

# **The Correlation Between Childhood Adversity and Specificity of Murder in American Serial Killers**

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## **ABSTRACT**

Previous research has shown that childhood adversity or childhood trauma has a direct relationship to most aspects of adult life. Many studies have demonstrated correlation between health, behavior, career and relationships to childhood adversity. Several researchers have also determined that childhood adversity has a direct relationship to the development of psychopathic tendencies in youths as well as the possibility to go on and commit violent crime, such as serial murder. Pre-existing research has also shown that greater specificity or consistency in a serial crime is linked to childhood trauma, specifically their abuser or abusers.

This study is an exploration of the difference between the specificity of male and female committed serial murders and the effect that their level of childhood trauma may have on it. The Adverse Childhood Experiences Scale (hereafter referred to as the ACE Scale) and the Specificity of Serial Murder Scale (hereafter referred to as the SSM Scale) were used to determine ACE Score and SSM Score, respectively. 60 serial killers were selected and categorized using information about childhood trauma and specificity in their serial crime with the ACE Scale and SSM Scale. It was expected that ACE Score and SSM Score would show a positive correlation.

**Keywords:** childhood adversity, serial murder, serial killer, psychopathy, psychopathic tendencies, modus operandi, specificity

## **INTRODUCTION**

In 2016, the United States saw a 5.3% increase in violent crimes, overall. There was at least a 0.1% increase of violent crimes in every state. That's about 62,000 more violent crimes than the previous year across the country and about 2,000 more per state. In 2019, the U.S. saw a 7.1% increase in homicides from 2018. About 4,000 more homicides than preceding years. The study of specificity correlation to childhood trauma hopes to be able to predict the probability of violent offenders and the characteristics of their victim pool. It also hopes to decrease homicidal behaviors overall.

## **Typology: Male vs. Female**

Serial killers are defined as someone who commits the premeditated, intentional killing of three or more victims, with a cooling-off period between killings of at least one week [1, 2, 3]. A consistent trait between serial killers is the presence of psychopathy or psychopathic tendencies. Primary psychopathy is defined as a mental disorder that cuts off certain emotional responses in the individual. It also shows a lack of empathy and a display of arrogant and callous behaviors. As children, psychopaths will have tendencies to hurt animals and peers without remorse and/or setting small fires that progressively get

larger and more violent as time goes on. Psychopathic tendencies are most often found in pre-pubescent or teenage boys. When symptoms are not caught quickly and handled, the individual has high potential to devolve into a violent offender. This is consistent with information about serial killers. Most commonly, serial killers are male. However, despite the claims of several researchers in the examination of serial murder that there are no female serial killers, or a limited number of them, serial murders committed in the last fifty years have revealed a great number of female serial killers. The reason for the misinformation regarding female serial killing populations is that many female serial killers are not often caught or prosecuted due to their “cleaner” kills and superior post-mortem care of incriminating evidence. Due to the clear distinction between male and female serial killers, there have been attempts to establish characteristics of female serial killers, which already exist for males. Within these characteristics, homicidal behavioral traits are discussed, as well as the variation of psychopathy as seen between male and female serial killers [1].

Even with a new typology the motive and modus operandi of male and female serial killers differ widely [1]. Harrison discusses the evolutionary reasoning behind the differences between male and female serial killers. They are compared to a hunter-gatherer, pre-Neolithic model, linking female serial killers with gatherers and their male counterparts to hunters. Women are described as gatherers due to their common familiarity with their victims

and the motive for financial or material gain or safety as a direct result to the death. Men are akin to hunters due to their predatory nature when finding and killing a victim. The murder is often pre-ambled with stalking, threats and/or possessiveness [1, 2].

This data is backed by the FBI's Expanded Homicide Data of the U.S. which declares that homicides are most often committed by males [2, 3]. The Expanded Homicide Data for the nation is derived from summary (SRS) and incident (NIBRS) reports voluntarily submitted to the FBI. In 2018, the FBI Expanded Homicide Crime statistics for the nation were based on 16,609 of 18,815 law enforcement agencies in the country. The statistics from the last ten years (2008-2018) show about 10x more male offenders than female offenders. 10,639 total male offenders were reported. In comparison the female populous had one-tenth of that number, with only 1,511 reported offenders. 4,572 offenders were of an unverified sex [3]. The clear dissonance in psychopathy between males and females concedes that distinct environments and trauma manifest in male versus female serial killers differently.

