Title

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Journal

Journal of Urban Health, 93(4)

ISSN

1099-3460

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Publication Date

2016-08-01

DOI

10.1007/s11524-016-0060-y

Peer reviewed

Journal of Urban Health: Bulletin of the New York Academy of Medicine, Vol. 93, No. 4
doi:10.1007/s11524-016-0060-y

Changes in Attitudes toward Guns and Shootings following Implementation of the Baltimore *Safe Streets* Intervention

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ABSTRACT *Among youth 15 to 24 years of age, homicide and nonfatal shootings are the leading causes of mortality and morbidity. Urban youth's attitudes and perceptions about the use of gun violence to resolve conflict present a major barrier to efforts to reduce gun homicides and nonfatal shootings. The current investigation extends the existing literature on attitudes toward guns and shootings among high-risk youth ages 18 to 24 by measuring perceived norms and viewpoints regarding gun violence in two analogous Baltimore City neighborhoods pre-implementation and 1-year post-implementation of the Safe Streets intervention (adapted from the CeaseFire/Cure Violence intervention). The Safe Streets intervention is designed for communities with high rates of gun violence and utilizes outreach workers to identify and build trusting relationships with youth ages 15 to 24 who are at greatest risk of being involved in gun violence. The outreach workers also position themselves in the community so that they can rapidly intervene in disputes that have the potential to lead to gun violence. Chi-squared tests and exploratory structural equation modeling (ESEM) were used to examine changes in attitudes toward gun violence 1 year after the implementation of the Safe Streets intervention. There was a statistically significantly improvement in 43 % of the attitudes assessed in the intervention community post-intervention compared to 13 % of the attitudes in the control community. There was a statistically significant improvement in the violent attitudes toward personal conflict resolution scale after implementation of the intervention in both the intervention ($b = -0.522$, $p < 0.001$) and control community ($b = -0.204$, $p < 0.032$). Exposure to the intervention (e.g., seeing stop shooting signs in your neighborhood) was also associated with the nonviolent attitudes toward conflict scale. Overall, the study found greater improvement in attitudes toward violence in the intervention community following the implementation of the Safe Streets program. These findings offer promising insights into future community violence prevention efforts.*

KEYWORDS *Violence, Young adult, Attitudes, Gun violence*

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INTRODUCTION

Despite an overall national reduction in fatal and nonfatal shootings since the 1990s, gun violence continues to have an enormous impact on the lives and well-being of many youth in urban areas of the USA. According to the US Department of Justice's Bureau of Justice, firearm homicides decreased nearly 40 % between 1993 and 2011, and nonfatal gun assaults against people 12 years old and older decreased 70 % during the same time period.[1] The FBI reports continued year-over-year decreases in gun homicides between 2011 and 2014.[2] However, among youth 15 to 24 years of age, homicide remains the leading cause of death for black males and the third leading cause of death for white males, with the crude rate of gun homicides for black males being over 10 times that of their white counterparts. Furthermore, the devastating effect of firearm violence on youth in America does not just involve homicides; for every young person killed with a gun, there are about four other youths who are victims of nonfatal gun assaults (Fig. 1).[3]

The majority of all firearm homicides and nonfatal shootings in the USA are committed with a handgun.[1] Although federal law prohibits the possession of a handgun for any person under the age of 18, research has shown that many juveniles and young men who are restricted due to disqualifying convictions do still possess and carry handguns.[3] Studies assessing gun possession and ownership among urban youth have found that witnessing violence and expressing violence-prone attitudes seem to predict ownership of guns, particularly handguns.[4] Ethnographic investigations have found that many urban youth believe that gun carrying, particularly in neighborhoods with high levels of crime, is a normal occurrence and that the social norm or "code of the street" is to be ready and willing to respond to threats with lethal violence.[5, 6] Many young males in high-crime neighborhoods also believe that an act of blatant disrespect requires a response

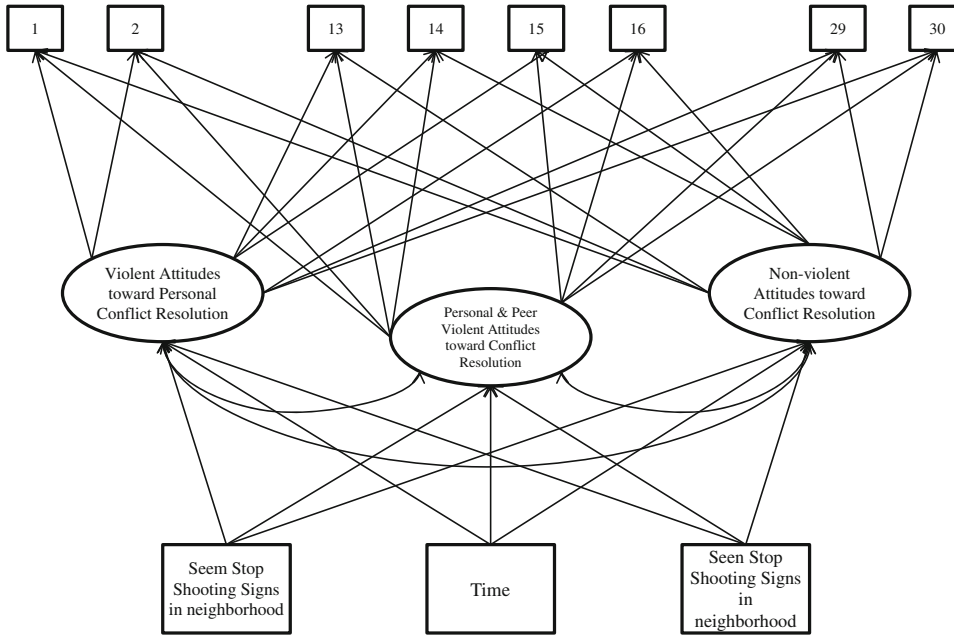

FIG. 1 Structural model examining attitudes toward gun violence after implementation of the *Safe Streets* intervention.

