On the dark side of human behavior:

Is it my neighbor who tempts me to steal?

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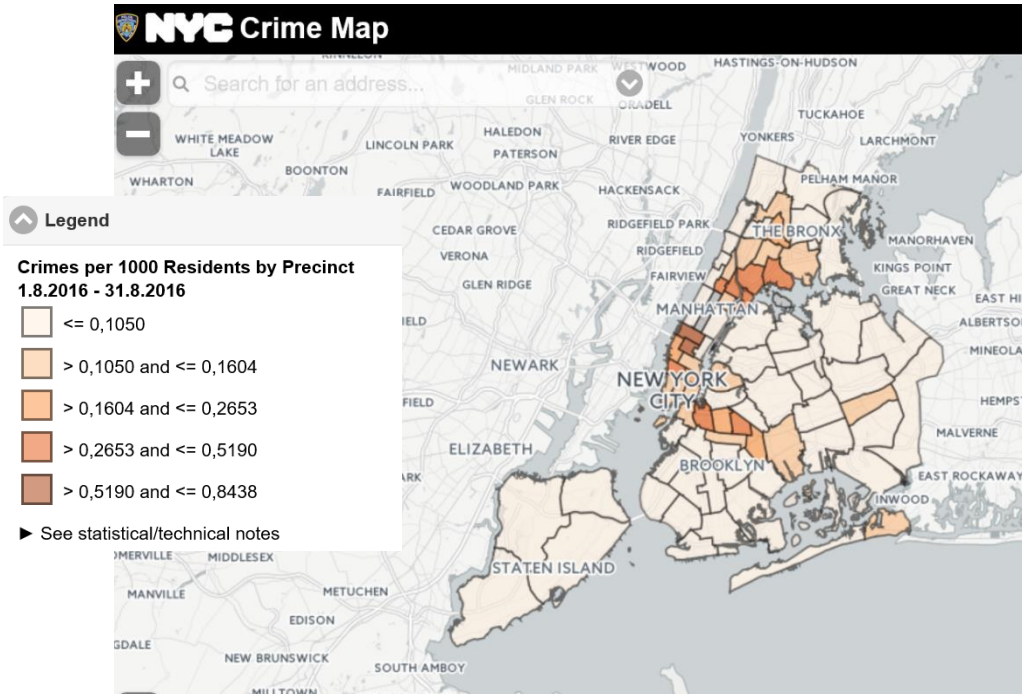
Outline

1. Introduction

The map below shows the crime rates (from robbery to murder) in the precincts of New York City in August 2016. One might wonder about the high differences and could consequently fall back on socioeconomic explanations like education, poverty etc. But why does the 51th precinct of NYC have 0,046 crimes and the wealthier 49th precinct 0,116 crimes per capita? This question was raised by Glaeser et al. in 1996. The researchers then started to examine why crime rates in the US vary that much, from 0,008 serious crimes per capita in Ridewood Village to 0,384 in the nearby Atlantic City in 1996. They found out that less than 30 percent of the variation in cross-city and cross-precinct crime rates can be explained by measurable city characteristics. But where do the differences come from?

Figure1.



https://maps.nyc.gov/crime/, 14.09.2016, screenshot

Various authors tried to investigate which further factors could explain these variations and many of them found out that social interaction and reciprocal motives play important roles. Especially adolescents are prone to engaging in criminal activities if either a family member is criminal, they live in delinquent neighborhoods or their peer groups turn to crime.

This leads to the central question of the here presented paper: Does social interaction determine criminal behavior?

In order to explain this behavior scientifically I am going to demonstrate a model by Falk and Fischbacher (2005) who investigated stealing behavior in the laboratory. They found out that the decision to take away from others strongly depends on reciprocal motives: if people are in a

"criminal environment" where everybody steals, subjects will steal from others. If they find themselves in a "lawful environment" where nobody steals, they will not steal either.
The presented paper is structured as follows: Firstly, I will shortly explain the model of Falk and Fischbacher. Then I will give an overview of the relevant literature concerning the topic of the influence of social interaction on criminal behavior. Therefore I will explain the impact of so called "channels" on criminal behavior, which can be interpreted as the influence of the environment on adolescents, such as parents, neighbors and peer groups. I will concentrate on adolescents as they can be influenced easily. Afterwards I will demonstrate an experiment which examines stealing behavior in the laboratory. In the end I will present a critique and a final conclusion.