### **Environmental & Parental Influence on Psychopathic Tendencies**

Many studies suggest that environment and parenting are the leading factors in the development of psychopathy in adolescents [4, 5]. It's found that generally as a child's trauma increases, their likelihood of retaining psychopathic tendencies also increases. It has also been remarked upon that even if a child *does*

display psychopathic tendencies and is diagnosed with psychopathy, it does not necessarily mean that that child will go on to become a murderer and/or criminal of any sort. Vice versa, if a child hasn't experienced childhood trauma or doesn't have early psychopathic markers it does not mean that that child will 100% *not* become a criminal. It is hypothesized that psychopathy manifests adverse qualities in young boys vs. young girls due to a generally sexist societal standard that females are held to and therefore a harsher and stricter upbringing. Research studies with antisocial children have posited that multiple etiologies, including ineffective parenting, can produce psychopathic traits. A study evaluated 136 Hispanic females and found that poor parenting predicted psychopathology and poor behavioral controls using the ACE Study. This study employed the same method to diagnose serial killers with adverse childhoods and/or trauma [5]. The effective clinical interventions with antisocial children should focus on improving the quality of parenting. However, stricter parenting and not just "bad" parenting has been shown to increase chances of psychopathology as well [5]. The chance of a stricter or harsher upbringing manifests within serial crimes to a varying degree. Male populations are generally more susceptible or sensitive to adverse parenting. The Hispanic female population is generally subjected to harsher and stricter parenting compared to both white females and Hispanic males. The conjunction of sexism in parenting and the culture of physical punishments, often seen in ethnic

households, contributes to the development of psychopathy in young Hispanic females [4, 5].

### **Childhood Trauma in Relation to Psychopathic Tendencies**

Even though females are generally subjected to greater trauma and/or harsh parenting, it has been observed that the female psyche is better equipped to handle childhood trauma [4, 5]. Overall, childhood traumatization is expected to have a significant impact on the development of antisocial and aggressive behavior in adulthood. Psychopathy is a syndrome that can predict future violent and aggressive behavior in adults and is therefore believed to be associated with early traumatization. The association between early childhood victimization and violence might at least be mediated through psychopathy. A 2003 study examined the relationship between early emotional, physical or sexual trauma and neglect and psychopathy in incarcerated delinquent female and male juveniles using the Childhood Trauma Questionnaire (CTQ) and the Psychopathy Checklist—Youth Version (PCL-YV). A sample of detained adolescents ( $n = 185$ ) was compared to adolescent students ( $n = 98$ ). Gender differences were also analyzed with respect to the association of trauma and psychopathy. The analyses revealed higher scores of traumatization in delinquent juveniles compared to school adolescents. Hypothesized relationships between physical traumatization and the PCL-YV total score could be confirmed among criminal boys, but not among criminal girls.

Results, therefore, indicated that an association exists between early physical, but also emotional traumatic experience and psychopathy in detained boys [6]. In girls, however, other family-related variables, such as non-parental living arrangements seemed to be more influential in developing the psychopathy syndrome than traumatization. This explains and corroborates the FBI's statistics as well as Hickey's findings of the lower rate of criminal offenses committed by females as well as their moderate typology [1, 2, 3, 6].

### Specificity in Previous Studies

Specificity is a very new variable, still relatively unknown to the field of criminal psychology. There has yet to be any literature published regarding specificity and no measures to determine specificity besides the SSM Scale (2019) or the SSM Scale Revised (2020). However, even considering the lack of literature and scientific backing that specificity has, it is a reasonable and measurable variable to include in the study of serial killers and murderers in general. It can be reasonably inferred that if consistency or specificity is high between killings, then serial killers have a very specific drive for killing. The study of specificity would greatly benefit the practice of profiling and better help protect and identify potential victims in the future as well as develop a better understanding of serial killers and their urges to kill.