potentially involving deadly force.[6, 7] Previous research proposes that violent retaliation is driven by the desire to restore one's perceived reputation and social status after an incident of disrespect, assault, or victimization.[7] Additionally, male youth in highly violent neighborhoods frequently believe that a failure to retaliate may affect one's status and even one's safety.[6–9]

Urban youth's attitudes and perceptions about the use of gun violence to resolve conflict present a major barrier to efforts to reduce gun homicides and nonfatal shootings among this population. However, violence prevention interventions aimed at shifting youth's views on violence as an acceptable means of retaliation or conflict resolution have demonstrated some promise.[10, 11] For example, one study of urban youth ages 7 to 17 found that approximately 1 month after touring a hospital and seeing a presentation on gun violence, followed by discussions with a police officer, the youth expressed significantly reduced scores on a scale measuring beliefs supporting aggressive behaviors. There was also a trend toward reduced scoring on a scale measuring likelihood of violence, yet no significant changes in scores on attitudes toward conflict or violent intentions.[11] Another study examined scores on a survey on attitudes regarding the use of violence in conflict before and after a cohort of mostly eighth and ninth grade urban school students participated in a 2-h hospital-based program that simulated the final living moments of a youth killed by a gunshot.[12] The validated Attitudes Toward Guns and Violence Questionnaire (AGVQ)[13] was given to the study participants 2 weeks prior and 4 weeks after the intervention, and the pre-post comparison in scores revealed significant decreases in public and charter students' scores on questions related to aggressive responses to shame and in total AGVQ score for public school students. However, no measurable change in total AGVQ score was found among charter school students.[13] These two studies suggest that the youth's attitudes involving guns and violence might be malleable, but they do not directly answer questions about whether a larger-scale, community-based intervention could alter perceptions and beliefs about the appropriateness of resorting to gun violence to settle disputes.

Cure Violence, formerly known as *CeaseFire* and referred to as *Safe Streets* in Baltimore and in the current paper, is a public health violence preventive intervention designed to prevent shootings among adolescents and young men by changing attitudes, behaviors, and social norms most directly related to gun violence. Following lessons learned from public health efforts to prevent the spread of infectious diseases, the program is designed for communities with high rates of gun violence and utilizes outreach workers to identify and build trusting relationships with youth ages 15 to 24 who are at greatest risk of being involved in gun violence, based on a history of violence or current involvement in risky street activities such as gang affiliation or illicit drug selling. In addition to serving as positive role models and resources for connecting youth to job and educational opportunities to steer them from actions that might heighten violence risk, the outreach workers also position themselves in the community so that they can rapidly intervene in disputes that have the potential to lead to gun violence. When encountering or being informed of potential conflicts, the workers act quickly to intervene with one or both parties in the dispute depending upon the circumstances. One component of the intervention is to get the involved individual(s) to identify that they could or would experience negative consequences to a violent response and to help identify alternatives other than violence for getting relief from the causes of the dispute(s). Ideally, this allows the parties to utilize alternative dispute resolution and reconciliations not involving the potential of death. Consistent with the *Cure*

Violence model, *Safe Streets* also seeks to shape community norms that renounce violence and the actions of many in the neighborhood who are not "clients" through public events and campaigns that bring the community together, provide positive activities for youth and families, and promote nonviolent behavior.[14] The *Cure Violence* intervention has been replicated in dozens of cities across the world and has been associated through multiple independent evaluations with significant reductions in shootings in implementation areas.[12] For example, prior research has shown that *Safe Streets* is largely effective at reaching its primary goal of reducing shootings and homicides in high-violence communities in Baltimore City.[15].

However, to date, no evaluation has measured *Cure Violence*'s (or *Safe Streets'*) impact on attitudes about the acceptability of using guns to settle conflicts, which are hypothesized to be an important mediator of the effects of the intervention on violence-related outcomes. Further exploration into the social norms related to gun violence among young men living in violent urban communities, as well as increased knowledge of the effectiveness of interventions aimed at shaping those norms, would not only inform our understanding of the potential effects of *Safe Streets* but also help to tailor gun violence prevention efforts for this high-risk population. The current investigation extends the existing literature on attitudes toward guns and shootings among high-risk youth by measuring the perceived norms and viewpoints regarding gun violence in two analogous Baltimore City neighborhoods pre- and post-implementation of the *Cure Violence* intervention, referred to as *Safe Streets* in Baltimore, in one of those two neighborhoods. Based on the intervention's program tenets and multilayered approach to reshaping social norms on gun violence, we hypothesized that *Safe Streets* would improve attitudes on the use of guns to resolve conflict in the treatment community.

