Young guns: How low does it go?

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Abstract

Objective: To specify the impact of first time gun carrying, by age, on violent behavior and gang membership in urban high risk youth.

Methods: A prospective longitudinal cohort study was conducted in Mobile, Alabama. This study compares first time gun carrying for adolescents, ages (ages 9 to 18).

Results: The findings indicate that: (1) there are no differences in violence or gang membership for first time gun carriers regardless of age; (2) 28% of first time gun carriers were "early onset" (age 9 to 11) or young guns; and (3) first time gun carrying, regardless of age, corresponded with a dramatic spike in violent behavior and gang membership.

Discussion: Delaying age of onset for first time gun carrying may reduce overall gun violence. A secondary benefit of delaying/preventing children carrying guns is a reduction in serious violent behavior and gang membership. As a result, policy should include younger adolescents, as young as nine years, to reduce gun violence because waiting until the teen or adult years will miss a significant portion of the population of gun carriers. Existing efforts focus on preventing adolescent access to guns, whereas they should be expanded to include gun carrying.

Introduction

Youth gun violence is a major public health threat. Homicide and suicide are leading causes of death[1-3] with African American males disproportionately affected. African American males are 350% more likely to be killed by a gun, and 13.2 times more likely to be injured by a gun compared to white youth.[4] African American youth are 842% more likely to be hospitalized for gun-related injuries compared to white youth.[5]

Most studies have focused on gun carrying by teenagers [6-10] or access to guns by children.[11-17] These studies rely on access to guns which masks gun carrying activity by younger children.[18]

Disentangling Youth Gun Carrying from Other At-Risk Behaviors

The temporal order between gun carrying, gang membership, and violent behavior remains unknown.[21-24] Research indicates delinquent peers and violent behavior during elementary school are risk factors for early onset of gun carrying (i.e., before age 18).[20] Other studies disentangle the effects of youth gun carrying from gang membership and violent behavior by focusing on the *precursors of first time gun carrying*, but do not identify the age of onset of gun carrying.[19, 21, 25-27] Existing research places the average age of gun carrying at 18.2 years with average first time gun carrying in mid to late teens.[19] The minimum age of onset for gun carrying (age 8) was described as a rare event that may not represent reliable information. Other research differentiates a dichotomy of first time gun carrying of less than 18 versus 18+ years of age.[20] Sampling and instrumentation may explain these differences. This study goes beyond existing research with a longitudinal sample of at-risk African American youth ages 9 to 18 years to address a fundamental research question: when do children first start carrying a gun?[20]

Methods

Overview of Study Design

Five waves of self-report data were collected annually between 1998 and 2002 as part of a large, ongoing community-based study of adolescent risk behavior called the Mobile Youth Survey (or MYS).[28] Youth age 9 to 19 living in twelve high poverty neighborhoods in Mobile, Alabama (1990 poverty levels between 57% and 91%) were asked to participate and the caregiver was asked to sign a consent form. Participants were paid $10 for their participation and then scheduled to attend a group-administered survey. Parents or caregivers were not allowed in the room during the administration of the survey. Any respondents who appeared to have difficulty reading were invited to a separate area where questions were read to them individually or in a very small group.

Study Population

African American youth represent 97% of the respondents, thus the current analysis focuses on African American youth who were: (1) first time gun carriers between 1998 to 2002; and (2) participated in the MYS for at least two waves between 1998 and 2002 to examine the impact of age of onset on violent behavior and gang membership before (N=225), during (N=312), and after (N=225) first time gun carrying.