2. Model

Falk and Fischbacher (2002) developed a theory that tries to explain reciprocal motives in criminal behavior. Numerous authors suggested models of reciprocity. Generally, not only the own material payoff determines the player´s utility in those models (as standard economic theory predicts) but also the payoff of the other players. Besides, subjects reward kind actions and punish unkind actions. A subject´s behavior is consequently determined by those factors.

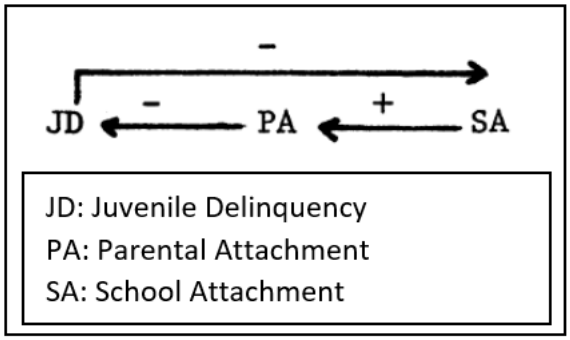
Applied to the criminal context, the model predicts that the amount which a subject steals is an increasing function of the amount stolen by the others. The theory thus predicts that reciprocally motivated subjects steal more if they are in a "bad" environment where the other subjects do also steal. Thus, in adaption to the model, stealing is perceived as an unkind act which is reciprocated, analogous it is perceived as kind action if nobody steals and is also reciprocated.

In the following chapter, I will present various relevant papers which discuss the influence of reciprocal preferences through social interaction.

3. Existing literature

Considering the limited scale of this work, I will only name the main result of "Ties to Conventional Institutions and Delinquency: Estimating Reciprocal Effects" by Allen E. Liska and Mark D. Reed in 1985.
The authors estimated reciprocal effects between delinquency, school attachment and parental attachment and found out that parental attachment affects criminal behavior which affects school attachment which in turn affects parental attachment. Fig. 2 shows these links visually.

Figure 2



This result indicates that the interaction with parents might be an important factor in explaining youth´s susceptibility to delinquency.

In "The Company You Keep: The Effects of Neighborhood on Disadvantaged Youths" (1991), Anne Case and Lawrence Katz examine how social interaction influences criminal behavior through family and neighborhood. They analyze the 1989 NBER survey of 1200 youths who live in poor neighborhoods of Boston and are disadvantaged in various socio-economic dimensions.

Regarding social contacts and neighborhood characteristics, many youths have friends or acquaintances who are involved in criminal activity, sell drugs or were in jail. This spatial concentration of unfortunate characteristics is alarming as those youths have few positive role models who perform normal work and are not involved in criminal activities.

The authors then connect family background and neighborhood characteristics with socioeconomic outcome variables and find considerable links. For example, the variables "family member in jail" and "family member with drug/alcohol problems" have the largest and most significant impact on self-reported criminal behavior (Appendix 1). Neighborhoods influence youths through two channels: First through "collective socialization" theory (Wilson 1987) which presumes that adults are role models for youths and therefore affect the juvenile behavior. Secondly young people are influenced through the interaction with their peers. Crane (1991) and Montgomery (1990) suggest the use of contagion models which assume that peers may directly influence youth´s behavior. Appendix 2 demonstrates that peer behavior has substantial and significant effects on juvenile crime, drug use etc. The point estimates of column one shows that "moving a youth with given family and personal characteristics to a neighborhood where 10 percent more of the youths are involved in crime than in his or her initial neighborhood is to raise the probability the youth will become involved in crime by 2,3 percent" (Case et al., 1991, p. 17).