METHOD

This investigation was conducted in two neighborhoods in Baltimore City. The Lower Park Heights community was selected for a multifaceted community violence prevention intervention that included some school-based interventions and planned alcohol interventions in addition to *Safe Streets*. The intervention community has a population of about 12,100 predominately African-American residents. Although the area has some limited commercial (primarily retail) and industrial uses, it is characterized in major part by residential zoning. Similar to the Park Heights community, the Southwest Baltimore community has limited commercial uses but is primarily residentially zoned. The community, which was selected as the control area, is less than 3 mi from Park Heights and home to approximately 9338 predominately African-American residents. The communities were selected based on similar demographics and rates of fatal and nonfatal shootings prior to the intervention. In 2011, the Park Heights community had 1.6 homicides and shootings per 1000 residents; the rate was 1.8 per 1000 residents in Southwest Baltimore and 1.1 in Baltimore City.

Individual blocks within each community were randomly ranked from 1 to the highest number of blocks. Blocks were then visited in the order of their ranking. Blocks were visited up to three occasions or until a maximum of six surveys were completed on that block face. A block face is defined as the even and odd sides of the street of the unit block.

The inclusion criteria for the street intercept survey were male youth aged 18–24 and were English speaking. Survey staffs were trained to approach any youth

appearing to be near or in that age range and ask for the potential respondents' age to determine eligibility. Youth males who appeared to be intoxicated, under the influence of drugs, or otherwise mentally impaired were ineligible to participate. The data collection and data analysis were approved by the Institutional Review Board of the Johns Hopkins University Bloomberg School of Public Health.

Staff Training and Procedures

Interviewers were trained in two in-office orientations that included human subjects training, study protocols, administration of survey to other interviewers, and safety procedures. Each interviewer took training packets in the field with the principal investigator and project manager's contact information, a summary of the survey being distributed, the study procedures, safety protocols, and participant inclusion requirements. As a safety precaution, all data was collected in teams of at least two interviewers.

The interviewers were expected to obtain at least six surveys per block throughout data collection. Participants were recruited from the Park Heights and Southwest neighborhoods in Baltimore, MD. Project staff approached potential participants and asked if they were in the target age range (18–24). The *Safe Streets* intervention targeted youth aged 18–24 who were physically present in the neighborhood, regardless of if they actually lived in the neighborhood. Similarly, our interview protocol did not require that the participants should be living in the neighborhood but that they were present on the selected block face at the time of the survey. Qualifying participants were then informed of the purpose of the study and were asked to complete the survey. Each person who completed the survey received a $10 gift card to a nearby convenience store for his or her participation. Completed surveys were stored in individual envelopes with no personal identifying information other than the location of the block on which it was completed. Surveys were returned to the researchers within 48 h of collection for data entry.

Survey of Attitudes about Guns and Shooting (Milam AJ, Furr-Holden CDM, Leaf PJ, Webster D, 2016). The 37-item survey included respondent age; exposure to community and school violence prevention programs; whether they have ever been arrested; whether they had ever been shot or shot at; whether they had seen a vigil, march, or gathering in response to a shooting; and a series of attitudinal items which ask whether the respondent think it is "okay" to shoot someone or threaten them with a gun under five common scenarios found in prior research to be "sparks" for shootings involving urban youth. The survey was anonymous and, to protect confidentiality, self-administered. The respondents completed the self-report measure using paper and pencil on clipboards with "blinders" to conceal responses from those other than the respondent. The participants were also offered the opportunity to listen to the questions and response options on a portable CD player with headphones to reduce nonresponse due to literacy. The survey has acceptable metric properties.[16]

Safe Streets Intervention

The *Safe Streets* program began initial community outreach in the Park Heights neighborhood in February 2013 and was fully implemented in June 2013. The program focuses on a single police post within the intervention community. The program's mission is to reduce homicides and shootings in the community, and as described earlier, the intervention team works to detect and interrupt potentially violent conflict in the community and to help shift ideas around the use of violence

to resolve disputes. The *Safe Streets* outreach staff in intervention community (Park Heights) averaged over 15 conflict mediations per month in 2013, reporting that 96 % of those conflicts were likely or very likely to have resulted in a shooting without intervention.[17] The outreach workers also helped make about 10 referrals per month for clients looking for employment, educational opportunities, and other social services. Furthermore, the program staff hosted an average of one community event per month, with approximately 1250 Park Heights residents in attendance or approximately 10 % of the neighborhood's population.

Statistical Analysis

Descriptive statistics for each of the responses were calculated and stratified by neighborhood (Park Heights and Southwest Baltimore). Chi-squared tests were used to examine the differences in responses stratified by the treatment condition. Previously conducted exploratory factor analysis (EFA) identified five factors as follows: (1) violent responses to personal conflict, (2) nonviolent responses to personal conflicts, (3) violent responses to conflict involving friends, (4) nonviolent responses to conflict involving friends, and (5) gun threats.[16] The factors were in the exemplary range for internal consistency (measured by Cronbach's alpha). Several items were loaded on multiple factors; confirmatory factor analysis only allows indicators to be affected by one factor (i.e., requires cross loadings of the factor indicators to be set to zero).[18–20] Given the restrictions of confirmatory factor analysis (CFA), we opted to use exploratory structural equation modeling (ESEM) to examine changes in attitudes toward violence by treatment condition (i.e., intervention vs. control community) and exposure to the *Safe Streets* intervention (i.e., (1) have you seen any signs, flyers, or posters in your neighborhood with a message to stop shooting and (2) has a *Safe Streets* worker ever helped YOU to peacefully settle a beef?). ESEM integrates an exploratory factor analysis (EFA) into structural equation modeling (SEM). All models were estimated in Mplus version 7.1 using a robust weighted least squares approach with mean and variance adjustment (WLSMV).

