Prevalence, demographic variation and psychological correlates of exposure to police victimisation in four US cities

J. E. DeVylder[1]*, H. Y. Oh[2], B. Nam[1], T. L. Sharpe[1], M. Lehmann[1] and B. G. Link[3]

[1] *School of Social Work, University of Maryland, Baltimore, MD, USA*
[2] *University of California Berkeley, School of Public Health, Berkeley, CA, USA*
[3] *School of Public Policy, University of California Riverside, Riverside, CA, USA*

Aims Victimisation by the police is purported to be widespread in cities in the USA, but there is limited data on police–public encounters from community samples. This is partly due to an absence of measures for assessing police violence exposure from the standpoint of civilians. As such, the demographic distribution and mental health correlates of police victimisation are poorly understood. The aims of this study were to present community-based prevalence estimates of positive policing and police victimisation based on assessment with two novel measures, and to test the hypotheses that (1) exposure to police victimisation would vary across demographic groups and (2) would be associated with depression and psychological distress.

Methods The Survey of Police–Public Encounters study surveyed adults residing in four US cities to examine the prevalence, demographic distribution and psychological correlates of police victimisation. Participants ($N = 1615$) completed measures of psychological distress (K-6 scale), depression (Patient Health Questionnaire 9) and two newly constructed measures of civilian-reported police–public encounters. Both measures were developed to assess police victimisation based on the WHO domains of violence, which include physical violence (with and without a weapon, assessed separately), sexual violence (inappropriate sexual contact, including public strip searches), psychological violence (e.g., threatening, intimidating, stopping without cause, or using discriminatory slurs) and neglect (police not responding when called or responding too late). The Police Practices Inventory assesses lifetime history of exposure to positive policing and police victimisation, and the Expectations of Police Practices Scale assesses the perceived likelihood of future incidents of police victimisation. Linear regression models were used to test for associations between police–public encounters and psychological distress and depression.

Results Psychological violence (18.6%) and police neglect (18.8%) were commonly reported in this sample and a substantial minority of respondents also reported more severe forms of violence, specifically physical (6.1%), sexual (2.8%) and physical with a weapon (3.3%). Police victimisation was more frequently reported by racial/ethnic minorities, males, transgender respondents and younger adults. Nearly all forms of victimisation (but not positive policing) were associated with psychological distress and depression in adjusted linear regression models.

Conclusions Victimisation by police appears to be widespread, inequitably distributed across demographic groups and psychologically impactful. These findings suggest that public health efforts to both reduce the prevalence of police violence and to alleviate its psychological impact may be needed, particularly in disadvantaged urban communities.

Received 6 August 2016; Accepted 8 October 2016; First published online 11 November 2016

Key words: Community mental health, depression, social factors, violence.

Introduction

Media reports of shootings by the police of unarmed people in the USA, particularly Black males, have multiplied following the widespread adaptation of smartphone technology (Brucato, 2015), spurring protest and anger across the nation. US police practices have also been denounced by more than a hundred nations during a recent United Nations Human Rights Council (UN HRC, 2015). The only prior study of the prevalence of police misconduct in the USA to our knowledge, conducted in Ohio households, found that a notable minority of respondents reported disrespectful treatment (15.9%), verbal abuse (6.8%), physical abuse (0.8%) and that all forms of misconduct were disproportionately experienced by Black civilians (Son & Rome, 2004). Despite the putative pervasiveness of victimisation by police in the USA, especially among communities populated primarily by

---

* Address for correspondence: Assistant Professor J. E. DeVylder, Ph.D., University of Maryland, Baltimore, 525 W Redwood Street, Baltimore MD 21201, USA.

(Email: jdevylder@ssw.umaryland.edu)

people of colour (Brunson, 2007; MacDonald *et al.* 2007), there has been minimal population-level research on the subject from a health perspective.

One recent study examined the psychological impact of aggressive policing directed at young males in New York City (e.g., 'stop and frisk' tactics), finding that such tactics were related to both generalised anxiety and trauma symptoms (Geller *et al.* 2014). Prior to this, a qualitative study ($N = 65$) took the promising approach of characterising police violence according to the World Health Organization (WHO) domains of violence (i.e., physical, sexual, psychological and neglect), finding that many users of injection drugs reported incidents of police violence that they attributed to perceived biases (Cooper *et al.* 2004). Aside from these studies, we know of no evidence on the prevalence or potential psychological impact of police violence.

The aims of the Survey of Police–Public Encounters study were to assess the prevalence, demographic and mental health correlates of police victimisation in a community sample of adults from four US cities (Baltimore, New York, Philadelphia and Washington, D.C.). We developed two novel self-report measures of police violence, assessing the full range of the WHO domains of violence (Krug *et al.* 2002), given that no validated measures existed. Domains of violence measured in this study include physical violence with and without a weapon, sexual victimisation (including inappropriate contact and public strip searches), psychological victimisation (e.g. threatening, inappropriate stops and discriminatory slurs) and neglect through police failure to respond when called. Anecdotal beliefs among the general public, policy makers, health professionals and the police themselves regarding the prevalence and consequences of police violence are speculative, and may diverge from the actual prevalence. Our study aims to ground police victimisation narratives in empirical evidence. Further, in theory, exposure to police violence would be associated with mental health outcomes; however, we have little knowledge about the magnitude of these associations. We hypothesise that the prevalence of police victimisation would be greatest among marginalised demographic groups in these four US cities (i.e., racial/ethnic minorities, sexual minorities, lower income) and that exposure to such violence would be associated with increased psychological distress and depression.

Methods

Participants and procedure

Adults (18+) were recruited from the previously indicated four cities through Qualtrics Panels, an online survey administration service. Qualtrics maintains a database of several million US residents that have previously consented to periodic participation in survey research, which has increasingly been used in epidemiological research (e.g., Tinghög *et al.* 2013; Cheng, 2015; Johnson *et al.* 2015; Jensen *et al.* 2016). Sampling was conducted by Qualtrics with the aim of achieving demographic representativeness of civilians residing within city limits, such that the total sample for each city would fall within +/− 10% of 2010 census distributions of age, sex and race/ethnicity. Representativeness was facilitated using a combination of demographic screening questions and recruitment quotas, in which participants were not asked to complete the survey if limits had been met for their particular demographic group. Recruiting shortfalls among some demographic groups in some cities caused minor divergence from these guidelines (Supplemental data, online). Participants were financially compensated at a rate determined by Qualtrics, pre-specified not to exceed $10/participant to prevent potential financial coercion. Data were collected March–April, 2016. Study procedures were approved by the Institutional Review Board of the University of Maryland, Baltimore.

