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The Mediated Effect of Contextual Risk Factors on Trajectories of Violence: Results from a Nationally Representative, Longitudinal Sample of Hispanic Adolescents

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Abstract

The current study sought to estimate trajectories of violent behavior and evaluate the direct and indirect effects of contextual factors among Hispanics, stratified by gender. Relying on data from 3,719 Hispanic adolescents surveyed as a part of the National Longitudinal Study of Adolescent Health (Add Health), violence trajectories were estimated using group-based trajectory modeling. The results identified three groups of violence trajectories for both males and females (non-violent, desistors, and escalators) and there were considerable gender differences in the direct and indirect effects of risk and protective factors on violent behavior. Study limitations and policy implications are also discussed.

Keywords

Trajectory; Violence; Adolescents; Gender; Hispanic

Introduction

Youth violence is an important public health problem. Violence and physical aggression often result in unintentional injuries, and homicide, and suicide, which are leading causes of death among adolescents (Centers for Disease Control and Prevention, 2010). Furthermore, aggressive behaviors are associated with drug use, unsafe sex, dangerous driving, and other health problems (Moffitt, 2006; Piquero, 2008). Despite these risks, little is known about the etiology of physical aggression and serious violence among Hispanic adolescents.

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Lack of data on aggressive behaviors among Hispanics in the larger criminological literature, however, has limited the study of aggression among Hispanic youth (Piquero, 2008). In a review of eighty articles on developmental trajectories of criminal activity over the life course, Piquero (2008) found no articles focusing specifically on Hispanics. Instead, the extant research on aggression trajectories has focused on Blacks and Whites, and Hispanics are often combined into a "non-White" categorization, despite knowledge that they may have a distinct set of risk factors compared to other ethnic groups (Loukas, Prelow, Suizzo, & Allua, 2008; McCord, Widom, & Crowell, 2001). Recently, few studies have investigated risk and protective factors associated with delinquency among Hispanic adolescents (Jennings, Maldonado-Molina, Piquero, & Canino, 2009; Maldonado-Molina, Piquero, Jennings, Bird, & Canino, 2009; Reingle, Jennings, & Maldonado-Molina, 2011; Maldonado-Molina, Reingle, Tobler, Jennings, & Komro, 2010). These studies reported that Hispanic-specific protective factors (such as acculturation, and/or speaking Spanish at home) are important in predicting violent delinquency.

There is also debate in the criminological literature as to whether or not the risk and protective factors for delinquent behavior are stable across gender. Across all racial/ethnic groups, Moffitt, Caspi, Rutter, and Silva (2001) found that boys are exposed to more risk factors than girls, thus increasing their likelihood of violent offending. In a test of this hypothesis, Daigle, Cullen, and Wright (2007) found that although there were similarities in predictors of delinquency across gender groups, differences did exist. For example, violent victimization, peer delinquency, age, and previous violence predicted increased levels of delinquent behavior for both boys and girls. In a multinational study of delinquency trajectories, Broidy et al. (2003) found that early, chronic physical aggression (e.g., elementary school) increases the risk of continual physical aggression and other forms of delinquency throughout adolescence among males. However, this finding did not hold among females in the sample, as early physical aggression did not predict membership in stable-violence trajectories. Finally, using a sample of Hispanic boys and girls in Puerto Rico and the Bronx, NY, Jennings et al. (2010) reported more similarities than differences in the predictors of delinquency across gender groups. Specifically, sensation-seeking, exposure to violence, and attitudes towards delinquency were predictive of violence across gender groups, while acculturation was not (Jennings et al., 2010).

Acknowledging the relatively sparse longitudinal research on gender differences in delinquency among Hispanic adolescents, it is important to use nationally representative data to understand the extent to which a common set of risk and protective factors identified in general population replicate among Hispanics. Focusing on risk and protective factors associated with racial/ethnic/cultural differences in physical aggression and violence has important implications to the extent to which general or race/ethnic/cultural-specific theories of crime are warranted. The general absence of literature examining the risks specific to Hispanic youth also highlights the need for further theoretically grounded research examining the epidemiology of physical aggression in young Hispanic populations (Akers & Lanier, 2009). According to the general strain theory (Agnew, 2001, 2006), strains are expected to vary across race/ethnicity/culture, which in turn generate differential outcomes (aggressive behavior versus non-aggressive behavior), suggesting important differences in the etiology of delinquency and physical aggression. This theoretical framework has been recently supported among Hispanic adolescents (Jennings, Piquero, Gover, & Pérez, 2009).