Several model-fit indices, including the root-mean-square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis index (TLI), were used to evaluate the model fit. RMSEA values ≤ 0.05, CFI values ≥ 0.95, and TLI values ≥ 0.90 generally represent an excellent fit to the observed data.[20] While we used the criteria for acceptable CFA fit, it should be noted that there is no sufficient research to confirm that these indexes can be used for ESEM studies.[20–21]

Missing Data. There were 625 participants (50.7 % in the intervention community) who completed the survey at baseline (i.e., pre-intervention) and 702 participants (49.1 % in the intervention community) completed the survey after the implementation of the intervention. Approximately 79.0 % of the participants had complete data for the 30 items about attitudes toward gun violence and conflict resolution. The remaining 21.0 % of the participants were missing because of at least one question unanswered. The participants who responded to all 30 items were similar (i.e., $p > 0.05$) to the participants with missing data in terms of age, if the participant had ever been shot at, been arrested, seen vigil, march, or gathering in neighborhood after shooting. The participants with missing data were more likely to report that they had been helped by a *Safe Streets* worker to peacefully settle a beef ($p = 0.04$) and have seen a *Safe Streets* worker help someone ($p < 0.01$). The descriptive data includes those without complete data. Missing data for the Mplus

models was accounted for by full information maximum likelihood (FIML). FIML is a widely accepted method to handle missing data and assumes that data are missing at random.

RESULTS

Baseline Comparisons of Attitudes toward Violence

The control and the intervention community were selected based on the demographics and the rates of violence (see the "Methods" section). Baseline comparisons by treatment condition (intervention vs. control neighborhood) were conducted for the participants with complete data ($n = 478$) to determine if there were differences in previously unmeasured characteristics. The mean age of the sample was 20.7 ($SD = 2.1$) There were only a few differences by neighborhood; the participants in the intervention community were more likely to report threatening a guy who robbed them (26.9 % in the intervention community and 17.9 % in the control community; $p = 0.01$) and shooting a guy owes them $100 (13.0 % in the intervention community and 7.5 % in the control community; $p = 0.03$). The participants in the control community were more likely to resolve conflicts at baseline using nonviolent approaches (e.g., guy on street owes you $100 and talk to him about it; 44.1 % in the intervention community and 56.3 % in the control community; $p = 0.03$).

Pre-Intervention vs. 1 Year Post-Intervention

Chi-squared tests were used to identify differences in each of the 30 items pre-intervention and 1 year after implementation of the intervention by treatment condition (Table 1). In the intervention community, there were 13 items (43.3 % of items) with statistically significant improvement in attitudes toward gun violence; an additional three items had marginally significant improvement ($p < 0.10$) following the intervention. For example, during the pre-intervention period, 16.8 % of the participants reported that they would shoot a guy on the street that beat up their brother; however, only 7.3 % of the participants endorsed this item 1 year after implementation of the intervention ($p < 0.001$). There were four items (13.3 % of the items) in the control community with a statistically significant improvement in attitudes toward gun violence, with an additional three items that showed a marginally significant improvement at 1 year post-intervention.

In the intervention community, there was a higher percentage of the participants reporting seeing stop shooting signs in the community post-intervention (41.2 % at baseline, 58.7 % after implementation; $p < 0.001$); there was no difference in the control community. However, there was a higher percentage of the participants reporting that a *Safe Streets* worker helped them in the control community (19.5 % at baseline, 26.2 % after implementation; $p = 0.031$) than in the intervention community (18.1 % at baseline, 24.3 % after implementation; $p = 0.127$). Self-report of someone you know being exposed to *Safe Streets* workers improved by nearly 10 % in both the intervention and the control communities following the intervention.

TABLE 1 Attitudes toward gun violence by neighborhood

	Yes (%) in intervention community			Yes (%) in control community		
	Wave 1	Wave 2	*p*	Wave 1	Wave 2	*p*
Mean age (in years)	2.5 (2.2)	21.2 (2.3)	0.069	2.9 (2.1)	21.4 (2.1)	0.404
I am at a club with my girl and this guy is dancing with her. Do you think it would be right to threaten the guy with a gun?	21.8	1.1	<0.001	2.4	6.4	<0.001
Do you think it would be right to shoot the guy?	1.5	5.6	0.091	6.3	6.7	0.943
Do you think it would be better to let him know that she is with you and you do not want any trouble?	49.2	65.6	<0.001	53.8	65.6	0.019
I see a guy on the street who beat up my brother last week. Do you think it would be right to threaten the guy with a gun?	27.3	9.0	<0.001	22.5	12.4	0.007
Do you think it would be right to shoot the guy?	16.8	7.3	<0.001	12.1	11.3	0.918
Do you think it would be better to let him go so as not to cause more trouble?	32.4	49.7	<0.001	41.3	5.4	0.11
I see a guy on the street who robbed me of $50 and my new shoes. Do you think it would be right to threaten the guy with a gun?	26.9	19.1	0.103	17.9	21.6	0.166
Do you think it would be right to shoot the guy?	19.3	13.9	0.208	13.8	15.2	0.882
Do you think it would be better to report the crime to police?	3.3	3.9	0.144	41.3	37.6	0.670
I see a guy who has not paid me the $100 he owes me. Do you think it would be right to threaten the guy with a gun?	26.9	13.2	<0.001	19.2	14.2	0.245
Do you think it would be right to shoot the guy?	13.0	1.8	0.238	7.5	1.3	0.516

