Adverse Childhood Experiences and Adolescent Police Contact in the United Kingdom

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abstract

OBJECTIVES: Adverse childhood experiences (ACEs) are prevalent in the population and yield several adverse consequences for child health and development as they accumulate. The objective of the current study is to examine the association between ACEs and adolescent police contact using a national, longitudinal study of adolescents born in the United Kingdom.

METHODS: Data come from a sample of 11 313 adolescents who participated in the UK Millennium Cohort Study (MCS), which is a national, longitudinal study of adolescents born in the United Kingdom between 2000 and 2002. Accumulating ACEs were measured at ages 5 and 7 years and reports of police contact were measured at age 14 years, including being stopped and questioned, warned/cautioned, and arrested.

RESULTS: Accumulating ACEs at ages 5 and 7 years are associated with a significant increase in the odds of experiencing police stops by age 14 years, with 3 or more ACEs corresponding to a 100% increase in the odds of police stops. Additional analyses reveal that behavioral health factors at age 11 years explain 58.5% to 78.1% of the association between ACEs and adolescent police stops, with externalizing behavior explaining the largest portion of the association. Finally, accumulating ACEs were most relevant to being warned/cautioned or arrested by police.

CONCLUSIONS: A history of accumulating ACEs during early childhood elevates the likelihood of police contact by age 14 years, in part by undermining behavioral health. Findings highlight the potential for early interventions in the lives of ACE-exposed adolescents to curtail justice system involvement.

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Dr Jackson conceptualized and designed the study, carried out the analyses, drafted portions of the initial manuscript, reviewed and revised the manuscript, and approved of the final manuscript submitted; and Drs Jindal, Testa, Ganson, Fix, and Nagata assisted in the design of the study, drafted portions of the initial manuscript, reviewed and revised the manuscript, and approved of the final manuscript submitted.

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WHAT'S KNOWN ON THIS SUBJECT: Adverse childhood experiences are linked to a host of deleterious outcomes among children and adolescents, including increases in behavioral health challenges.

WHAT THIS STUDY ADDS: Accumulating adverse childhood experiences (ACEs) elevate the likelihood of adolescent–police contact, in part by elevating behavioral health challenges; findings highlight the potential for early interventions in the lives of ACE-exposed adolescents to curtail justice system involvement.

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Adverse childhood experiences (ACEs) are stressful or traumatic events of abuse, neglect, or household dysfunction early in life that have been shown to interfere with multiple facets of development and wellbeing across the life course,[1] particularly as they accumulate.[2] Research has revealed that ACEs can be especially detrimental to behavioral health as children age, elevating the risk of interpersonal difficulties,[3] hyperactive and externalizing behaviors,[4–6] disengagement from school,[7] and a variety of conduct problems (eg, substance use, delinquency).[8,9] Research also reveals high rates of accumulating ACEs among adolescents who have had contact with the juvenile justice system.[10,11] This may be because many of the behavioral challenges associated with ACE exposure are more likely to draw the attention of police (eg, externalizing behaviors, conduct problems) and/or increase opportunities for police contact (eg, school disengagement).[12,13] Although recent reviews focus on the relationship between ACEs and formal contact with the justice system such as arrest, residential placement, and community supervision,[14,15] there is a lack of scientific research investigating the association between accumulation of ACEs and adolescents' informal experiences with police (eg, police-initiated contact not resulting in an arrest or formal record) or the behavioral mechanisms that might explain such associations.

Importantly, informal police contact is a fairly common experience during early adolescence,[16,17] and police can and do deploy invasive policing strategies with young people, such as frisks and searches during stops and even use of force.[16,18] Both frequent and invasive contact with police, similar to ACEs, has been linked to poor health outcomes for adolescents, even in the absence of arrest.[17–19] Despite the health effects of both ACEs and police contact, it remains unclear whether key components of behavioral health that may draw the attention of police or increase opportunities for police contact might explain the elevated risk of police contact among ACE-exposed adolescents. Much of the current literature on ACEs and justice contact overlooks these potential mediating pathways (eg, externalizing behavior, school disengagement, substance use), limiting our ability to develop meaningful solutions. Also, studies on ACEs and justice system contact are overwhelmingly US-centric,[10,11] raising questions about whether ACEs similarly elevate the risk of justice system contact in other national contexts.