Table 1. Variable Description and Descriptive Statistics for MYS youth before, during, and after carrying a gun for the first time

Variables	Description	Range	Before 1st time		During 1st time		After 1st time	
			%	N	%	N	%	N
Age of onset of gun carrying (in yrs)	Age of MYS respondent who: (1) carried a gun during the past 90 days; (2) has no history of gun carrying based on measure of lifetime prevalence; and (3) has not carried a gun based on responses to other waves of the MYS (1998 to 2002).	9,18	---	---	13.4	312	---	---
Early onset of gun carrying (age 9-11)	Dichotomous measure of MYS respondent who carried a gun for the first time between age 9 to 11 (1=yes)	0,1	29%	225	28%	312	29%	225
Violent behavior	Prevalence of violent behavior measured by four items: (1) Have you been in a physical fight someone in the past 90 days (a fight with hitting, kicking, or pushing)? (2) Have you cut someone bad enough to require a doctor's visit in the past year? (3) Have you fought with someone while drunk or high on drugs in the past 90 days? (4) Have you had sexual intercourse with someone when they really didn't want to during the past 90 days? (1=yes)	0,1	61%	110	81%	312	54%	169
Gang member	Are you currently involved in a gang? (1=yes)	0,1	7%	115	28%	312	7%	176

Age of Onset for First Time Gun Carriers

Table 1 provides a brief description of gun carrying before (N=225), during (N=312), and after (N=225) MYS youth carry a gun for the first time. Two items on gun carrying from the each wave of the MYS (1998 to 2002) were used to identify first time gun carriers (see Table 1). If the respondent carried a gun in the past 90 days, but had no history of gun carrying based on the measure of lifetime prevalence of gun carrying, the MYS youth was coded as a first time gun carrier. Second, the measure of first time gun carrying was cross-checked based on the MYS youth's responses to the two items on gun carrying in other waves of the survey.

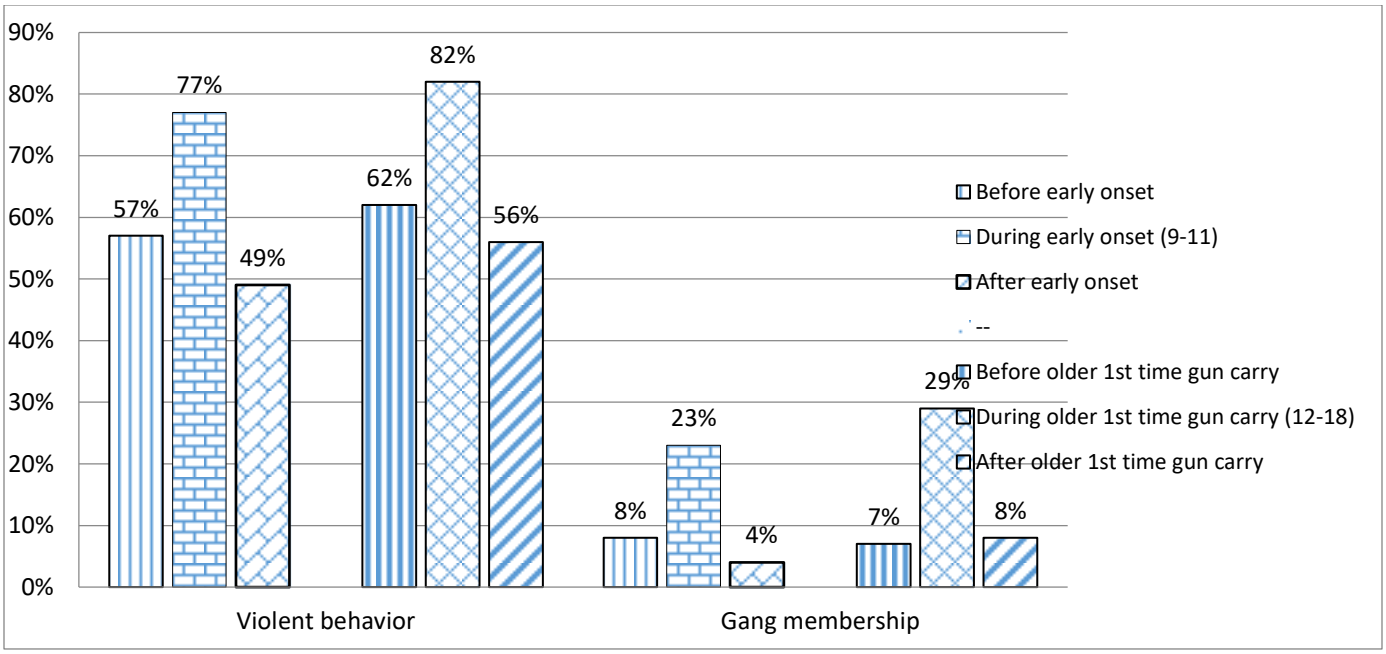

Figure 1. Violent behavior and gang membership before, during and after first time gun carrying

