



Youth Mental Well-Being Following Witnessed Police Stops

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Abstract The purpose of the present study is to investigate mental well-being among youth after witnessing police stops. A national, urban-born sample of youth in the USA from the most recent wave (2014–2017) of the Fragile Families and Child Well-being Study (FFCWS) was employed, with a focus on youth who had not been directly stopped by police ($N=2506$). We used t -tests and multivariable ordinary least squares (OLS) regression to estimate direct associations, product-term analysis to test for effect modification by gender and race/ethnicity, and the

Karlson-Holm-Breen (KHB) method to assess for mediation by experiences of emotional distress during a stop. Findings indicate that youth who have witnessed police stops report significantly higher levels of depression ($t=5.93$, $p<0.01$) and anxiety ($t=6.57$, $p<0.01$) and lower levels of happiness ($t=-4.02$, $p<0.01$) following the stop than those who have not. Among youth witnessing stops ($N=1488$), more intrusive witnessed encounters correspond to diminished mental well-being across indicators, in part due to elevated emotional distress during witnessed stops. Findings hold regardless of gender, yet vary somewhat by race and ethnicity, with youth of color reporting less anxiety than their White counterparts after witnessing an intrusive stop, but reporting greater reductions in happiness. Collectively, our findings suggest that witnessing police stops may contribute to inequities in youth mental well-being. A public health approach that combines prevention and treatment strategies may mitigate the harms of police exposure and reduce disparities in youth well-being.

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There is now ample evidence that police violence is a public health crisis [1–3]. In 2016, a total of 1091 individuals were killed by law enforcement in the United States (US) [4] resulting in 54,754 years of life lost [5] and disproportionately impacting Black

men [6]. Additionally, there were approximately 76,440 law-enforcement-related nonfatal injuries in 2016 [2]. Relative to other age groups, young people in particular are more likely to come in contact with the police [7], partly due to widespread proactive policing strategies [8] and expansion of police in schools [9]. In 2018, approximately 1.1 million adolescents aged 16–17 (14.2% of all those ages 16–17) had police contact within the previous year [7], and mounting evidence indicates that they can and do experience police violence and its deleterious health effects [10–19].

Still, most studies of the health consequences of youth-police contact have focused on direct (rather than vicarious) experiences. Even so, a recent systematic review of diverse police exposures among Black youth underscores the importance of vicarious police contact in adolescent health outcomes [20], which echoes extant work on vicarious experiences of racism and child health [21]. Still, research on vicarious police contact typically combines experiences of witnessing police stops and knowing someone who experienced a police stop, revealing health impacts on youth and parents alike [19, 22, 23]. Still, this work remains limited in key respects. For instance, youth-focused research on vicarious police encounters rarely narrows in on *witnessed* stops specifically, the features and context of the stops youth witness, and how these might inform mental health responses *following* stops. Indeed, only one study to date has considered the health implications stemming from witnessed police stops among youth. Using data from a sample of urban-born youth, Jackson and colleagues [13] demonstrated that youth of color were more likely than White youth to report emotional distress (i.e., feeling angry and unsafe) *during* witnessed police stops, and these feelings of distress largely stem from police officer intrusiveness characterizing these stops and perceptions of procedural injustice.

While this work provides initial insights into the emotional distress that can accompany witnessed police stops, several gaps in knowledge concerning the health ramifications of witnessing a police encounter remain. First, although prior research supports a connection between direct police contact and diminished mental well-being [10–12, 14–19], little research has evaluated mental health responses to *witnessed* police stops months or even years after exposure (rather than during the stop). Second, previous

research details that the mental health repercussions of personal police contact are partially a function of stop features and contexts, as well as the immediate emotional response of youth during the stop [14]. Accordingly, it may be that youth mental well-being following *witnessed* police stops is also eroded by police officer intrusiveness and emotional distress experienced during the witnessed stop. Third, it remains unclear whether mental well-being following witnessed stops differs across demographic characteristics. To be sure, rates of general police contact and intrusive police stops are higher among boys and youth of color [12], leading to racially disparate criminalization of young people [24]. Research also documents that the impacts of personal police contact for mental well-being is worse for girls [19] and Black youth [18, 19]. However, the degree to which such heterogeneity occurs among youth who have only witnessed stops (but who have not been directly stopped) remains unexplored. Accordingly, the current study expands upon extant research on the mental health repercussions of witnessed police stops by assessing the following four research questions:

Q1: Is there an association between witnessed police stops and diverse indicators of youth mental well-being (depression, anxiety, and happiness)?

