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Elevations in Blood Pressure Associated with Exposure to Violence are Mitigated by Pro-Gun
Carrying Attitudes among Street-Identified Black Males and Females

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Abstract

Living in neighborhoods with elevated rates of violent crime, such as in many poor Black-American communities, is a risk factor for a range of physical and mental disorders. However, the individual different factors that influence health outcomes in these stressful environments remain poorly understood. This study examined relations between exposure to violence, gun carrying attitudes, and blood pressure in a community sample of street-identified Black-American boys/men and girls/women. Survey data and blood pressure were collected from 329 participants (ages 16-54; 57.1% male) recruited from two small, urban neighborhoods with high rates of violence using Street Participatory Action Research methodology. Results revealed that systolic blood pressure was elevated in the sample as was exposure to severe forms of direct and vicarious violence (e.g., shootings, assault). Attitudes about carrying guns moderated associations between the degree of violence exposure endorsed by participants and both systolic and diastolic blood pressure. Specifically, the positive association between exposure to violence and both systolic and diastolic blood pressure at *low* levels of pro-gun carrying attitudes was no longer apparent at high levels of pro-gun attitudes. Further, pro-gun attitudes appeared to moderate the association between exposure to violence and systolic pressure for older participants but not younger participants. Results suggest that positive attitudes about carrying guns (presumably indicative of pro-gun carrying behavior) weakened the link between violence exposure and blood pressure. These novel findings suggest carrying a gun may protect against the harmful effects of chronic stress from violence exposure on physical health outcomes (i.e., hypertension) among street-identified Black-Americans.

58 **Elevations in Blood Pressure Associated with Exposure to Violence are Mitigated by Pro-**
59 **Gun Carrying Attitudes among Street-Identified Black Males and Females**

60 Homicides increased by 30% from 2019 to 2020 [1], and although the causes are still
61 under investigation, it is clear that the wellbeing and physical health of people, particularly in
62 poor Black-American communities, are being permanently affected by gun violence. In fact,
63 homicide victimization for Black-Americans is nearly seven times higher than for white-
64 Americans (20.4 vs. 3.1 per 100,000, respectively) [2]. Missing from the literature on homicide
65 and its health consequences is analysis of large community samples of *street-identified Black-*
66 *Americans*—the population most likely to be victimized by, and perpetrate, gun violence. In
67 short, a “street-identity” or street culture is an adaptive social identity anchored in a racial-ethnic
68 designation guided by notions of personal, social and economic survival [3]. A street-identity
69 encompasses a system of behaviors maintained through prosocial and illegal activities. To better
70 understand the correlates of violence exposure in this key demographic, we investigated
71 determinants of systolic and diastolic blood pressure among street-identified Black-Americans
72 affected by gun violence.

73 **Violence Exposure and Cardiovascular Risk**

74 Dire health conditions disproportionately affect Black communities, with 30.2% of all
75 Black male deaths in 2017 being attributed to heart disease, stroke and hypertension [4], while
76 31.5% of all Black female deaths in 2018 were attributed to the same causes [5]. There is
77 accumulating evidence that cardiovascular risk in Black communities is partly caused by chronic
78 exposure to violence and victimization, which also contributes to high blood pressure [6,7]. A
79 large epidemiological longitudinal study of over 7,000 adolescents found that experiencing or
80 witnessing serious violence (e.g., shootings) was associated with increased odds of developing