To illustrate, there are key differences in policing in the United States and other developed democracies such as the United Kingdom that may have implications for the association between ACEs and police contact. For instance, this association may be less apparent in the United Kingdom considering that, relative to the United States, policing in the United Kingdom is more centralized and subject to greater government oversight.[20,21] UK policing also more regularly uses a community-oriented strategy rather than a proactive approach, and police and citizens rarely carry firearms in the United Kingdom. Despite these differences, there are also similarities between the UK and US policing that might suggest similar patterns in the relationship between ACEs and police contact. For instance, ~15% of youth in the United Kingdom have experienced a police stop by age 14 years,[22] and survey data reveal a substantial number of youth distrust and/or fear the police.[23] Police contact in the United Kingdom is also racially disparate, as it is in the United States, with Black individuals being most likely to be stopped.[24] Also similar to the US-based research is a connection between ACEs and other forms of criminal justice contact in the United Kingdom, as adults with 4 or more ACEs are nearly 8 times more likely to be incarcerated than those with no ACEs.[25] Despite these findings, there has been no research on the connection between ACEs and informal types of justice involvement (ie, police contact) among adolescents in the United Kingdom.

To address critical gaps in the literature, we draw on a national sample of adolescents from the UK Millennium Cohort Study (MCS) to investigate whether the accumulation of early ACEs is associated with police contact by age 14 years, which factors mediate this relationship, and whether the relationship varies by features of the encounter (ie, stopped and questioned by police vs warned/cautioned vs arrested).

DATA AND METHODS

Data for the current study come from the UK MCS, a national, longitudinal panel study of 18 818 adolescents born in the United Kingdom between 2000 and 2002. This national birth cohort was followed over time, with data being collected on the same youth at 7 intervals (labeled sweeps, henceforth noted as S): 9 months of age (S1, 2001), 3 years of age (S2, 2004), 5 years of age (S3, 2006), 7 years of age (S4, 2008), 11 years of age (S5, 2012), 14 years of age (S6, 2015), and 17 years of age (S7, 2018). The MCS data were obtained using a stratified cluster sampling design, with the population being stratified by UK country: England, Wales, Scotland, and Northern Ireland. The study

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oversampled children from families living in low-socioeconomic status areas and in areas with higher proportions of Black and Asian residents. Specifically, the study oversampled children from families living in the poorest 25% of wards from the ward-based Child Poverty Index as well as wards in which at least 30% of their total population was Black or Asian. Even so, the data contain the appropriate sampling weights to produce findings that are nationally representative and generalizable to the entire United Kingdom. For additional details on the MCS design and sample, see https://cls.ucl.ac.uk (the MCS data are also available at https://cls.ucl.ac.uk upon request).

The current study uses data from S2 through S6, with covariates being taken from S2, ACEs being taken from S3 and S4, mediators being taken from S5, and police contact being taken from S6. Although the study incurred significant loss to follow-up since birth, 11 717 households were still participating in the study at S6 when youth were 14 years of age (with the largest declines in sample size after S1). The current study is restricted to the sample of adolescents who participated in the young person questionnaire at S6 and had valid police contact data (N = 11 313).

Police Contact

At S6, when adolescents were on average 14 years of age, they were asked, "Have you ever been stopped and questioned by the police?" Response options included Yes and No. In 2 follow-up questions, additional details about police stop features pertaining to officer warning/cautions (ie, Have you ever been given a formal warning or caution by a police officer?) and arrests (ie, Have you ever been arrested by a police officer and taken to a police station?) were also obtained. Adolescents who reported any form of lifetime police contact as described in these items were assigned a value of 1, whereas adolescents reporting no police contact were assigned a value of 0. As is the case in previous MCS research on police contact,[17] details pertaining to officer warnings/cautions and adolescent arrests are also examined separately from being only stopped and questioned by police in a subset of models.