Q2: Among youth who have witnessed police stops, is police officer intrusiveness associated with youth mental well-being?

Q3: To what degree is the association between police officer intrusiveness during witnessed stops and youth mental well-being mediated by emotional distress experienced during the witnessed stop?

Q4: Does the association between officer intrusiveness and mental well-being among youth who have witnessed stops vary by youth sex and/or youth race and ethnicity?

Methods

Data from the Fragile Families and Child Wellbeing Study (FFCWS) were employed for the current analysis. The FFCWS is a large, national study of approximately 4800 children who were born between 1998 and 2000. To date, six waves of data have been collected, with a seventh wave currently in progress.

The FFCWS data were gathered using a multi-staged, clustered sampling procedure in which unmarried couples with one or more children were oversampled. As a result of this sampling strategy, the sample includes a large number of families and children who are disproportionately exposed to various adversities and risk factors, including police encounters. Using a population of cities with 200,000 or more residents, a stratified random sample of 20 US cities was chosen. The subsequent sampling stage involved the selection of 75 hospitals within these 20 cities, followed by a random sample of couples who had just given birth to a child and who consented to participate in the study. For the present study, we restrict the sample to youth who participated in the sixth (i.e., year 15) wave of data collection ($N=3444$, referred to as “total sample”), administered between 2014 and 2017. For our main analyses, we focus on two subsamples derived from the full year 15 sample noted previously ($N=3444$). First, we narrow in on the sample of youth who have no history of being directly stopped by police ($N=2506$, referred to as “eligible sample”). Still, for follow-up analyses examining the role of features of witnessed stops in mental well-being outcomes, the sample is further restricted to youth who report having witnessed police stops in their neighborhoods and/or schools, despite not being directly stopped by the police ($N=1488$, referred to as “analytic sample”). These are youth who responded in the affirmative to *either* or *both* of the following questions: “Have you ever seen someone stopped by the police in your neighborhood?” and “Have you ever seen someone stopped by the police in your school?” The present study was exempt from IRB approval as it employs publicly available, de-identified data.

Youth Mental Well-Being

Depression

Depressive symptomatology was measured during the Y15 youth survey and includes the following five statements about feelings and emotions experienced in the past 4 weeks: (1) I feel I cannot shake off the blues, even with help from my family and friends; (2) I feel sad; (3) I feel happy (reverse-coded); (4) I feel life is not worth living; and (5) I feel depressed. Response options range from 1 (*strongly disagree*) to 4 (*strongly agree*). For the purposes of

this study, items were summed into an additive index ($\text{Alpha}=0.76$). The items, which have been employed in prior FFCWS research [19, 25], are taken from a modified version of the Center for Epidemiologic Studies Depression Scale (CES-D) [26].

Anxiety

Anxiety symptomatology was also measured during the Y15 youth survey and includes the following six statements about feelings and emotions experienced in the past 4 weeks: (1) I have spells of terror or panic, (2) I feel tense or keyed up, (3) I get suddenly scared for no reason, (4) I feel nervous or shaky inside, (5) I feel fearful, and (6) I feel so restless I cannot sit still. Response options range from 1 (*strongly disagree*) to 4 (*strongly agree*). For the current study, items were summed into an additive index ($\text{Alpha}=0.75$). The items, which have been employed in prior FFCWS research [25], are drawn from the Brief Symptom Inventory 18 [27].