Proximal risk factors have traditionally been the strongest factors associated with violent delinquency in the general population. Peer substance use and delinquency, parental influences, and alcohol and other drug use are strongly associated with participation in violence (Walker-Barnes & Mason, 2001). Dembo et al. (1991) conducted a cohort study of detained juvenile delinquents, and found that alcohol use predicted violent behavior, and

violence was a significant predictor of drug use (e.g., cocaine, marijuana) at the 10–15 month follow-up. Other longitudinal studies using the National Longitudinal Study of Adolescent Health (Add Health) have found that alcohol use was a significant predictor of physical violence 2 years later (Resnick, Ireland, & Borowsky, 2004), and as many as 7 years later (Maldonado-Molina, Reingle, & Jennings, 2011). In the study by Maldonado-Molina and colleagues (2011), consistent use of alcohol predicted serious physical violence, while alcohol abstainers were less likely to be violent than alcohol users. Although it seems that these proximal risk factors would apply to all racial and ethnic groups, it is unclear as to whether these relationships are as strong (or stronger) for Hispanics.

Specifically, only five studies to our knowledge have evaluated the predictors of serious violence in samples including Hispanic adolescents (Esbensen, Peterson, Taylor, & Freng, 2010; McNulty & Bellair 2003; Pih, De la Rosa, Rugh, & Mao, 2008; Tolan, Gorman-Smith, & Henry, 2003; Reingle et al., 2011). Four of these studies were longitudinal (Esbensen, et al., 2010; McNulty & Bellair 2003; Tolan et al., 2003; Reingle et al., 2011); however, only two used a nationally representative sample of adolescents (McNulty & Bellair 2003; Reingle et al., 2011). None of these studies examined gender differences in the direct and indirect effect of risk factors for serious violence. This study will utilize data from a longitudinal, nationally representative study of Hispanic adolescents to evaluate the effects of multilevel predictors (e.g., neighborhood, parental, peer, and individual) on trajectories of serious violence. This study makes an important contribution to the literature in that it permits the investigation of gender differences in violence among Hispanic youth. Specifically, we examine the shape and number of trajectories of violence by gender group. Then, we evaluate the direct and indirect effect of multilevel risk and protective factors on violent behavior. We hypothesize that males will participate in more serious violence compared to females, and the predictors of violence will differ by gender.

Methods

Data for this study were derived from the restricted-use sample of the National Longitudinal Study of Adolescent Health dataset (Add Health), a longitudinal school-based survey of health-related behaviors among adolescents from grades 7 to 12 followed longitudinally into adulthood. The Add Health study was designed to explore the causes of various health-related behaviors, emphasizing social and contextual influences. Data was collected from 1994 (Wave I) through 2008 (Wave IV), when participants ages ranged from 11 to 32 (Chantala & Tabor, 1999).

Participants

The current study includes 3719 self-identified Hispanic adolescents. At Wave 1, participants were 15.27 (se=0.21) years old, and the majority of the sample was US-Born (69% were second- or third-generation US Born) (see Table 1). Approximately 28% of adolescents reported any violence at baseline, and the mean violence score at Wave II was 0.81(se=0.11), 0.31(se=0.05) at Wave III, and 0.95(0.14) at Wave IV.

Measures

Violent Delinquency—Violence was measured using three items that were measured across each of the four waves of data collection: In the past 12 months, have you 1) hurt someone badly enough that he or she needed care from a doctor or nurse?; 2) pulled a knife or gun on someone?; and 3) shot or stabbed someone? At each wave, a value from 0 to 12 was assigned to each participant, where a value of "0", "2", or "4" was assigned for each of these violent acts in which the individual has participated in during the past year. A zero was assigned for each item if the participant did not report the behavior. A two was assigned if

the adolescent reported hurting someone badly enough to need care from a doctor or nurse one to three times in the past year. A four was assigned for each of the following occurrences: 1) shooting or stabbing someone; 2) pulling a knife or gun on someone; or 3) hurting someone badly enough to need care from a doctor or nurse four or more times in the past year. These values were used to create trajectories of delinquency over Waves II–IV.

Group Fighting—Group fighting was measured using the variable, "In the past 12 months, how often did you take place in a physical fight where a group of your friends was against another group?". Responses to this item include: "0=Never", "1=One or two times", "2= Three to four times", and "3=5 or more times". These responses were dichotomized into "0=never" group fighting and "1=group fighting" in the past year.

Racial Dispersion—Racial dispersion is a measure (ranging from 0 to 1) of the racial heterogeneity in a neighborhood. Dispersion is equal to zero when all census tract members are members of the same racial group, and equal to one when residents are equally distributed among White, African-American, Asian, Native American, and Other races.

Poverty—Poverty was measured using the percentage of families in the respondents' census tract whose income was at or below the poverty level. Racial dispersion was measured using the concentration of racial/ethnic homogeneity within the neighborhood, so higher proportions would indicate greater concentration of one race/ethnicity within a neighborhood. These items were incorporated into the analysis in accordance with Shaw and McKay's (1942) theory of Social Disorganization.