Summing up it is to say that family and neighbors significantly influence a young people´s behavior as they are role models for them. This supports the hypothesis that social interaction accounts for criminal actions.

As I mentioned in the introduction, Edward Glaeser, Bruce Sacerdote and José Scheinkman (1996) wondered why crime rates between different cities and even within the same town differ that much. The main goal of their research was to find out "how much of the high variance of crime rates across space occurs because of unobservable attributes differing across space and how much is due to social interactions" (Glaeser et al., 1996, p.517). They used FBI cross-city data of 1979 and 1985 and data from NYC in 1993 (Appendix 3). The first column shows the cross-location crime rates expected if criminal decisions were independent of other subjects. The second column shows the actual variance of crime rates across locations divided by the first column. If crime decisions were independent from other agent´s criminal decisions this number would be equal to one but it is not. This indicates that there might be interaction between subjects. Columns three, four and five show results of a regression. Column three shows the estimates of the omitted city characteristics (λ^2). They range from 0 to 0,027 which implicates that the variance is not exclusively accounted for by differences in city characteristics which again point out to social interaction. $f(\pi)$ in column four estimates the levels of social interaction. It is to realize that for rape, murder and arson the levels are lower whereas for serious crimes, burglary, larceny, assault and theft levels are higher.
In addition the authors estimate the level of social interaction ($f(\pi)$) if criminals commit more than one crime and still find significant levels of social interaction, except for assuming 141 crimes per criminal. If they assume 141 crimes per criminal, there is no interaction but it is not very likely that a criminal commits 141 crimes.

Jens Ludwig, Greg Duncan and Paul Hirschfeld carried out a housing-experiment in order to investigate the effects of neighborhood on juvenile criminal activity. In their paper "Urban Poverty and Juvenile Crime: Evidence from a Randomized Housing-Mobility-Experiment" (2000) they analyzed data from the Moving to Opportunity (MTO) of the U.S. Department of Housing and Urban Development of Baltimore (whose crime rate is three times as high as in the entire state) from 1994 on. 638 families from high-poverty neighborhoods in Baltimore were randomly assigned to three groups which received different levels of assistance: The experimental group received housing subsidies, counseling and search assistance to move to the private-market housing, the Section 8-only comparison group received housing subsidies without program constraints and the Control group got no special assistance of MTO.

All households showed similar baseline characteristics in relation to poverty and criminal background.

After start of the program 54% of the experimental group moved through MTO, most moved outside the city. Others stayed within the city but moved further away from their baseline neighborhood.

73% of the Section 8-only group moved but most stayed within Baltimore city, close to their baseline neighborhoods. Less than 5% of the Control group moved to low poverty areas by the end of 1997.

Figure 3.