All survey respondents were screened to ensure that they met inclusion criteria as adults residing in the cities of Baltimore, New York, Philadelphia, or Washington D.C. Of 3518 screened respondents, 1122 were ineligible due residence outside of these cities and 41 were excluded for being under 18 years old. Following initial screening, 2355 adults consented to participate. 322 (13.7%) were excluded due to incorrectly responding to attention checks, one (0.0%) for responding too quickly and 417 (17.7%) discontinued participation prior to completion. This left a final sample of $N = 1615$ (68.6% of eligible respondents). Non-completers who provided demographic data ($N = 220$) did not vary from completers in terms of age, $t(\mathrm{df} = 1833) = 0.15$, $p = 0.87$, gender, $\chi^2(\mathrm{df} = 2) = 3.08$, $p = 0.22$, or race, χ^2 ($\mathrm{df} = 3$) $= 5.78$, $p = 0.12$. In order to assess measure reliability, we sought retest data on a subsample with a goal of obtaining data from 120 males and 120 females, an average of 7 days after initial data collection (final retest $n = 243$).

Survey measures

Demographics and crime involvement

Participants self-reported demographic characteristics including gender, age, race, ethnicity, sexual orientation, familial income, educational attainment and immigration status. Involvement in illegal activities was coded using a binary variable indicating any

positive response to items assessing lifetime purchase or sale of illegal drugs, use of injectable opiates, robbery or burglary and assault or other interpersonal violence.

Police practices inventory (PPI)

The 27-item PPI was developed specifically for this study based on the four WHO domains of violence: physical, psychological, sexual and neglectful. Additional items assess positive interactions with police using a similar format. The present study used only the six dichotomous items assessing the lifetime occurrence of individual domains of police practices (i.e., positive encounters, physical victimisation, physical victimisation with a weapon, sexual victimisation, psychological victimisation and neglect), each coded as a separate exposure variable. The complete PPI can be found in Appendix 1.

Expectations of police practices scale (EPPS)

The 8-item EPPS assesses respondent expectations that police will victimise them or a close family member or friend over the subsequent year. As with the PPI, the EPPS likewise is based on the WHO domains of violence. Unlike the PPI, which separately assesses particular types of police encounters, the EPPS is coded as a sum score and does not include items assessing positive policing. The internal consistency of the EPPS was excellent in this sample, Cronbach's $\alpha = 0.95$. The complete measure can be found in Appendix 2.

Mental Health outcome variables

Psychological distress was assessed using the K-6 scale, a brief assessment designed to be maximally discriminant for detecting clinically significant psychological difficulties, including hopelessness, worthlessness, nervousness, agitation and depression (Kessler *et al.* 2003*a*). The K-6 total score was the primary mental health outcome measure of the study. The 9-item Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002) was used to assess depression (past 2 weeks) as a secondary outcome. Each of the 9 items has a 4-point Likert response option ranging from 0 to 3 (not at all to nearly every day). The internal consistency of both the K-6 (Cronbach's $\alpha = 0.90$) and PHQ-9 (Cronbach's $\alpha = 0.91$) were excellent in this sample. The K-6 and PHQ-9 were strongly correlated with one another, $r = 0.81$, $p < 0.001$, but were both included given their diverging theoretical foundations and targeted constructs.

Data analysis

Analyses were conducted using SPSS version 22 (Macintosh) software. Missing cases were deleted listwise due to the low rates of missing data for primary exposure (i.e., 0.0–0.4% for each PPI item, 4.1% for EPPS score) and outcome (i.e., 0.0% for K-6 score, 3.2% for PHQ-9 score) measures. Skewness and kurtosis values were within acceptable ranges (skewness < 2, kurtosis < 7; West *et al.* 1995) for the use of parametric statistics with all continuous variables.

Bivariate associations between demographic variables and (1) the EPPS score and (2) each domain of the PPI were assessed using *t*-tests and chi-square tests, respectively. Bivariate associations between mental health outcomes and (1) the EPPS score and (2) each domain of the PPI were assessed using Pearson's *r* correlations and *t*-tests. Linear regression analyses were then used to test associations between the independent variables, (1) the EPPS score and (2) each domain of the PPI and the dependent variables, (1) K-6 score and (2) PHQ-9 score, with adjustment for crime involvement and demographic variables that were significantly associated with each exposure.

Results

Descriptives and measurement

Complete demographic characteristics of the sample are reported in Supplementary Table s1. Approximately half of respondents reported a lifetime history of positive encounters with police, and a notable minority reported each of the five domains of police victimisation assessed in the PPI (Table 1). Average scores on the EPPS were consistent with a low yet non-zero expected likelihood of police violence occurring over the subsequent year and average scores of the K-6 and PHQ-9 were consistent with mild psychological distress and depression in the overall sample (Table 1). All test-retest reliability correlation values (PHQ-9, K-6 and EPPS) were strong and Kappa values (PPI categorical variables) were in the moderate to substantial range, 0.40–0.64 (Landis & Koch, 1977), except for the small but significant agreement for the variable indicating physical victimisation with a weapon (0.13, potentially due to biases in Kappa for low prevalence phenomena; Sim & Wright, 2005). EPPS scores were greater for respondents endorsing each individual PPI domain of police victimisation, but were not related to positive policing (Fig. 1). Further, each PPI domain (including positive police encounters) was independently associated with the EPPS score when modelled together (Supplemental Table s2).

