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Xinyi Zhu   April 13, 2015

The MPAA (Motion Picture Association of America) Rating System and

Juvenile Delinquency: A Look at the Movie Impact on Society and Human Behavior

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Abstract

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This paper examines the empirical relationship between the introduction of "PG-13" rating rule by MPAA (Motion Picture Association of America's) in 1984 and the juvenile crime in United States. This paper uses the adoption of "PG-13" in 1984 as a natural experiment to study how the movies affect adolescents' behavior. By using OLS models, this paper discover that there is a significant negative coefficient between the adoption of the policy and sex-related crime rate as well as a significant and positive coefficient between the adoption of the policy and violence-related crime rate. Thus, this paper concludes that the adoption of "PG-13" in 1984 decreased the number of sex-related crime conducted by children from 10-12 but increased the number of violence-related crime conducted by children from 10-12. The results from the paper suggest that MPAA board to pay equally attention on both violent and sexual content while rating movies.

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I.   Introduction:

The first audience to experience a moving film did so in 1895. The film, by Lumiere brothers was called "workers leaving the Lumiere Factory (1895)." Since then, film have gradually become to be considered as a ubiquitous art form, a source of recreation, depicting reality, and a powerful medium for indoctrinating citizens.

The visual basis of film gives it a universal power of communication. Film is a reflection of society, both present and past. As a form of communication, it influences society and human behavior in various ways. A romantic movie will make people want to fall in love. Public displays of affection become more popular due to the influence of romantic movies. It is more familiar for us to watch people holding hands, hugging each other, and kissing while walking on the street. A violence movie can have different impacts on audience, which according to research probably depends on the personality and character traits of young adults and children. A child or teenager who has been raised in an abusive family is more likely to dash out at other people especially if they have just seen a very violent film.

In 2013, there are nearly 700 movies released in U.S. creating total box office revenues of over US$10 billion. As there are more people entering cinemas and enjoying films, movies certainly are having larger and larger impact on society and human behavior.

Surveys have shown that in 2012 young people in 12-24 groups represented almost a quarter of moviegoers and 31% of tickets sold. Movies are definitely an important part in teenagers' daily life. Thus parents need tools to decide what movies are suitable for their children

to watch. The rating system established by the MPAA in 1968 provides parents with advance information about the content of movies to help them determine whether or not to let their children watch the movies. The MPAA rating system is designated to classify films with regard to suitability for audiences in terms of issues such as sex, violence, substance abuse, profanity, impudence and other types of mature content. Ratings typically carry age recommendations in an advisory or restrictive capacity.

In this paper, I will use the PG-13 rating system, which was introduced by the MPAA in 1984 as an amendment to the original rating system in 1968, as a natural experiment for examining how films affect adolescents' behavior. My research question concerns whether the introduction of the PG-13 rating in 1984 has any impact on juvenile delinquency. I will compare the crime rates conducted by age 10-12 before and after the adoption of the PG-13 policy and study whether the policy has any impact on reducing the crime rates.

My result suggests that the adoption of "PG-13" rating rule does have an effect on juvenile delinquency. The introduction of this policy effectively decreases sex-related crime conducted by children from 10-12; however, it does not have a positive impact on reducing violence-related crime conducted by children from 10-12.

This rest of this paper is structured as follows. Section 1 introduces the thesis topic and research question. Section 2 presents literature review and hypotheses based on previous researches. Section 3 describes the data set. Section 4 illustrates the empirical method. Section 5 discusses the research results. Section 6 gives the conclusion and my suggestion.

II.   Literature review:

A.   Sociological analysis of culture

There are many articles studying the sociological aspect of culture and Wendy Griswold advanced one of the most influential approaches –(Cultural Diamond) – in 1986. The cultural diamond as she presents it in her 2004 textbook is below (see figure 1). It contains four points (social world, creator, receiver, and cultural object) and six linages.