TABLE 1 ***Continued***

	Yes (%) in intervention community			Yes (%) in control community		
Do you think it would be better to talk to him and give him time to pay back the money?	44.1	58.7	0.004	56.3	6.6	0.266
A guy disrespects me on the street in front of my friends. Do you think it would be right to threaten the guy with a gun?	15.5	8.7	0.006	14.2	7.4	0.024
Do you think it would be right to shoot the guy?	8.4	8.0	0.203	7.1	8.5	0.833
Do you think it would be better to just let it go?	33.6	47.6	0.002	45	54.3	0.079
Your friend is at a club with his girl and this guy is dancing with her. Would most of your friends think it was right to threaten the guy with a gun?	3.3	24.7	0.356	28.3	24.1	0.108
Would most of your friends think it was right to shoot the guy?	18.5	2.8	0.179	17.1	16.7	0.351
Would most of your friends think it would be better to let him know that she is with you and you do not want any trouble?	34.0	44.4	0.051	44.6	48.2	0.496
Your friend sees a guy on the street who beat up his brother last week. Would most of your friends think it was right to threaten the guy with a gun?	32.8	24.3	0.011	28.7	26.2	0.518
Would most of your friends think it was right to shoot the guy?	27.3	19.4	0.045	18.8	2.9	0.811
Would most of your friends think it would be better to let him go so as not to cause more trouble?	27.3	36.5	0.075	34.6	41.1	0.078
Your friend sees a guy on the street who robbed him of $50 and his new	26.1	29.5	0.309	22.9	29.8	0.062

TABLE 1 ***Continued***

	Yes (%) in intervention community			Yes (%) in control community		
shoes. Would most of your friends think it was right to threaten the guy with a gun?						
Would most of your friends think it was right to shoot the guy?	18.1	24.0	0.241	18.3	21.3	0.563
Would most of your friends think it would be better to report the crime to police?	26.5	29.5	0.655	31.7	37.6	0.166
Your friend sees a guy who has not paid him the $100 he owes him. Would most of your friends think it was right to threaten the guy with a gun?	28.2	27.1	0.368	27.5	28.7	0.235
Would most of your friends think it was right to shoot the guy?	21.0	2.5	0.779	17.5	19.5	0.296
Would most of your friends think it would be better to talk to him and give him time to pay back the money?	29.4	42.0	0.011	41.3	48.6	0.141
A guy disrespects your friend on the street in front of his friends. Would most of your friends think it was right to threaten the guy with a gun?	24.4	23.3	0.679	23.3	23.0	0.310
Would most of your friends think it was right to shoot the guy?	1.9	16.3	0.150	14.6	16.7	0.313
Would most of your friends think it would be better to just let it go?	26.1	37.2	0.023	36.7	41.1	0.194
Have you seen a vigil, march, or gathering in your neighborhood in response to a shooting?	38.2	47.6	0.032	47.1	41.1	0.206
Have you seen any signs in your in your neighborhood with a message "Stop the Shooting?"	41.2	58.7	<0.001	51.5	49.3	0.947
Has a *Safe Streets* worker ever helped you to	18.1	24.3	0.127	19.5	26.2	0.031

TABLE 1 ***Continued***

	Yes (%) in intervention community			Yes (%) in control community		
peacefully settle a beef?						
Have you seen a *Safe Streets* worker help someone else to peacefully settle a beef?	24.8	35.8	0.015	26.7	36.9	0.013
Have you ever been arrested?	45.8	57.6	0.016	42.1	55	0.008
Have you ever been shot at (even if you were not hit)?	31.9	42.7	0.024	35.0	38.3	0.470

Exploratory Structural Equation Modeling

Measurement Model. The fit indices for one- and two-factor solutions were not acceptable (i.e., CFI/TFI <0.95 and RMSEA >0.05). The three-factor solution had acceptable fit indices (CFI/TFI = 0.96/0.95, RMSEA = 0.059). The first factor, *violent attitudes toward personal conflict resolution*, included eight items with significant and positive high loadings (>0.40; e.g., I see a guy on the street who beat up my brother last week, I think it would be right to threaten the guy with a gun). The second factor, *personal and peer violent attitudes toward conflict resolution*, included 19 items with significant and positive high loadings (e.g., Your friend sees a guy who has not paid him the $100 he owes him. Most of your friends think that it was right to shoot the guy). This factor included violent attitudes from the respondents as well as their friends. The third factor, *nonviolent attitudes toward conflict resolution*, had 10 items with significant and positive high loadings (e.g., A guy disrespects me on the street in front of my friends. I think the guy is carrying a gun. Let it go). There was a significant inverse relationship between the *nonviolent attitudes toward personal conflict resolution* and the *personal and peer violent attitudes toward conflict resolution* factors ($b = -0.378$, $p < 0.001$). There was a positive but nonsignificant correlation between the *violent attitudes* and the *personal and peer violent attitudes* factors ($b = 0.107$, $p = 0.087$; Table 2).

Structural Model. The structural model was used to assess changes in attitudes after implementation of the intervention and in response to exposure to the intervention. The preliminary analyses included an interaction term for intervention condition (intervention vs. control community) and time (pre-intervention vs. post-intervention). The interaction term ($b = -0.284$, $p = 0.036$), time ($b = -0.220$, $p = 0.025$), and the effect for intervention condition ($b = 0.477$, $p = 0.023$) were significant when regressed on the *violent attitudes toward personal conflict* factor. We stratified the data by intervention condition to detect differences in the magnitude of effect by community (Table 3).