81 hypertension 10+ years later relative to unaffected peers [6]. Another longitudinal study of over
82 17,000 adults seen in outpatient clinics in Chicago during the 2014-2016 crime surge
83 documented an association between increased violence and adjusted odds of having elevated
84 blood pressure or a cardiovascular-related hospital admission [7]. Such studies reveal a clear
85 correlation between violent crime exposure and decline in cardiovascular health. Some research
86 has shown that chronic stress exposure has been linked to blunted physiological responses (e.g.,
87 lower cortisol levels [8]), although the literature has been mixed [9]. Given links between
88 glucocorticoids and bodily systems that manage cardiovascular functioning [10], it is
89 unsurprising that research has found that individuals with hypertension also showed lowered
90 cortisol levels [11]. Together, these findings are consistent with Carlson & Chamberlain's theory
91 of allostatic load [12], which posits that chronic exposure to environmental stress leads to
92 dysfunction in physiological systems (e.g., HPA axis), which ultimately contributes to
93 cardiovascular diseases. Thus, hypertension is one potential manifestation of dysfunction in
94 physiological systems stemming from chronic stress exposure, though more research is needed to
95 uncover the psychological factors that exacerbate and attenuate the link between experiences of
96 chronic violence and cardiovascular health risk, especially among populations heavily impacted
97 by gun violence.

98 **Gun Carrying as a Protective Factor**

99 A burgeoning literature reframes gun use as a rational response to potential threats of
100 violence posed by living in dangerous environments [3,13,14]. Such findings are consistent with
101 prominent theories of violence that highlight the adaptive, protective, and resilient nature of gun
102 carrying particularly in low-income environments. Sites of Resilience (SOR) theory, for
103 example, argues gun carrying in response to violence and crime is an expression of resilience [3],

104 because employing this behavior in the streets enhances survivability and overall wellbeing.
105 Consistent with this theory, a longitudinal study of male juvenile offenders found gun carrying
106 was related to a history of victimization and, of those participants who carried guns, about 50%
107 did not actually use them during the follow-up period [14]. These findings suggest gun carrying
108 is often employed to defend oneself and may be a protective mechanism for some street-
109 identified persons.

110 Insofar as gun carrying and use are enacted to increase safety and/or reduce the likelihood
111 of victimization, these behaviors may lead to less stress and better health outcomes for persons at
112 risk for being harmed. Knowing more about exposure to violent crime, attitudes about gun
113 carrying, and health outcomes in street-identified populations would critically inform
114 interventions and greatly expand analysis on violence and health. The goal of the present study
115 was to test associations between exposure to violence, attitudes about gun carrying, and blood
116 pressure in a community sample of street-identified Black boys/men and girls/women (ages 16-
117 54) in two small, urban neighborhoods. Applying research showing that both experiences of
118 direct and vicarious exposure to violence (through witnessing or hearing about these events) are
119 associated with poor long-term health outcomes, including hypertension [15-17], we examined a
120 combined measure of direct and vicarious violence exposure in this study.

121 In terms of demographic characteristics, we hypothesized blood pressure would increase
122 with age and be higher in male than female participants on average [18-19]. We also expected
123 exposure to violence to correlate positively with age, as participants who have lived longer have
124 had a greater opportunity to experience violence. Male and female participants were not expected
125 to show differences in exposure to violence on average, given the high concentration of violence
126 in the sampled neighborhoods and operationalization of exposure to violence as both direct and

127 vicarious experiences (e.g., witnessing or hearing about violence). Regarding gender differences
128 in violence exposure and gun carrying among urban adults [20], some studies have found gun
129 carriers are more likely to be male, Black and reside in urban communities in the South [20-21].
130 Across race, men generally have higher pro-gun carrying attitudes and higher gun ownership;
131 and only about 20% of those with gun licenses are women [20].

132 Moreover, and based on prior research on stress exposure and hypertension, we expected
133 the sample to show average blood pressures above the normal range based on national guidelines
134 (e.g., systolic pressure >120 mmHg) [22]. We also hypothesized exposure to violence would be
135 positively related to blood pressure, as seen in prior studies [6-7]. Finally, we tested whether the
136 association between exposure to violence and blood pressure differs depending on attitudes about
137 gun carrying. In line with the theories reviewed above, we posited pro-gun carrying attitudes
138 may serve as a buffering, protective factor that partially mitigates the chronic stress caused by
139 violence exposure and its association with blood pressure among a large community sample of
140 street-identified Black males and females.

141 **Methods**

142 **Participants**

143 To recruit participants, we used a street participatory action research (Street PAR)
144 approach [3]. Street PAR is an ethnographic method and epistemological orientation that trains
145 persons entrenched in street culture to study and do activism on behalf of street-identified
146 populations, because this group is assumed to best understand street culture.