Residence in an Urban Neighborhood—All addresses were geocoded at the time of the interview, and these addresses were linked to U.S. Census data (1990) to determine the urbanicity of the residence. Addresses were considered "completely urban" or "not completely urban".

Parental Involvement—Parental influence and involvement was measured using a scale of twenty items (10 for maternal involvement, 10 measuring paternal involvement). Each individual item was dichotomized, and the scale is the sum of all twenty items (range: 0–20). The ten items which comprised the scale included whether or not the respondent reported participating in the following activities with their mother and/or father in the past 4 weeks: 1) going shopping; 2) playing a sport; 3) attending a religious or church-related event; 4) talking about someone they are dating or a party they attended; 5) attending a movie, play, concert, or sporting event; 6) talked about a personal problem they were having; 7) had a serious argument about their behavior; 8) talked about work or grades; 9) worked on a project for school; and 10) talked about other things they are doing in school. Cronbach's coefficient alpha for this scale was 0.74. This scale was included as a covariate because evidence suggests that parenting variables (e.g., monitoring, involvement) are related to violence (Park, Morash, & Stevens, 2010).

Parental Alcohol Use—At the Wave I survey, parents of surveyed adolescents were asked, "How often do you drink alcohol?". Response options included, "Never", "Once a month or less", "2 or 3 days a month", "Once or twice a week", "3 to 5 days a week", and "Nearly every day". Responses were dichotomized into "parents use alcohol" and "parents do not use alcohol" based upon the distribution of the responses.

Peer Marijuana and Alcohol Use—Peer alcohol use was measured using one item: "Of your three best friends, how many drink alcohol at least once a month?" Respondents who reported having one or more friends who use alcohol monthly were coded as "1". Similarly,

respondents were asked, "Of your three best friends, how many use marijuana at least once a month?" Respondents who reported having one or more friends who use marijuana monthly were coded as "1". These items were included because literature suggests that individuals who have peers who use alcohol (Herrenkohl et al., 2007; Kuntsche, Gossrau-Breen, & Gmel, 2009; Leech, Day, Richardson, & Goldschmidt, 2003) or marijuana (Herrenkohl et al., 2007; Leech et al., 2003) are more likely to engage in violent behavior.

Depression—This mental health status variable was measured with one item, "How often in the past week have you felt depressed?". Values for this variable were dichotomized so that 1="One or more times" and 0="0 instances of depression" in the past week. Depression was included as a covariate because higher levels of depression have been associated with violence (Elbogen & Johnson, 2009; Senn, Carey, & Vanable, 2010; Thurnherr, Berchtold, Michaud, Akre, & Suris, 2008) and other risk behaviors (Latzman & Swisher, 2005; Senn et al., 2010).

Academic Achievement—Academic performance was measured using the variable, "On a scale of 1 to 5, where 1 is low and 5 is high, how likely is it that you will go to college?". This item was included as a covariate because academic achievement and IQ have been associated with increased risk of violence (Herrenkohl et al., 2007; Leech et al., 2003).

Alcohol Use—Lifetime alcohol use was evaluated using the item, "Have you had a drink of beer, wine, or liquor—not just a sip or a taste of someone else's drink—more than 2 or 3 times in your life?". Those who responded affirmatively to this item were categorized as "Alcohol Users".

Marijuana and Other Drug Use—Marijuana use was measured using the item, "During your life, how many times have you used marijuana?" Responses were categorized into "users" and "non-users". Other drug use was created using the self-reported number of times the respondent used cocaine, inhalants, or other drugs in their lifetime. If any of these drugs were used, respondents were categorized as "users." These items were included because evidence suggests that the use of marijuana and other drugs (Boles & Miotto, 2003; Dhungana, 2009; Herrenkohl et al., 2007) increases the risk of violent behavior.

Desire to Leave Home—This variable was measured using the following item: "How much do you feel that you want to leave home?". Respondents who reported "very much" or "quite a bit" were categorized as "1", others were categorized as "0". This variable was included because some evidence suggests that a negative home environment increases the likelihood of violent delinquency (Ou & Reynolds, 2010).

Spanish at Home—For Hispanic males and females only, the variable "Speaking Spanish at home" will be added as an individual-level measure of acculturation. Specifically, all adolescents were asked, "What language is usually spoken at home?". Hispanic adolescents who reported "Spanish" was coded as "Speaking Spanish at Home". Those who reported "English" were the referent for this category. Those reporting any other language spoken were excluded from the analysis.