### Specificity as Defined by the SSM Scale

Greater specificity or consistency in a serial crime is linked to childhood trauma, as serial killers often use their victims as surrogates for childhood abusers. The denotation of specificity by Merriam-Webster is as follows: *The condition of being peculiar to an individual or group of organisms* [10]. In the terms of this study however, specificity will henceforth be defined as: *The consistency of a serial killer within a set of murders or a serial killing. Determined through the consistency in victimology, modus operandi and geography* [11]. Victimology is defined as a set of traits or characteristics that contributes to an individual's victimization. Examples of this are hair color, profession and sex. Modus operandi is the pattern of behaviors someone follows to achieve a particular outcome, repeatedly. In serial killers this is how they kill their victims and how they dispose of them afterwards. Geography, in the context of serial murder, refers to where the murders were committed and where the victims were disposed of after the fact. Meaning that when a serial killer is 100% consistent throughout their murder and no aspect of the murders change, the killer is defined as a **highly specific** serial killer. In opposition, when a killer varies throughout their murders, their specificity decreases. In a direct cause and effect relationship, as variation increases, specificity decreases and as variation decreases, specificity increases.

## **TASK / HYPOTHESIS**

This study hopes to be able to determine the relationship between childhood adversity and specificity in a serial murder.

**Hypothesis A:** Childhood adversity contributes to an increase in specificity in a serial crime.

**Hypothesis B:** If childhood adversity is a contributor to specificity, the rate at which specificity increases in male serial killers is greater than the rate of specificity growth in female serial killers.

### **Validation for Hypothesis B**

Psychopathy is found to increase as childhood adversity increases so it is reasonable to assume that as specificity increases, which is believed to be influenced by psychopathy, childhood adversity will also be at a positive incline. It is also reasonable to hypothesize that males will react more aggressively to child adversity because males react more aggressively to psychopathy and are ill equipped to mentally handle childhood adversity or trauma compared to females.

## **METHODS & MATERIALS**

This study employed mass media to access archival data on serial killers, a common method used by investigators in this field [7, 8, 9]. The data that was collected was used to determine scores using the SSM Scale and ACE Scale, to measure specificity and childhood adversity, respectively. Verifiable data sources were consulted for information on offenders in the United States who have committed serial murder from any date to now (2020). Several different search engines were used as well as Murderpedia.org.

Murderpedia.org served as a reliable source of names and a pool of reputable news sources and newspapers. Murderpedia entries are confirmed to be 100% true and reliable [2]. However, Murderpedia did not serve as the only source. It was found that most serial killer profiles did not provide 100% of the information required, such as childhood experiences or victim profiles. As

a result, time was dedicated to finding other online sources, such as archived newspapers and crime scene reports and vetting them for accuracy and consistency.

### **Participants**

Serial killers that had been active in the United States alone were selected to control for differences in political climate, culture and upbringing standards and practices. 40 male serial killers with 5+ victims and 20 female serial killers with 3+ victims were looked at. Considering the lack of female serial killers and information about them, the population of female serial

killers was half that of the male population, however this did not disrupt the study because this condition creates an appropriate representative sample. The victim pool of 5 or more for male serial killers was made to ensure that any pattern or consistency in their victimology, modus operandi or geography that can be identified is a purposeful decision and not a coincidence. The number of victims was also considered due to the time it takes serial killers to develop an M.O. 2-3 murders are consistent with how long it takes for police to recognize a serial killing as well. Any less than 5 victims might see a pattern of randomness and inconsistency. The female victim pool was chosen for the same reasons; however, it is smaller since female serial killers generally have a very small volume of victims compared to their male counterparts, about 1 victim per every 3-4 victims of a male serial killer.

**Measure for Specificity**

Each of the serial killers were vetted to confirm that they fit the criteria. Each individual offender must have 3+ or 5+ victims (dependent on the gender of the serial killer) and a readily available record of their childhood. The number of total victims was determined (**victims + escaped victims + planned victims**) to act as the divisor for the Specificity of Serial Murder Scale (SSM Scale) developed by Reeti Patel. The SSM Scale was used to determine the specificity of all serial murders that were looked at. The greatest percent of consistency was found by finding the

percent affected in each category. For example:

**number of victims with blonde hair ÷ by total number of victims = some decimal value → percent value rounded to the nearest whole number, is the percent of victims with blonde hair;**

12 victims with blonde hair ÷ 15 total victims = 0.8 → 80% of victims had blonde hair, compared to brown hair (2 ÷ 15 = .13 → 13%) or red hair (1 ÷ 15 = 0.06 → 6%).