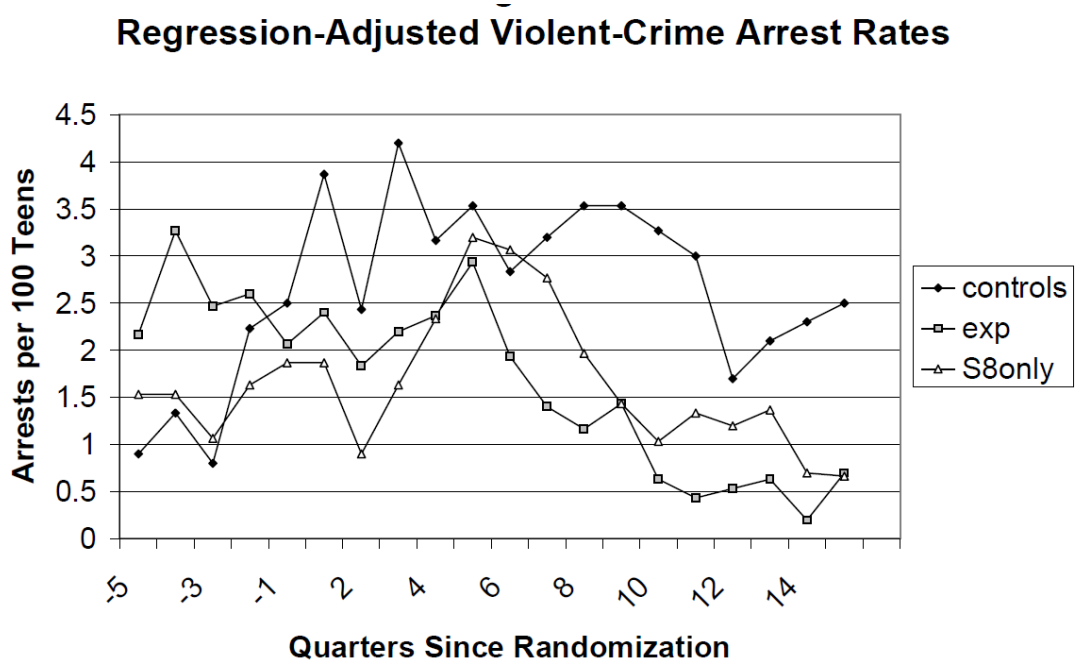


Figure 4.

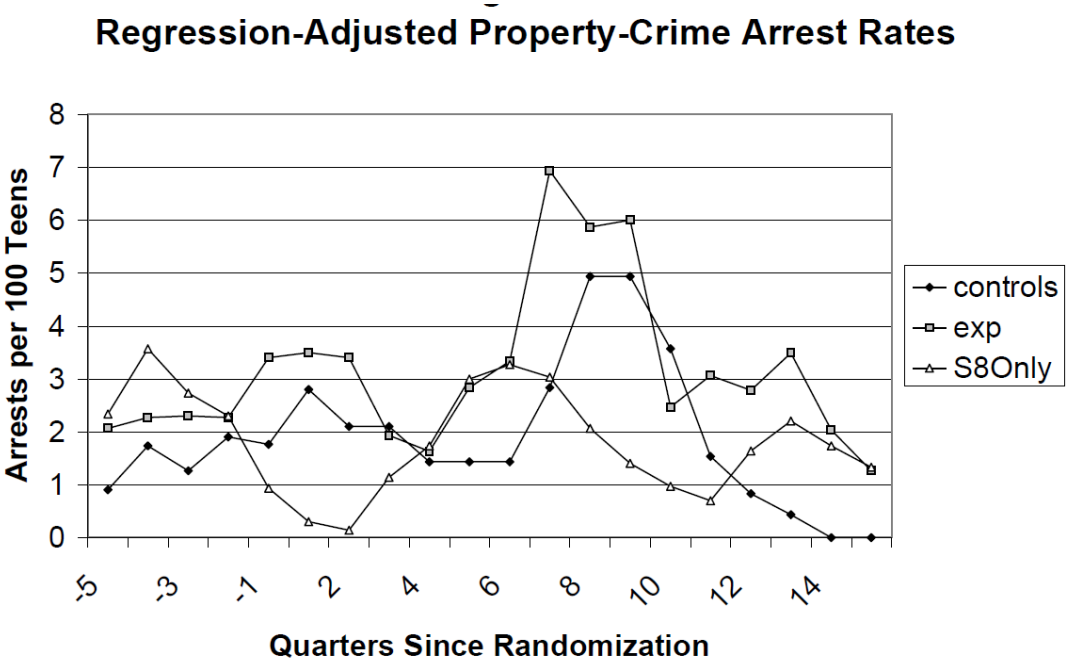


Figure 3 shows the regression-adjusted number of arrests for violent crime per 100 teens in each of the groups. The figure demonstrates that experimental and section 8-only groups experienced a reduction in violent crime arrests relative to controls beginning six quarters after the relocation. This is what has been expected as the good influence of the better-off neighborhood should lead to less crimes. Figure 4 shows an increase in property crimes for the experimental group. This increase is no longer significant adjusting for pre-program characteristics but I will deal with this in the discussion.
In summary you can see that moving the families from high-poverty to wealthier neighborhoods reduced juvenile crime arrests for violent offenses by 30 to 50% of the arrests for control group.
Generalizing the results is in so far complicated as MTO-participants self-selected to the experiment. They suggest nevertheless that crime levels can be reduced by changing the spatial concentration of poverty and crime as the interaction of youths with criminals is reduced. Thus this experiment strongly supports the hypothesis that social interaction highly influences the level of crime.

