

# Heritability of Latino Youth Violence



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## Abstract

Latino youth violence is a serious issue for all communities especially in the context of educational excellence, public security, and social justice. Scholars have attempted to understand youth violence at large; however, they do not have in depth understanding to comprehend Latino youth violence. Particularly, there is no literature looking into the hereditary aspect of Latino youth violence. One theory, biosocial criminology, examines the heritability effects through twin study designs. Drawing from biosocial criminology, this study utilizes National Longitudinal Study of Adolescent Health (Add Health) data to examine the heritability effects of Latino youth violence. The results suggest that there exists a relationship between genetic and environmental effects that play a role in Latino youth violence. Limitations and future implications shall be discussed

**Keywords:** Latino; Youth; Violence; Twins; Gene-environmental interaction

## Introduction

Interpersonal violence is a prevalent social issue and growing public health threat within the United States [1,2]. Research reveals that interpersonal violence is an imminent danger to youth in the United States [2,3]. Family, school, parental maltreatment, and self-control are among many factors that affect juvenile delinquency [4]. The projection of delinquent behavior is best understood examining the biological and psychological characteristics and their reaction to the social environment [4]. What is not well established is the heritability effects of Latino youth violence. The purpose of this paper is to examine whether gene-environmental effects have any role in Latino youth violence.

## Literature Review

### Problem statement

Male youth of Latino descent are overrepresented in the criminal justice system [5]. Latinos accounted for majority of crimes in certain states [6]. Latino youth are also arrested and convicted at alarming rates versus other racial ethnic groups. Latino youth suffer from higher dropout rates in schools than any other racial or ethnic group [6]. Also, most Latino students attend segregated schools in poor neighborhoods and high crime rates [6]. With Latino students often underperform on academic test, and increased zero tolerance policies lead to high expulsion and arrests rates [7]. Teachers even discriminate against Latino students with the stereotypical idea that they will either turn to be criminals or prostitutes [7].

## Latino Youth Background

Latinos or Hispanics are pan-ethnic groups with a heritage based out of Latin American countries and Spain [6]. Most Latinos lives in segregated communities in Texas, California, and Florida with high levels of poverty, pollution, gangs, and crime [6]. In 2010, the average Latino lived in a neighborhood with a median income a quarter less than the median income in neighborhoods where most Whites live [8]. On average, affluent Latinos were more likely to live in neighborhoods with fewer resources than poor Whites [8]. About one in four public school students is Latino [7,9]. The Latino student portion of public school population is growing, but the White student population is shrinking [9]. Latino drop out of high school is much higher than that of White students nationwide [10]. The average Latino student attends school with double the amount of low-income students than schools attended by average White or Asian students [9]. In 2010, Latino youth accounted for more than 25% if the juvenile population in 7 states [1]. In Texas alone, Latino youth composed 48% of the juvenile population in that state [1]. The Census Bureau estimates that the number of Latino juveniles in the United States will increase to 37% between 2010 and 2030 [1]. Also, Latino youth reported being victim's cyber bullying and hate crime than certain other ethnic groups [1].

Less than 20% of Latino students in the fourth and eighth grade are performing at or above the reading proficiency level set by the Department of Education, compared to over 40%

percent of White students [11]. Only 24% of Latinos in the fourth grade and 20% in the eighth grade are performing at or above the mathematics proficiency level set by the Department of Education, compared to over 52% percent of White students [11]. Also, 13% of Latinos in the fourth and 16% in the eighth grade are performing at or above the science proficiency level set by the Department of Education, compared to over 40% of White students [11].

### Twin Studies

Literature on violence is vast and certain theories have emerged on explanations of youth violence. Theories that made prominent progress in explanation of youth violence were social class, social control, and self-control theory [12-14]. The mentioned theories, however, do not take any biological elements into consideration like biosocial criminology. Biosocial criminology is an interdisciplinary approach to criminology that integrates data, concepts, and methods from the biological sciences into traditional criminology [15]. The three general elements of biosocial theory are: genetics, neuroscience, and evolutionary science [16]. Although biosocial criminology recognizes the enormous role the social environment plays in all aspects of human life, it also recognizes that the importance of the social environment [15,17].