Blonde hair occurs at the greatest frequency (**6% < 80% > 13%**) therefore that is the value that will be used when assessing total specificity for the category of Victimology: Hair Color. Each percent was then converted into a single digit value from 1 (lowest specificity) to 5 (highest specificity) using a conversion scale:

0%-25%	26%-45%	46%-65%	66%-85%	86%-100%
→ 1	→ 2	→ 3	→ 4	→ 5

The blonde-haired victims in this situation would have received a final score of 4 due to being 80% consistent or specific.

The final scores for each category:

Victimology	M.O.	Geography
Age of Victims	Cause of Death	Kill Sight of Victims
Race of Victims	Signature of Killer	Disposal Sight of Bodies
Hair Color of Victims	Disposal Method of Bodies	
Sex of Victims	Ante- Mortem Rituals	
Sexual Orientation of Victims	Post- Mortem Rituals	

were added together to determine a final SSM score from 0-60.

The simplified quantification of data is highly necessary to be able to compare more than 10 different variables with one number.

### **Measure for Childhood Adversity**

Childhood Adversity was measured using the ACE Scale, first developed and utilized by CDC-Kaiser Permanente. The ACE Scale asks a series of yes or no questions. For every “yes” a person answers they gain a point towards their ACE Score, the higher the score the more adversity or trauma they faced as a child. A total of 17 points can be gained on a generally administered ACE Survey. To answer the ACE Survey, research of the individual serial killers was completed through online resources. No interviews were conducted. For this reason, question 4 (*Did you often or very often feel that... No one in your family loved you or thought you were important or special? Or Your family didn't look out for each other, feel close to each other, or support each other?*) and question 5 (*Did you often or very often feel that... You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? Or Your parents were too drunk or high to take care if you or take you to the doctor if you needed it?*) were omitted. Both questions address the feelings of an individual and these questions cannot be addressed with impersonal research. Question 1b (*Did a parent or other adult in the household often or very often... act in a way that made you*

*afraid that you might be physically hurt?*) was answered using context. For example, if the child *was* physically hurt or the parent was described as a violent individual, then question 1b was answered with a yes.

## RESULTS

The final results were analyzed using two Linear Regression T Tests. Test A was used to determine the p-value of the male data (Figure 1, Figure 2). Test B was used to determine the p-value of the female data (Figure 3, Figure 4). Both analysis' determined that hypothesis A was rejected, with no significant correlation between childhood adversity and specificity in a serial murder, for both male and female serial killers. Hypothesis B was reliant on a significant p-value for hypothesis A. Due to the fact there was no correlation found for hypothesis A, hypothesis B cannot be answered.

### Linear Regression T Test A & B

Linear Regression T Test A →

**Null hypothesis:** No correlation between childhood adversity experienced and specificity in serial murders for male serial killers.

**Alternative hypothesis:** Positive correlation between childhood adversity and specificity in serial murders for male serial killers.

Figure 1: Male Data

Male ACE Score (Y)	Male SSM Score (X)	Male ACE Score (Y)	Male SSM Score (X)
0	34	0	41
6	47	0	40
1	35	5	49
1	38	3	36
6	37	0	45
1	32	1	39
1	42	1	42
6	45	11	35
0	48	8	41
0	32	0	44
1	49	4	37
2	49	2	31
1	36	1	39
0	49	7	36
2	32	0	38
1	51	9	27
0	39	4	39
2	33	0	51
0	35	8	44
0	36	6	50

