The Effects of Youth Clubs on Education and Crime

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Introduction
●○○

Background
○○○

Data
○○

Empirical strategy
○○

Results
○○○○○

Mechanisms
○○

Cost Benefit Analysis
○

Conclusion
○

Motivation

- Many countries have **public after-school programs** which are free or heavily subsidised
- They intend to reduce barriers to non-formal education to **lower income youths**
- Their **effects** are **unclear** from a theoretical perspective
  - These spaces provide opportunities for human capital development
  - But concentrating lower income youths might have unintended consequences
- The empirical **literature** is **scarce** due to lack of data and endogeneity issues
  - Some papers find beneficial effects studying small populations in specific contexts
  - Correlational works find these programs are associated with worse outcomes

(Mahoney et al., 2001; Gottfredson et al., 2004; Feinstein et al., 2005; Lechner, 2009; Dinarte, 2020; Behtoui, 2019; Allcott et al., 2020; Aguiar et al., 2021; Braghieri et al., 2022; Santos et al., 2023; Blanchflower et al., 2024)

▸ Analysis of Understanding Society

This paper

- What is the effect of youth clubs on education and crime?
- I study London (UK) between 2010 and 2019 a context in which:
  - Youth clubs were popular (223 youth clubs in 2010)
  - New data sources can be created
  - Extensive administrative education and crime records can be explored
  - A quasi-experiment allows to disentangle causal link
- In this setting 30% of youth clubs closed due to austerity cuts
- I use difference in differences models and show that after closures:
  - Pupils affected perform worse in high-school exams ↓ test scores by 7% of a s.d at age 15
  - Teenagers affected become more likely to commit crime ↑ 18% offending at ages 10 to 18
  - Effects larger for lower-income youths
- Youth clubs affect human capital development in medium run, not pure incapacitation
- Closing youth clubs was not cost-effective

UK's youth clubs

- Youth clubs are after-school programs which are **universal**, **free**, and **voluntary**
- They usually take place in **community-based** bespoke spaces
- Their provision is coordinated by local authorities
- They can be managed by local authorities or by charities
- 40% of kids attended occasionally, and 10% attended almost every day in 2009
- These spaces always have a trained youth workers or volunteer in the premise
- 64% offer sport activities, 36% music, at least 22% have IT suites/videogames

▸ Usage and attributes   ▸ Word cloud of activities   ▸ Youth club attributes

A youth club in London
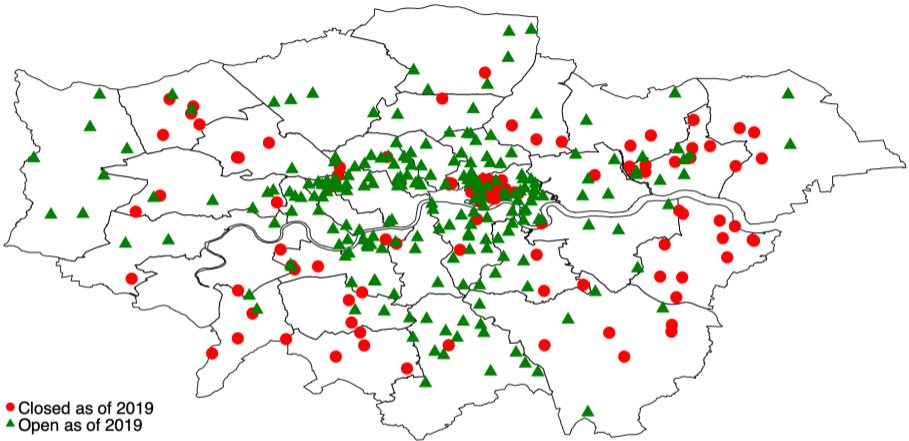*Photography by Graeme Robertson/The Guardian*

Austerity and the closure of youth clubs

- Spending Review in 2010 meant severe cuts to public services (nation-wide)
- Between 2010-2019 spending in youth activities ↓ by 72%
- Some clubs had to close, and others had to open fewer hours, or offer less activities
- How did local authorities choose which ones to close?
    - Different reasons in minute meetings (corruption, age of buildings etc...)
    - But LPM regressions show main predictor was being council managed vs ran by charity
    - Some areas seem to have prioritised keeping clubs open in more deprived areas

▸ LPM closures ▸ Areas affected vs unaffected

Introduction
○○○
Background
○○●
Data
○○
Empirical strategy
○○
Results
○○○○○
Mechanisms
○○
Cost Benefit Analysis
○
Conclusion
○

Data

- New database on youth clubs
  - Hand-constructed from Freedom Of Information requests
  - Includes location and year of closure (when relevant)
- Survey data from Understanding Society
  - Longitudinal survey conducted in the household
  - Includes question on after-school activities for people aged 10 to 15
- Administrative records from the Department for Education
  - Universe of pupils
  - Includes exam results and suspensions details
- Administrative records from the London Metropolitan Police
  - Universe of crimes, for subset of cleared crimes (20%) details on offenders' address and age