Violent Behavior and Gang Membership

Table 1 includes measures of violent behavior and gang membership before, during, and after first time gun carrying by MYS youth. The prevalence of violent behavior is measured by four items: (1) did you threaten someone with a knife or gun in the past 90 days? (2) have you fought someone in the past 90 days? (3) have you pulled a knife or a gun on someone in the past 90 days? (4) have you cut someone bad enough to require a doctor's visit in the past year? MYS youth who responded "yes" to any of these questions were included in this measure of violence behavior. Gang membership is measured by a single item (are you currently involved in a gang?).

Analysis Plan

Chi-square was used to determine if "early onset" gun carriers were more likely than older first time gun carriers to engage in violent behavior and gang membership before, during, and after carrying a gun for the first time.

Results

Table 2 provides the age of first time gun carrying for MYS youth, which provides critical insight into both the range and distribution of first time gun carrying in

a high poverty sample of at-risk minority youth. For example, there are no "gaps" in the age of onset for gun carrying for MYS youth between the ages of 9 and 18. More importantly, the youngest MYS youth were also carrying a gun for the first time. More specifically, 2.6% (n=8) MYS youth carried a gun for the first time at age 9, 14.1% (n=44) at age 10, and 11.5% (n=36) at age 11. Table 2 also provides the cumulative frequency of age of onset of gun carrying by age. About 28% of first time gun carriers are age 9, 10, and 11, which are categorized as "early onset" (9-11) or young guns compared to older first time gun carriers who started carrying a gun between the ages of 12 and 18.

Table 2 – Age distribution for first time gun carrying for MYS youth (N=312)

		Percent	Cumulative Percent	N
		(1)	(2)	(3)
Age of MYS youth when carrying a gun for the first time				
9	Early onset (age 9-11)	2.6%	2.6%	8
10		14.1%	16.7%	44
11		11.5%	28.2%	36
12		12.8%	41.0%	40
13		15.4%	56.4%	48
14		10.3%	66.7%	32
15		9.6%	76.3%	30
16		7.7%	84.0%	24
17		6.7%	90.7%	21
18		9.3%	100%	29

Violent Behavior & Gang Membership Before First Time Gun Carrying

Column one and two in Table 3 examine violent behavior and gang membership *the year before* MYS youth carried a gun for the first time for young guns (age 9-11) versus older first time gun carriers. There was no statistically significant difference (chi-square = .16, df=1, p=.69) between violent behavior for "early onset" (57%) versus older first time gun carriers (62%). Gang membership is almost equal for young guns (8%) versus older first time gun carriers (7%), (chi-square= .04, df=1, p=.83).

Table 3. Prevalence of violent behavior and gang membership for early onset (age 9-11) versus older first time gun carriers (age 12-18) before, during, and after MYS youth carry a gun for the first time

	Before 1st time gun carrying				During 1st time gun carrying				After 1st time gun carrying			
	Early onset (9-11)		Older 1st time gun carriers		Early onset (9-11)		Older 1st time gun carriers		Early onset (9-11)		Older 1st time gun carriers	
	(1)		(2)		(3)		(4)		(5)		(6)	
	%	N	%	N	%	N	%	N	%	N	%	N
Violent behavior	57%	21	62%	89	77%	88	82%	224	49%	51	56%	118
Gang membership	8%	24	7%	90	23%	88	25%	224	4%	53	8%	122

The Contemporaneous Effect of First Time Gun Carrying on Violent Behavior & Gang Membership

Column three and four in Table 3 report the contemporaneous effects of first time gun carrying on violent behavior and gang membership including the prevalence of violent behavior and gang membership for young guns versus older gun carriers *during the year* that the MYS youth carries a gun for the first time? There were no differences between violent behavior for young guns (77%) versus older first time gun carriers (82%). Although gang membership is slightly less likely for early onset versus older first time gun carriers (23% vs. 29% respectively), there is no difference in gang membership (chi-square=1.43, df=1, p=.23).