The key to understanding the roots of criminal behavior is through genetic method. One avenue of research for the genetic foundation to behavior is through twin studies [18]. The twin study design allows researchers to break down phenotypic variance into three components: heritability, shared environment, and shared environment – and non-shared environment [15]. Any results with differences from the twins will indicate to what extent is a certain behavioral trait is genetic and environmental [18,19]. A recent study conducted a meta-analysis of twin studies which included over 14 million twins, over 17,000 traits from over 2,000 publications in the past 50 years. The results of this study provide evidence that all human traits are heritable, and not one trait had a heritability of zero [19]. This finding basically debunks the nature and nurture argument in of itself, rather behavior is a result of both nature and nurture [20]. Both nature and nurture of human behavior work interactively called the gene-environment interaction.

The limitation of twin based research is that they mostly include Caucasian participants and they are not abundantly available. There is insufficient amount of twin based research on Latino youth to examine behavioral outcomes such as violence. The goal of this research is to see the gene and environmental heritability effects of Latino youth violence based on a twin design. The twin method is designed to make a distinction to which part of human behavior is genetic and which part of behavior is due to environmental influences. To what extents does genes and social influence play a role in Latino youth

behavior is the research question of this project.

### Methods

#### Data

This project utilizes quantitative secondary data analysis from the National Longitudinal Study of Adolescent to Adult Health (Add Health), which encompasses a nationally representative sample of 90,000 adolescents in grades 7-12 enrolled in 132 middle or high schools in the United States during the 1994-1995 school year completing a self-report survey at school [21]. The Add Health cohort has been followed by four separate surveys of in-home interviews conducted in 1995, 1996, 2001-2002, and 2007-2008 [22]. Other sources of data included questionnaires for parents, siblings, other students, school administrators, and romantic partners [21]. The current thesis utilizes only wave one of the Add Health study. The finalized subsample for this study is comprised of individuals did not have missing data on violence measures and those who identified as Hispanic or non-Hispanic twins which was total of 97 participants.

#### Participants

The participants in this study will only comprise of those individuals indicated that they were identical twins and fraternal twins. Also, this study will include those individuals who identified as Hispanic or non-Hispanic males only. Research has shown males to be more prone to violence than female counterparts [17].

#### Violence Variable

Violence was measured using a dichotomous fighting variable which is assessed averaging self-report items from the Add Health Fighting and Violence Scale Section 31 that asked about a broad range of delinquent behaviors within the past 12 months [22]. These survey questions focus on violent acts and entailed the following:

**a) "You got into a physical fight?"**

This survey question was recorded to include those participants who answered yes or no.

#### Analysis

The methodology will involve using a Chi-square analysis to examine the violent outcome of identical twins and fraternal twins who identified as Hispanic and non-Hispanic. Then the differences between identical twins and fraternal twins will measure the proportion of violence that is genetic and environmental. The appropriate test for this analysis will be a layered Chi-square analysis. The null hypothesis here is that there is no statistical relationship between gene and environmental interaction of Hispanic and non-Hispanic twins and self-reported violence. The test hypothesis is that there is a statistical relationship between gene and environmental

interaction of Hispanic and non-Hispanic twins and self-reported violence.

**Results**

The purpose of this paper is to examine the genetic and environmental relationship between Hispanic and non-Hispanic twins and violent outcome. The analysis of this test was examined using a layered Chi-square test. The reason for this was that

layered Chi-square allowed separating groups of Hispanics and non-Hispanics, identical twins and fraternal twins as cross tabs on violent outcome in the past 12 months. The overall model in Table 1 show that the total relationship between fraternal and identical twins of Hispanic and non-Hispanic violence were not significant ( $X^2 (1) = 3.711, p = .054$ ). The fraternal twins were found to have no statistical significance on violence ( $X^2 (1) = .292, p = .589$ ). However, the identical twins had statistical

significance on violence ( $X^2 (1) = 9.504, p < .05$ ). This difference of significance would indicate that there is a significance of effect on violence between fraternal twins and identical twins.