147 Using this method, a total of 366 participants with blood pressure data were available for
148 analysis. Of these, eight were excluded for incomplete age, BMI, or exposure to violence data.
149 Given that we did not have information on medication use, we also removed individuals with a

150 history of medical conditions that were infrequently reported in the sample but may impact blood
151 pressure, specifically stroke ($n = 12$), heart attack ($n = 5$), cancer ($n = 4$), and kidney disease ($n =$
152 8). Thus, the analyses included a community sample of 329 street-identified Black-Americans
153 ages 16-54 ($M/SD = 30.28/10.17$; 57.1% male).

154 **Procedures**

155 Participants were recruited using snowball sampling, a technique useful for collecting
156 data from sensitive populations [23]. Because asking individuals if they identify as “street” or
157 engaged in illegal activity could jeopardize safety, we used snowball sampling to collect data
158 through study participants and Street PAR Associates. Street PAR Associates for our study
159 included 14 Black-American male residents with experiences in the criminal legal system who
160 were trained in nine research methods workshops to critically examine street-identified Black-
161 Americans in the Northside and Westside sections of Wilmington, Delaware. Associates aided in
162 enacting our snowball sampling approach by accessing street-identified family and friends, and
163 providing information on familiar places (e. g., street corner locations) frequented by street-
164 identified populations. Most data were collected at four local community centers in
165 neighborhoods where violence or crime frequently occur. Less data were collected in “warm”
166 sites or areas with moderate levels of crime (e.g., barbershop) and “cool” sites or areas with
167 relatively little crime (e.g., near a church). At each location, Street PAR Associates identified a
168 set of gatekeepers (respected neighborhood residents) who provided access to street
169 communities. Also, a stratified quota design was used to ensure age groups reflected the
170 percentage of the total population of Black residents in the Northside and Westside.

171 The Institutional Review Board approved all protocols and procedures, and participants
172 were covered by a Certificate of Confidentiality. We obtained informed consent before

173 participation, and minors completed a waiver of consent before participating. Participants had
174 their blood pressure taken before completing survey packets; and they received \$10 cash
175 compensation for having their body-mass-index and blood pressure taken and \$40 cash
176 compensation for completing surveys. Participants also received an information package with
177 potential employment and educational opportunities, and reentry, health and counseling services.

178 Although the paper has no Street PAR Associate co-authors, our study builds on previous
179 research on violence in Wilmington authored and co-authored with Associates [3].

180 **Measures**

181 **Blood Pressure Measurement.** After a five-minute rest period Associates used an
182 Omron automated blood pressure monitoring device to assess participants' systolic blood
183 pressure (*Min/Max* = 92/216; *skewness/kurtosis* = 1.16/2.71) and diastolic blood pressure
184 (*Min/Max* = 47/126; *skewness/kurtosis* = 0.66/0.39).

185 **Body-Mass-Index Measurement.** After collecting blood pressure data, Associates
186 evaluated participants' body-mass-index (BMI) by collecting data on height and weight (*Min/Max*
187 = 16.30/55.40; *skewness/kurtosis* = 1.28/2.03).

188 **Exposure to Violence.** Respondents completed a modified version of the Survey of
189 Exposure to Community Violence Index [24], which measures the frequency of direct and
190 vicarious exposure to violence in the community over the lifespan. For each item, participants
191 rated how frequently they experienced, witnessed, or heard about a type of violence in their
192 lifetimes on a 5-point scale (1 = *Never*, 2 = *1-4 Times*, 3 = *5-8 Times*, 4 = *9-12 Times*, 5 = *Twelve*
193 *or More Times*). Given that systolic blood pressure is likely impacted by more severe forms of
194 stress, we averaged responses on this scale for the items indexing relatively severe forms of
195 community violence (e.g., 16 items; physical fight, serious injury from assault, knife attack or

196 shooting). An overall index of exposure to community violence was used in analyses, with
197 higher scores indicating greater exposure to violent events (Cronbach's alpha = 0.86; *Min/Max* =
198 1.00/4.13; *skewness/kurtosis* = 0.66/0.04).