Generational Status—Generational status has been identified as an important risk factor for multiple health behaviors among Hispanics, as the more acculturated adolescents tend to engage in more risky behaviors (Maldonado-Molina, Reingle, Jennings, & Prado, 2011; Maldonado-Molina et al., 2010; Jennings et al., 2009). In this study, generational status was derived from two variables. Both adolescents and their parents were asked, "Were you born in the United States?". If neither a parent nor the child reported being born in the United

States, the adolescent was considered a "First Generation Immigrant". If the parent reported being foreign-born and the adolescent reported being born in the United States, the adolescent was considered "Second Generation US-Born". If one or more parents were born in the United States, and the adolescent reported being born in the United States, the adolescent was considered "Third Generation US-Born and Beyond". Because of the association between speaking Spanish at home and generational status, language spoken in the home was evaluated as a risk factor for violence, while generational status was retained only as a covariate in mediation analyses.

Analytical Methods

Group-Based Trajectory Modeling—Trajectory groups were fitted to the data using group-based trajectory modeling (Nagin & Land, 1993; Nagin, 2005). This method of analysis grouped individuals together based upon common attributes (e.g., levels of violence over time). This approach is appropriate in this situation because violence varies over time (Farrington, 1986), and individuals with different levels of violence may be substantially different from each other. Grouping participants with heterogeneous levels of violent behavior together and then attempting to predict violence may dilute the effect of risk or protective factors (Nagin, 2005).

Group-based trajectory models are finite mixture models, which use single- and multiple-group models structures (Nagin, 2005). Finite mixture models (also known as latent class models) represent the heterogeneity in a finite number on unmeasured (latent) classes. The trajectory groups that are created using these analyses are derived from maximum likelihood estimation. In this case, violence data follow a Poisson distribution with a large number of non-violent events (zero violent events). Therefore, a zero-inflated poisson (ZIP) distribution was specified in the model (Jones, Nagin, & Roeder, 2001).

Models were tested until the most parsimonious number of trajectory groups maximizes the Bayesian Information Criterion (BIC). The BIC refers to: $BIC = \log(L) - 0.5k\log(N)$, where log likelihood at the maximum likelihood estimate is subtracted from half the number of parameters multiplied by the log of the sample size. The trajectories were descriptive in nature, and quadratic, cubic and linear models will be tested to correctly depict the slopes represented in the data. SAS PROC TRAJ was used to estimate the trajectories (SAS Institute, Cary, NC; Jones et al., 2001).

Multinomial Logistic Regression—Once trajectory groups have been specified, bivariate and multivariate multinomial logistic regression was used to estimate odds-ratios for risk and protective factors on membership in each trajectory. Under this model, each $(g - 1)$ odds-ratios will be generated (Hedeker, 2003). Clustered robust standard errors will be estimated to produce error estimates that take into account the autocorrelation due to the sampling design. STATA 11 software (College Station, TX) was used to conduct all multinomial regression analyses.

The first stage of model selection involved a bivariate test of the association of each predictor variable with the trajectory groups. All variables that were not marginally predictive of any dependent variable (trajectory group) in bivariate analyses were removed from the analysis. After this initial model selection, distal variables (e.g., community-level) will be added to the model first, followed by parental and peer-level variables, and then individual-level characteristics. The final model will assess the influence of all risk and protective factors, accounting for baseline violence.

Mediation Analysis—Mediation analyses were conducted with any variables that were significantly associated with both the contextual variables and the outcome (violence).

Covariance matrices were generated and regression estimates were standardized to obtain an overall mediated effect of each individual-level variable for each contextual variable. The percentage of the total effect of the contextual variable that is mediated by the proximal variable was calculated using standardized beta estimates (*ab*).

Results

Trajectories of Violence

A three-group trajectory model showed the lowest AIC (−5884 for males, −3272 for females) and BIC (−5906 for males, −3295 for females) compared to higher-class models. The mean posterior probabilities ranged from (0.79 to 0.91). Among Hispanic males, 59.6% were non-violent, 17.5% were desistors, and 21.4% were escalators. Hispanic females were less violent overall, with 78.8% considered non-violent, 10.3% desistors, and 10.9% escalators. Trajectories of violence are displayed in Fig. 1.

Risk and Protective Factors for Violent Trajectory Membership

Males—When considering the effect of parent- and peer-level variables on the desistor and escalator trajectory groups alone, parental alcohol use was a marginally significant protective factor for escalators only (OR=0.45; 95% CI 0.20–1.03) (results not shown). The fully adjusted multivariate model is presented in Table 2. Marijuana use was a marginally significant risk factor for both desistors (OR=2.07; 95% CI 0.87–4.93) and escalators (OR=2.13; 95% CI 0.87–5.22). Depression was a risk factor for escalators only (OR=2.39; 95% CI 1.24–4.62). Group fighting was not a significant predictor of membership in either trajectory group once baseline aggression was added to the model. Baseline violence predicted membership in both high-risk trajectory groups (OR=5.64; 95% CI 2.18–14.55 for desistors, OR=3.56; 95% CI 1.30–9.62 for escalators).