Table 1. *Descriptive and reliability data for exposure and outcome measures*

Measure	Missing n (%)	Positive responses, n (%)	Mean (SD)	Test-retest reliability ($N = 243$)
Exposure variables				
PPI				
Positive interaction	0 (0.0)	766 (47.4)	–	$K(n = 243) = 0.57, p < 0.001$
Physical	2 (0.1)	99 (6.1)	–	$K(n = 241) = 0.58, p < 0.001$
Physical with weapon	4 (0.2)	54 (3.3)	–	$K(n = 239) = 0.13, p = 0.017$
Sexual	7 (0.4)	46 (2.8)	–	$K(n = 237) = 0.40, p < 0.001$
Psychological	7 (0.4)	300 (18.6)	–	$K(n = 238) = 0.60, p < 0.001$
Neglect	1 (0.1)	303 (18.8)	–	$K(n = 243) = 0.64, p < 0.001$
EPPS				
Total score	67 (4.1)	–	5.37 (5.50)	$r(n = 221) = 0.78, p < 0.001$
Outcome variables				
K-6				
Total score	0 (0.0)	–	5.01 (5.32)	$r(n = 217) = 0.83, p < 0.001$
PHQ-9				
Total score	52 (3.2)	–	5.17 (5.71)	$r(n = 207) = 0.77, p < 0.001$

Demographic distribution of police–public encounters

The prevalence of all assessed domains of police–public encounters varied across demographic groups, typically in a consistent fashion across each domain of violence for any particular demographic variable (for statistics and values, see Table 2). All domains of police victimisation were more common among male than female respondents, and even more prevalent among those identifying as transgender or other (statistically significant for all domains except neglect). Notably, prevalence rates of police victimisation were higher among non-white respondents, whereas White and Latino respondents were most likely to report positive encounters with police (all significant). Prevalence of police victimisation appeared to be greater among respondents that did not identify as heterosexual or straight, although power was limited for most of these analyses (yet still significant for sexual violence).

Police victimisation was also more common among younger participants, especially aged 25–44 (statistically significant for all domains). Only sexual and psychological victimisation significantly varied by income. Prevalence of psychological victimisation and neglect were both significantly higher among respondents that had not completed high school, whereas positive police encounters were more likely at increasing levels of educational attainment. Psychological victimisation and neglect were both more common among respondents born in the USA,
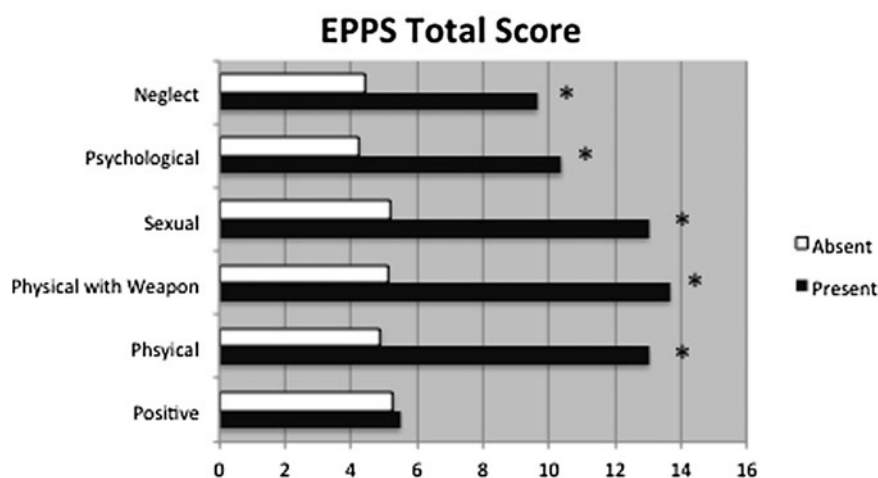

Fig. 1. Difference in mean scores on the EPPS for participants that did or did not report each domain of police practices. Asterisks (*) denote statistical significance (all $p < 0.001$), based on unadjusted t-tests.

Table 2. *Lifetime prevalence (%) of each time of police-public encounter within specified demographic groups, with bivariate statistics assessing for differences in each type of police-public encounter by each demographic variable*

	PPI Domains of Police–Public Encounters (lifetime exposure, %)						EPPS
	Positive	Physical	Physical w/weapon	Sexual	Psychological	Neglect	Total score[a]
Gender	$\chi^2_{(2,1615)}=2.70$, $p=0.259$	$\chi^2_{(2,1615)}=31.44$, $p<0.001$	$\chi^2_{(2,1611)}=26.36$, $p<0.001$	$\chi^2_{(2,1608)}=13.35$, $p=0.001$	$\chi^2_{(2,1608)}=27.02$, $p<0.001$	$\chi^2_{(2,1614)}=3.69$, $p=0.158$	$F_{(2,1545)}=7.18$, $p=0.001$
Male	49.0	9.8	6.0	3.7	24.3	21.0	5.46 (5.59)
Female	46.6	3.3	1.4	2.0	14.4	17.2	5.23 (5.39)
Trans or other[b]	27.3	18.2	9.1	18.2	36.4	18.2	11.45 (6.22)
Age group	$\chi^2_{(3,1615)}=21.21$, $p<0.001$	$\chi^2_{(3,1613)}=13.08$, $p=0.004$	$\chi^2_{(3,1611)}=7.77$, $p=0.05$	$\chi^2_{(3,1608)}=9.81$, $p=0.02$	$\chi^2_{(3,1608)}=13.14$, $p=0.004$	$\chi^2_{(3,1614)}=21.91$, $p<0.001$	$F_{(3,1544)}=13.93$, $p<0.001$
18–24	36.2	4.7	2.9	4.4	17.5	17.8	6.25 (5.85)
25–44	51.6	8.4	4.6	3.6	21.8	22.9	5.91 (5.69)
45–64	48.6	3.9	1.7	1.5	16.4	15.2	4.39 (4.97)
65+	41.3	3.7	2.8	0.0	9.2	7.4	3.43 (4.17)
Race	$\chi^2_{(3,1615)}=23.12$, $p<0.001$	$\chi^2_{(3,1613)}=23.82$, $p<0.001$	$\chi^2_{(3,1611)}=8.47$, $p=0.037$	$\chi^2_{(3,1608)}=11.00$, $p=0.012$	$\chi^2_{(3,1608)}26.87$, $p<0.001$	$\chi^2_{(3,1614)}=22.48$, $p<0.001$	$F_{(3,1544)}=48.50$, $p<0.001$
White, non-Latino	49.9	3.7	2.6	2.1	15.2	15.9	3.92 (4.65)
Black, non-Latino	43.7	8.0	3.0	2.8	22.6	20.2	7.42 (5.80)
Latino	54.9	12.0	6.5	6.6	28.8	30.4	6.81 (6.20)
Other	28.0	8.6	5.4	3.2	12.0	15.1	5.59 (5.78)
Sexual orientation	$\chi^2_{(3,1609)}=6.46$, $p=0.091$	$\chi^2_{(3,1607)}=3.42$, $p=0.331$	$\chi^2_{(3,1605)}=2.56$, $p=0.465$	$\chi^2_{(3,1602)}13.43$, $p=0.004$	$\chi^2_{(3,1602)}=6.91$, $p=0.075$	$\chi^2_{(3,1608)}=4.55$, $p=0.208$	$F_{(3,1540)}=4.33$, $p=0.005$
Hetero/straight	47.5	5.8	3.2	2.4	17.9	18.2	5.21 (5.45)
Homo/G/L	50.0	9.1	6.1	4.6	21.2	18.5	5.65 (5.15)
Bisexual	50.0	9.8	4.4	8.7	28.3	27.2	7.10 (5.95)
Not specified	20.0	5.0	0	5.0	25.0	20.0	7.44 (6.63)
Income	$\chi^2_{(5,1606)}=14.10$, $p=0.015$	$\chi^2_{(5,1604)}=1.60$, $p=0.902$	$\chi^2_{(5,1602)}=7.62$, $p=0.178$	$\chi^2_{(5,1599)}=16.38$, $p=0.006$	$\chi^2_{(5,1599)}=13.27$, $p=0.021$	$\chi^2_{(5,1599)}=4.94$, $p=0.423$	$F_{(5,1533)}=9.39$, $p<0.001$
<20 000	37.4	7.4	3.1	1.9	16.1	20.2	6.85 (6.42)
20 000–39 999	44.9	6.6	1.8	1.8	20.1	21.7	6.18 (5.59)
40 000–59 999	46.2	6.7	2.7	1.7	24.6	19.6	5.93 (5.39)
60 000–79 999	47.0	6.4	3.0	3.0	16.8	16.4	4.81 (5.09)
80 000–99 999	52.3	5.6	6.2	7.2	21.0	20.5	5.62 (5.48)
>100 000	53.1	5.0	4.0	2.7	14.7	16.2	4.00 (5.10)