- Closed as of 2019
- Open as of 2019

Introduction
○○○

Background
○○○

Data
○●

Empirical strategy
○○

Results
○○○○○

Mechanisms
○○

Cost Benefit Analysis
○

Conclusion
○

Empirical strategy

- Compare individuals affected by closures to individuals unaffected
    - Treated: areas where all nearby youth clubs close
    - Control: areas where all nearby youth clubs remain open
    - Nearby $= 40$ mins on foot
    - Estimate DD models and event studies

Introduction
ooo

Background
ooo

Data
oo

Empirical strategy
●o

Results
ooooo

Mechanisms
oo

Cost Benefit Analysis
o

Conclusion
o

Estimating equation

$$Y_{n(i)t} = \mu_n + \mu_t + \gamma \text{After} \times \text{Closure}_{it} + \varepsilon_{n(i)t}$$

- Y is reported by individual n, living in block i, in year t
- After × Closure is 1 in years after clubs close if individual lives in a treated area
- Staggered intervention, estimate using TWFE + stacked design
- Linear form assumption, estimate using OLS
- Cluster SEs on blocks called MSOAs ($\sim 8,000$ residents)
- Identifying assumptions: PT, No anticipation, No spillovers

Do closures affect attendance to organised activities?

Figure: Event study, effect of closures on the probability of attending organised activities 10-15

$\hat{\beta}_{DID}$ = -0.318
SE_{DID} = 0.098
Mean = 0.357
Magnitude = -89.14%
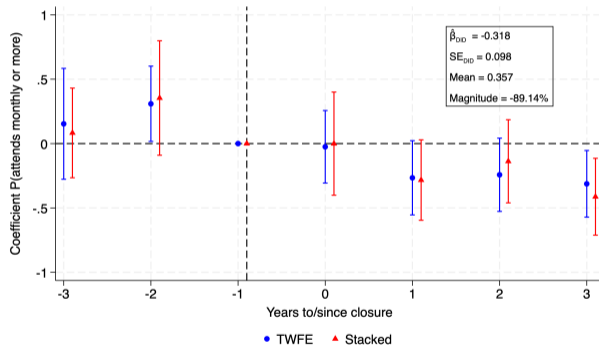
Notes: Estimated change in the probability of attending *organised activities* in Understanding Society. N=704 pupil-year observations in 2011-2019. The base year is the year before youth clubs close. The coefficients in blue (circles) are estimated using TWFE. The coefficients in red (triangles) are estimated using a stacked event study design. Standard errors clustered on MSOA level.

Do closures affect educational outcomes?

Figure: Event study, effect of closures on test scores in national exam at ages 15 and 16
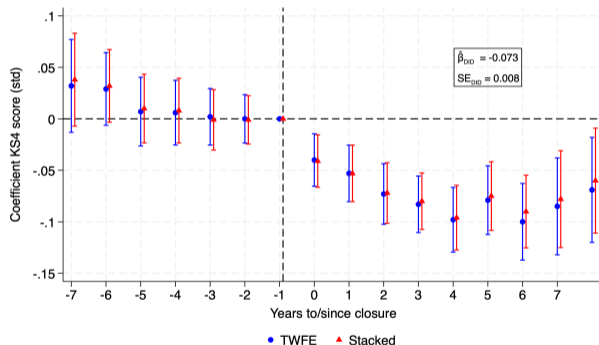
Notes: Estimated change in the standardised test scores in KS4 exams from the National Pupil Database. N=454,787 pupils in Year 11 in 2010-2019. The base year is the year before youth clubs close. The coefficients in blue (circles) are estimated using TWFE. The coefficients in red (triangles) are estimated using a stacked event study design. Standard errors clustered on MSOA level.
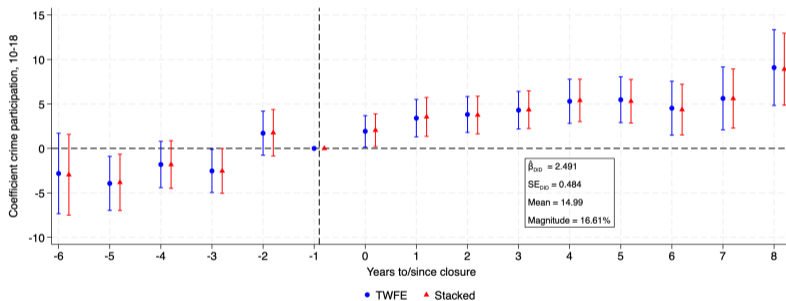
Do closures affect residents' offending rates?

Figure: Event study, effect of closures on youth offending rates

Notes: Estimated change in the offending rates from administrative records from MPS combined with population estimates from ONS. Individuals aged 10 to 18. The base year is the year before youth clubs close. N=19,836 block-year observations. The coefficients in blue (circles) are estimated using TWFE. The coefficients in red (triangles) are estimated using a stacked event study design. Estimates weighted by population. Standard errors clustered on MSOA level.

Additional results

- The effects are much stronger for lower-income pupils
  - The fall in test scores is 15% for pupils in lower income quantile
  - These pupils also become excluded from school more often (by 20%)
  - The rise in crime increase is 25% for BAME, but only 11% for Whites.