The hypothesized mediation pathway is presented in Fig. 2. The significance of pathway *a* indicated that all variables except parental alcohol use met the criteria for inclusion in the mediation analysis (e.g., contextual variables must be significantly associated with at least one hypothesized mediator). The indirect effects of each peer-level variable by each individual-level variable are detailed in Table 3. Specifically, 86.9% of the direct effect of peer alcohol use on violence, and 79.0% of the direct effect of peer marijuana use on violence was mediated by the individual-level variables, including alcohol use, marijuana use, other drug use, depression, group fighting, and baseline violence).

Females—When considering only the effect of neighborhood- and peer-level variables on the desistor and escalator trajectory groups (results not shown), residence in an urban neighborhood was a significant protective factor for escalators only (OR=0.29; 95% CI 0.13–0.66). Peer alcohol use was a risk factor for both desistors (OR=3.34; 95% CI 1.14–9.72) and escalators (OR=2.52; 95% CI 0.96–6.56). When individual-level variables were added to the model (Table 2), residence in an urban neighborhood in the escalator group was the only contextual variable that remained significant (OR= 0.30; 95% CI 0.13–0.67). Alcohol use marginally predicted desistance (OR=2.30; 95% CI 0.87–6.11), and less acculturated youth were at significantly higher risk for membership in the escalator group (OR=6.51; 95% CI 1.42–29.98) only. Group fighting did not significantly predict membership in either high-risk trajectory group.

The hypothesized mediation pathway is presented in Fig. 2. The significance of pathway *a* indicated that all variables met the criteria for inclusion in the mediation analysis (e.g., contextual variables must be significantly associated with at least one hypothesized mediator). The indirect effects of each contextual-level variable by each individual-level

variable are detailed in Table 3. Specifically, 59.7% of the direct effect of residing in an urban neighborhood on violence, 52.3% of peer alcohol use on violence, and 63.0% of peer marijuana use on violence is explained by individual-level variables, including alcohol use, group fighting, and baseline violence.

Discussion

The present study examined the number and shape of trajectories of violent behavior among Hispanic males and females, as well as the direct and indirect effects of multilevel risk and protective factors for membership in each trajectory group. The latent-group based trajectory models found a three-class model across both gender groups: a non-violent group, a group who desists from violent behavior, and a group of escalators whose severity of violence increases over time. As expected, males were over-represented in the high-risk trajectory groups.

These results are consistent with previous research on trajectories of violence. Three trajectory groups were extracted from the data in this study, and this is consistent with the extant literature that suggests there are between three and five unique groups of violent adolescents (Piquero, 2008; Maldonado-Molina et al., 2009, 2010). The findings from this study are unique in that a late-onset group of violent adolescents was identified across gender groups. Although some studies have found support for the existence of this group (D'Unger et al., 2002; Zara & Farrington, 2009), the majority of the literature on trajectories of delinquency supports the age-crime curve, in which adolescents "age out" of delinquent behaviors before age 20 (Piquero, 2008; Farrington, 1986). The sharp increase found among the late-onset escalators in this study may be due to the weighting of more severe forms of violence used in this study (e.g., using a knife or gun in a fighting, shooting someone). If this is the case, participants assigned to the escalator group initiate late in life, and with more severe forms of violent behavior.

The current study found few consistent risk and protective factors for violence across gender groups. Depression was a unique risk factor among males for late-onset escalation, and baseline violence predicted violent trajectory membership. Among females, however, residing in an urban residence was protective from escalation, and lower acculturation was a risk factor for escalation. The finding that previous violence is predictive of future violence only among males has been previously identified (Broidy et al., 2003); however, the mechanism by which urban residence and the language spoken in the home influences violence for females is a direction for future research.

The identification of language spoken in the home as a risk factor for late-onset escalation among Hispanic females highlights one culture-specific risk factor for violent behavior. Although lower levels of acculturation are protective for violence (Jennings et al., 2009; Maldonado-Molina et al., 2009; Reingle et al., 2011), this finding may reflect the acculturative transition process of adolescence aging into adulthood. Specifically, speaking Spanish in the home is not a risk factor for desistance, because adolescents who are less acculturated have yet to participate in violence at young ages. As adolescents transition into adulthood, the acculturation processes break down the protective cultural values from the culture of origin (Chun, Balls Organita, & Gerardo, 2003). This late-onset escalation may be a direct reflection of the increased acculturation experiences during the transition to adulthood.