Happiness

Finally, happiness was also measured during the Y15 youth survey and includes four items where youth were asked how much each item describes how they felt during the past four weeks, ranging from 1 (*almost never*) to 5 (*almost always*). The items include (1) I feel happy, (2) I have a lot of fun, (3) I love life, and (4) I am a cheerful person. For the purposes of this study, items were summed into an additive index ($\text{Alpha}=0.74$). The measure of happiness is consistent with the conventional use of the word, and includes positive mood, emotions, and general feeling of contentment with one’s life. These items are drawn from the Happiness dimension of the FFCWS adaptation of the EPOCH Measure of Adolescent Well-Being [28], which is intended to capture critical components of adolescents’ positive psychological functioning/well-being.

Witnessed Police Stop

During the Y15 survey, youth were asked, “Have you ever seen someone stopped by the police in your neighborhood? (Y/N),” followed by “Have you ever seen someone stopped by the police in your school? Y/N)” For the current study, youth were considered

to have witnessed a police stop if they responded in the affirmative to either of these questions ($N=1488$). For analyses among the eligible sample ($N=2506$), we also examine variation in the location of the witnessed stop (i.e., neighborhood only, school only, or both).

Witnessed Police Stop Features

Officer Intrusiveness

During the Y15 survey, youth were asked about their exposure to police stops. Among this series of questions, youth were also asked about the behavior of law enforcement during the reference stop. For the purposes of the present study and given our analytic sample ($N=1488$), the reference stop refers to either the only or most salient witnessed stop. Specifically, youths were asked whether the following forms of officer intrusiveness towards the person occurred: “Did the officer: (1) Frisk them or pat them down?, (2) search their bags or pockets?, (3) use harsh language?, (4) use racial slurs?, (5) threaten physical force?, (6) use physical force?, or (7) handcuff them?.” In line with prior research [12], responses to each of these items were *Yes* (coded as 1) or *No* (coded as 0). Subsequently, the items were summed into a count measure of officer intrusiveness ranging from 0 to 7 (Kuder-Richardson; $\text{Alpha}=0.72$) [29].

Mediator

Emotional Distress During Stop

In line with recent research [13, 14], we also examined the emotional distress reported by youth *during* the witnessed stop. Youth who reported witnessing stops were asked follow-up questions concerning their feelings of distress during the reference stop, which in this case is either (1) a single witnessed stop for youth who have experienced this only once and have not been personally stopped or (2) the most salient witnessed stop (i.e., the one that stands out most in their minds) for youth who have witnessed multiple stops but have not been personally stopped. Ultimately, youth were asked to report on the emotions they experienced during the witnessed stop being referenced. We employed items asking the following: “At the time of this incident, did you feel (1) scared?,

(2) angry?, and (3) safe?” (reverse-coded) [13, 14]. Responses to each of these items were *Yes* (coded as 1) or *No* (coded as 0) and were summed into an additive index ($\text{Alpha}=0.73$).

Moderators

Youth sex

The biological sex of youth is employed as a moderating variable in a subset of analyses, with male being assigned a value of 1 and female being assigned a value of 0.

Youth Race/Ethnicity

During the Y15 survey, youth were asked the open-ended, “What is your race and ethnicity?” FFCWS staff organized and coded responses to identify diverse groups of youth respondents, which included White/Caucasian, Black/African American, American Indian/Alaskan Native, Asian, Native Hawaiian/Pacific Islander, Hispanic/Latino, and other/unspecified. Given the racial/ethnic make-up of the sample (i.e., majority Black/African American) and the large number of racial/ethnic categories identified, we followed the lead of prior research [13] and employed an item available in the public-use data (ck6ethrace) that simplified racial/ethnic categories into the following: White, Hispanic, Black, multiracial, and other race/ethnicity (for more details, see the online appendix).