**P-value = .6035**



Figure 2: Male Data- Correlation Between ACE Score and SSM Score

Male Data

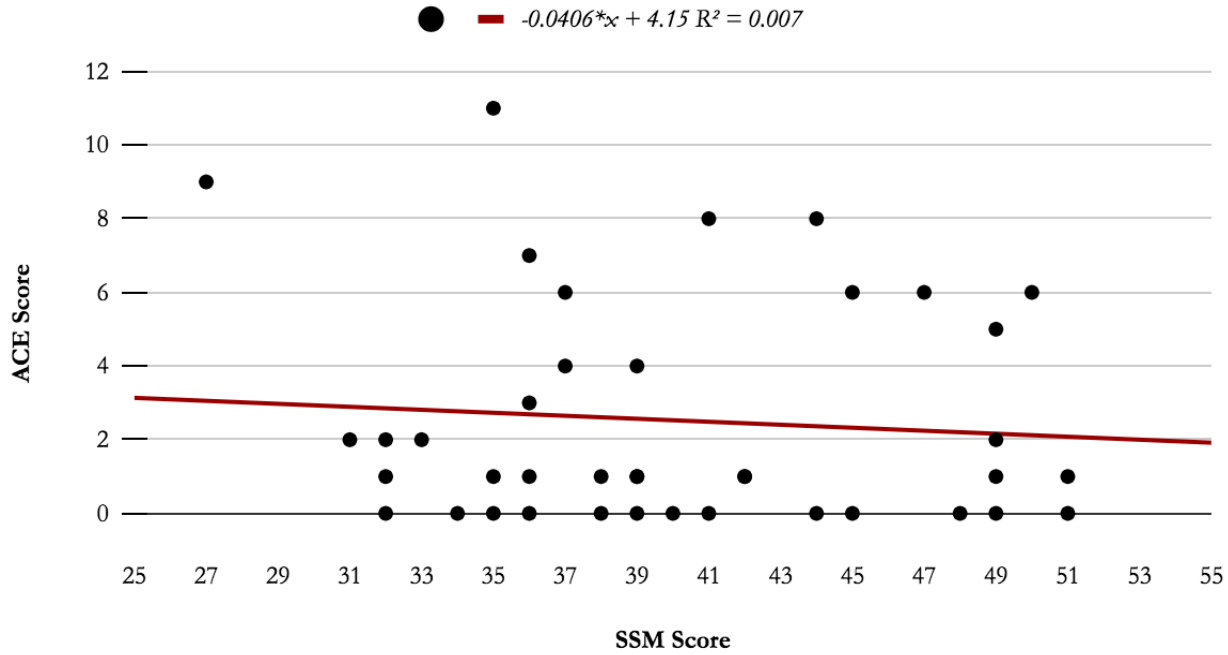
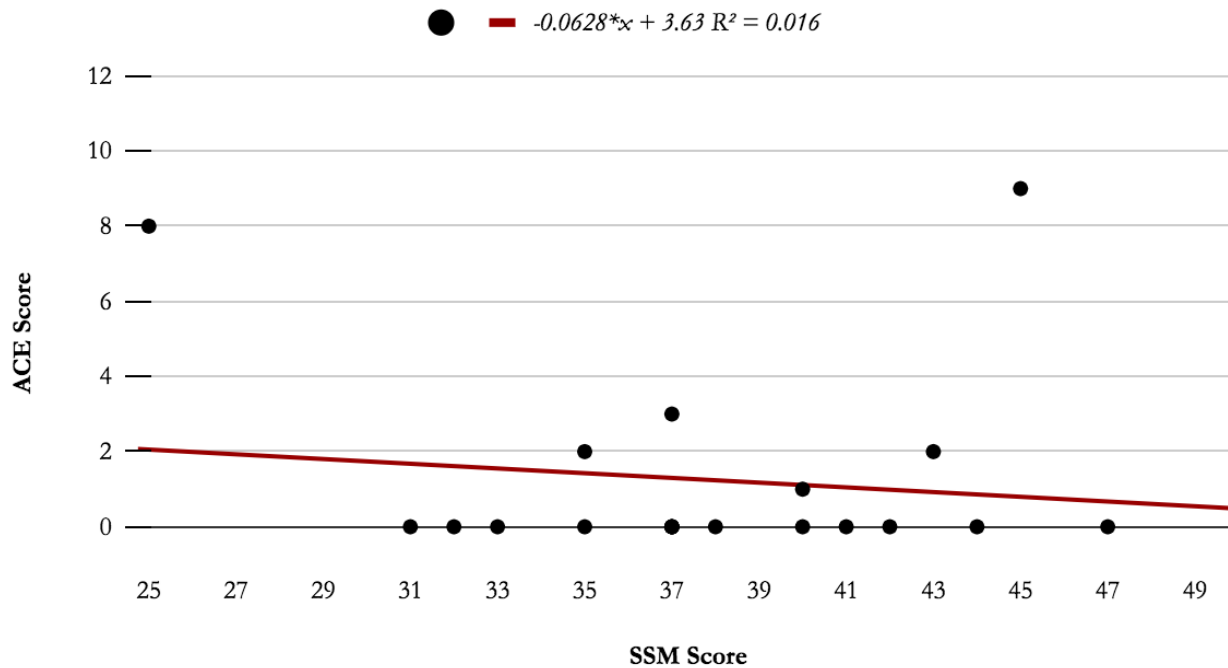


Figure 3: Female Data- Correlation Between ACE Score and SSM Score

Female Data



Linear Regression T Test B →

**Null hypothesis:** No correlation between childhood adversity experienced and specificity in serial murders for female serial killers.