These findings have significant implications for violence prevention and intervention programming. Specifically, the identification of cultural-specific influences on violence (e.g., level of acculturation), as well as risk factors unique to Hispanic adolescents (e.g.,

depression), warrants programming that targets these risk factors among Hispanics. The differential predictors between gender groups may justify prevention strategies targeted at specific demographic characteristics of the population, or for large-scale prevention programming to include all of these dimensions to maximize the preventive effect across demographic groups.

This study had several limitations. First, we were unable to account for some of the variables that are important in predicting violence, such as peer delinquency, IQ, and psychological disorders. Second, latent-group based trajectory modeling provides an estimation of the type and number of groups in the data, and this process is exploratory in nature. Despite the exploratory nature of trajectory estimation, the results of this study were consistent with the expected number and shape of trajectory groups from other studies (Piquero, 2008; Zara & Farrington, 2009). Finally, risk factors were analyzed at multiple levels; however, hierarchical linear modeling (HLM) was not used due to the small sample sizes available in some of the trajectory groups. In accordance with the sampling design, all analyses accounted for the nesting of adolescents within schools, which may account for a portion of the variability in Census tract measures. Use of HLM to account for the nesting within Census blocks is a direction for future research.

Despite these weaknesses, the current study had a number of strengths. First, data were derived from a longitudinal, nationally representative sample of Hispanic adolescents followed into young adulthood. This sampling design allows generalization to a national sample of Hispanic youth across the United States. Second, the large sample size in the Add Health provides adequate power to stratify by gender to understand the differential risk factors by subgroup. Third, although two studies have evaluated the risk factors for violence among Hispanics, none have assessed the degree to which contextual variables are mediated by more proximal variables at the individual-level. The mediated effects allow us to acknowledge that contextual variables are important in predicting violence even though their effects are mitigated using multivariate regression models. Finally, the trajectories estimated in this study are especially appropriate for studies of delinquency and violence, as patterns tend to vary significantly over time (Farrington, 1986; Piquero, 2008).

In conclusion, the findings from this study indicate that there are substantial differences in the risk factors for violence by gender among Hispanic adolescents. Future research should continue to examine cultural-specific risk factors for violence by gender group, and how risk factors vary across race/ethnicity.