199 **Attitudes Toward Guns.** Pro-gun attitudes were assessed using four items from the
200 *Attitudes Toward Violence Scale* [25] pertaining to firearms. Example items are "It's good to
201 have a gun" and "Carrying a gun or knife would help me feel safer." Participants rated each item
202 on a 4-point scale (1=*Strongly Disagree*, 2 = *Disagree*, 3 = *Agree*, 4 =*Strongly Agree*).
203 Responses to these items were averaged to create a total score with higher scores reflecting
204 stronger agreement with pro-gun carrying statements (Cronbach's alpha = 0.75; *Min/Max* =
205 1.00/4.00; *skewness/kurtosis* = -0.25/0.11).

206 **Data Analysis**

207 Analyses were conducted using SPSS Version 28. All tests were two-tailed. Pearson
208 correlations were used to assess bivariate relations. Primary analyses were conducted using
209 hierarchical linear regression analyses, with confidence intervals provided as a measure of effect
210 size. Age, gender (male = 1; female = 2), body-mass-index (BMI), and commonly reported
211 medical conditions were examined as potential confounds in analyses, specifically asthma,
212 arthritis, and diabetes. Conditional effects of the moderator were examined at +/- 1 SD from the
213 mean using the PROCESS Procedure for SPSS Version 3.5.3 [26]. Supplemental analyses were
214 conducted using hierarchical linear regression, with covariates, main effects, two-way
215 interactions, and three-way interactions entered in separate steps.

216 **Results**

217 **Descriptive Statistics**

218 Descriptive statistics and bivariate relations among the variables are presented in Table 1.
219 Blood pressure was elevated based on population norms, with systolic pressure averaging 128.39
220 and diastolic pressure averaging 83.45, indicative of heightened cardiovascular risk. As
221 displayed in Figure 1, the prevalence of exposure to severe forms of community violence was
222 high. For example, over 80.0% of the sample reported directly or indirectly experiencing gun
223 violence in the community. Participants also endorsed experiencing, witnessing, or hearing about
224 severe forms of violence between 1-4 times on average in their lifetimes.

225 **Exposure to Violence, Pro-Gun Attitudes, and Systolic Blood Pressure**

226 First, we tested whether pro-gun attitudes moderated the association of exposure to
227 violence with systolic blood pressure. Results of this analysis are presented in Table 2. As
228 hypothesized, the interaction between exposure to violence and endorsement of pro-gun attitudes
229 on systolic pressure was significant ($95\% CI = -8.33/-0.84$). As illustrated in Figure 2, exposure
230 to violence showed a robust positive correlation with systolic blood pressure at *low levels* of pro-
231 gun attitudes ($-1SD: Effect = 5.59, SE = 2.09, 95\% CI = 1.48/9.71$), and this association weakened
232 as endorsement of pro-gun attitudes increased ($+1SD: Effect = -0.73, SE = 1.84, 95\% CI =$
233 $-4.35/2.90$). These findings suggest pro-gun attitudes partially mitigate the harmful association of
234 violence exposure with systolic blood pressure.

235 **Exposure to Violence, Pro-Gun Attitudes, and Diastolic Blood Pressure**

236 Next, we examined whether the interactive association between exposure to violence and
237 pro-gun attitudes extended to diastolic pressure. Results of this analysis are presented in Table 3.
238 Paralleling the findings for systolic blood pressure, exposure to violence and endorsement of pro-
239 gun attitudes also had synergistic associations with diastolic pressure ($95\% CI = -5.98/-0.30$). As
240 illustrated in Figure 3, exposure to violence showed a positive correlation with diastolic blood

241 pressure at *low levels* of pro-gun attitudes ($-1SD$: $Effect = 3.18$, $SE = 1.59$, $95\% CI = 0.06/6.30$),
242 and this association weakened as endorsement of pro-gun attitudes increased ($+1SD$: $Effect = -$
243 1.15 , $SE = 1.40$, $95\% CI = -3.90/1.59$). These findings are consistent with those for systolic
244 pressure and suggest pro-gun attitudes partially mitigate the harmful association of violence
245 exposure with diastolic blood pressure.