Adverse Childhood Experiences

To measure ACEs using the MCS data, we follow the lead of Straatmann and colleagues[26] and include 7 indicators of ACEs: Verbal Maltreatment, Physical Maltreatment, Parental Divorce, Parental Mental Illness, High Frequency of Parental Alcohol Use, Domestic Violence, and Parental Drug Use. Critically, these ACEs are commonly used in other studies, which can facilitate useful comparisons.[27–29] For this study, these items were extracted from S3 and S4 of the MCS study, when participants were on average 5 and 7 years old (except for Parental Drug Use, which was available at S3 only). Participants were considered to have experienced an ACE if the main caregiver respondent (usually the mother, ~98%) indicated the presence of a given ACE at either S3 or S4. All items were taken from the S3 or S4 Computer-Assisted Person Interview questionnaire, as completed by the main caregiver. As was the case with Straatmann and colleagues,[26] we summed the ACEs and created the following 4 groups: 0 ACEs, 1 ACE, 2 ACEs, and 3+ ACEs. For measurement details pertaining to each of the 7 ACEs, see Supplemental Table 4.

Mediators (S5)

We examined the following 4 mediators derived from S5, when participants were on average 11 years of age: child school disengagement, child externalizing behavior, child property delinquency, and child substance use. For measurement details on these mediators, see the Supplemental Information.

Covariates

The following covariates were included in multivariate models to address omitted variable bias and minimize the likelihood of spurious results: adolescent age (self-report in years; S6), sex (male = 1; self-report; S6), race (Asian, Black, Mixed, and Other, with White as the reference category; self-report; S6), Mother's age at birth (parent report, S2), parent education based on National Vocational Qualification (NVQ; NVQ1 [reference category], NVQ2, NVQ3, NVQ4, NVQ5, overseas or other education, and none; parent report; S2),[17] household poverty (McClements equivalence scales below 60% median poverty indicator; parent report; S2),[30] household size (ie, number of persons residing in focal child's household; parent report; S2), and low neighborhood safety (ie, parent-reported perceptions of safety of their neighborhood, from very safe [1] to very unsafe [5]; S2).

Analytic Approach

The analysis proceeded as follows. First, we calculated descriptive statistics pertaining to the full analytical sample of adolescents (N = 11 313). Second, we graphed the proportion of adolescents with police contact by level of ACEs. Third, we estimated unadjusted and adjusted logistic regression models of the association between ACEs and police contact. Fourth, we used the Karlson-Holm-Breen (KHB) method to examine the extent to which S5 child school disengagement, externalizing behavior, property delinquency, and substance use mediated associations between ACEs and police contact.[31] We opted to

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test mediation using the KHB method for 2 reasons. The KHB method provides the benefit of (1) decomposing the independent mediating effects of each hypothesized mediator and (2) calculating whether the change in the focal independent variable across models, following the inclusion of that mediator, is greater than excepted by chance. Additionally, coefficients across nested nonlinear models cannot be directly compared because of a rescaling of the model that occurs after additional variables are added. The KHB method adjusts for this rescaling and provides an estimate of the proportion of the association between the independent and dependent variables that is explained by a given mediator. Finally, in a set of ancillary multinomial logistic regression analyses, we examined associations between ACEs and police contact across police encounter features (eg, officer warning/cautions, arrest). All analyses were conducted in Stata v 17.1 using multiply imputed data (chained equations, 20 imputations) and weights were used to adjust for nonresponse, probability of selection, and the demographic distribution of the target population.[32]

RESULTS

Approximately 16% of adolescents reported any form of police contact by age 14 years. Additionally, 38.5% of adolescents experienced no ACEs, 44.4% of adolescents experienced 1 ACE, 14.1% experienced 2, and 3.0% experienced 3 or more by age 7 years. The sample is approximately one-half male (49.4%) and predominantly White (79.9%), with most of the non-White sample being Asian (10.8%). Still, 3.2% of the sample was Black, 4.7% of the sample was mixed race, and 1.4% of the sample was another/other race (for more descriptive statistics, see Supplemental Table 5).