Acknowledgments

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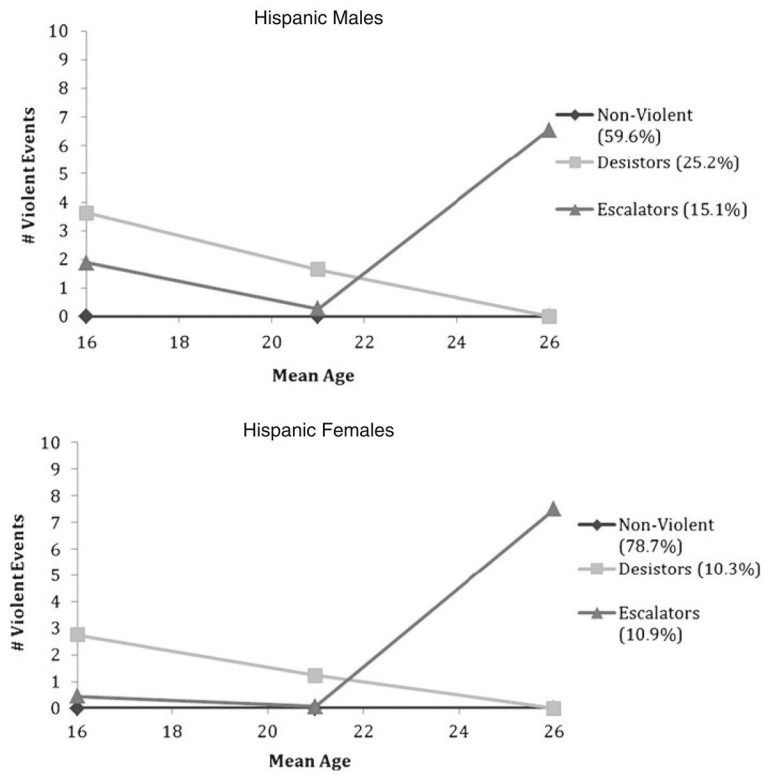
Fig. 1.
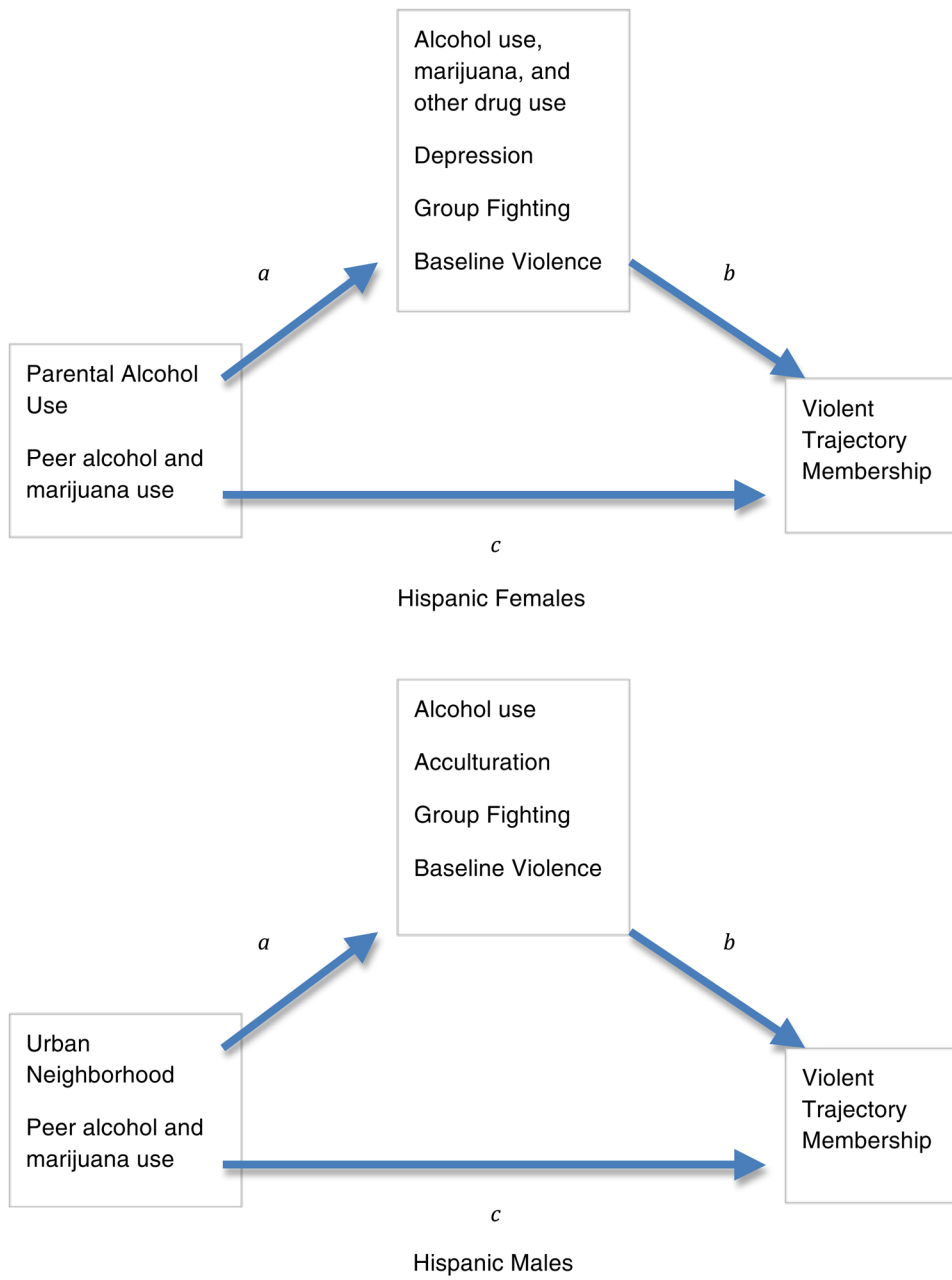Trajectories of serious violence by gender

Fig. 2.
Hypothesized mediation pathway by gender

Table 1

Description of sample, add health. N=3719

Variable	Overall	Hispanic males	Hispanic females
Trajectory Groups			
Violence, Wave II (Mean, SE)	0.81(0.11)	1.25(0.19) [***]	0.38(0.09)
Violence, Wave III (Mean, SE)	0.31(0.05)	0.44(0.09) [*]	0.18(0.07)
Violence, Wave IV (Mean, SE)	0.95(0.14)	1.18(0.26)	0.72(0.13)
Community-level			
Racial Dispersion (Mean, SE)	0.47(0.03)	0.47(0.04)	0.48(0.04)
% Poverty (Mean, SE)	0.13(0.002)	0.14(0.003)	0.14(0.002)
Urban area	81.1	80.5	82.0
Parental and Peer Influences			
Parental Involvement (Mean, SE)	5.41(0.19)	5.13(0.30)	5.68(0.19)
Parental alcohol use	48.9	50.1	47.7
Peer alcohol use	59.7	57.5	61.9
Peer marijuana use	38.9	39.9	41.0
Individual-level Risk Factors			
Alcohol use	61.2	62.6	59.8
Marijuana use	34.8	37.3	32.3
Other drug use	17.4	15.4 [***]	19.4
Depression	46.6	38.9	54.3
Intend to go to college	61.2	57.0	65.3
Desire to leave home	34.4	28.4 [**]	40.6
Speaking Spanish at home	37.2	17.9	19.3
Violence			
Group fighting	31.6	33.4	29.9
Baseline violence	28.1	19.4	36.8
Demographics			
Gender (Male)	50.0		
Age (Mean, SE)	15.27(0.21)	15.45(0.23) [*]	15.09(0.21)
1st Generation Immigrant	31.2	30.1	31.9
2nd Generation US-Born	17.7	13.7	21.6
3rd Generation US-Born	51.1	55.8 [**]	46.5