  ▸ Education by income ▸ Crime by ethnicity

- Youth crime rises in all main crime categories, and all ages (drugs, violence, acquisitive)

  ▸ ATT crime type

- No change in the spatial distribution of crime *local crime*

  ▸ ATT local crime

- The effects are mitigated by proximity to operative youth clubs

11/16

Introduction   Background   Data   Empirical strategy   **Results**   Mechanisms   Cost Benefit Analysis   Conclusion
○○○   ○○○   ○○   ○○   ○○○●○   ○○   ○   ○

Robustness checks

- Closures uncorrelated with other austerity shocks ⟨▸ Individual welfare transfers⟩ ⟨▸ Police station closures⟩
- Closures do not increase policing activity (recording) ⟨▸ Effects on detection and stop and search⟩
- Placebo exercises
  - No effect on test scores at age 10 (KS2) ⟨▸ DDD education⟩
  - No effect on offending rates at ages 18-34 ⟨▸ DDD crime⟩
- Changes in estimation
  - Sample selection ⟨▸ Distance thresholds⟩ ⟨▸ Excl. inner London, Data Quality⟩ ⟨▸ Leave-one-out⟩
  - Dependent variable and outliers ⟨▸ Effect on levels, different censoring⟩
  - Inference calculations
  - Other estimators of DD
  - Non linear DD models
  - Control for proximity to police stations year on year
- Evidence of symmetry in effects ⟨▸ Analysis of openings⟩

Introduction
ooo

Background
ooo

Data
oo

Empirical strategy
oo

Results
ooooo●

Mechanisms
oo

Cost Benefit Analysis
o

Conclusion
o

Mechanisms

- Loss of youth club changes habits towards more isolating activities
  - Suggestive evidence of more time devoted to videogames, less to friendships and homework
- Youth clubs contribute to human capital acquisition, healthy habits, social capital
  - Effects larger for pupils who were younger at closure
- Effects are not explained only through pure incapacitation
  - Crime rises occur across all hours

▸ ATT time use   ▸ ATT by hour of crime

13/16

Introduction   Background   Data   Empirical strategy   Results   **Mechanisms**   Cost Benefit Analysis   Conclusion
○○○   ○○○   ○○   ○○   ○○○○○   ●○   ○   ○

Figure: Effects of youth club closures by age at closure
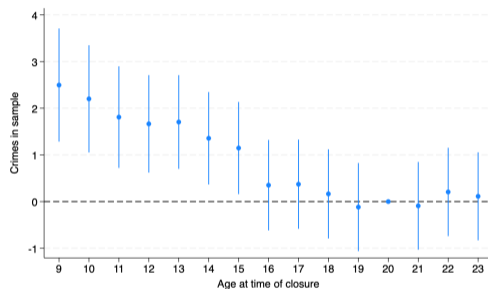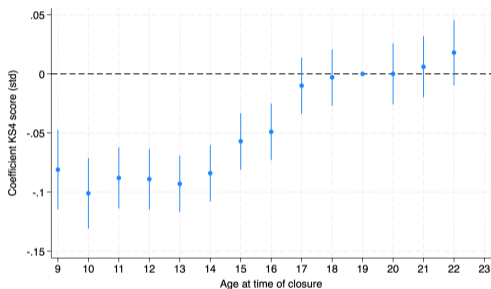
Test scores in national exam at ages 15 and 16

Crimes committed in 2010 to 2019

Notes: Effects of youth club closures by individual's age at closure. Education estimates from National Pupil Database. Crime estimates from cohort-block level regressions from MPS combined with population estimates from ONS, weighted by population.

Cost-Effectiveness and Cost-Efficiency of the closures

- Cost-Effectiveness
  - I compare savings from closing clubs to crime costs
  - Under some reasonable assumptions for every £1 saved the public is internalising £1.7 in costs
- Cost-Efficiency
  - I compute elasticity of crime w.r.t distance as 0.38%
  - I use these estimates to compare *real* closures to alternative regimes
  - Considering spatial problem could have mitigated crime rises

▸ Table cost benefit analyses   ▸ Elasticity estimates   ▸ Table counterfactual analysis

15/16

Introduction
OOO

Background
OOO

Data
OO

Empirical strategy
OO

Results
OOOOO

Mechanisms
OO

Cost Benefit Analysis
●

Conclusion
O

Conclusion

- Youth club closures affect teenagers' education and crime outcomes
  - Performance in national high-school exam at age 15-16 ↓ by 7%
  - Youth offending rates ↑ by 18%, in all hours, all crimes
  - Effects much stronger for lower income youths
- Youth clubs affect human capital development in medium run, not pure incapacitation
- The closures were not cost-effective nor cost-efficient

Introduction
○○○
Background
○○○
Data
○○
Empirical strategy
○○
Results
○○○○○
Mechanisms
○○
Cost Benefit Analysis
○
Conclusion
●

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Table: Differences between youths attending organised activities and not, 2010-2019