There was a decline in the *violent attitudes toward personal conflict* factor after the implementation of the intervention in the intervention community ($b = -0.522$, $p < 0.001$). There was also an inverse relationship between seeing stop shooting signs and *violent attitudes toward personal conflict resolution* ($b = -0.203$, $p = 0.039$), such that the participants who reported seeing stop shooting signs were less likely to endorse violent attitudes to resolving personal conflict. There was a positive and

TABLE 2 ESEM measurement model ($n = 1327$)

	Violent attitudes toward personal conflict resolution	Personal and peer violent attitudes toward conflict resolution	Nonviolent attitudes toward conflict resolution
I am at a club with my girl and this guy is dancing with her. Do you think it would be right to threaten the guy with a gun?	0.623*	0.400*	−0.010
Do you think it would be right to shoot the guy?	0.582*	0.462*	0.075*
Do you think it would be better to let him know that she is with you and you do not want any trouble?	−0.519*	0.068	0.552*
I see a guy on the street who beat up my brother last week. Do you think it would be right to threaten the guy with a gun?	0.546*	0.539*	−0.058*
Do you think it would be right to shoot the guy?	0.547*	0.534*	−0.025
Do you think it would be better to let him go so as not to cause more trouble?	−0.422*	−0.010	0.605*
I see a guy on the street who robbed me of $50 and my new shoes. Do you think it would be right to threaten the guy with a gun?	0.330*	0.587*	0.003
Do you think it would be right to shoot the guy?	0.386*	0.599*	0.031
Do you think it would be better to report the crime to police?	−0.169*	−0.051	0.648*
I see a guy who has not paid me the $100 he owes me. Do you think it would be right to threaten the guy with a gun?	0.539*	0.555*	−0.076*
Do you think it would be right to shoot the guy?	0.534*	0.546*	−0.005*
Do you think it would be better to talk to him and give him time to pay back the money?	−0.455*	0.001	0.581*
A guy disrespects me on the street in front of my friends. Do you think it would be right to threaten the guy with a gun?	0.543*	0.569*	0.089*
Do you think it would be right to shoot the guy?	0.550*	0.548*	0.115*
Do you think it would be better to just let it go?	−0.339*	0.043	0.682*
Your friend is at a club with his girl and this guy is dancing with her. Would most of your	0.064*	0.830*	0.013

TABLE 2 ***Continued***

	Violent attitudes toward personal conflict resolution	Personal and peer violent attitudes toward conflict resolution	Nonviolent attitudes toward conflict resolution
friends think it was right to threaten the guy with a gun?			
Would most of your friends think it was right to shoot the guy?	0.044	0.832*	−0.006
Would most of your friends think it would be better to let him know that she is with you and you do not want any trouble?	−0.094*	−0.044	0.764*
Your friend sees a guy on the street who beat up his brother last week. Would most of your friends think it was right to threaten the guy with a gun?	0.006	0.845*	−0.022*
Would most of your friends think it was right to shoot the guy?	−0.010	0.814*	−0.070*
Would most of your friends think it would be better to let him go so as not to cause more trouble?	0.019	−0.048*	0.839*
Your friend sees a guy on the street who robbed him of $50 and his new shoes. Would most of your friends think it was right to threaten the guy with a gun?	−0.048	0.863*	0.007
Would most of your friends think it was right to shoot the guy?	−0.113*	0.830*	−0.023
Would most of your friends think it would be better to report the crime to police?	0.087*	−0.014	0.807*
Your friend sees a guy who has not paid him the $100 he owes him. Would most of your friends think it was right to threaten the guy with a gun?	−0.014	0.875*	0.005
Would most of your friends think it was right to shoot the guy?	−0.080*	0.824*	−0.067*
Would most of your friends think it would be better to talk to him and give him time to pay back the money?	0.004	−0.023	0.830*
A guy disrespects your friend on the street in front of his	0.001	0.879*	0.040

TABLE 2 ***Continued***

	Violent attitudes toward personal conflict resolution	Personal and peer violent attitudes toward conflict resolution	Nonviolent attitudes toward conflict resolution
friends. Would most of your friends think it was right to threaten the guy with a gun?			
Would most of your friends think it was right to shoot the guy?	−0.148*	0.840*	−0.003
Would most of your friends think it would be better to just let it go?	0.027	−0.015	0.844*

CFI/TFI = 0.96/0.95, RMSEA = 0.059
*$p < 0.001$

significant relationship between personal interaction with *Safe Streets* workers and the *violent attitudes toward personal conflict resolution* factor ($b = 0.371$, $p < 0.001$). Young adults who reported seeing stop shooting signs in their neighborhood were more likely to endorse nonviolent attitudes to resolving conflict ($b = 0.276$, $p = 0.001$).

In the control community, there was also a decline in *violent attitudes toward personal conflict* 1 year later ($b = -0.204$, $p = 0.032$) and an inverse relationship with seeing stop shooting signs ($b = -0.300$, $p = 0.002$). Seeing stop shooting signs and personal interaction with *Safe Streets* workers were both associated with *nonviolent attitudes toward conflict resolution* factor ($b = 0.232$, $p = 0.007$ and $b = 0.255$, $p = 0.009$, respectively).