As shown in Fig 1, only about 13% of adolescents with no ACEs reported police contact by age 14 years, yet 27% of adolescents with 3 or more ACEs reported police contact by this age. Findings from Table 1 indicate that ACE exposure was consistently associated with significantly greater odds of adolescent police stops. Furthermore, children experiencing 3 or more ACEs (OR = 2.5; CI = 1.9–3.4) were at significantly higher risk of adolescent-police contact than those reporting a single ACE (odds ratio [OR], 1.3; confidence interval [CI], 1.2–1.5) (Wald $\chi^2 = 17.7$; $P < .01$). After adjustment for covariates, accumulating ACEs remained significantly associated with police contact (3 or more ACEs: OR, 2.0; CI, 1.5–2.7). Older youth, male youth, and Black youth were more likely to be stopped by police, as were youth in poorer households and in neighborhoods perceived as less safe (for more details, see Supplemental Table 6). Results of ancillary analyses revealed that interactions between ACEs and youth sex as well as ACEs and youth race were consistently null (see Supplemental Table 7; Supplemental Table 8).

Table 2 indicates that child school disengagement, externalizing behavior, property delinquency, and substance use all significantly mediated associations between ACE exposure and police contact. Child-externalizing behavior explained 31.9% to 47.7% of the association between ACEs and adolescent police stops. By comparison, school disengagement explained 10.8% to 16.0% of the association, child property delinquency explained 7.3% to 11.4% of the association, and child substance use explained 5.3% to 6.8% of the association. Collectively, the mediators explained 58.5% to 78.1% of the association between ACEs and adolescent police stops.

Table 3 demonstrates that as ACEs accumulated, they were significantly associated with being warned/cautioned by police and being arrested. After adjusting for confounders, adolescents who experienced 3 or more ACEs by 7 years of age incurred a 186%

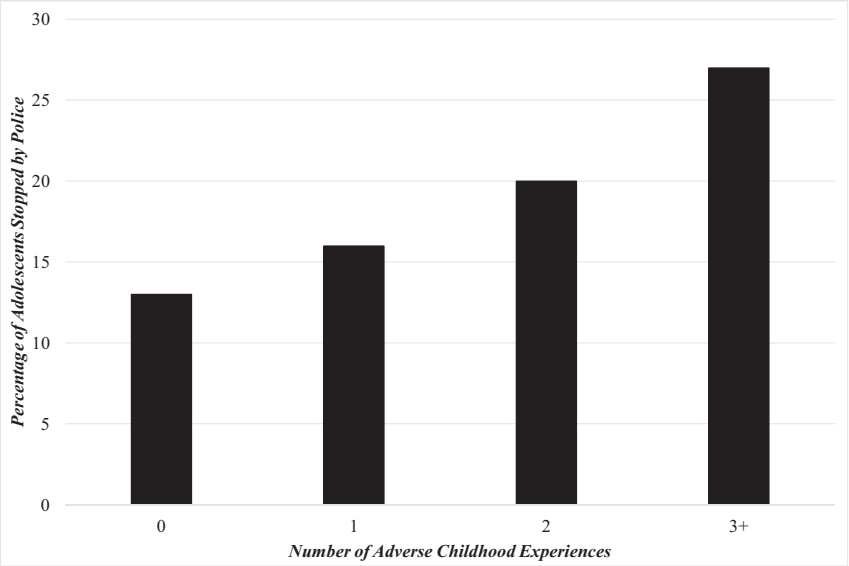

FIGURE 1
The proportion of adolescents reporting police stops by age 14 years, stratified by ACE exposure.

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TABLE 1 Unadjusted and Adjusted Logistic Regression Models of the Association Between Adverse Childhood Experiences and Adolescent Police Stops (N = 11 313)

	Adolescent Police Stops			
	Model 1		Model 2	
Variables	OR	CI	AOR	CI
Number of adverse childhood experiences				
1	1.3**	1.2–1.5	1.3**	1.1–1.5
2	1.5**	1.3–1.8	1.4**	1.2–1.7
3+	2.5**	1.9–3.4	2.0**	1.5–2.7

Model 2 includes adjustment for the following covariates: adolescent age (self-report in years; S6), sex (male = 1; self-report; S6), race (Asian, Black, Mixed, and Other, with White as the reference category; self-report; S6), mother's age at birth (parent reported, S2), parent education based on NVQ (NVQ1 [reference category], NVQ2, NVQ3, NVQ4, NVQ5, overseas or other education, and none; parent reported; S2), household poverty (McClements below 60% median poverty indicator; parent reported; S2), household size (ie, number of persons residing in focal child's household; parent reported; S2), and low neighborhood safety (ie, parent-reported perceptions of safety of their neighborhood, from very safe [1] to very unsafe [5]; S2). AOR, adjusted odds ratio.
*$P < .05$; **$P < .01$.

increase in the odds of being warned/cautioned by police and a 301% increase in the odds of being arrested/taken into custody by age 14 years. Associations between exposure to 3 or more ACEs and being only stopped and questioned by police were null.