	Attends organised activities		
	No	Yes	Diff
Hours watching TV schoolday	3.9	3.73	-0.173***
	(0.02)	(0.02)	(0.023)
Hours social media schoolday	3.65	3.38	-0.269***
	(0.02)	(0.02)	(0.033)
Hours videogames schoolday	2.78	2.35	-0.432***
	(0.07)	(0.08)	(0.108)
Hours homework schoolday	2.34	2.34	-0.003
	(0.03)	(0.04)	(0.051)
Ever alcohol	0.28	0.22	-0.059***
	(0.00)	(0.00)	(0.00)
Days sports per week	3.24	3.92	0.684***
	(0.02)	(0.02)	(0.04)
Number of friends	7.33	8.17	0.846***
	(0.20)	(0.26)	(0.328)
Feel about life (std)	-0.07	0.08	0.147***
	(0.01)	(0.01)	(0.01)
N	16257	14685	30942
Parental take home monthly pay	1750.13	1984.73	234.594***
	(48.89)	(50.30)	(70.677)
Working mum (dummy)	0.59	0.67	0.077***
	(0.00)	(0.00)	(0.007)
N	7608	8817	16425

Notes: Mean values and difference in means for selected responses in Understanding Society. Column 'No' shows people who replied 'never' or 'almost never' to 'How often do you go to youth clubs or other youth projects such as youth councils'. Column 'Yes' for respondents stating 'several times a year', 'several times a month', 'at least once a week' or 'most days'. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Figure: Log odd-ratios of youth club usage and individual characteristics
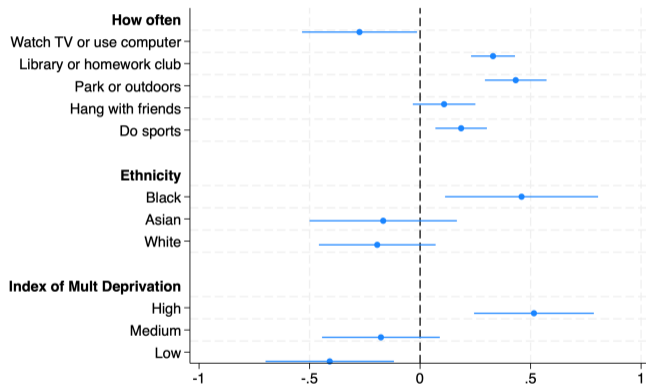
Notes: Estimates from logit regressions of propensity to attend youth clubs based on socioeconomic and behavioural characteristics from the Young Londoner Survey. The dependent variable is an index from 0 to 4 depending on the frequency of attendance. The variables on other behavioural aspects are also indexes from 0 to 4. The variables on ethnicity and index of multiple deprivation are dummy indicators. The survey took place in 2009.

Activities mentioned on websites, N=242

Table: Attributes of London's youth clubs

	Mean	SD	Range	N
Management				
Charity managed (dummy)	0.42	0.49	0-1	335
Yearly spending (GBP)	169,567	187,992	32,500-610,523	18
Opening				
Year club opened	1997	19.84	1929-2019	75
Year club closed	2014	2.20	2009-2019	105
Opening hour	13:00	6 hours	10:00 - 19:00	238
Closing hour	19:30	4 hours	19:00-23:00	238
Visitors				
Minimum age	10	2.33	4-16	232
Maximum age	19	2.27	11-25	233
Number of yearly visits	5,031	6,943	2,046 - 25,681	25
Activities				
Sports activities (dummy)	0.65	0.48	0 - 1	235
Videogames/IT activities (dummy)	0.22	0.42	0-1	240
Music workshops (dummy)	0.12	0.32	0-1	240
Homework support (dummy)	0.16	0.36	0-1	339
Building attributes				
Building post-1980 (dummy)	0.13	0.34	0-1	285
Building 1960 - 1979 (dummy)	0.09	0.28	0-1	285
Building 1945 - 1959 (dummy)	0.24	0.43	0-1	285
Building 1918–1944 (dummy)	0.13	0.34	0-1	285
Building pre-1918 (dummy)	0.41	0.49	0-1	285

Notes: Characteristics of youth clubs gathered through FOI requests and an online search of each youth club in London. Total number of youth clubs in sample is 339. It was more likely to find information for clubs that were still open as of 2019 than for those that had closed.

Table: Summary statistics, crime variables on block and year level

	Mean	St. dev	Min	Max
Offending rates				
Crime participation rate 10-18	14.018	13.791	0	57.143
Crime participation rate 10-15	8.096	10.487	0	40.000
Crime participation rate 16-17	31.437	37.691	0	153.846
Crime participation rate 18-24	40.928	28.370	0	120.567
Crime participation rate 25-34	18.849	14.087	0	59.783
Crime incidence rate 10-18	20.577	22.416	0	98.361
Crime incidence rate 10-15	11.649	16.488	0	72.727
Crime incidence rate 16-17	45.696	59.451	0	269.231
Crime incidence rate 18-24	53.082	39.979	0	173.653
Crime incidence rate 25-34	23.931	19.214	0	83.799
Drug incidence rate, 10-18	4.019	6.229	0	22.346
Violent incidence rate, 10-18	3.786	6.213	0	23.669
Acquisitive incidence rate, 10-18	6.970	10.877	0	51.471
CDAO incidence rate, 10-18	0.978	2.544	0	10.526
Local crime				
Crime rate	65.914	66.599	1	818.744
% crime detected	0.230	0.103	0	1
Policing activity				
Stop and search rate	15.448	31.968	0	881.667
Stop and search rate, ages 10-18	32.774	81.879	0	625.000
Observations	48,350			

Notes: Data from administrative records from the London Metropolitan Police, and from public data in Police UK. Summary statistics for 4,835 blocks across 10 years. Crime rates have been winsorised at the 99th percentile and are expressed per 1,000 population. CDAO stands for Criminal Damage and Arson.