Covariates

The following covariates were included in each of the multivariable models to minimize the likelihood of spurious results, in line with prior research [13]: youth age (in years; Y15), youth sex (male = 1), youth race/ethnicity (Latinx, Black, Multiracial, Other Race, with Non-Latinx White as reference category; Y15), youth delinquency and substance use (17 items index; $\text{alpha}=0.71$; Y9), youth internalizing behavior (32 item index including the anxious/depressed, withdrawn/depressed, and somatic complaints subscales of the Child Behavioral Checklist) [30], police at school (Y15), youth age witnessed stop (in years; Y15), income-to-poverty ratio [ranging from <0.50 (score of 1) to >3.00 (score of 5); Y9], material hardship (11-item index; $\text{alpha}=0.72$; Y9), low

neighborhood cohesion (5-item index; $\alpha=0.78$; Y9), perceptions of neighborhood danger (binary item assessing parents fear of child going outside because of violence; Y9), mother relationship status (mother married to bio father, mother cohabiting with bio father, with other as reference; Y9), maternal education [ranging from less than high school (1) to college graduate (4); Y9], maternal depression (mother met criteria for depression; Y9), and paternal incarceration (father ever or currently incarcerated; Y9).

Statistical Analyses

First, in preliminary analyses, we focus on the eligible sample (i.e., those with no history of direct police stops, $N=2506$) and conduct difference-of-means t-tests to examine significant differences in key demographics and covariates between youth who had and had not witnessed stops. We also employ multivariable ordinary least squares (OLS) regression to examine associations between youth witnessing police stops in their neighborhoods, schools, or both and each indicator of mental well-being (adjusting for covariates) among the eligible sample, including both standardized and unstandardized coefficients. The standardized coefficients were calculated by multiplying the unstandardized coefficients by the ratio of the standard deviations of the independent variable and the dependent variable. Second, for the main analyses, we focus on the analytic sample of youth who witnessed stops ($N=1488$) and, after calculating descriptive statistics, estimate multivariable OLS regression models examining associations between officer intrusiveness and indicators of youth mental well-being, controlling for all covariates. Third, we use the Karlson-Holm-Breen method to examine the extent to which emotional distress during the witnessed stop explains associations between officer intrusiveness and youth mental well-being following the stop [31]. The KHB method provides an estimate of how much the mediating variable of interest attenuates the association between the independent (officer intrusiveness) and dependent variables (depression, anxiety, and happiness) and also calculates whether the change in the focal independent variable across models is greater than expected by chance. This method measures the percent change in a coefficient of the independent variable after including one or more mediating variables net of rescaling. While

various mediation methods are available, studies have shown the KHB approach performs as good or better than alternative approaches to mediation [32–34] and are not sensitive to type 1 errors resulting from large sample size or the number of mediation tests [31]. The KHB approach is applicable in cases where the distribution of either the dependent or mediator variable is continuous, discrete, binary, ordinal, or categorical [33]. Finally, we examine whether associations between officer intrusiveness and indicators of youth mental well-being vary by youth sex and race and ethnicity using product-term analysis.

Missing data were multiply imputed in STATA 16.1 using *mi* commands in an effort to retain all cases for present analyses, and given the multiple advantages of multiple imputation (e.g., resolves issues related to wastefulness as well as biased covariances, p-values, and confidence intervals) [35]. In a similar fashion to Jacobsen [36], all individual variables are missing less than 10% of observations with one exception: the count measure of delinquency at Y9 is missing approximately 13% of observations. Multiple imputation began by first generating a determined number of datasets where imputed values are derived from all predictors relevant to imputed variables. This process uses an expectation maximization algorithm [37]. Subsequently, multiple imputation performs the statistical analyses specified on all individual imputed datasets and then pools the results from each dataset into a single set of results using standard formulas [38]. In the present study, we employ multiple imputation with chained equations and perform these analyses using 20 multiply imputed data sets. Alternative approaches to handling missing data (e.g., listwise deletion) did not substantively alter the results.

Results

We began by examining our first research question: is there an association between witnessed police stops and diverse indicators of youth mental well-being (depression, anxiety, and happiness)? In doing so, we examined key differences between youth who had and had not witnessed stops among the eligible sample ($N=2506$). The findings, which are presented in the online appendix, indicate that relative to youth who had not