DISCUSSION

Our study demonstrates that older youth, male youth, and Black youth were more likely to be stopped by police in the United Kingdom, similar to in the United States.[16] Additionally, accumulated exposure to ACEs in early childhood is associated with increased odds of police contact by age 14 years, which is partially mediated by several behavioral health factors, including externalizing behaviors. Findings also indicate that the greater number of ACEs a child is exposed to, the more likely the child is to be warned or arrested by police rather than simply stopped and questioned. Despite police contact varying by key adolescent demographic factors (eg, age, race, and gender), these factors did not moderate the relationship between ACEs and police contact in this sample.

These findings build on recent US-based research revealing that ACEs confer additional risk for unfair police treatment and other forms of criminal justice contact by adulthood.[33,34] They also fill a critical gap in the literature by identifying possible mechanisms linking ACE exposure to justice system contact among adolescents and distinguishing between informal and formal types of police contact. Given the accumulating evidence that both ACEs and justice system contact carry a wide range of life course consequences,[1] including an increased likelihood of continued justice system contact,[14,15] understanding the complex relationship and factors that influence this relationship is essential to mitigating their detrimental impact on adolescent health and well-being.

Our findings raise some important points for pediatricians and health care providers to consider. Recent events call on pediatric health care practitioners to consider the role of police contact in threatening adolescent health and wellbeing as well as the impact of experiences potentially driven by racism, such as police contact, on overall health.[35] When considering how to address a more comprehensive set of ACEs in a busy clinical setting, assessment of exposure to racism and police contact, in addition to traditional ACEs, may be a fruitful avenue to better align services with youth needs. Future research efforts should focus on effective approaches to assess for ACEs, when practical, to assist clinicians with early identification of adolescents at higher risk for certain behavioral health challenges that may increase the odds of police contact. When needed, referrals to behavioral health providers who use trauma-informed and healing-centered approaches may be equally useful to ensure children receive targeted interventions and support.[36] This may be particularly true when these health concerns stem from trauma

TABLE 2 Karlson-Holm-Breen Test of Mediators Between ACE Exposure and Adolescent Police Stops

	Adolescent Police Stops					
	1 ACE		2 ACEs		3 or More ACEs	
Mediators	% Reduction	*z*-score	% Reduction	*z*-score	% Reduction	*z*-score
Child school disengagement	16.0	4.6**	10.8	4.8**	14.5	5.1**
Child externalizing behavior	47.7	6.8**	33.6	6.8**	31.9	6.5**
Child property delinquency	9.1	3.1**	7.3	3.7**	11.4	3.9**
Child substance use	5.3	2.1*	6.8	3.7**	6.2	2.8**
Total	78.1	—	58.5	—	64.0	—

Includes adjustment for the following covariates: adolescent age (self-report in years; S6), sex (male = 1; self-report; S6), race (Asian, Black, Mixed, and Other, with White as reference category; self-report; S6), mother's age at birth (parent reported, S2), parent education based on NVQ (NVQ1 [reference category], NVQ2, NVQ3, NVQ4, NVQ5, overseas or other education, and none; parent reported; S2) household poverty (McClements below 60% median poverty indicator; parent reported; S2), household size (ie, number of persons residing in focal child's household; parent reported; S2), and low neighborhood safety (ie, parent-reported perceptions of safety of their neighborhood, from very safe [1] to very unsafe [5]; S2). —, not applicable.
**$P < .01$.