(0.20,0.38]
(0.17,0.20]
(0.15,0.17]
[0.02,0.15]
No data

Why did some centres close and not others?

- Various reasons discussed in local authorities' minute meetings:
    - proximity to other centres
    - change towards targeted provision
    - corruption scandals in one borough
- I use a linear probability model to assess the likelihood of closure as a function of:
    - Youth club attributes X_c: council vs charity ran, distance to other clubs, building age
    - Block attributes X_i from 2011 census: % social housing, % population 0-13, pop density, political control, youth offending rates

$$P(Close = 1)_c = \alpha + \beta X_c + \gamma X_i + \mu_c + \varepsilon_c$$

Table: Relationship between youth club attributes and likelihood of closure between 2010 and 2019

	P (closure) > 0			
Council managed	0.280***	0.184**		
	(0.053)	(0.061)		
Dist. to nearest alternative centre	-0.087	-0.080	-0.105	-0.143*
	(0.044)	(0.047)	(0.057)	(0.066)
Building pre 1945	0.050	0.088	0.072	0.092
	(0.082)	(0.076)	(0.132)	(0.128)
Building 1945-1959	-0.004	0.030	-0.059	-0.010
	(0.090)	(0.085)	(0.142)	(0.136)
Building 1960-1979	0.056	0.022	0.149	0.085
	(0.117)	(0.104)	(0.181)	(0.154)
% social housing (2011)	-0.260	-0.015	-0.362	-0.038
	(0.167)	(0.150)	(0.242)	(0.231)
% population 0-13 (2011)	0.277	-0.453	0.746	-0.844
	(0.533)	(0.565)	(0.911)	(1.050)
Pop. density (log)	-0.114*	-0.017	-0.163*	-0.040
	(0.051)	(0.051)	(0.074)	(0.071)
Conservative council	-0.073		-0.039	
	(0.060)		(0.092)	
Offenders ages 10-18	0.012	0.014	0.015	0.016
	(0.008)	(0.008)	(0.013)	(0.014)
Sample	All	All	Council funded	Council funded
Mean	0.323	0.323	0.451	0.451
Borough FE	No	Yes	No	Yes
N	285	285	164	164
R-squared	0.148	0.396	0.088	0.465
F-stat	6.20	2.02	1.87	1.26

Notes: Determinants of youth club closures from LPM model estimated using OLS. The variable *Council managed* was derived from FOI requests and online data. The building data comes from Verisk, downloaded via Digimap. The proportion of population living in social housing, and the proportion aged 0-13 come from the 2011 Census. Robust standard errors in parentheses. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Table: Differences in characteristics between treated and control areas at baseline

	Treated	Control	Diff	N
	(all nearby centres closed)	(all nearby centres open)		
Population 2011	1679	1649	30.81**	3,119
			(3.17)	
% aged 0-13 2011	17.548	17.561	-0.013	3,119
			(-0.08)	
% aged 14-18 2011	5.606	6.323	-0.718***	3,119
			(-9.38)	
% BAME 2011	39.096	32.963	6.133***	3,119
			(8.10)	
% no qualifications 2011	9.203	11.150	-1.947***	3,119
			(-10.07)	
% social housing 2011	22.052	14.016	8.036***	3,119
			(11.63)	
% offending rate 10-18 2011	11.003	8.591	2.412***	3,119
			(4.34)	
% FSM in Year 11 (2010-2019)	12.99	22.24	9.25***	781,329
			(0.00)	
% Male in Year 11 (2010-2019)	50.20	51.00	0.00	781,329
			(0.00)	

Notes: Mean values and difference in means for selected attributes comparing treated and control areas in the main analytical sample. The characteristics come from the 2011 census from ONS, and the offending rate is derived from administrative crime records from MPS. Crime participation rate expressed per 1,000 residents as of 2010. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Table: Effect of closures on youth offending rates, heterogeneity by crime type

| | Crime incidence, ages 10-18 | | | |
	Drugs	Violence	Acquisitive	Criminal Damage
TWFE				
After x Treated	0.527**	0.852***	1.950***	0.000
	(0.211)	(0.221)	(0.440)	(0.106)
Magnitude (%)	12.04	20.34	25.58	0.01
P-value	0.013	0.000	0.000	0.999
Mean	4.38	4.19	7.62	1.26
N	22,040	22,040	22,040	22,040