DISCUSSION

This investigation sought to examine if attitudes toward guns and shootings changed following the implementation of the *Safe Streets* community-level intervention focused on reducing gun violence among high-risk young adults in Baltimore. The intervention was implemented in a community with high rates of gun violence; a community with similar demographics and rates of gun violence was used as the control condition. The baseline survey of attitudes toward guns and shootings showed comparable attitudes toward violence in the intervention and control community. After implementation of the intervention, there were more attitudes that improved within the intervention community as compared to the control community. The structural equation model also showed consistent results; namely, there was a greater magnitude of improvement in violent attitudes to personal conflict in the intervention community compared to the control community. This model demonstrated changes among a group of attitudes (i.e., a latent construct) as opposed to changes in individual items, which are also presented in the results. These results should be viewed in light of the greater baseline and post-intervention exposure to the *Safe Streets* program in the control community as compared to the intervention community.

TABLE 3 Unstandardized estimates of the structural model

	Intervention community[a]	Control community[b]
Violent attitudes toward personal conflict resolution		
Time	−0.522*	−0.204*
Seen any signs in your in your neighborhood with a message "Stop the Shooting?"	−0.204*	−0.300*
Safe Streets worker ever helped you to peacefully settle a beef?	0.371*	0.126
Personal and peer violent attitudes toward conflict resolution		−0.051
Time	−0.091	0.064
Seen any signs in your in your neighborhood with a message "Stop the Shooting?"	0.073	0.071
Safe Streets worker ever helped YOU to peacefully settle a beef?	0.043	
Nonviolent attitudes toward conflict resolution		
Time	0.106	0.105
Seen any signs in your in your neighborhood with a message "Stop the Shooting?"	0.276*	0.232*
Safe Streets worker ever helped you to peacefully settle a beef?	0.179	0.285*
Violent attitudes toward personal conflict resolution with		
Personal and peer violent attitudes toward conflict resolution	0.153	0.210
Nonviolent attitudes toward conflict resolution	−0.118	0.027
Personal and peer violent attitudes toward conflict resolution with		
Nonviolent attitudes toward conflict resolution	−0.347*	−0.363*

[a]CFI/TFI = 0.96/0.95, RMEA = 0.053, $n = 642$
[b]CFI/TFI = 0.97/0.97, RMEA = 0.047, $n = 658$
*$p < 0.05$

It is important to note that the 13 items in the SAGAS related to violent attitudes toward conflict resolution in the intervention community significantly improved, compared to just four items in the control community. The overall improvement in attitudes toward violence to resolve conflict can partly be attributed to citywide efforts to improve violence and attitudes toward violence. Despite these global efforts, our targeted community intervention demonstrated greater improvements in violence compared to standard community settings. We also saw similar changes pre- and post-intervention but witnessed a higher magnitude of improvement in the intervention community.

These results should be viewed in light of several limitations. First, the sample is a cross-sectional representation of young African-American males in each of the communities, and it is possible that people either moved between waves of data collection or that the sample represents people who hang out in the neighborhood but do not actually live there. Residential mobility is predictably higher in this urban, low-income population than in more affluent populations [22, 23], but we have no evidence to suggest that the residents moving in and out of the community

are different in their attitudes about violence. Further, despite our efforts to target comparable communities, the self-reported *Safe Streets* exposure in the control community was higher than the intervention community at baseline. This would have biased our results toward the null but in fact had little impact on the analyses by treatment condition. We suspect that the *Safe Streets* efforts in other communities across the city have disproportionately reached the residents in our control community, and we will deliberately acquire this information in future investigations. Because we selected respondents who were present on the block face but did not necessarily live in the community, it is possible that their *Safe Streets* exposure was in a different neighborhood. Similarly, a resident in the intervention community could have been exposed to *Safe Streets* in a neighborhood outside of their residential neighborhood. Future surveys will expand the battery of items assessing *Safe Streets* exposure to better specify the context and location of *Safe Streets* exposure. Finally, our analyses did not account for clustering of respondents within groups. It was difficult to ascertain which respondents were in peer groups with other respondents both because the data were collected without identifiers and we did not want to alienate participants by asking whom on the block they were affiliated with. This could have biased our results in either direction and strategies to account for clustering, even if by block level will be employed in future investigations.

Despite these limitations, this investigation builds upon previous research suggesting that youth's perceptions and attitudes about violence to resolve disputes can be positively shaped through targeted intervention. These findings are also consistent with our hypothesis and prior research [11–13] suggesting that attitudes involving violence can be improved through intervention; moreover, this study expands the current literature by looking specifically at the acceptability of gun violence among urban youth in a neighborhood with a high rate of shootings and gun homicides. This investigation also illuminated specific intervention components, namely, stop shooting signs and interactions with *Safe Streets* workers that led to significant increases in nonviolent attitudes toward conflict.

Future research should explore expansions of the *Safe Streets* program to larger geographic areas across the city. There is also a compelling need for targeted interventions to curtail high endemic levels of violence. Consistent with that goal, the *Safe Streets* team is developing strategies to ensure sustainability of the *Safe Streets* program and its continued implementation and success. Future studies should explore other factors related to violent aggression, such as impulsivity, emotion regulation, and self-efficacy, to avoid fighting. Additionally, observational assessments (i.e., systematic social observation) of signage and other measures theoretically linked to reductions in attitudes toward violence (e.g., police tape and vigils in the community) will be explored. Better understanding how the physical and social landscape of neighborhoods change as a function of the *Safe Streets* program may prove useful in explaining mechanisms that account for intervention effects. The current study expands upon prior research showing that *Safe Streets* is effective at reaching its primary goal of reducing shootings and homicides in high-violence communities by exploring whether a primary hypothesized mechanism by which these reductions occur notably shifts in community norms and attitudes related to violence perpetration and retaliation.[15] As such, these findings offer promising insights into future community violence prevention efforts.