246 **Supplemental Analyses**

247 We examined whether demographic characteristics, specifically gender and age,
248 moderated associations between exposure to violence, pro-gun attitudes, and blood pressure. For
249 systolic blood pressure, we did not observe significant two-way interactions between gender and
250 exposure to violence ($p = .306$) or gender and pro-gun attitudes ($p = .646$). The three-way
251 interaction between gender, exposure to violence, and pro-gun attitudes did not explain
252 significant variance in systolic blood pressure ($p = .197$). Analysis of diastolic pressure produced
253 similar results. Gender did not moderate associations between exposure to violence and diastolic
254 pressure ($p = .385$) or between pro-gun attitudes and diastolic pressure ($p = .696$). The
255 interaction between gender, exposure to violence, and pro-gun attitudes was also non-significant
256 for diastolic blood pressure ($p = .637$).

257 Next, we examined age as a potential moderator of the associations between exposure to
258 violence, pro-gun attitudes, and blood pressure, given the relatively large age range in our
259 sample. The associations of exposure to violence ($Std Beta = 0.50$, $SE = 0.14$, $95\% CI =$
260 $0.02/0.57$) and pro-gun attitudes ($Std Beta = -0.75$, $SE = 0.13$, $95\% CI = -0.69/-0.18$) with systolic
261 blood pressure differed as a function of age. These two-way interactions were qualified by a
262 three-way interaction between age, exposure to violence, and pro-gun attitudes for systolic
263 pressure ($Std Beta = -1.96$, $SE = 0.18$, $95\% CI = -0.73/-0.02$). As displayed in Figure 4, pro-gun

264 attitudes moderated the association between exposure to violence and systolic pressure in older
265 adults [*+1SD on Age* (40.23 years), Exposure to Violence x Pro-Gun Attitudes Interaction Effect
266 =-6.31, $F= 6.61$ $p = .010$] but not younger participants [*-1SD on Age* (20.12 years), Exposure to
267 Violence x Pro-Gun Attitudes Interaction Effect =1.15, $F= 0.17$, $p = .684$]. Among older adults,
268 exposure to violence showed a robust positive correlation with systolic blood pressure at low
269 levels of pro-gun attitudes (*-1SD on Pro-Gun Attitudes: Effect* =8.41, $SE = 2.43$, 95% $CI =$
270 3.62/13.20), and this association became non-significant as endorsement of pro-gun attitudes
271 increased (*+1SD on Pro-Gun Attitudes: Effect* = -0.30, $SE = 2.72$, 95% $CI = -5.65/5.06$). These
272 findings suggest pro-gun attitudes had a stronger moderating effect on the association between
273 exposure to violence and systolic pressure as participants aged in this sample.

274 In contrast to systolic pressure, age did not moderate the main effects of exposure to
275 violence ($p = .252$) or pro-gun attitudes ($p = .055$) for diastolic blood pressure. Furthermore, the
276 interaction between exposure to violence and pro-gun attitudes was not significant ($p = .421$) for
277 diastolic blood pressure.

278 Discussion

279 Studies of the health outcomes of street-identified Black populations are sparse,
280 underlining a significant omission in investigating the determinants that uniquely impact the
281 health and wellbeing of this particular demographic. Our use of Street Participatory Action
282 Research (Street PAR) methodology to examine the health correlates of chronic exposure to
283 violence among a community sample of Black-Americans involved in street culture uncovered
284 several novel findings. First, lifetime exposure to severe forms of violence (e.g., assault,
285 shootings) showed a small positive association with systolic blood pressure at the bivariate level,
286 providing new evidence that chronic stress from violence may contribute to the elevated rates of