**Alternative hypothesis:** Positive correlation between childhood adversity and specificity in serial murders for female serial killers.

Figure 4: Female Data

Female ACE Score (Y)	Female SSM Score (X)	Female ACE Score (Y)	Female SSM Score (X)
0	32	0	37
2	43	2	35
0	42	0	33
1	40	0	47
9	45	0	37
8	25	0	40
0	41	0	38
0	44	0	31
0	37	3	37
0	35	0	37

**P-value = .5982**

**Statistical Conclusions**

Both Test A & B yielded ≈ 60% probabilities, concluding that there is no significant correlation between childhood adversity and specificity in serial murders, regardless of the sex of the serial killer.

**Distribution of Data**

Initial readings of the correlational graph revealed that significant correlation is unlikely, however, it did reveal a significant cluster of data to fall between the SSM scores of 30 and 50 and the ACE scores of 0 and 2. 61.6% of all data falls between these parameters, including both male and female data (Figure 7). Isolated male data (Figure 2) shows 57.5% of the data to fall between SSM 30-50 and ACE 0-2 and female data (Figure 3) shows 70% of data to fall within the same parameters.

**Outliers**

There were no outliers when considering male SSM scores (Figure 5) and only one female outlier with an SSM score of 25 (Figure 6). When considering ACE scores the male data, once again had no outliers, (Figure 5) however the female data yielded 2 outliers at 8 and 9 (Figure 6).

Figure 5: Male Data: Upper and Lower End Outliers

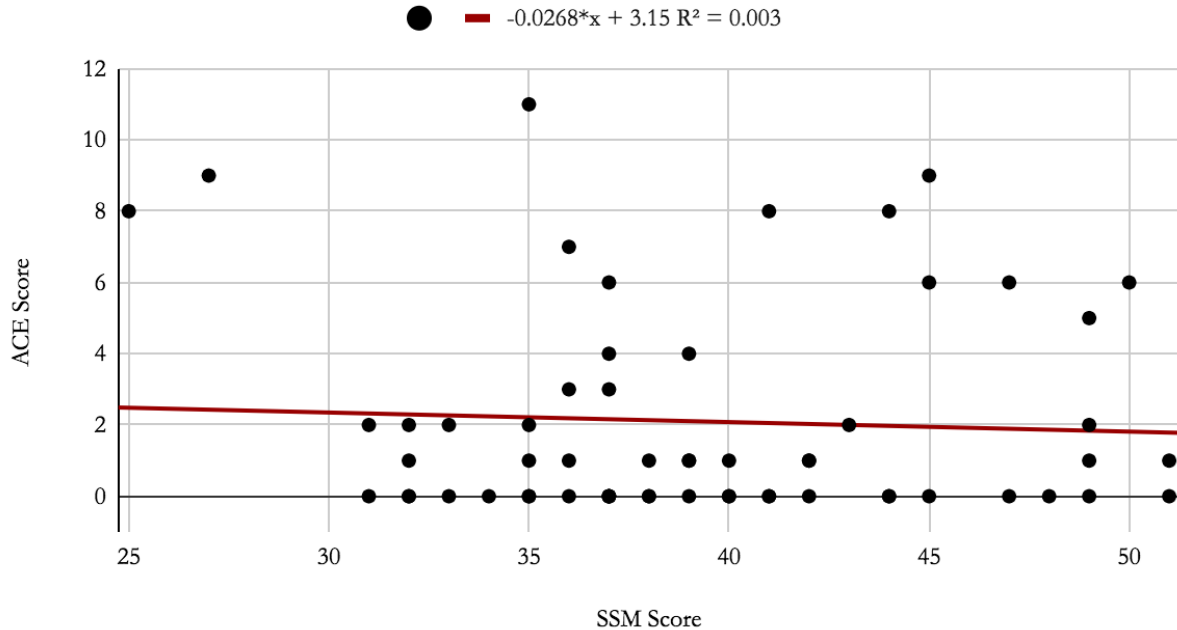
Male Data	Lower Outlier		Upper Outlier	
SSM	19.75	X	60.75	X
ACE	-6.75	X	11.25	X