Last but not least I will present an experiment that investigates the role of social interaction in reference to criminal behavior. In "Crime in the Lab – Detecting Social Interaction" (2002) Falk and Fischbacher carry out an experiment in which subjects make stealing decisions dependent on the stealing decision of others.
After earning maximally 40 points, subjects were assigned to groups of four and could steal between zero and 20 points of their group members. There were two types of decisions: conditional and unconditional. In the conditional decision, subjects had to decide how much they wanted to steal given the amount stolen by the others. Some subjects were lead to believe in a "good" environment where nothing was stolen and the others in an increasingly "bad" one in which subjects stole an amount between one and 20. In the unconditional decision, subjects made their decision without knowing how much the others had stolen.
Besides, there were two treatments: In the "low" treatment, stealing was highly inefficient as the stolen amount was halved. If each subject stole everything (20), everybody ended up with ten points. In the "high" treatment, stealing had no efficiency costs so if everybody fully stole, all ended up with 20 points, just as if nobody stole.
Following their reciprocity model, Falk and Fischbacher (2002) predict that a reciprocally motivated subject steals the more the others take away from him.

Figure 5. L - treatment

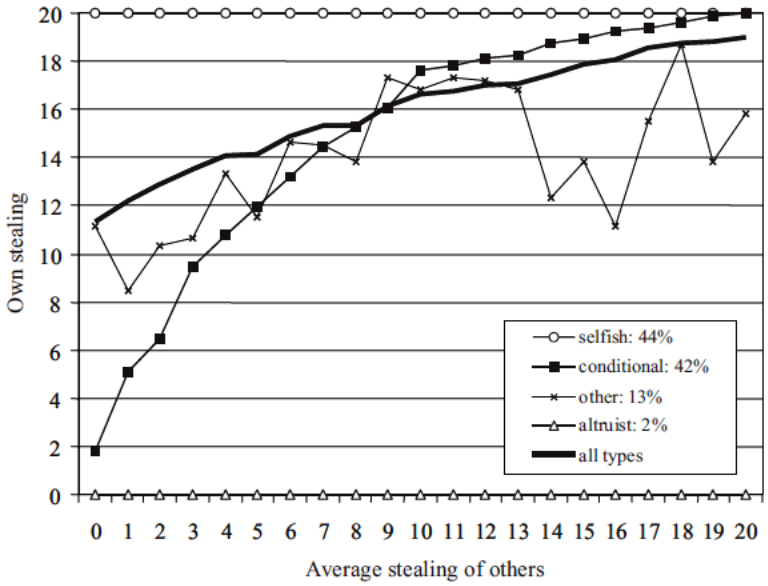
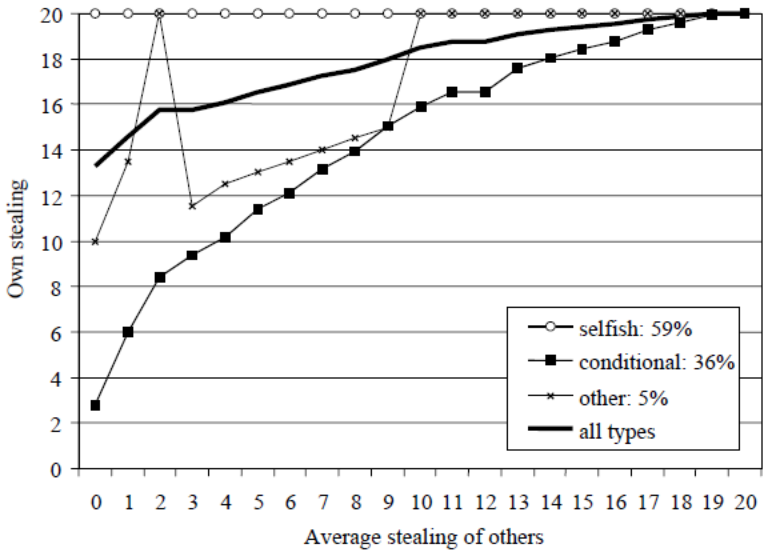