287 hypertension - amongst those persons or groups most likely to be victimized and perpetrate
288 violence. Second, consistent with our hypothesis that gun carrying is adaptive for individuals
289 exposed to violence, we found that the association between violence exposure and blood pressure
290 differed as a function of pro-gun attitudes (Tables 2-3; Figures 2-3). The apparently harmful link
291 between violence exposure and systolic and diastolic blood pressure observed at *low* levels of
292 pro-gun carrying attitudes was absent at *high* levels of pro-gun attitudes. Further, positive
293 attitudes about carrying guns weakened the link between violence exposure and systolic blood
294 pressure for older participants in particular. Overall, the present findings provide evidence that
295 gun carrying may be beneficial for reducing the cardiovascular risks associated with chronic
296 violence exposure, particularly hypertension, amongst street-identified Black populations
297 affected by high levels of violence.

298 **Cardiovascular Risk: Gun Carrying as an Adaptive Reaction to Violence Exposure**

299 The first notable finding in this study was the elevated systolic pressure observed in the
300 sample, which is consistent with prior work demonstrating higher rates of hypertension and
301 average blood pressures in Black-Americans than white-Americans [27]. Given most research on
302 cardiovascular health outcomes has been conducted on white-Americans [27], the causes of high
303 blood pressure among Black-Americans remains poorly understood. Our findings underscore the
304 need to identify risk and protective factors associated with blood pressure and cardiovascular risk
305 among Black-Americans across the lifespan, which research indicates may differ from white-
306 Americans [28].

307 Although the cause of high blood pressure in Black-Americans is multifactorial,
308 converging evidence underscore the physical toll caused by striving to persevere and actively
309 cope in the face of extreme psychosocial stress and other constraints imposed by living in

310 disadvantaged communities [12] and experiences of traumatic stress [29]. The present findings
311 extend these literatures in two important ways. First, results generalize the findings to street-
312 identified Black-Americans, a group that has been historically excluded from health research
313 despite being highly affected by both violence exposure and poor health outcomes. Research
314 points to chronic activation of physiological stress response systems (e.g., hypothalamic–
315 pituitary–adrenal-axis) as an important pathway linking repeated traumatic stress with disease
316 [30] including cardiovascular outcomes [31]. Risk for traumatic stress-related disease is only
317 compounded in street-identified Black-Americans who experience multiple marginalities
318 characterized by blocked access to mental and physical healthcare, mass incarceration, and other
319 forms of structural racism. In addition to the effects of violence on cardiovascular health, more
320 research is needed on other stress-related disease trajectories that likely contribute to disparities
321 in morbidity and mortality in low-income Black communities (e.g., accelerated-aging [32]).

322 The finding that pro-gun attitudes moderated the association between exposure to
323 violence and systolic pressure more strongly in older than younger participants underscores the
324 importance of understanding the health consequences of chronic stress exposure from severe
325 violence, and factors that mitigate these relations, across developmental periods. Given the cross-
326 sectional nature of the data, it is possible that the interaction between pro-gun attitudes and
327 exposure to violence was stronger with advancing age, because the individuals with positive
328 views about gun carrying are more likely to survive in dangerous environments. For example, it
329 is possible that gun carrying actually protects individuals against potentially deadly attacks or
330 helps reduce the stress of living in a high crime or violent neighborhood. Longitudinal studies are
331 needed to parse apart the influence of aging, race, gender, developmental period and gun
332 carrying, violent stress exposure, and cohort effects on systolic blood pressure.

333 Second, the present findings indicate the association of violence with blood pressure is
334 sensitive to how individuals respond to experiences of violence. The finding that favoring gun
335 carrying can moderate the physical harm caused by chronic environmental stress exposure is a
336 very novel and important finding, because it highlights the potentially adaptive nature of this
337 behavior for mitigating the stress associated with living in dangerous environments. More
338 specifically, the negative impact of violence exposure on systolic pressure significantly
339 decreased as participants endorsed more favorable attitudes towards gun carrying, which is
340 traditionally conceptualized as an “antisocial behavior” - at least among street-identified
341 populations with criminal records. Our results, however, are consistent with Sites of Resilience
342 theory, which argues violence perpetration can signify an adaptive response that increases
343 survival for persons living amid violent crime³. Further, the present findings underscore the
344 importance of conducting research that takes a phenomenologically-informed and mechanistic
345 approach to understanding how gun carrying in the context of violence impacts health and well-
346 being by, for instance, reducing physiological stress.