Continued

Table 2. *Continued*

	PPI Domains of Police–Public Encounters (lifetime exposure, %)						EPPS
	Positive	Physical	Physical w/weapon	Sexual	Psychological	Neglect	Total score[a]
Education	$\chi^2_{(4,1609)} = 16.95,$ $p = 0.002$	$\chi^2_{(4,1607)} = 4.92,$ $p = 0.296$	$\chi^2_{(4,1606)} = 6.11,$ $p = 0.191$	$\chi^2_{(4,1602)} = 2.82,$ $p = 0.588$	$\chi^2_{(4,1602)} = 9.81,$ $p = 0.044$	$\chi^2_{(4,1608)} = 13.56,$ $p = 0.009$	$F_{(4,1537)} = 11.72,$ $p < 0.001$
<High School	36.1	11.4	0.0	2.8	28.6	38.9	10.20 (6.49)
High school/GED	37.5	6.5	1.7	2.2	16.5	17.7	5.56 (5.22)
Some college/tech	46.7	6.4	3.5	2.0	21.3	20.8	5.80 (5.62)
College graduate	49.8	6.7	3.2	3.5	19.3	18.4	5.31 (5.58)
Grad/professional	53.6	3.8	5.2	3.4	13.8	15.1	4.06 (4.81)
Foreign-born	$\chi^2_{(1,1604)} = 4.25,$ $p = 0.039$	$\chi^2_{(1,1602)} = 0.87,$ $p = 0.35$	$\chi^2_{(1,1600)} = 0.04,$ $p = 0.852$	$\chi^2_{(1,1597)} = 0.00,$ $p = 0.98$	$\chi^2_{(1,1597)} = 5.04,$ $p = 0.025$	$\chi^2_{(1,1603)} = 7.29,$ $p = 0.007$	$F_{(1,1535)} = 0.26,$ $p = 0.611$
Yes	39.1	4.3	3.6	2.9	11.6	10.1	5.37 (5.49)
No	48.3	6.4	3.3	2.9	19.4	19.5	5.11 (5.63)
City	$\chi^2_{(3,1615)} = 5.08,$ $p = 0.166$	$\chi^2_{(3,1613)} = 7.21,$ $p = 0.066$	$\chi^2_{(3,1611)} = 5.53,$ $p = 0.137$	$\chi^2_{(3,1608)} = 3.43,$ $p = 0.330$	$\chi^2_{(3,1608)} = 1.27,$ $p = 0.736$	$\chi^2_{(3,1614)} = 4.37,$ $p = 0.224$	$F_{(3,1544)} = 1.51,$ $p = 0.209$
Baltimore	41.2	3.1	1.3	2.2	17.4	17.3	5.36 (5.52)
NYC	48.4	7.9	3.9	2.7	19.9	19.4	5.71 (5.66)
Philadelphia	47.1	5.6	2.8	2.4	17.6	20.9	5.00 (5.38)
Washington D.C.	50.7	5.7	4.7	4.4	18.6	15.2	5.22 (5.31)
Crime involvement[c]	$\chi^2_{(1,1604)} = 33.81,$ $p < 0.001$	$\chi^2_{(1,1602)} = 89.14,$ $p < 0.001$	$\chi^2_{(1,1600)} = 40.76,$ $p < 0.001$	$\chi^2_{(1,1597)} = 12.63,$ $p < 0.001$	$\chi^2_{(1,1597)} = 78.10,$ $p < 0.001$	$\chi^2_{(1,1604)} = 50.76,$ $p < 0.001$	$F_{(1,1539)} = 59.57,$ $p < 0.001$
Yes	62.5	17.8	9.2	6.0	36.5	33.2	7.53 (5.97)
No	44.0	3.4	1.9	2.2	14.5	15.5	4.84 (5.25)

[a]Numerical values in the EPPS column refer to the mean (S.D.) total score, by demographic group.

[b]Reliability of analyses including the 'trans or other' attribute may be limited by cell sizes.

[c]Although not a demographic variable, crime involvement is included here as a potential confounder that may be associated with both police encounters and psychological outcomes.

but so were positive police encounters. Anticipated police violence similarly varied across demographic groups, with higher scores among transgender and male respondents, younger respondents, non-white respondents, non-heterosexual respondents, lower income respondents and less educated respondents. No domains of police encounters varied in prevalence across the four cities examined in this study.