Figure 6. H - treatment



The predictions come true for between one third and one half of the players. In the L- treatment (low efficiency), 44% act purely selfish and steal everything, irrespective of the others. 42% steal more the more the others steal.

In the H – treatment (high efficiency), the percentage of selfish players is higher, 59%. The conditional, socially interactive players perform 36%. These conditional players show the presence of interaction as their behavior depends on the other´s decisions. Taken together, both treatments

show approximately the same picture and prove the influence of social interaction on criminal behavior.

4. Discussion

There are some limitations which often appear while working with field data. There are always characteristics that cannot be measured or that are unobservable. So drawing causal conclusions might be fraught with problems as the causality might be reversed. Besides, measuring differences in crime rates is complicated as the local legal systems differ.

In addition to that it is questionable if the expected effects are always that clear. Figure 4 for instance shows an increase in property-crime arrests for the experimental group after the relocation to a better-off neighborhood. On the one hand this runs counter to social interaction as an explanation for criminal behavior, but on the other hand might be intuitive as the adolescents are faced with a wealthier neighborhood where property crimes are more profitable.

Beyond that it is not clear if all the effects are significant. In Appendix 1 which shows the influence of family variables on socio-economic outcomes standard errors are quite high which suggests a high deviation from the estimated parameter and therefore it has to be asked if effects are that strong.

However, the experiment of Falk and Fischbacher (2002) proved the results of all presented papers. The experiment clearly revealed the importance of social interaction even under the strict conditions of the lab. At least more than one third turned out as “conditional norm violators” (Falk and Fischbacher, 2002) whose propensity to break the laws increases as others are involved in criminal activity. These comply with the norms in a good environment and don´t comply in a bad environment which confirms the findings of the other papers.

5. Conclusion

To summarize the estimates and results of the experiments of the presented literature clearly showed that criminal behavior can not only be explained by socio-economic variables but also by social interaction. Human-beings, especially adolescents, are susceptible for their parent´s, their neighbor´s and their peer-group´s behavior. If their company is involved in criminal activity, they are likely to also turn to crime. This happens through social interaction and can be interpreted in terms of reciprocity.

6. Appendix

Appendix 1

Explanatory Variable	Mean	Dependent Variable: (1) Crime in last year	(2) Use illegal Drugs	(3) Single Parent	(4) Idle	(5) Highest Grade Completed	(6) Attend Church Often
Female	.44	−.142 (.022)	−.093 (.028)	.189 (.025)	.102 (.028)	.079 (.089)	.039 (.029)
Black	.48	−.071 (.025)	−.021 (.031)	.067 (.028)	−.013 (.031)	.229 (.099)	.038 (.032)
Family Member in Jail	.35	.084 (.025)	.028 (.032)	.032 (.028)	.112 (.031)	−.192 (.101)	−.016 (.032)
Family Member with Drug/Alc. Problems	.46	.083 (.024)	.153 (.030)	.036 (.027)	−.000 (.030)	−.033 (.097)	−.016 (.031)
Adults in Family Went to Church Often	.47	−.020 (.022)	−.044 (.028)	.012 (.025)	.012 (.027)	−.042 (.089)	.194 (.029)
Both parents present at age 14	.46	−.025 (.024)	−.016 (.030)	−.031 (.027)	−.077 (.029)	.326 (.095)	.018 (.031)
Mother less than 20 years old at birth	.19	.035 (.030)	.059 (.037)	.094 (.034)	.095 (.037)	−.139 (.120)	.009 (.038)
Mother's age missing	.19	−.023 (.031)	.012 (.039)	.067 (.035)	.110 (.038)	−.236 (.123)	−.026 (.040)
Parents not married	.21	.024 (.030)	.018 (.038)	.108 (.034)	.017 (.037)	−.006 (.121)	−.026 (.039)
Parent's years of schooling	11.85	.001 (.005)	.015 (.007)	−.009 (.006)	−.014 (.006)	.095 (.021)	.009 (.007)
Parent's schooling missing	.13	.004 (.034)	−.012 (.043)	.008 (.039)	−.034 (.043)	−.620 (.138)	−.046 (.044)
7 age dummies and an intercept		yes	yes	yes	yes	yes	yes
Mean of dependent var.		.162	.289	.246	.314	11.21	.315
R^2		.10	.07	.17	.14	.28	.06