ACKNOWLEDGMENTS

This research was supported by the Centers for Disease Control and Prevention (CDC) 1U01CE001954-01A1.

COMPLIANCE WITH ETHICAL STANDARDS

The data collection and data analysis were approved by the Institutional Review Board of the Johns Hopkins University Bloomberg School of Public Health.

REFERENCES

1. Planty M, Truman JL. *Bureau of Justice Statistics, special report: firearm violence, 1993–2011*. Washington, DC: US Department of Justice, Bureau of Justice Statistics; 2013. http://www.bjs.gov/content/pub/pdf/fv9311.pdf. Accessed on: October 17, 2015.
2. United States Department of Justice, Federal Bureau of Investigation. Crime in the United States, 2014. Washington, DC: US Department of Justice, Federal Bureau of Investigation. 2015. https://www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2014/crime-in-the-u.s.-2014. Accessed on: October 17, 2015.
3. Vittes KA, Vernick JS, Webster DW. Legal status and source of offenders' firearms in states with the least stringent criteria for gun ownership. *Inj Prev*. 2013; 19: 26–31.
4. Shapiro JP, Dorman RL, Welker CJ, Clough JB. Youth attitudes towards guns and violence: relations with sex, age, ethnic group, and firearm exposure. *J Clin Child Psychol*. 1998; 27(1): 98–108.
5. Anderson E. *The code of the street: decency, violence, and the moral life of the inner city*. New York: WW Norton & Co; 1999.
6. Wilkinson DL. *Guns, violence and identity among African American and Latino youth*. New York: LFB Scholarly Publishing; 2003.
7. Rich JAN, Jones VC, Haynie DL, Simons-Morton BG, Wright JL, Cheng TL. Factors associated with retaliatory attitudes among African American adolescents who have been assaulted. *J Pediatr Psychol*. 2007; 32(7): 760–70.
8. Rich JA, Stone DA. The experience of violent injury for young African American men: the meaning of being a sucker. *J Gen Intern Med*. 1996; 11(6): 77–82.
9. Rich JA, Gray CM. Pathways to recurrent trauma among young black men: traumatic stress, substance use, and the "code of the street". *Am J Public Health*. 2005; 95: 816–24.
10. Chang DC, Cornwell EE, Sutton ERH, Yonas MA, Allen F. A multidisciplinary youth violence-prevention initiative: impact on attitudes. *J Am Coll Surg*. 2005; 201(5): 721–3.
11. Butts JA, Roman CG, Bostwick L, Porter JR. Cure violence: a public health model to reduce gun violence. *Annu Rev Public Health*. 2015; 36: 39–53.
12. Goldberg AJ, Toto JM, Kulp HR, Lloyd ME, Gaughan JP, Seamon MJ, Charles SP. An analysis of innercity students' attitudes towards violence before and after participation in the "cradle to grave" programme. *Injury*. 2010; 41: 110–5.
13. Shapiro JP, Dorman RL, Burkey WM. Development and factor analysis of a measure of youth attitudes towards guns and violence. *J Clin Child Psychol*. 1997; 26: 311–20.
14. Cure Violence. Cure violence: the model website. www.cureviolence/the-model.org. Accessed on: November 29, 2015.
15. Webster DW, Whitehill JM, Vernick JS, Curriero FC. Effects of Baltimore's *Safe Streets* program on gun violence: a replication of Chicago's *CeaseFire* program. *J Urban Health: Bull N Y Acad Med*. 2013; 90: 27–40. doi:10.1007/s11524-012-9731-5.
16. Milam AJ, Furr-Holden CDM, Leaf PJ, Webster D. Managing conflicts in urban communities: youth attitudes regarding gun violence. *Journal of Interpersonal Violence*, 2016; Epub ahead of print.

17. Baltimore City Health Department. Safe Streets Park Heights web site. http://health.baltimorecity.gov/sites/default/files/health/attachments/brochure_PH.pdf. Accessed on: January 7, 2016.
18. Asparouhov T, Muthen B. Exploratory structural equation modeling. *Struct Equation Model A Multidisciplinary J*. 2009; 16: 397–438.
19. Browne MW. An overview of analytic rotation in exploratory factor analysis. *Multivariate Behav Res*. 2001; 36: 111–50.
20. Marsh HW, Muthén B, Asparouhov T, et al. Exploratory structural equation modeling, integrating CFA and EFA: application to students' evaluations of university teaching. *Struct Equation Model A Multidisciplinary J*. 2009; 16: 439–76.
21. Furr-Holden CDM, Lee MH, Johnson R, et al. Neighborhood environment and marijuana use in urban young adults. *Prev Sci*. 2015; 16: 268–78.
22. Jelleyman T, Spencer N. Residential mobility in childhood and health outcomes: a systematic review. *J Epidemiol Community Health*. 2008; 62(7): 584–92.
23. Voight A, Shinn M, Nation M. The longitudinal effects of residential mobility on the academic achievement of urban elementary and middle school students. *Educ Res*. 2008; 41(9): 385–92.