Violent Behavior & Gang Membership After First Time Gun Carrying

Column five and six in Table 3 examines violent behavior and gang membership for "early onset" (vs. older) first time gun carriers *the year after* the MYS youth carries a gun for the first time. There was no difference between violent behavior for "early onset" (49%) versus older first time gun carriers (56%) (chi-square = .67, df=1, p=.41). Similarly, there is no statistical difference in gang membership for early onset (4%) versus older first time gun carriers (8%) (chi-square= 1.13, df=1, p=.29).

Identifying Patterns: Violent Behavior & Gang Membership Before, During, & After First Time Gun Carrying

Figure 1 contrasts violent behavior and gang membership before, during and after first time gun carrying for young guns versus older first time gun carriers. One key

finding is that first time gun carrying is similar for young guns and older first time gun carriers in that they both spike in violent behavior and gang membership during the first year they carry a gun.

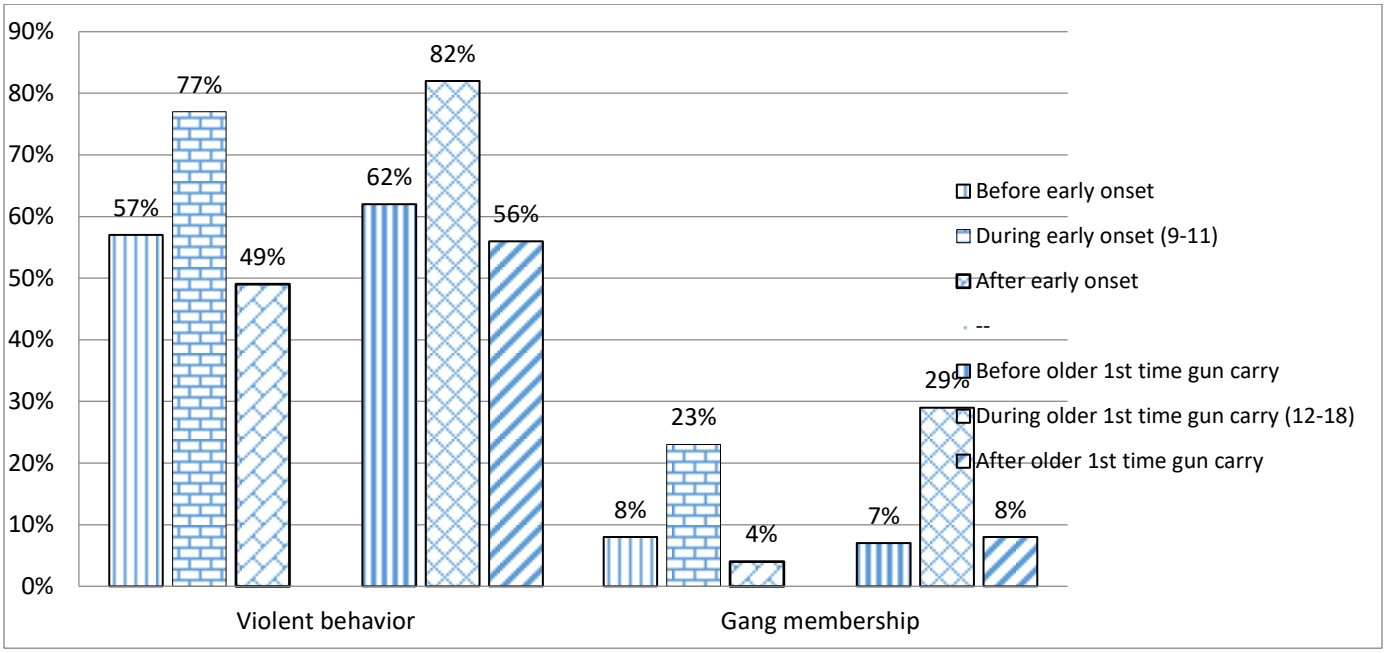

Figure 1. Violent behavior and gang membership before, during and after first time gun carrying

Violent behavior and gang membership increased from 57% to 77% for early onset gun carriers. Similarly, the prevalence of violent behavior increases from 62% (the year before) to 82% (contemporaneous effect) for older first time gun carriers. The prevalence of gang membership drops from 23% (contemporaneous effect) to 8% (the year after) for early onset gun carriers, which is a very similar pattern for older first time gun carriers where gang membership drops from 35% (contemporaneous effect) to 7% (the year after).