[*] $p<0.05$

[**] $p<0.01$

[***] $p<0.001$

Table 2

Multilevel effects on trajectories of violence, adjusted for baseline violence

| | Trajectory Group | | | |
| | Desistors | | Escalators | |
	OR	95% CI	OR	95% CI
Hispanic males				
Parental and Peer Influences				
Parental alcohol use	1.14	0.59–2.21	0.51	0.23–1.14
Peer alcohol use	0.77	0.30–1.97	0.50	0.17–1.51
Peer marijuana use	0.88	0.35–2.18	1.32	0.44–3.95
Individual-level Risk Factors				
Alcohol use	1.49	0.53–4.24	0.82	0.32–2.10
Marijuana use	2.07	0.87–4.93	2.13	0.87–5.22
Other drug use	1.35	0.82–2.24	0.43	0.14–1.33
Depression	1.01	0.48–2.12	2.39[*]	1.24–4.62
Violence				
Group fighting	1.33	0.88–2.00	1.59	0.88–2.90
Baseline violence	5.64[**]	2.18–14.55	3.56[*]	1.3–9.62
Hispanic females				
Community and Peer Influences				
Urban neighborhood	1.33	0.52–3.45	0.30[**]	0.13–0.67
Peer alcohol use	2.27	0.83–6.26	2.13	0.72–6.35
Peer marijuana use	1.48	0.59–3.76	0.67	0.29–1.55
Individual-level Risk Factors				
Alcohol use	2.30	0.87–6.11	1.51	0.76–3.02
Acculturation	1.33	0.49–3.58	6.51[*]	1.42–29.98
Violence				
Group fighting	1.11	0.66–1.88	0.82	0.51–1.32
Baseline Violence	1.97	0.67–5.77	1.79	0.60–5.36

The "Non-Violent" trajectory group serves as the reference category. All analyses are controlling for age and generation

[*]
$p<0.05$

[**]
$p<0.01$

Table 3

Mediated effect of peer-level variables on violence trajectories

Mediator	Indirect Effect (*ab*)	z	SE	Percent Mediated
Hispanic males				
Peer alcohol use				
Alcohol Use	0.376	2.17[*]	0.18	14.5
Marijuana Use	0.486	1.96[+]	0.25	18.7
Other Drug Use	0.427	1.52	0.28	16.4
Depression	0.063	2.32[*]	0.08	2.4
Group Fighting	0.443	2.20[*]	0.20	17.1
Baseline Violence	0.464	2.17[*]	0.21	17.8
Total				86.9
Peer marijuana use				
Alcohol Use	0.219	2.26[*]	0.10	10.0
Marijuana Use	0.482	2.12[*]	0.23	21.9
Other Drug Use	0.329	1.96[+]	0.17	14.9
Depression	0.124	2.49[*]	0.05	5.6
Group Fighting	0.176	0.82	0.21	8.0
Baseline Violence	0.404	2.21[*]	0.18	18.4
Total				79.0
Hispanic females				
Urban neighborhood				
Alcohol Use	0.668	2.46[*]	0.03	24.9
Group Fighting	0.043	2.64[**]	0.02	15.9
Baseline Violence	0.051	1.63	0.03	18.9
Total				59.7
Peer Alcohol Use				
Alcohol Use	0.316	2.65[**]	0.12	23.6
Group Fighting	0.153	2.35[*]	0.07	11.5
Baseline Violence	0.231	1.86[+]	0.12	17.3
Total				52.3
Peer marijuana use				
Alcohol Use	0.356	2.38[*]	0.15	28.1
Group Fighting	0.168	2.45[*]	0.07	13.3
Baseline Violence	0.275	1.94[+]	0.14	21.7
Total				63.0

All models are adjusted for age and generation

(a): These mediated effects were generated in accordance with MacKinnon (2008). The percent mediation was generated using the formula: [(a*b/ (a*b + c)] (MacKinnon, 2008)

[†]p<0.10

[*]p<0.05