**Table 1:** Total relationship between fraternal and identical twins of Hispanic and non-Hispanic violence were not significant.

Chi-Square Tests						
Modified Twins		Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Identical Twins	Pearson Chi-Square	9.504 <sup>c</sup>	1	.002		
	Continuity Correction <sup>b</sup>	4.567	1	.033		
	Likelihood Ratio	7.529	1	.006		
	Fisher's Exact Test				.028	.028
	Linear-by-Linear Association	9.152	1	.002		
	N of Valid Cases	27				
Fraternal Twins	Pearson Chi-Square	.292 <sup>d</sup>	1	.589		
	Continuity Correction <sup>b</sup>	.002	1	.966		
	Likelihood Ratio	.274	1	.601		
	Fisher's Exact Test				.628	.453
	Linear-by-Linear Association	.288	1	.592		
	N of Valid Cases	70				
Total	Pearson Chi-Square	3.711 <sup>a</sup>	1	.054		
	Continuity Correction <sup>b</sup>	2.207	1	.137		
	Likelihood Ratio	3.151	1	.076		
	Fisher's Exact Test				.075	.075
	Linear-by-Linear Association	3.673	1	.055		
	N of Valid Cases	97				

**Discussion**

This paper was intent to bring additional literature on twin studies on gene and environmental interaction on behavior. Most of the twin based research is based on Caucasian samples. Therefore, there is a lack of twin based research including Hispanics. This is evident for the need to include Hispanics on twin based research to justify the stance on gene and environmental interaction on human behavior. Most literature argues that culture and social environment are the sole

foundation of behavior such as crime and educational outcome [7]. However, research such as twin's studies provide evidence that genetic components such as genes also play a role in all human traits [19]. Twin studies bring robust findings that human behavior is not only just based on learned behavior but that both genes and the environment interact to manifest human behavior [18].

The study showed mixed findings in providing evidence of genetic and environment interplay toward violent behavior of

Hispanics. The results in the analysis showed that overall there was no significant relationship between Hispanics and Non-Hispanic twin youth on violent outcome. However, the identical twins had statistically significant relationship on violent outcome and fraternal twins had no statistically significant relationship on violent outcome. This means that the cultural background of identifying as Hispanic or non-Hispanic did not have implications of self-reported violence. This is also proof that identical twins account for the genetic part of violent behavior. Social environment has been shown in this project as not the sole predictor of behavior [23].

This study is not without limitations. First this study only had a small sample of 97 participants, and only 8 participants identified as Hispanic. This would have largely influence the validity of Hispanic representation in this study. Secondly, this study is only partial subsample of the Add Health data set that is publicly available. To remedy this issue would be to have access to the full sample population of the Add Health data set in order to have the representative sample. Third, the small sample size had major influence on the outcome of this study in that there needs to be a similar or larger sample size of Hispanics in order to examine if there is a statistical significance of violent behavior within the community of Hispanic and not compare with another racial group. Further research is needed to accomplish robust validity of twin research of Hispanic behavior.

## Conclusion

There is currently not enough research and knowledge of the Hispanic community and this paper certain attempted to bring light to that topic. Also, this paper attempted to examine the biological behavior of Hispanic which has not been done. Future research in needed to address the lack of twin population of Hispanics to make valid conclusions on behavior of the community. This will benefit the science in that there is little knowledge on Hispanic and the uniqueness of culture that have major implication in American society. Once we gain an understanding of Hispanic behavior such as violence and other behavioral outcome, then public policy will better address the needs of the Hispanic community.

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