Psychological correlates of police–public encounters

Scores on the K-6 and PHQ-9 scales were consistently higher among respondents that reported each domain of police victimisation, but did not vary between respondents that did or did not report positive encounters with the police (Fig. 2). Similarly, anticipated police violence (EPPS score) was positively correlated with the K-6 score, $r(1548) = 0.235$, $p < 0.001$ and PHQ-9 score, $r(1505) = 0.284$, $p < 0.001$. Associations between the EPPS score and each PPI victimisation exposure and

each mental health outcome, except between physical victimisation without a weapon and the K-6 score, remained significant following adjustment for potential confounds (Table 3). Neither mental health outcome was associated with positive policing in adjusted analyses. We also tested for interactions between (a) race, income, gender, sexual orientation and age, and (b) police victimisation (any, yes/no) and positive police practices. No interactions were significantly related to K-6 scores, although there was a significant interaction by race for PHQ-9 scores, such that police victimisation was associated with greater depression for respondents in the 'other' race category, $B = 0.11$, $t = 3.29$, $p = 0.01$ (Supplemental Figure).

Discussion

Public discourse reveals deep concern about the relations between the police and the community, yet little
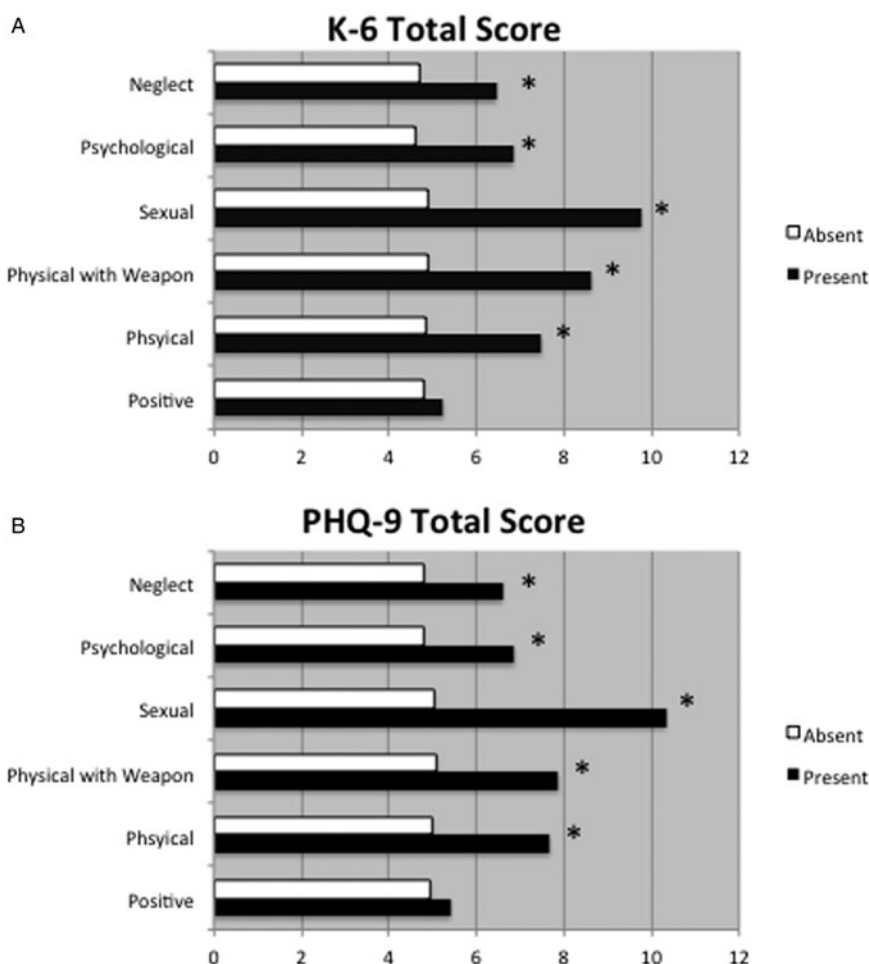

Fig. 2. Difference in mean scores on mental health outcomes for participants that did or did not report each domain of police practices. Mean K-6 total scores are shown in section A. Mean PHQ-9 total scores are shown in section B. Asterisks (*) denote statistical significance (all $p < 0.001$), based on unadjusted *t*-tests.

Table 3. *Fully adjusted linear regression models of associations between police exposures and mental health outcomes*

Independent variable	Demographic adjustments	Linear regression results for primary exposure
K-6 total score (psychological distress)		
PPI lifetime exposures		
Positive	Foreign, education, race, income, age	B(s.e.) = 0.33(0.26), $t = 1.27$, $p = 0.203$
Physical	Gender, age, race	B(s.e.) = 0.86(0.54), $t = 1.60$, $p = 0.111$
Physical with weapon	Gender, race	B(s.e.) = 2.35(0.72), $t = 3.28$, $p = 0.001$
Sexual	Gender, age, race, orientation, income	B(s.e.) = 3.80(0.80), $t = 4.77$, $p < 0.001$
Psychological	Gender, age, race, income, education, foreign	B(s.e.) = 2.14(0.34), $t = 5.03$, $p < 0.001$
Neglect	Age, race, education, foreign	B(s.e.) = 0.91(0.34), $t = 2.72$, $p = 0.007$
EPPS expectations of future exposures		
Total score	Gender, age, race, orientation, income, education	B(s.e.) = 0.17(0.03), $t = 6.57$, $p < 0.001$
PHQ-9 Total score (depression)		
PPI lifetime exposures		
Positive	Foreign, education, race, income, age	B(s.e.) = 0.47(0.29), $t = 1.64$, $p = 0.102$
Physical	Gender, age, race	B(s.e.) = 1.28(0.60), $t = 2.14$, $p = 0.033$
Physical with Weapon	Gender, race	B(s.e.) = 1.81(0.80), $t = 2.27$, $p = 0.024$
Sexual	Gender, age, race, orientation, income	B(s.e.) = 4.46(0.92), $t = 4.86$, $p < 0.001$
Psychological	Gender, age, race, income, education, foreign	B(s.e.) = 2.09(0.37), $t = 5.66$, $p < 0.001$
Neglect	Age, race, education, foreign	B(s.e.) = 0.86(0.37), $t = 2.33$, $p = 0.020$
EPPS expectations of future exposures		
Total Score	Gender, age, race, orientation, income, education	B(s.e.) = 0.22(0.03), $t = 7.84$, $p < 0.001$

Note: Demographic variables were included for adjustment as potential confounders if they were significantly associated with the exposure variable in bivariate analyses ($p < 0.05$). In addition to demographic factors, all analyses were additionally adjusted for self-reported crime involvement.

is known from the point of view of community residents about the frequency and consequences of police–public encounters. We fill this gap by (1) providing prevalence estimates of self-reported encounters, (2) examining disparities according to race, class, gender and sexual orientation, (3) assessing differences in future expectations of negative contact and (4) assessing the strength of association between encounters and expectations about encounters on mental health outcomes.