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TABLE 3 Adjusted Multinomial Logistic Regression Models of the Association Between Adverse Childhood Experiences and Adolescent Police Stop Features (N = 11 313)

	Police Stop Features					
	Stopped and Questioned		Warned/Cautioned		Arrested/Taken Into Custody	
Variables	ARRR	CI	ARRR	CI	ARRR	CI
Number of adverse childhood experiences						
1	1.2*	1.0–1.5	1.3**	1.1–1.6	1.5	0.8–2.6
2	1.0	0.8–1.4	1.8**	1.4–2.3	2.5**	1.3–4.7
3+	1.3	0.8–2.0	2.9**	1.9–4.4	4.0**	1.7–9.6

Includes adjustment for the following covariates: adolescent age (self-report in years; S6), sex (male = 1; self-report; S6), race (Asian, Black, Mixed, and Other, with White as reference category; self-report; S6), mother's age at birth (parent reported, S2), parent education based on NVQ (NVQ1 [reference category], NVQ2, NVQ3, NVQ4, NVQ5, overseas or other education, and none; parent reported; S2) household poverty (McClements below 60% median poverty indicator; parent reported; S2), household size (ie, number of persons residing in focal child's household; parent reported; S2), and low neighborhood safety (ie, parent-reported perceptions of safety of their neighborhood, from very safe [1] to very unsafe [5]; S2). ARRR, adjusted relative risk ratio.

*$P < .05$; **$P < .01$.

histories that go unreported or unnoticed. Pediatric clinicians should also consider promoting and advocating for evidence-based interventions that mitigate the consequences of ACEs,[37] foster positive childhood experiences to promote greater thriving,[38] and have the potential to reduce repeat contact with the justice-system.[39]

Limitations

Our study's findings must be considered in light of several limitations that can be expanded upon in future research. First, although the MCS data are weighted to be nationally representative of the United Kingdom, the findings from this study cannot be generalized to adolescents outside of the UK context. Additionally, the loss to follow-up that occurred across study sweeps may yield an unknown degree of bias in the results to the extent that dropout was nonrandom. Second, although we examined the role of race in the link between ACEs and police contact to the extent possible, future research should include more racially and ethnically diverse samples to further explore the role of race and racism in the findings. Third, there are relatively limited details on the police stop features in the MCS data and no information on the type of law enforcement officer involved, as the survey simply refers to "police." It would be valuable for future research on ACEs and criminal justice contact to more explicitly define police officers (eg, patrol versus school resource officer) and consider other features of police stops such as the degree of officer intrusiveness or adolescent perceptions of procedural justice, given their dose-response relationship to poor child health.[18] Fourth, other facets of mental health (eg, anxiety) may be important to examine as mediators in future research, despite no evidence that internalizing behavior at age 11 years increased the odds of police contact in ancillary analyses. Finally, the current study was not designed at its outset to replicate the original ACEs study.[2] Although the measure of ACEs was based on procedures used in previous research,[26] it is nonetheless limited in a few respects. For example, the measure is based on 7 items, whereas the original ACE scale was based on 10. Accordingly, ACEs such as sexual abuse, household incarceration, and emotional and physical neglect were not included in the MCS ACEs measure.[2] In addition, the ACEs questions were collected at ages 5 and 7 years. Although this supports proper temporal order with the outcomes studied, our estimates may be conservative because additional ACEs occurring after the age of 7 years but before police contact may have been relevant. Thus, it would be beneficial for future research to invest in longitudinal data collected at more frequent time intervals (ie, on an annual basis).

CONCLUSIONS

Using a national, longitudinal study of adolescents born in the United Kingdom, the current research demonstrates that accumulating adverse childhood experiences are associated with adolescent police stops, particularly those involving arrests or police warnings/cautions. Moreover, the results show this relationship is partially explained by behavioral health factors that stem from ACEs and elevate the risk of police contact, highlighting the complex and mutually reinforcing nature of these relationships. Given that both ACEs and police contact have negative repercussions for health, wellbeing, and life-course development, it is critical that targeted interventions and policies be developed and implemented to mitigate potential harms.

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ABBREVIATIONS

ACE: adverse childhood experience
CI: confidence interval
KHB: Karlson-Holm-Breen
MCS: Millennium Cohort Study
NVQ: National Vocational Qualification
OR: odds ratio
S: sweep

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