witnessed stops, those who had were more likely to be Black ($t=3.62$, $p<0.01$), and less likely to be White ($t=-3.04$, $p<0.01$). Additionally, youth delinquency and substance use ($t=2.79$, $p<0.01$), material hardship ($t=4.01$, $p<0.01$), residing in households below the poverty line (<0.50 : $t=1.97$, $p<0.05$; $0.50-0.99$: $t=2.27$, $p<0.05$), low neighborhood cohesion ($t=4.43$, $p<0.01$), neighborhood perceptions of danger ($t=2.65$, $p<0.01$), and paternal incarceration ($t=3.11$, $p<0.01$) were all significantly higher/more common among youth who had witnessed stops, whereas maternal education ($t=-3.18$, $p<0.01$) and maternal marriage to biological father ($t=-3.05$, $p<0.01$) were significantly lower or less common among these youth. We also conducted multivariable OLS regression models among this sample to examine associations between witnessing police stops and youth mental well-being. Findings revealed that, net of covariates, youths who had witnessed stops in their neighborhoods ($B=0.096$, $Beta=0.065$; $p<0.01$), their schools ($B=0.070$, $Beta=0.044$; $p<0.05$), or both ($B=0.192$, $Beta=0.142$; $p<0.01$) exhibited significantly higher levels of depression than youths who had not witnessed stops. Similar patterns emerged in models examining anxiety (neighborhoods: $B=0.134$, $Beta=0.082$; $p<0.01$; schools ($B=0.152$, $Beta=0.086$; $p<0.01$; both $B=0.203$, $Beta=0.134$; $p<0.01$). In terms of happiness, only youth who reported witnessing stops in both their neighborhoods and their schools reported significantly lower levels of happiness ($B=-0.127$, $Beta=-0.110$; $p<0.01$) (for more details, see the online appendix).

Next, we turned to the analytic sample, which involved only youth who reported witnessing police stops despite not having been personally stopped by the police ($N=1488$). The descriptive statistics, displayed in Table 1, reveal that 44.42% of these youths (average age 15.56) were boys, with 26.41% being Latinx and 48.86% being Black. Approximately 37% of youth lived in homes below the poverty line, and only 30.51% of their mothers were married to their biological fathers. More than 80% of youth reported having police in their schools and 49.06% had experienced the incarceration of their father. Finally, youth were an average age of 13.30 years when they witnessed the focal stop (i.e.,

Table 1 Descriptive statistics of youth who have witnessed stops ($N=1488$)

	Mean/%	SD	Range
Youth mental well-being			
Depression	1.62	0.60	1–4
Anxiety	1.85	0.65	1–4
Happiness	3.61	0.52	1–4
Police encounter features			
Officer Intrusiveness	2.28	1.79	0–7
Covariates			
Youth age	15.56	0.74	14–19
Youth male	44.42	-	0–1
White	17.54	-	0–1
Latinx	26.48	-	0–1
Black	48.66	-	0–1
Multiracial	5.17	-	0–1
Other race	2.15	-	0–1
Youth delinquency and substance use	1.12	1.71	0–17
Youth internalizing behavior	1.16	0.18	1–3
Police at school	81.04	-	0–1
Youth age witnessed stop	13.32	1.82	8–18
Income-to-poverty ratio: <0.50	16.80	-	0–1
Income-to-poverty ratio: $0.50-0.99$	20.43	-	0–1
Income-to-poverty ratio: $1.00-1.99$	28.49	-	0–1
Income-to-poverty ratio: $2.00-2.99$	14.52	-	0–1
Income-to-poverty ratio: ≥ 3.00	19.76	-	0–1
Material hardship	1.54	1.87	0–10
Low neighborhood cohesion	1.99	0.66	1–4
Perceptions of neighborhood danger	19.82	-	0–1
Mother married to bio father	30.04	-	0–1
Mother cohabiting with bio father	9.41	-	0–1
Maternal education	2.52	1.01	1–4
Maternal depression	11.49	-	0–1
Paternal incarceration	49.34	-	0–1
Mediator			
Emotional distress during stop	0.68	0.91	0–3

focal witnessed stops occurred on average ~2 years prior to Y15 youth survey).