Figure 6: Female Data: Upper and Lower End Outliers

Female Data	Lower Outlier	Score of Outlier	Upper Outlier	Score of Outlier
SSM	25.25	25	51.25	X
ACE	-2.25	X	3.75	8, 9

Figure 7: Male x Female Data- Correlation Between ACE Score and SSM Score

Total Data (Male x Female)



**Frequency of Occurrence for Specific Childhood Adversities**

The most frequently occurring forms of childhood adversity were addressed by questions 1a, 1b, 2a and 6 of the ACE Scale.

1a) Before you turned 18, did your parent(s) or guardian(s) often swear at you, insult you, put you down or humiliate you?

1b) Before you turned 18, did your parent(s) or guardian(s) act in a way that made you afraid that you might be physically hurt?

2a) Before you turned 18, did your parent(s) or guardian(s) often push, grab, slap, or throw something at you?

6) Before you turned 18, was a parent or guardian ever lost to you through divorce, abandonment or other reason?

Within the full data set, question 1a occurred 22% of the time (female: 3%, male: 18.3%), question 1b and 2a occurred 20% of the time (female: 3%, male: 16.6%), question 6 occurred most frequently and was answered yes more than 43% of the time (female: 10%, male: 33.3%). The percentages of “yes” in the female population are as follows: 10% (1a), 10% (1b), 10% (2a) and 30% (6). The male population yielded 27.5% (1a), 25% (1b), 25% (2a) and 50% (6).

Figure 8: Most Frequent ACE Q's  
(Measured by Number of Yes')

Q	Total	F T	M T	F	M
1a	22%	3%	18.3%	10%	27.5%
1b	20%	3%	16.6%	10%	25%
2a	20%	3%	16.6%	10%	25%
6	43%	10%	33.3%	30%	50%

The least frequently occurring forms of childhood adversity were addressed by questions 3a, 3b and 7c of the ACE Scale.

3a) Before you turned 18, did your parent(s) or guardian(s) try to touch or fondle you in a sexual manner?

3b) Before you turned 18, did your parent(s) or guardian(s) attempt oral, vaginal or anal intercourse with you?

7c) Before you turned 18, was your mother ever threatened with a knife, gun or other weapon?

Question 3a and 3b occurred about 6.6% of the time (female: 1.6%, male: 5%), and question 7c occurred the least and was answered yes only 5% of the time (female: 0%, male: 5%). The percentage of "yes" in the female population were 5% (3a), 5% (3b) and 0% (7c). The male population yielded 7.5% (3a), 7.5% (3b) and 7.5% (7c).

Figure 9: Least Frequent ACE Q's  
(Measured by Number of Yes')

Q	Total	F T	M T	F	M
3a	6.6%	1.6%	5%	5%	7.5%
3b	6.6%	1.6%	5%	5%	7.5%
7c	5%	0%	5%	0%	7.5%

### Frequency of Occurrence of Variables from the SSM Scale

The most frequently highest scored variable measured by the SSM scale was Sexual Orientation of the Victims. 100% of the serial killer's that were scored, received a 5 for this variable (female: 33.3%, male: 66.6%). The percentage of 5's in both the male and female populations was 100%.

Figure 10: Most Frequent SSM Variable  
(Measured by Number of 5's)

Q	Total	F T	M T	F	M
S.O.	100%	33.3%	66.6%	100%	100%

The variable most frequently scored lowest, was Post Mortem Rituals, with 91.6% of serial killers scoring a 0 (female: 33.3%, male: 58.3%). The percentage of 0's in the female population was 100%. The male population scored a 0, 87.5% of the time.