Notes: Estimated effect of youth club closures on youth offending rates, by crime type from administrative records from MPS combined with population estimates from ONS. Acquisitive crime includes Theft, Burglary, Shoplifting and Robbery. Estimates weighted by population. Crime rates expressed per 1,000 population. Standard errors clustered on MSOA level. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Table: Effect of closures on youth offending rates, heterogeneity by offender attributes

|	Ethnicity		Crime incidence at ages 10-18 Number of offenders		Recidivism	
	White	BAME	Solo	Co-offences	First-time	Re-offenders
After x Treated	1.081*	2.712***	2.806***	1.422***	2.223***	0.942***
	(0.554)	(0.555)	(0.642)	(0.470)	(0.421)	(0.246)
Magnitude (%)	11.40	25.11	18.28	17.97	18.08	18.87
P-value	0.051	0.000	0.000	0.003	0.000	0.000
Mean	9.48	10.80	15.35	7.91	12.30	4.99
N	19,836	19,836	19,836	19,836	19,836	19,836

Notes: Estimated effect of youth club closures on youth offending rates from administrative records from MPS combined with population estimates from ONS. BAME includes Black, Asian, and other Ethnic Minorities. Solo refers to crimes where only one person was accused. Co-offences refers to crimes where there was more than one person accused. Estimates weighted by population. Crime rates expressed per 1,000 population. Standard errors clustered on MSOA level. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Figure: Correlation youth centre closures and loss in individual transfers
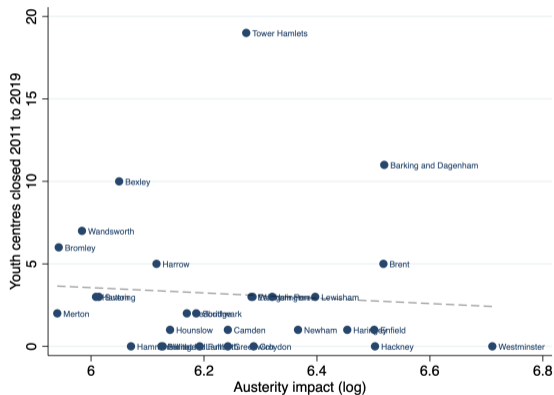
Notes: Expected loss in benefit income as estimated in Beatty and Fothergill (2014). It is calculated using public expenditure data and number of claimants per area.

Figure: Correlation youth centre closures and police station closures

Coeff: -0.09, SE=0.40
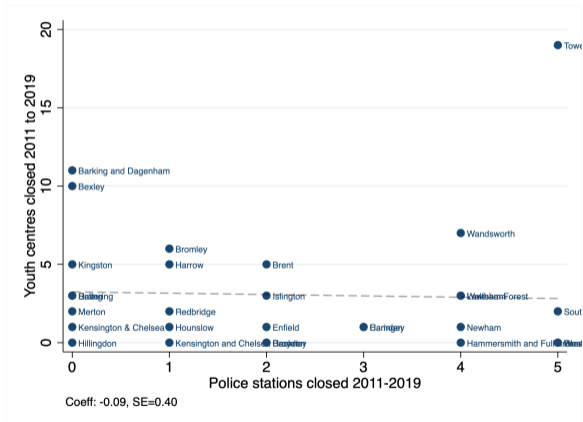
Notes: Police station closures from Freedom of Information data from MPS.

Table: Effect of closures on youth offending rates, changes in sample

	Crime participation at ages 10 to 18	
TWFE		
After × Treated	2.160***	2.096***
	(0.538)	(0.386)
Sample	30 minutes	50 minutes
Magnitude (%)	14.77	15.69
P-value	0.000	0.000
Mean	14.624	13.356
N	15,210	25,460

Notes: Estimated effect of youth club closures on offending rates from administrative records from MPS combined with population estimates from ONS. Estimates weighted by population. Crime rates expressed per 1,000 population. Standard errors clustered on MSOA level. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Table: Effect of closures on youth offending rates, borough sample restrictions

	Crime participation at ages 10 to 18	
TWFE		
After x Treated	2.352***	2.403***
	(0.476)	(0.477)
Magnitude (%)	17.53	16.59
P-value	0.000	0.000
Sample	Exclude Inner London	Exclude Low Quality Data
Mean	13.423	14.487
N	15,390	19,745

Notes: Estimated effect of youth club closures on youth offending rates from administrative records from MPS combined with population estimates from ONS. Outer London boroughs include Barking and Dagenham, Barnet, Bexley, Brent, Bromley, Croydon, Ealing, Enfield, Harrow, Havering, Hillingdon, Hounslow, Kingston upon Thames, Merton, Newham, Redbridge, Richmond upon Thames, Sutton, and Waltham Forest. Estimates weighted by population. Crime rates expressed per 1,000 population. Standard errors clustered on MSOA level. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Table: Effect of closures on educational performance in KS2, and triple difference estimates

|	KS2 score (std)	Score
After × Treated	-0.006	
	(0.009)	
After × Treated × KS4		-0.067***
		(0.009)
Model	DD	DDD
Controls	Yes	Yes
Mean	0.017	0.019
N	383,549	838,336