347 **Policy Implications**

348 Conventional interventions designed to reduce violence and improve health, in many
349 respects, lack a cultural understanding on why people engage in violence and risk their physical
350 health [3]. With this said, we first recommend policymakers enact policy that significantly
351 increases quality structural opportunity (e.g., employment) for poor Black-Americans. Such
352 opportunities would certainly reduce experiences with violence and crime overall and improve
353 health outcomes in low-income Black neighborhoods. Further, in addition to Street PAR being
354 an ethnographic method, it is also an individual level intervention that offers its Street PAR
355 Associates an intensive paid training in scholarly activities (i.e., writing, analysis, formal

356 presentations). Additionally, Street PAR provides Associates with case management and aids
357 them with securing employment and educational opportunities beyond the Street PAR project.
358 Also, culturally competent counseling is especially needed for street-identified persons affected
359 by post-traumatic stress disorder and other mental health outcomes related to violent exposure
360 [33]. Lastly, we call on health practitioners to develop or tailor health interventions for street-
361 identified populations.

362 **Limitations and Strengths**

363 Given the sample was limited to street-identified Black-Americans, the generalizability
364 of the findings to Black-Americans overall and other racial-ethnic groups chronically exposed to
365 violence is necessary. Moreover, we surveyed participants about their attitudes towards guns to
366 avoid the potentially harmful legal implications of asking participants who are street involved if
367 they carry guns using a subset of items from a broader survey on attitudes towards violence. As
368 research confirms behavior is closely linked to attitudes [34], it is reasonable to assume that
369 individuals who endorse pro-gun attitudes also carry guns. However, this needs to be directly
370 tested and the subset of items used to assess gun-carrying attitudes requires further validation.
371 Further, our measure of violence exposure was susceptible to retrospective recall bias, though
372 this threat to validity was minimized by focusing on serious and easily operationalized events
373 (e.g., being shot) [35]. The cross-sectional nature of the study also prohibits inferences about
374 causality. Finally, the measurement of blood pressure relied on a single reading and participants
375 were not asked to abstain from substances that could impact blood pressure (e.g., tobacco) before
376 the reading was taken. Since these data collection practices have the potential to introduce error
377 into the blood pressure measurement, replication of the findings is necessary.

378 Despite these weaknesses, this study has several notable strengths. First, the use of Street
379 PAR to study health outcomes in communities characterized by high exposure to violent crime is
380 not only a unique methodological approach, but it provides much needed insight into the lived
381 experiences of low-income Black-Americans who have been traditionally excluded from health
382 research. Second, analyses were based on a relatively large number of participants, especially
383 given the difficult-to-recruit nature of the sample. Third, observed associations with blood
384 pressure remained significant with potential confounds included in the model, indicating the
385 synergistic effects of exposure to violence and pro-gun attitudes explain unique variance in
386 systolic pressure beyond that of age, gender, and body-mass-index.

387 **Conclusion**

388 Gun violence and its health-related outcomes continues to be a major challenge for low-
389 income Black-American communities. It is critical that the public health literature better
390 contextualize the wellbeing and physical health of poor Black-American communities and
391 especially its street-identified populations. In fact, more community-level quantitative and mix-
392 methods studies must be conducted to address this glaring gap in the literature, so these data can
393 be used to develop more efficient interventions to reduce violence and improve health outcomes
394 for street-identified Black populations—the persons or groups most likely to be victimized by
395 and perpetrate gun violence. Results of the current study advance understanding of health
396 outcomes in street-identified Black communities affected by high rates of violence exposure and
397 demonstrate for the first time that the association of exposure to violence with systolic and
398 diastolic blood pressure may be mitigated by pro-gun attitudes.

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