Figure 11: Least Frequent SSM Variable  
(Measured by Number of 0's)

Q	Total	F T	M T	F	M
P.M.	91.6%	33.3%	58.3%	100%	87.5%

## DISCUSSION

The research conducted hoped to find a significant correlation between childhood adversity and specificity in serial murder using the ACE Scale and the SSM Scale, respectively. Against hypothesis A, it was found that there is **no significant correlation** between childhood adversity and specificity in serial murder. Tests have shown that the probability of these data sets occurring is 60% or have a p-value of  $\approx 0.60$ .

Though the overall hypothesis concluded an insignificant relationship, the data collected from this study is valuable in relation to behavioral psychology. Analysis of the sub-set data yielded from both the ACE Scale and SSM Scale can be used to grow the understanding of psychopathy, as it occurs in serial killers.

### Data Clusters

As discussed previously, much of the data lies between ACE scores 0-2 and SSM scores 30-50, as seen in Figures 2, 3 and 5.

The amount of data found between 0-2 of the ACE scale is most likely due to lack of data or testimony regarding the childhood experiences of many serial killers. There is a significant possibility that the ACE scores that have been determined in this study are inaccurate due to the fact that they were established via available data collection and not interviews. The most accurate way to acquire ACE scores is through the direct questioning of the test subjects.

It can be assumed that the large amount of data between 30-50 on the SSM scale is due to the fact that to be classified as

a serial killer, some amount of behavior must be repeated and therefore each crime already involves some degree of specificity.

### Significant Outliers

Within the female data set for SSM scores, outliers were found twice (Figure 3), however the male data yielded no outliers. Once again, within the data for SSM scores, the female data set had one outlier, whereas the male data, once again, had no outliers. The significant outliers in both sets of female data are most likely due to the small sample size of 20, whereas the male sample size was double that, at 40 subjects. However, a much larger population size is desirable for both male and female groups.

### Frequency of ACE's

The findings from the ACE data (question 1a, 1b and 2a) are consistent with previous findings. Many psychopaths report (verbally, physically, emotionally, or sexually) abusive parents or guardians. It has been found that abusive parenting and/or abusive households in general, are one of the greatest contributors to the development of psychopathy or psychopathic tendencies [4, 5, 6 & 7]. The data from question 6 is also consistent with previous studies. It has been found that while not all serial killers have separated parents or have lost a parent, it is highly probable that any given serial killer will have separated parents, a single parent or no parents [4].

### **Frequency of SSM Variables**

The accuracy of the findings from the SSM Scale, in reference to the sexual orientation of the victims, is incredibly dubious, due to the fact that the sexual orientation of the victims was scored through speculative inferences.

At the time that the SSM Scale was initially developed, the question referencing sexual orientation was added to account for hate crimes. For this reason, if sexual orientation was not explicitly mentioned within the case, or referenced as motive, the serial killer received a 100% specificity score in said category. Given that, this information is most likely inaccurate, however due to the fact that every test subject received a 5, it did not skew the data.

When considering the data about post-mortem rituals, there is a possibility that many serial killers were underscored. While forensic science can determine post-mortem rituals to a certain extent, not all of them can be discovered by simply studying the victims' bodies. Many killers have post-mortem rituals that don't involve leaving permanent damage on the victims, such as taking photographs. Unfortunately, it is difficult to gauge the veracity of post-mortem rituals as reported in forensic files, for this reason. The best way to collect data for the SSM Scale overall, would be to conduct interviews with the killer's themselves.

### **CONCLUSION**

Hypothesis A: *Childhood adversity contributes to an increase in specificity in a serial crime*, was found to have no significant correlation. Both Test A & B yielded  $\approx 60\%$  probabilities or p-values of 0.60, concluding that there is no significant correlation between childhood adversity and specificity in serial murders, regardless of the sex of the serial killer.

Due to the fact that hypothesis A was refuted, there are no grounds to investigate hypothesis B: *If childhood adversity is a contributor to specificity, the rate at which specificity increases in male serial killers is greater than the rate of specificity growth in female serial killers*, as it was reliant on a significant correlation between ACE and SSM scores, which was not found.

### **Future work**

Though this study yielded no significant correlation between ACE and SSM scores, there is reason to believe that a re-trial conducted with interviews rather than data collection would yield different results.

There is also the possibility to determine correlation between SSM score and specific types of childhood adversity, i.e. SSM score will increase as the number of years spent with a physically abusive parent increases.

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