Notes: Estimated effect of youth club closures on test scores in KS2, and differential test-scores from National Pupil Database. In column 2 (the DDD) the comparison group are individuals aged 10 or 11 years old. Standard errors are clustered at the MSOA level in parenthesis. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Table: Effect of closures on adult offending rates, and triple difference estimates

| | Crime participation | | |
Age	18-24	25-34	over 35
After x Treated	-0.509	0.278	0.997***	
	(0.959)	(0.443)	(0.157)	
After x Treated x 10-18				2.230***
				(0.573)
After x Treated x 18-24				-0.780
				(0.934)
After x Treated x over 35				0.725*
				(0.426)
Model	DD	DD	DD	DDD
Magnitude (%)	-1.18	1.37	12.44	10.25
P-value	0.596	0.531	0.000	
Mean	43.20	20.30	8.01	21.76
N	19,836	19,836	19,836	145,960

Notes: Estimated effect of youth club closures on adult offending rates, and differential offending rates from MPS records combined with population estimates from ONS. In column 4 (the DDD) the comparison group are individuals aged 25 to 34 years old. Estimates weighted by population. Crime rates expressed per 1,000 population. Standard errors clustered on MSOA level. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Figure: Effect of closures on youth offending rates, leave one borough out robustness
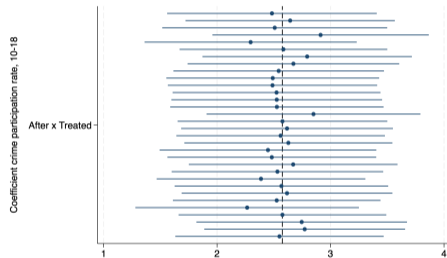
Notes: Estimated effect of youth club closures on offending rates from MPS combined with population estimates from ONS. Each dot and confidence interval shows the result excluding a borough in London at a time. Estimates weighted by population. Crime rates expressed per 1,000 population. Standard errors clustered on MSOA level.

Table: Effect of closures on youth offending rates, different measures

	Rate, uncensored	Rate, censored at at p99	Count of offending residents
TWFE			
After x Treated	2.572***	2.389***	0.345***
	(0.466)	(0.459)	(0.074)
Magnitude (%)	17.80	16.71	15.03
P-value	0.000	0.000	0.000
Mean	14.449	14.298	2.295
N	22,040	22,040	22,040

Notes:

Notes: Estimated effect of youth club closures on youth offending rates from MPS combined with population estimates from ONS. The first two columns present rates per 1,000 population. The last column presents the effects on the count variable. Each dot and confidence interval shows the result excluding a borough in London at a time. Estimates weighted by population. Standard errors clustered on MSOA level. *** p<0.01, ** p<0.05, * p<0.1

Table: Effect of closures on crime detection and stop and search

	% detected	Stop & search	Stop and search, 10-18
After × Treated	-0.011***	-3.766***	-34.740***
	(0.003)	(1.398)	(8.490)
Magnitude (%)	-4.64	-26.93	-37.69
P-value	0.002	0.007	0.000
Mean	0.23	13.99	92.18
N	22,295	8,884	8,884

Notes: Estimated effect of youth club closures on crime detection rates from MPS records combined with population estimates and from ONS, and on stop and search rates from Police UK. The data from Police UK is only available from April 2016 onwards. Estimates weighted by population. Crime rates expressed per 1,000 population. Standard errors clustered on MSOA level. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Table: Effects of closures on time use at ages 10 to 15

	Homework hours	Hang out w friends	Video-games hours	TV hours
TWFE				
After x Treated	-1.653***	-1.129***	1.827***	0.617*
	(0.596)	(0.387)	(0.653)	(0.345)
Magnitude (%)	-54.24	-39.79	78.75	14.59
P-value	0.006	0.004	0.006	0.075
Mean	3.048	2.837	2.321	4.230
N	730	707	446	1,386

Notes: Estimated effect of youth club closures on self-reported time use from Understanding Society. Controls include age, gender, and ethnicity. Standard errors are clustered at the MSOA level in parenthesis. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Table: Effects of closures on educational outcomes, heterogeneity by FSM status

	P (achieve Level 2 > 0)	KS4 score (std)	P (suspended)	Sessions suspended
After x Treat x non FSM	-0.017***	-0.053***	0.000	0.012
	(0.005)	(0.009)	(0.001)	(0.011)
After x Treat x FSM	-0.030***	-0.132***	0.001***	0.093***
	(0.009)	(0.018)	(0.001)	(0.028)
Controls	Yes	Yes	Yes	Yes
Mean	0.655	0.021	0.153	0.042
N	454,787	454,787	2,635,606	2,635,606

Notes: Estimated effect of youth club closures on educational outcomes from the National Pupil Database by Free-School-Meals status of the pupil. Controls include age, gender, and ethnicity. Standard errors are clustered at the MSOA level in parenthesis. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Table: Effect of closures on youth offending rates, by hour of the crime

| | Crime incidence at ages 10-18 | | | |
	School hours	After-school	Holidays and weekend	Night
After × Treated	0.772***	1.160***	0.168*	1.228***
	(0.285)	(0.280)	(0.093)	(0.413)
Magnitude (%)	13.85	19.55	17.44	13.84
P-value	0.007	0.000	0.073	0.003
Mean	5.577	5.935	0.961	8.869
N	21,250	21,250	21,250	21,250