Prevalence of community-reported police encounters

This study presents, to the best of our knowledge, the first general population prevalence estimates of police victimisation in US cities. A substantial minority of respondents from all four sampled cities reported police victimisation, ranging from approximately 3% for each of the most salient forms of victimisation (specifically sexual violence and physical violence with a weapon) to 6% for general physical violence, and up to approximately 19% for the two least invasive but nonetheless meaningful forms of victimisation (psychological violence and neglect). Our online survey approach allowed us to rapidly assess the prevalence

and correlates of police victimisation in response to changing trends in public awareness. Notably, positive policing was also widely reported, more so than police abuse, suggesting that police are generally fulfilling their expected role despite these incidents of victimisation.

Disparities in police violence exposure

The prevalence of all types of police abuse was higher among non-Whites in this sample, supporting the idea of racial disparities in US policing. This aligns with existing literature that about 40% of Blacks in the USA reported unfair treatment by the police because of their race (Weitzer & Tuch, 2004), and that Blacks were more likely than Whites to be verbally abused by police (Son & Rome, 2004). A recent analysis of the US Police Shooting Database (2011–2014 data) showed that unarmed Blacks were at 3.49 greater probability of being shot by police compared with unarmed Whites, which was most pronounced in urban communities and was not explained by local crime rates (Ross, 2015). Another recent study paired police department case files with mug shots, finding that police used less force with individuals that appeared more

stereotypically white (Kahn *et al.* 2016). In addition to victimisation, Blacks in our study were also less likely to report any positive encounters with police and were more likely to report police neglect. These findings together suggest that the relationships between police and the community vary strongly by race in the USA, with Whites typically experiencing positive police encounters punctuated by rare instances of police abuse, while Blacks experience a nearly equal distribution between positive and negative experiences. The prevalence of psychological victimisation and neglect were both significantly higher among respondents that had not completed high school, whereas positive police encounters were more likely at increasing levels of educational attainment and income, although class effects were less consistent than the effects of race/ethnicity.

Sexual minorities, in terms of both gender identity and sexual orientation, also reported elevated rates of police victimisation, particularly sexual victimisation. One prior study found that 7.4% of assessed police officers reported witnessing another officer harass citizens due to their sexual orientation (Son & Rome, 2004). This follows broader US trends, where sexual minorities are more likely to experience victimisation in general across the life course (Hughes *et al.* 2010; Friedman *et al.* 2011), especially sexual victimisation (Balsam *et al.* 2005) and hate-crime related sexual assaults (Rothman *et al.* 2011), reflecting the widespread experience of stigma and discrimination among these populations (Herek, 2009).

Expectations of future police–public encounters

All types of police victimisation reported on the PPI were independently associated with substantially greater expectations of future police victimisation (EPPS score), whereas positive police encounters (when adjusting for victimisation) were associated with decreased expectations of future police victimisation. We also found that expected police violence over the subsequent year was more commonly reported by transgender and male respondents, younger respondents, non-white respondents, non-heterosexual respondents, lower income respondents and less educated respondents. These expectations align with existing literature that shows Black Americans, compared with whites, are less satisfied and trusting of the police, perceive greater levels of injustice and racial bias, are more likely to report negative personal experiences from police encounters, and are more likely to report experiencing or witnessing police wrongdoing (Decker, 1981; Flanagan & Vaughn, 1996). Although less studied, similar mechanisms of societal oppression may explain the higher ratings of anticipated police

victimisation by sexual minorities and respondents of lower socioeconomic status. Male expectations of police victimisation, on the other hand, may correspond to pronounced gender differences in the rates of crime perpetration (Canter, 1982).

Associations with clinical outcomes

All indicators of police victimisation exposure were associated with both of our clinical outcome measures (i.e., depression and psychological distress), and all associations except one (physical violence without a weapon and K-6 score) were robust to adjustment for potentially confounding variables. Respondents' self-reported assessment of the future likelihood of exposure to police violence was likewise associated with both clinical outcomes. These cross-sectional data suggest that individuals who are victimised by police, and those who expect that such victimisation may occur in the future, are more psychologically distressed and depressed than other members of their communities. This is particularly salient given the high prevalence estimates of police victimisation in these data. One possibility is that victimisation is a stressful or traumatic event that directly impacts psychological well-being, consistent with an extensive body of literature linking victimisation to adverse mental health outcomes, which has been well-replicated across demographic groups, types of victimisation, and a broad range of mental health outcomes (Hawker & Boulton, 2000; Fowler *et al.* 2009; Maniglio, 2009). Effects of victimisation may be particularly impactful when the perpetrator is in a position of power relative to the victim (Schmitt & Branscombe, 2002), as with police-initiated violence. Given our use of cross-sectional data, it is alternatively possible that people who are more depressed or distressed experience victimisation at higher rates. Individuals with mental health issues may be differentially targeted by police (Borum *et al.* 1997), or more likely to engage in behaviours that attract police attention, such as substance use (Kessler *et al.* 2003*b*; Grant *et al.* 2004). Further, unmeasured variables, including community-level factors such as neighbourhood poverty and aggregated crime rates, may contribute to both police exposure and psychological distress.

Measurement of police–public encounters

This study presents two novel measures of encounters with police from the perspective of civilians. The individual domains of the PPI allow a more nuanced understanding of interactions between the police and general public than was previously available by subdividing victimisation according to the WHO domains

of violence. This is an important advancement in measurement of police–public interactions given the wide range of prevalence rates depending on the chosen definition of victimisation in our study, suggesting that reliable estimates of police victimisation would be difficult or impossible to attain using single-item measures. Notably, all reported types of victimisation were associated with mental health outcomes, supporting the needs to assess for lower intensity exposures such as psychological victimisation and police neglect. In addition, we know of no measure prior to the EPPS that assesses subjective expectations of future exposure to police violence, which may capture the degree to which negative police interactions pervade an individual's immediate environment, and are likewise associated with mental health concerns in our data.