Discussion

Given that first time gun carrying is a logical starting point for the primary prevention of youth gun violence, the current study clearly illustrates the need to include young guns as well as older teens and adults[29] in policy and prevention efforts. Restricting the focus to teenagers will undermine such efforts since 28% of the at-risk minority youth start carrying a gun before adolescence (age 9 to 11). It is not *when* you carry a gun for the first time but *if* you carry a gun that triggers a dramatic increase in violent behavior (+36%) and gang membership (+251%).

Limitations of the Current Study

The estimate of age of onset of gun carrying is restricted to age of 9 for the lower boundary of gun carrying. Similarly, Tolan and Thomas examined the National Youth Survey (NYS) and described how their measure of early onset (before age 12) was limited by left-hand censoring since the NYS sample focused on youth age 12 to 17.[30] As a result, their estimate of early onset failed to differentiate youth who started offending in pre-school or childhood (age 4-6) from youth who began during early adolescence (age 12), which has the

net effect of skewing the estimate of early onset on offending over time.

Conclusion

The current study is a first step toward specifying and integrating age of first time gun carriers into public health initiatives focused on the primary prevention of youth gun violence. The findings illustrate that first time gun carrying is not limited to the teen years and spans the entire age range of MYS youth (age 9 to 18), which includes young guns who make up almost one out of three first time gun carriers. The current study also highlights the need collect additional longitudinal data on gun carrying for at-risk children less than 9 years old to provide a more accurate picture of youth gun carrying to advance public health initiatives focused on the primary prevention of youth gun violence.

References

1. Cook PJ. The Great American Gun War: Notes from Four Decades in the Trenches. *Crime and Justice.* 2013;42(1):19-73.
2. Fowler KA, Dahlberg LL, Haileyesus T, Gutierrez C, Bacon S. Childhood firearm injuries in the United States. *Pediatrics.* 2017:e20163486.
3. Grossman DC. Reducing youth firearm suicide risk: evidence for opportunities. *Pediatrics.* 2018:e20173884.
4. CDC. Web-based Inquiry Statistics Query and Reporting System (WISQARS). 2019; https://www.cdc.gov/injury/wisqars. Accessed January 21, 2019.
5. Kalesan B, Vyliparambil MA, Bogue E, et al. Race and ethnicity, neighborhood poverty and pediatric firearm hospitalizations in the United States. *Annals of epidemiology.* 2016;26(1):1-6. e2.
6. Vaughn MG, Salas-Wright CP, Boutwell BB, DeLisi M, Curtis MP. Handgun carrying among youth in the United States: An analysis of subtypes. *Youth violence and juvenile justice.* 2017;15(1):21-37.
7. Beardslee J, Mulvey E, Schubert C, Allison P, Infante A, Pardini D. Gun- and Non-Gun–Related Violence Exposure and Risk for Subsequent Gun Carrying Among Male Juvenile Offenders. *Journal of the American Academy of Child & Adolescent Psychiatry.* 2018;57(4):274-279.
8. Garbarino J, Bradshaw CP, Vorrasi JA. Mitigating the effects of gun violence on children and youth. *The Future of Children.* 2002;12:73-85.
9. Wintemute GJ. What you can do to stop firearm violence. *Annals of internal medicine.* 2017;167(12):886-887.
10. Hemenway D, Vriniotis M, Johnson RM, Miller M, Azrael D. Gun carrying by high school students in Boston, MA: does overestimation of peer gun carrying matter? *Journal of adolescence.* 2011;34(5):997-1003.
11. Hanratty LA, Miltenberger RG, Florentino SR. Evaluating the effectiveness of a teaching package utilizing behavioral skills training and in situ training to teach gun safety skills in a preschool classroom. *Journal of Behavioral Education.* 2016;25(3):310-323.
12. Lee N, Vladescu JC, Reeve KF, Peterson KM, Giannakakos AR. Effects of Behavioral Skills Training on the Stimulus Control of Gun Safety Responding. *Journal of Behavioral Education.* 2018:1-17.
13. Anglemyer A, Horvath T, Rutherford G. The accessibility of firearms and risk for suicide and homicide victimization among household members: a systematic review and meta-analysis. *Annals of internal medicine.* 2014;160(2):101-110.
14. Rowhani-Rahbar A, Simonetti JA, Rivara FP. Effectiveness of interventions to promote safe firearm storage. *Epidemiologic reviews.* 2016;38(1):111-124.
15. Hardy MS, Armstrong FD, Martin BL, Strawn KN. A firearm safety program for children: they just can't say no. *Journal of Developmental & Behavioral Pediatrics.* 1996;17(4):216-221.
16. Hardy MS. Keeping children safe around guns: Pitfalls and promises. *Aggression and violent behavior.* 2006;11(4):352-366.
17. DuRant RH, Barkin S, Craig JA, Weiley VA, Ip EH, Wasserman RC. Firearm ownership and storage