Notes: Estimated effect of youth club closures on youth offending rates from administrative records from MPS combined with population estimates from ONS, by hour of the crime. School-days proxied using FOIs to each local authority. School hours proxied from 9 to 15. After-school from 15 to 21. Night, from 21 to 9. Estimates weighted by population. Crime rates expressed per 1,000 population. Standard errors clustered on MSOA level. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Analysis on openings

- Between 2010-2019 28 youth centres open of which 13 also close
- I study the 15'lasting' openings
- To find a suitable control I use a propensity score matching algorithm
- Matching variables: distance to centres at baseline, % social housing, % college graduates, % age 0-14, % no qualifications, distance to nearest school, distance to nearest park
- Areas within 40 minutes after opening

$$R_{it} = \mu_i + \mu_t + \delta\text{After} \times \text{Opening}_{it} + u_{it}$$

Table: Effect of openings on youth offending

	Crime participation rates		
	10-18	10-15	16-17
After * Treated	-4.581**	-2.700**	1.749
	(1.914)	(1.319)	(13.058)
Magnitude (%)	-26.44	-27.01	4.00
P-value	0.018	0.043	0.894
Mean	17.326	9.996	43.724
N	2,770	2,770	2,770

Notes: Estimated effects of youth club openings on offending rates from administrative records from MPS combined with population estimates from ONS. Estimates weighted by population. Crime rates expressed per 1,000 population. Standard errors clustered on MSOA level. Stars (*, **, ***) indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

"They help you meet new people and learn new things" - Emma, 15
"They get me out the house and being social" - Craig, 12
"They ran loads of fun activities each week (...) I felt like I found purpose" - Joseph, 18
"I feel safe in the youth club because all the youth workers are really nice" - Scott, 14

Table: Comparison of different closing regimes and associated change in commute (and crime)

Scenario	Description	Avg. commute	Δ mins	Δ crime 10-18	
Baseline		24.90			
Austerity	Real closures 100 clubs	28.48	3.58	14%	5.47%
Random closures	Random closures 100 clubs	29.19	4.29	17%	6.55%
Minimise commute		25.36	0.46	2%	0.71%
Minimise commute	weight by youth population	25.37	0.47	2%	0.72%
Minimise commute	weight by other amenities	25.39	0.49	2%	0.75%
Close all centres		60.00	35.10	141%	53.58%

Notes: Estimated change in crime under different closing regimes. *Austerity* represents the real observed policy, where 223 youth clubs were open in 2020. *Random* shows the average of 1,000 random closing regimes which would have maintained open 223 random centres as of 2020. The various *optimal* exercises were computed using the p-median model, which selects youth club locations to minimise commuting across demand nodes conditional on only 223 youth clubs being open. The different exercises weight centroids by different attributes, taken from the 2011 census.

Table: **Costs and benefits of youth club closures**

	Lower bound		Upper bound	
	Calculation	Value (£)	Calculation	Value (£)
Saving from closures	586 × 70,000	41,020,000	586 × 70,000	41,020,000
Costs justice system	754 × 8,000 (175)	-6,032,000	890 × 8,000 (207)	-7,120,000
Costs in violent crimes	533 x 1.8 × 11,446 (189)	-10,981,292	593 x 1.8 × 11,446 (210)	-12,217,460
Costs in acquisitive crimes	1,189 x 1.8 × 4,093 (263)	-8,759,839	1,208 x 1.8 × 4,093 (267)	-8,759,839
NPV forgone education	595 × 73,459	-43,708,105	595 × 73,459	-43,708,105
Net benefit		-28,461,236		-30,785,404
Cost/Benefit		1.69		1.75

Figure: Optimal locations according to p-median model solution
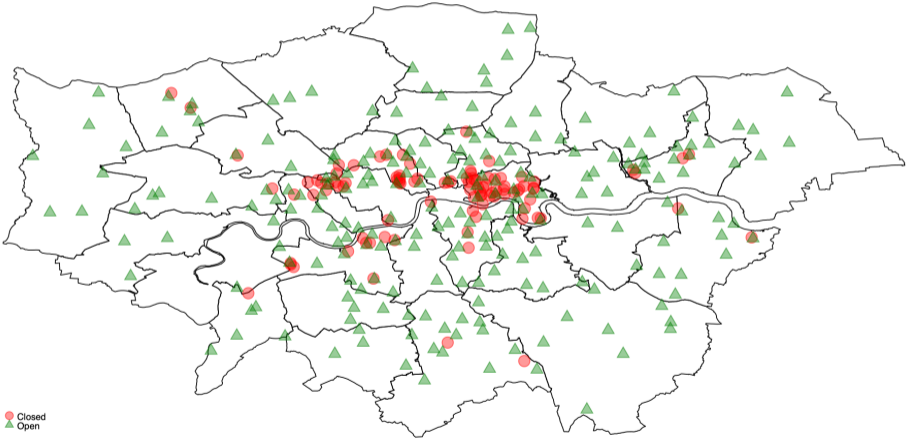

Closed
Open

Figure: Comparison of real closures and optimal locations according to p-median model solution

Closed
Open
Should have open
Should have closed