We then examined our second research question: among youth who have witnessed police stops, is police officer intrusiveness associated with youth mental well-being? In doing so, we estimated associations between officer intrusiveness and youth mental well-being using OLS regression models. Shown in Table 2, findings revealed that officer intrusiveness

Table 2 OLS regression models of the association between officer intrusiveness during witnessed stops and youth mental well-being ($N=1488$)

	Youth mental well-being					
	<i>Depression</i>		<i>Anxiety</i>		<i>Happiness</i>	
	B/Beta	SE	B/Beta	SE	B/Beta	SE
Unadjusted estimate						
Officer intrusiveness	0.048**/0.140	0.009	0.050**/0.135	0.009	-0.033**/-0.111	0.008
Adjusted estimate						
Officer intrusiveness	0.042**/0.124	0.009	0.047**/0.129	0.010	-0.031**/-0.104	0.008
Covariates						
Youth age	0.006/0.007	0.022	-0.007/-0.008	0.024	-0.015/-0.021	0.019
Youth male	-0.150**/-0.124	0.032	-0.145**/-0.111	0.034	0.145**/0.140	0.027
Youth Latinx	-0.047/-0.034	0.051	-0.042/-0.028	0.054	0.051/0.044	0.044
Youth Black	-0.038/-0.032	0.047	-0.120*/-0.092	0.050	0.065/0.063	0.041
Youth multiracial	-0.014/-0.005	0.078	-0.105/-0.036	0.084	0.024/0.010	0.067
Youth other race	0.193/0.047	0.111	-0.082/-0.019	0.119	-0.070/-0.020	0.096
Youth delinquency and substance use	0.028**/0.079	0.009	0.032**/0.086	0.010	-0.007/-0.022	0.008
Youth internalizing behavior	0.375**/0.113	0.088	0.444**/0.124	0.094	-0.210**/-0.074	0.076
Police at school	-0.017/-0.011	0.040	-0.031/-0.019	0.042	0.028/0.021	0.034
Youth age witnessed stop	0.001/0.002	0.009	-0.023*/-0.065	0.010	-0.005/-0.016	0.008
Income-to-poverty ratio: 0.50-0.99	-0.046/-0.031	0.051	-0.028/-0.017	0.055	0.019/0.015	0.044
Income-to-poverty ratio: 1.00-1.99	-0.050/-0.038	0.049	-0.011/-0.008	0.053	0.060/0.052	0.042
Income-to-poverty ratio: 2.00-2.99	-0.019/0.011	0.059	-0.020/-0.011	0.063	-0.005/-0.004	0.051
Income-to-poverty ratio: ≥ 3.00	-0.092/-0.061	0.063	-0.055/-0.033	0.069	0.111*/0.085	0.055
Material Hardship	0.000/0.000	0.009	0.010/0.030	0.010	0.001/0.004	0.008
Low neighborhood cohesion	-0.007/-0.007	0.027	-0.013/-0.014	0.029	-0.025/-0.032	0.024
Perceptions of neighborhood danger	0.020/0.013	0.044	0.041/0.025	0.048	-0.026/-0.020	0.038
Mother married to bio father	-0.002/-0.002	0.040	-0.030/-0.021	0.043	-0.041/-0.036	0.034
Mother cohabiting with bio father	0.111*/0.054	0.055	0.064/0.028	0.060	-0.073/-0.042	0.047
Maternal education	-0.040*/-0.068	0.018	-0.007/-0.010	0.019	0.016/0.031	0.015
Maternal depression	0.000/0.000	0.050	-0.129*/-0.064	0.053	-0.070/-0.043	0.043
Paternal incarceration	0.023/0.019	0.034	0.031/0.024	0.037	0.025/0.024	0.029

B unstandardized coefficient, *Beta* standardized coefficient, *SE* standard error

* $p < 0.05$;

** $p < 0.01$

during witnessed stops was associated with significant increases in depression ($B=0.048$, $Beta=0.140$, $p < 0.01$) and anxiety ($B=0.050$, $Beta=0.135$, $p < 0.01$), and significant decreases in happiness ($B = -0.033$, $Beta = -0.111$, $p < 0.01$). To illustrate, experiencing all forms of intrusiveness v. none is associated with a 0.35 increase on the anxiety outcome, which equates to an 0.54-standard-deviation increase in anxiety. Notably, these results held (and attenuate only slightly) after adjusting for covariates. Furthermore, standardized coefficients reveal

that officer intrusiveness was the strongest predictor of youth mental well-being in each of these models, with the sole exception of youth male sex when predicting happiness ($B = 0.145$, $Beta = 0.140$, $p < 0.01$).