Public health implications

Given the high prevalence of police victimisation, its racial and other disparities, and its correlates with mental health outcomes, police victimisation demands attention in public health. Macro-level approaches to reduce the prevalence and impact of police victimisation may include direct training interventions within police departments, greater accountability for police officer actions within the criminal justice system and the implementation of efficient and confidential community mechanisms through which civilians can file grievances without fear of retaliation. Indeed, our findings provide data to support the legitimacy of such complaints; however, addressing those grievances through police reform efforts remains a challenge (Smith, 2004; Clarke, 2009). Recent independent analyses of FBI data (Miller *et al.* 2016) and by the National Bureau of Economic Research (Fryer, 2016) suggested that exposure to police violence may be more strongly associated with disparities in likelihood of police contact, rather than disparities in the use of force following contact, suggesting that reducing inequality in police stops can simultaneously address inequalities in exposure to violence among those who are stopped. Further research can determine risk factors for the perpetration of victimisation by police officers and proactively address such factors through individual-level interventions, possibly through an employee assistance program (Kurutz *et al.* 1996). Despite the code of silence that pervades police forces, few police officers report complacency with the misconduct of others (e.g., in one survey study of Ohio police officers, 3.0% of reported knowing of police officers covering-up incidents of excessive force by fellow officers and 7.4% reported knowing of police officers failing to report incidents of excessive force by fellow officers; Son & Rome, 2004), suggesting that some

individuals within the police force can hold their fellow officers accountable (Rothwell & Baldwin, 2007). The presence of social workers and mental health professionals can mitigate the effects of police victimisation during the detention intake process. Greater racial integration of police forces has also been shown to improve perceptions of police among communities of colour (Weitzer, 2000) and may decrease the risk of police violence. Adults in the USA are generally more approving of police violence if they believe racial disparities are due to lack of motivation and ability rather than structural racism (Hadden *et al.* 2016), suggesting that broader changes in attitudes regarding racism in the USA may be accompanied by less social approval of police violence (Jee-Lyn García & Sharif, 2015). Further, the high prevalence and clinical significance of police victimisation suggests that there may be direct benefits to screening for history of police victimisation among individuals from disadvantaged communities who are engaged in mental health treatment.

Limitations

Several potential limitations should be considered. First, the cross-sectional observational design limited our ability to infer causality although, as noted above, an association between psychological issues and police victimisation is of public health interest regardless of the direction of causality (which may be bi-directional). Retrospective survey items, particularly items assessing lifetime exposures, may be subject to recall bias. Additionally, our sample was not a probability sample and therefore may not be truly representative of the four constituent cities. Divergence from the target sample, particularly the inadvertent oversampling of white respondents, may mean that our prevalence data underestimates the true prevalence of police victimisation in these cities. Nonetheless, the use of online computer-based sampling may introduce biases in the sample, limiting representativeness. Finally, we identified very high rates of victimisation among our small sub-sample of individuals who identified as transgender, which should be further studied using adequately powered samples.

Conclusions

The most commonly reported police–public encounters are positive, suggesting that the police generally satisfy the expectations of their roles. However, in keeping with current concern, these positive and negative experiences fall sharply along the fault lines of race, ethnicity and socioeconomic status. Minority

respondents reported substantially more exposure to negative contact, but also much less exposure to positive policing. Then our results suggest that this collective experience translates into a future expectation of unequal police treatment. A large proportion of minority and low socioeconomic status individuals expect treatment that is not as good as their more advantaged/privileged counterparts. Our results also show that the more people are exposed to negative police treatment, denied positive police treatment and expect this state of affairs to continue into the future, the more psychological distress and the higher levels of depression they experience. Future research should expand our understanding of the causes and effects of police violence, and develop appropriate and feasible public health interventions accordingly.

Supplementary material

The supplementary material for this article can be found at https://doi.org/10.1017/S2045796016000810

Conflict of Interest

The authors have no conflicts of interest to declare in relation to this study.

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Availability of Data and Materials

Data supporting the findings of this study are available as supplemental online material. The complete data set is available on request from the principal investigator and corresponding author, Dr Jordan DeVylder, University of Maryland, Baltimore.

References

Balsam KF, Rothblum ED, Beauchaine TP (2005). Victimization over the life span: a comparison of lesbian, gay, bisexual, and heterosexual siblings. *Journal of Consulting and Clinical Psychology* **73**, 477–487.

Borum R, Swanson J, Swartz M, Hiday V (1997). Substance abuse, violent behavior, and police encounters among persons with severe mental disorder. *Journal of Contemporary Criminal Justice* **13**, 236–250.

Brucato B (2015). The new transparency: police violence in the context of ubiquitous surveillance. *Media and Communication* **3**, 39–55.

Brunson RK (2007). "Police don't like black people": African-American young men's accumulated police experiences. *Criminology & Public Policy* **6**, 71–101.

Canter RJ (1982). Sex differences in self-report delinquency. *Criminology* **20**, 373–393.

Cheng ZH (2015). Asian Americans and European Americans' stigma levels in response to biological and social explanations of depression. *Social Psychiatry and Psychiatric Epidemiology* **50**, 767–776.

Clarke S (2009). Arrested oversight: a comparative analysis and case study of how civilian oversight of the police should function and how it fails. *Columbia Journal of Law and Social Problems* **43**, 1–49.

Cooper H, Moore L, Gruskin S, Krieger N (2004). Characterizing perceived police violence: implications for public health. *American Journal of Public Health* **94**, 1109–1118.

Decker SH (1981). Citizen attitudes toward the police: a review of past findings and suggestions for future policy. *Journal of Police Science and Administration* **9**, 80–87.

Flanagan TJ, Vaughn MS (1996). Public opinion about police abuse of force. In *Police Violence: Understanding and Controlling Police Abuse of Force* (Ed. W.A. Geller and H. Toch), pp. 113–128. Yale University Press: New Haven.

Fowler PJ, Tompsett CJ, Braciszewski JM, Jacques-Tiura AJ, Baltes BB (2009). Community violence: a meta-analysis on the effect of exposure and mental health outcomes of children and adolescents. *Development and Psychopathology* **21**, 227–259.