Note: All models were estimated by OLS and contain 1048 observations. The numbers in parentheses are standard errors. Observations with missing values for mother's age and parent's schooling were given the mean age for mothers and mean years of schooling for parents by race and sex.

Appendix 2:

	Dependent Variable:						
Explanatory Variable	(1) Crime in last year	(2) Use illegal Drugs	(3) Single Parent	(4) Idle	(5) Friends with Gang Members	(6) Attend Church	(7) Alc. Use Weekly
Neighbors' outcome (ϕ)	.231 (2.50)	.320 (2.78)	.160 (1.01)	.245 (1.74)	.273 (2.05)	.266 (2.06)	.339 (3.53)
Female	-.107 (5.42)	-.111 (3.66)	.247 (6.72)	.104 (2.87)	-.066 (2.28)	.017 (0.46)	-.209 (7.57)
Black	-.049 (1.99)	-.010 (0.30)	.049 (1.15)	-.040 (0.96)	.071 (1.93)	-.030 (0.76)	-.026 (0.77)
Family Member in jail	.056 (2.73)	.039 (1.16)	.047 (1.20)	.111 (2.83)	.059 (1.86)	-.030 (0.74)	.016 (0.54)
Family Member with Drug/Alcohol problems	.066 (3.26)	.133 (4.12)	.053 (1.37)	-.014 (0.36)	.081 (2.63)	.027 (0.70)	.042 (1.48)
Adults in family went to church often	-.022 (1.13)	-.031 (1.02)	-.003 (0.07)	.009 (0.26)	-.014 (0.48)	.152 (4.25)	-.028 (1.04)
Both parents present at age 14	-.024 (1.22)	-.025 (0.77)	-.063 (1.63)	-.118 (3.19)	.033 (1.13)	.056 (1.53)	-.011 (0.39)
Mother less than 20 at respondent's birth	.023 (0.99)	.061 (1.57)	.140 (3.09)	.119 (2.54)	.033 (0.96)	-.040 (0.86)	.002 (0.07)
Mother's age missing	.004 (0.12)	.032 (0.72)	.093 (1.99)	.145 (2.90)	-.038 (0.83)	-.106 (2.17)	-.034 (0.86)
Parents not married	.033 (1.29)	.015 (0.36)	.109 (2.35)	.004 (0.09)	.065 (1.80)	-.043 (0.90)	.031 (0.84)
Parent's years of schooling	-.000 (0.05)	.014 (1.93)	-.007 (0.93)	-.016 (1.82)	.002 (0.33)	.003 (0.31)	.012 (2.03)
Parent's schooling missing	.001 (0.03)	.005 (0.11)	.030 (0.58)	-.023 (0.43)	-.004 (0.08)	-.030 (0.56)	-.000 (0.00)
7 age dummies and an intercept	yes	yes	yes	yes	yes	yes	yes
# observations	880	880	880	880	880	880	880

Note: The numbers in parentheses are t-statistics of the β parameters.

All models are of the form: $Y^* = \phi W Y + X\beta + u$.

Changes in probability are evaluated at the sample means.