Next, we turned to our third research question: to what degree is the association between police officer intrusiveness during witnessed stops and youth mental well-being mediated by emotional distress experienced during the witnessed stop? To examine this question, we employed the KHB method to test the extent to which emotional distress during the

Table 3 KHB analysis of the mediating role of emotional distress during stop ($N = 1488$)

<i>Officer intrusiveness</i>	Youth mental well-being					
	Depression		Anxiety		Happiness	
<i>Mediator</i>	% Reduction	<i>z</i> -score	% Reduction	<i>z</i> -score	% Reduction	<i>z</i> -score
Emotional distress during stop	49.77%	5.91**	45.64%	5.75**	50.37%	-5.04**

** $p < 0.01$

witnessed stop mediated the associations presented in Table 2. The findings (as displayed in Table 3) indicate that emotional distress during the witnessed stop emerged as a consistently significant mediator, explaining 50.37% of the association between officer intrusiveness during witnessed stops and youth happiness ($z = -5.04$; $p < 0.01$), 49.77% of the association between officer intrusiveness during witnessed stops and youth depression ($z = 5.91$; $p < 0.01$), and 45.64% of the association between officer intrusiveness during witnessed stops and youth anxiety ($z = 5.75$; $p < 0.01$).

Finally, we turned to our final research question: Does the association between officer intrusiveness and mental well-being among youth who have witnessed stops vary by youth sex and/or youth race and ethnicity? We did so using product-term analysis. The findings (Table 4) revealed consistently null moderation effects in the case of sex (i.e., p values consistently greater than 0.05), but mixed findings in the case of race and ethnicity. While race and ethnicity did not moderate associations between officer intrusiveness and depression, they did moderate

associations in the case of anxiety and happiness. To be precise, findings indicate that the positive association between officer intrusiveness and youth anxiety was significantly weaker among Latinx youth ($B = -0.096$, $Beta = -0.198$, $p < 0.01$), Black youth ($B = -0.057$, $Beta = -0.150$, $p < 0.05$), and youth of other racial groups ($B = -0.154$, $Beta = -0.087$, $p < 0.05$) relative to White youth. However, findings also indicate that the negative association between officer intrusiveness and youth happiness is significantly stronger among Latinx youth ($B = 0.054$, $Beta = 0.143$, $p < 0.05$) and Black youth ($B = 0.071$, $Beta = 0.241$, $p < 0.01$) relative to White youth.

Discussion

In this study, we set out to investigate mental well-being among a national sample of young people in the US who had witnessed police stops, extending prior research on the collateral health consequences of negative police encounters [10–12, 14–19, 39]. The results yielded three main findings. First, among

Table 4 Is the association between officer intrusiveness during witnessed stops and youth mental well-being conditioned by sex or race and ethnicity?

<i>Officer intrusiveness</i>	Youth mental well-being					
	Depression		Anxiety		Happiness	
<i>Interaction terms</i>	B/Beta	SE	B/Beta	SE	B/Beta	SE
Intrusiveness \times youth male	0.000/0.000	0.017	-0.012/-0.030	0.019	0.001/0.001	0.015
Intrusiveness \times youth Latinx	-0.039/-0.089	0.029	-0.096**/-0.198	0.031	0.054*/0.143	0.025
Intrusiveness \times youth Black	-0.024/-0.072	0.027	-0.057*/-0.150	0.028	0.071**/0.241	0.051
Intrusiveness \times youth multiracial	-0.060/-0.072	0.044	-0.054/-0.061	0.047	0.039/0.055	0.038
Intrusiveness \times youth other race	-0.046/-0.027	0.060	-0.154*/-0.087	0.065	0.055/0.038	0.052

B unstandardized coefficient, *Beta* standardized coefficient, SE standard error

* $p < 0.05$;