patterns among families with children who receive well-child care in pediatric offices. *Pediatrics.* 2007;119(6):e1271-e1279.
18. Dillon KP, Bushman BJ. Effects of exposure to gun violence in movies on children's interest in real guns. *JAMA pediatrics.* 2017;171(11):1057-1062.
19. Dong B, Wiebe DJ. Violence and beyond: Life-course features of handgun carrying in the urban United States and the associated long-term life consequences. *Journal of criminal justice.* 2018;54:1-11.
20. Beardslee J, Docherty M, Mulvey E, Schubert C, Pardini D. Childhood risk factors associated with adolescent gun carrying among Black and White males: An examination of self-protection, social influence, and antisocial propensity explanations. *Law and human behavior.* 2018;42(2):110.
21. Spano R, Bolland JM. Is the nexus of gang membership, exposure to violence, and violent behavior a key determinant of first time gun carrying for urban minority youth? *Justice Quarterly.* 2011;28(6):838-862.
22. Decker SH, Melde C, Pyrooz DC. What do we know about gangs and gang members and where do we go from here? *Justice Quarterly.* 2013;30(3):369-402.
23. Dijkstra JK, Gest SD, Lindenberg S, Veenstra R, Cillessen AHN. Testing Three Explanations of the Emergence of Weapon Carrying in Peer Context: The Roles of Aggression, Victimization, and the Social Network. *Journal of Adolescent Health.* 2012;50(4):371-376.
24. Melde C, Esbensen F-A. Gangs and violence: Disentangling the impact of gang membership on the level and nature of offending. *Journal of quantitative criminology.* 2013;29(2):143-166.
25. Spano R, Bolland J. Disentangling the effects of violent victimization, violent behavior, and gun carrying for minority inner-city youth living in extreme poverty. *Crime & Delinquency.* 2013;59(2):191-213.
26. Doherty E, & Bacon, S.N. Age of onset and offending behavior. In: Farrington DP, Kazemian, L., & Piquero, A.R., ed. *The Handbook on Developmental and Life Course Criminology.* Oxford: Oxford University Press; 2019.
27. Loeber R, Ahonen, L., Stallings, R., & Farrington, D.P. Violence De-Mystified: Findings on Violence by Young Males in the Pittsburgh Youth Study. *Canadian Psychology.* 2017;58(4):305-315.
28. Spano R, Rivera C, Bolland J. The Impact of Timing of Exposure to Violence on Violent Behavior in a High Poverty Sample of Inner City African American Youth. *Journal of Youth and Adolescence.* 2006;35(5):681-692.
29. Spano R. First time gun carrying and the primary prevention of youth gun violence for African American youth living in extreme poverty. *Aggression and Violent Behavior.* 2012;17(1):83-88.
30. Tolan PH, Thomas P. The implications of age of onset for delinquency risk II: Longitudinal data. *Journal of abnormal child psychology.* 1995;23(2):157-181.