhood, & Facts. *Encyclopedia Britannica*. https://www.britannica.com/biography/Richard-Ramirez

Thijssen, S., Ringoot, A.P., … Wildeboer, A. et al. (2015). Brain morphology of childhood aggressive behavior: A multi-informant study in school-age children. *Cognitive Affect Behavior Neuroscience 15*, 564-577. https://doi.org/10.3758/s13415-015-0344-9

Torres-Berrío, A., Issler, O., Parise, E. M., & Nestler, E. J. (2019). Unraveling the epigenetic landscape of depression: focus on early life stress. *Dialogues in clinical neuroscience, 21*(4), 341-357. https://doi.org/10.31887/DCNS.2019.21.4/enestler

Uprety, A. (2022b). *Mercedes Ramirez: Everything To Know About Richard Ramirez's Mother*. CelebSuburb. https://celebsuburb.com/mercedes-ramirez-everything-to-know-about-richard-ramirezs-mother/