Appendix 3

TABLE IIA
ESTIMATES OF $f(\pi)$

Data series	Crimes per capita (p) times 1-crimes per capita ($1-p$)	Sample variance / $p(1-p)$	Estimated λ^2	Estimated $f(\pi)$	Estimated $f(\pi)$ $\lambda^2 = .008$
Serious crime					
1985	0 073	1313 8	013	754 6	604 7
N = 658			(.003)	(118 2)	
1970	0 042	1045.5	004	475.1	284.3
N = 617			(.001)	(42.5)	
NYC	0 053	575 1			248.1
N = 70					
1986	0 078	1500 0	.0003	155.0	73.2
N = 631			(0015)	(58.5)	
Murder					
1985	0 0001	10.0	012	4 49	2.9
N = 658			(.002)	(46)	
1970	0.0001	10 0	0*	4.0	1.9
N = 617				(0 3)	
NYC	0.0003	20.0			1.4
N = 70					
1986	0 00015	11 3	0005	2.58	1 2
N = 631			(.0009)	(.21)	
Rape					
1985	0 0006	26 7	011	14.8	0.4
N = 658			(003)	(1.2)	
1970	0 0003	16 7	.005	14 6	6.7
N = 617			(006)	(2 0)	
NYC	0.0004	17 5			1 7
N = 70					
1986	0.0006	28.3	002	4 4	3 4
N = 631			(001)	(0 4)	
Robbery					
1985	0 0047	408 5	0*	155.0	54 7
N =658				(13 2)	
1970	0.0037	435 1	0*	111.0	37 7
N = 617				(12.5)	
NYC	0.011	340.9			56.0
N = 70					
1986	0 005	400.0	0*	52.2	23.1
N = 631				(7.8)	
Assault					
1985	0.0048	268.8	014	224 0	134.7
N = 658			(004)	(18 0)	
1970	0.0025	134 8	.002	113.1	58.3
N = 617			(.003)	(10.6)	

TABLE IIA
(CONTINUED)

Data series	Crimes per capita (p) times 1-crimes per capita ($1-p$)	Sample variance $p(1-p)$	Estimated λ_2	Estimated $f(\pi)$	Estimated $f(\pi)$ $\lambda^2 = .008$
NYC	0.0054	281.5			16.4
N = 70					
1986	0.0056	296.4	0*	58 3	45.4
N = 631				(12 1)	
Burglary					
1985	0 019	424 1	027	236	209.4
N = 658			(003)	(30)	
1970	0.016	453.1	009	257	173.4
N = 617			(.002)	(26)	
NYC	0.013	112 3			53.4
N = 70					
1986	0 02	480.5	0011	63 9	30.7
N = 631			(0007)	(6 5)	
Larceny					
1985	0.04	743.8	.024	441	414 7
N = 658			(005)	(67)	
1970	0.012	294 2	.005	186 4	170 5
N = 617			(002)	(18 2)	
NYC	0.01	1123 0			332 0
N = 70					
1986	0 042	906 0	0005	143 3	143 7
N = 631			(.0065)	(100 5)	
Auto theft					
1985	0 008	651 3	024	382 2	219.3
N = 658			(004)	(42.7)	
1970	0 008	453 8	0*	340 3	140 8
N = 617				(31.1)	
NYC	0.015	356 7			88.0
N = 70					
1986	0 009	648 9	001	118.0	70 8
N = 631			(.0009)	(10 2)	
Arson					
1985	0.00074	45 9	0*	33 1	22 2
N = 628				(3 6)	
1986	0 00077	45 5	0001	11 7	7 0
N = 578			(0009)	(8)	

The second column gives the ratio of the sample variance to the first column. Sample variance for cross-city data is defined below. (An analogous formula is used for cross-precinct variance)

$$\text{Sample variance} = \frac{1}{\#\ cities} \sum_{i=1}^{\#\ cities} [(crime\ rate\ city_i - crime\ rate\ in\ US)*\sqrt{pop_i}]^2$$

*λ^2 fixed at zero in cases where estimated λ^2 would have been negative

7. Literature

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