Friedman MS, Marshal MP, Guadamuz TE, Wei C, Wong CF, Saewyc EM, Stall R (2011). A meta-analysis of disparities in childhood sexual abuse, parental physical abuse, and peer victimization among sexual minority and sexual nonminority individuals. *American Journal of Public Health* **101**, 1481–1494.

Fryer RG Jr (2016). An empirical analysis of racial differences in police use of force. Technical Report, National Bureau of Economic Research.

Geller A, Fagan J, Tyler T, Link BG (2014). Aggressive policing and the mental health of young urban men. *American Journal of Public Health* **104**, 2321–2327.

Grant BF, Stinson FS, Dawson DA, Chou SP, Dufour MC, Compton W, Pickering RP, Kaplan K (2004). Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: results from the national epidemiologic survey on alcohol and related conditions. *Archives of General Psychiatry* **61**, 807–816.

Hadden BR, Tolliver W, Snowden F, Brown-Manning R (2016). An authentic discourse: recentering race and racism as factors that contribute to police violence against unarmed Black or African American men. *Journal of Human Behavior in the Social Environment* **26**, 336–349.

Hawker DS, Boulton MJ (2000). Twenty years' research on peer victimization and psychosocial maladjustment: a meta-analytic review of cross-sectional studies. *Journal of Child Psychology and Psychiatry* **41**, 441–455.

Herek GM (2009). Hate crimes and stigma-related experiences among sexual minority adults in the United States prevalence estimates from a national probability sample. *Journal of Interpersonal Violence* **24**, 54–74.

Hughes T, McCabe SE, Wilsnack SC, West BT, Boyd CJ (2010). Victimization and substance use disorders in a national sample of heterosexual and sexual minority women and men. *Addiction* **105**, 2130–2140.

Jee-Lyn García J, Sharif MZ (2015). Black Lives Matter: a commentary on racism and public health. *American Journal of Public Health* **105**, e27–e30.

Jensen JD, Holton AE, Krakow M, Weaver J, Donovan E, Tavtigian S (2016). Colorectal cancer prevention and intentions to use low-dose aspirin: a survey of 1000 US adults aged 40–65. *Cancer Epidemiology* **41**, 99–105.

Johnson R, Harkins K, Cary M, Sankar P, Karlawish J (2015). The relative contributions of disease label and disease prognosis to Alzheimer's stigma: a vignette-based experiment. *Social Science & Medicine* **143**, 117–127.

Kahn KB, Goff PA, Lee JK, Motamed D (2016). Protecting whiteness white phenotypic racial stereotypicality reduces police use of force. *Social Psychological and Personality Science* **7**, 403–411.

Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, Howes MJ, Normand ST, Manderscheid RW, Walters EE, Zaslavsky AM (2003*a*). Screening for serious mental illness in the general population. *Archives of General Psychiatry* **60**, 184–189.

Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, Rush J, Walters EE, Wang PS (2003*b*). The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *JAMA* **289**, 3095–3105.

Kroenke K, Spitzer RL (2002). The PHQ-9: a new depression diagnostic and severity measure. *Psychiatric Annals* **32**, 1–7.

Krug EG, Mercy JA, Dahlberg LL, Zwi AB (2002). The world report on violence and health. *Lancet* **360**, 1083–1088.

Kurutz JG, Johnson DL, Sugden BW (1996). The United States Postal Service employee assistance program: a multifaceted approach to workplace violence prevention. In *Violence on the Job* (Ed. G. VandenBos & E. Bulatao). American Psychological Association: Washington, DC.

Landis JR, Koch GG (1977). The measurement of observer agreement for categorical data. *Biometrics*, 159–174.

MacDonald J, Stokes RJ, Ridgeway G, Riley KJ (2007). Race, neighbourhood context and perceptions of injustice by the police in Cincinnati. *Urban Studies* **44**, 2567–2585.

Maniglio R (2009). Severe mental illness and criminal victimization: a systematic review. *Acta Psychiatrica Scandinavica* **119**, 180–191.

Miller TR, Lawrence BA, Carlson NN, Hendrie D, Randall S, Spicer RS (2016). Perils of police action: a cautionary tale from US data sets. *Injury Prevention.* Published Online First: accessed September 23, 2016: doi: 10.1136/injuryprev-2016–042023.

Office of the United Nations High Commissioner for Human Rights (2015). Committee on the Elimination of Racial Discrimination. Retrieved 7 July 2016 from http://www2.ohchr.org/english/bodies/cerd/.

Ross CT (2015). A multi-level Bayesian analysis of racial bias in police shootings at the county-level in the United States, 2011–2014. *PloS ONE* **10**, e0141854.

Rothman EF, Exner D, Baughman AL (2011). The prevalence of sexual assault against people who identify as gay, lesbian, or bisexual in the United States: a systematic review. *Trauma, Violence, & Abuse* **12**, 55–66.

Rothwell GR, Baldwin JN (2007). Whistle-blowing and the code of silence in police agencies policy and structural predictors. *Crime & Delinquency* **53**, 605–632.

Schmitt MT, Branscombe NR (2002). The meaning and consequences of perceived discrimination in disadvantaged and privileged social groups. *European Review of Social Psychology* **12**, 167–199.

Sim J, Wright CC (2005). The kappa statistic in reliability studies: use, interpretation, and sample size requirements. *Physical Therapy* **85**, 257–268.

Smith G (2004). Rethinking police complaints. *British Journal of Criminology* **44**(1), 15–33.

Son IS, Rome DM (2004). The prevalence and visibility of police misconduct: a survey of citizens and police officers. *Police Quarterly* **7**, 179–204.

Tinghög G, Andersson D, Bonn C, Böttiger H, Josephson C, Lundgren G, Västfjäll D, Kirchler M, Johannesson M (2013). Intuition and cooperation reconsidered. *Nature* **498**, E1–E2.

Weitzer R (2000). White, black, or blue cops? Race and citizen assessments of police officers. *Journal of Criminal Justice* **28**, 313–324.

Weitzer R, Tuch SA (2004). Race and perceptions of police misconduct. *Social Problems* **51**, 305–325.

West SG, Finch JF, Curran PJH, Rick H (Ed.) (1995). *Structural Equation Modeling: Concepts, Issues, and Applications*. Sage Publications, Inc.: Thousand Oaks, CA, USA, pp. 56–75.