** $p < 0.01$

the eligible sample, youth who had witnessed police stops had poorer mental well-being than those who had not witnessed any stops, including greater depression and anxiety and lower levels of happiness. This is consistent with, yet builds upon, the literature revealing higher levels of depression [19] and worse mental health [14] among youth with direct and vicarious exposure to the police. It also echoes work suggesting that collective exposures to police (i.e., in the media) can erode adolescent mental health [40]. Still, future work should examine how in-person witnessed stops and vicarious contact through various media channels might interact to exacerbate mental health problems for particularly vulnerable youth (e.g., youth of color). Doing so is critical to prevent police exposure misclassification and the underestimation of the true association in future work.

Second, among the analytic sample of youth who had witnessed stops, officer intrusiveness during these stops was consistently associated with diminished mental well-being across all outcomes, explained in part by the emotional distress reported during the witnessed stop. This is consistent with, yet builds upon, recent work revealing that officer intrusiveness is associated with feeling angry and unsafe *during* the witnessed stops [13]. The present findings underscore ways that the mental health repercussions of witnessed stops may persist months and years into the future and impact diverse indicators of mental well-being. Although data were collected during a critical era of proactive policing (2014–2017), future research should seek to replicate this work with more recent data (e.g., following the murder of George Floyd in 2020 and ensuing protests) to ensure generalizability to the present day context.

Finally, while the results did not differ by youth sex, they were partially moderated by race and ethnicity. Specifically, youth of color (Latinx, Black, other race) reported less anxiety than their White counterparts after witnessing an intrusive stop whereas Black and Latinx youth reported greater reductions in happiness than White youth. These findings add to the work suggesting that the impacts of diverse police exposures on youth mental health outcomes may be concentrated among youth of color; however, our findings suggest that in the case of witnessed stops, there may be critical racial/ethnic differences in mental health responses, even if youth across the board are more likely to experience adverse mental health

outcomes. While our findings do shed initial light on these patterns, much can be done in future research to illuminate this further. For instance, future research on the mental health impacts of witnessed stops should consider the race or ethnicity of the citizen or officer involved in the witnessed stop, which may further influence the results found here considering research on the potential influence of police officer-citizen race-dyads in influencing perceptions of police behavior [41] and officer decision making [42].

These findings should be considered in light of certain limitations. First, we cannot definitively determine the causal ordering between our main variables of interest. Even so, the variable related to witnessing a police stop measures experiences over the course of a lifetime and mental health outcomes pertain to the four weeks leading up to the Year 15 survey. Thus, while it is possible that the mental states reported preceded witnessed police stops, this would likely only apply to a negligible number of cases in the sample. Second, the moderated findings by race and ethnicity may correspond to previously observed racial and ethnic group and cultural differences in presentation of symptoms — as well as in interpretation of questions — regarding anxiety and depression [43–45] and potentially to observed differences in happiness as well [46]. Researchers should therefore consider the implementation of culturally informed measures of mental well-being in future studies to parse out these differences. Finally, low-income youth living in urban areas of the US are overrepresented in this study, limiting its generalizability.

Conclusions

Despite the limitations of this study, results have important implications for policy and practice. It is becoming increasingly clear that youth-police contact can be a racialized adverse childhood experience [12, 47] and that reductions in the proactive policing and surveillance of residents in low-income communities of color are long overdue [48]. Critically, income- and racial disparities persist following police contact as people become more deeply embedded in the criminal legal system and experience additional harms to well-being via incarceration exposure [49]. For police interactions that do occur, officers must receive training in diversion and de-escalation

strategies to limit the negative health consequences of officer intrusiveness both for those involved and others that witness a stop [50]. Preliminary findings from research with police also demonstrate the need for and interest in youth-centered police trainings to improve outcomes [51, 52]. Youth service providers such as school counselors, social workers, and pediatricians should also screen for police exposure as an adverse childhood experience to provide trauma-informed care that accounts for the specific harms of police interaction on mental well-being [47]. A public health approach that combines prevention and treatment strategies is necessary to mitigate the harms of police exposure and reduce broader disparities in well-being among youth.

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