After referring to different philosophers' interpretation of "culture" and examining culture from both the humanities and anthropology's viewpoint, she comes up with the working definition of culture: "Culture refers to the expressive side of human life –in other words, to behavior, objects, and ideas that appear to express, or to stand for, something else" (11).

The "Cultural Object" is defined as shared significance embodied in form, which means it is a "socially meaningful expression that is audible, visible, or tangible or that can be articulated" (12). On the "Creator" point of the diamond, the production perspective of culture has exemplified research into how cultural meaning is shaped by the organizations, institutions, and processes that create cultural objects (Peterson and Anand 2004). In studying movies, both production companies and MAPP rating system can be considered as creators of movies, because they both affect the contents and characteristics of the resulting objects. On the "Receiver" point of the diamond, there are many researches concerning the processes by which people receive and interpret cultural messages. The research "Short-term and Long-term Effects of Violent Media on Aggression in Children and Adults" (2006) conducted by Brad Bushman and Rowell Huesmann studies the impact of cultural object on receiver. By using meta-analytic procedures,

they find out that there are significant effect sizes for exposure to media violence on aggressive behaviors, aggressive thoughts, angry feelings, arousal levels, and helping behavior. On the "Social World" point of the diamond, sociologists concerns both macro-level structures like religion, politics, and the economy and individual-level beliefs and values.

Thus, according to Griswold definition of culture object, movie definitely is considered as a cultural object. So, in attempting to understand the connections between a society and movies, especially movie's impact on society and people, it is reasonable and effective to use Griswold's cultural diamond.

B.   MPAA Rating System

The MPAA Rating System is used in the United States and its territories to rate a film's suitability for certain audiences, based on its content. The MPAA rating system is a voluntary scheme that is not enforced by law; films can be exhibited without a rating, though many theaters refuse to exhibit non-rated or NC-17 rated films.

There is a careful study of the motion picture rating system of 1968 by Jane Friedman (1973). MPAA regulations require that prior to commercial release each film produced or distributed by any member company by submitted to MPAA's Code and Rating Administration (CARA) for rating (10). Ratings and rating descriptors issued by CARA are intended to be used by parents to assist them in determining whether the motion pictures is appropriate for their children to see and whether their children should be accompanied while seeing the motion picture in its entirety and considers those aspects of the motion picture that most parents would consider in determining whether that motion picture is suitable for viewing by their children,

including mature themes, language, depictions of violence, nudity, sensuality, depictions of

sexual activity, adult activities (i.e. activities that adults, but not minors, may engage in legally),

and drug use (Classification and Rating Rules 10).

CARA assigns one of the following ratings, with the following meanings, to each picture

(11-12):

(1)   G—General Audiences. All Ages Admitted.

A G-rated motion picture contains nothing in theme, language, nudity, sex, violence or

other matters that, in that view of the Rating Board, would offend parents whose younger

children view the motion picture. The G rating is not a "certificate of approval," nor does it

signify a "children's" motion picture. Some snippets of language may go beyond polite

conversation but they are common everyday expressions. No stronger words are present in G-

rated motion pictures. Depictions of violence are minimal. No nudity, sex scenes or drug use are

present in the motion picture.

(2)   PG—Parental Guidance Suggested. Some Material May Not Be Suitable For

Children

Parents should investigate a PG-rated motion picture before they let their younger

children attend. The PG rating indicates, in the view of the Rating Board, that parents may

consider some material unsuitable for their children, and parents should make that decision.

The more mature themes in some PG-rated motion pictures may call for parental

guidance. There may be some profanity and some depictions of violence or brief nudity. But

these elements are not deemed so intense as to require that parents be strongly cautioned beyond the suggestion of parental guidance. There is no drug use content in a PG-rated motion picture.

(3)   PG-13 –Parents Strongly Cautioned. Some Material May Be Inappropriate For Children Under 13.

A PG-13 rating is s sterner warning by the Rating Board to parents to determine whether their children under age 13 should view the motion picture, as some material might not be suited for them. A PG-13 motion picture may go beyond the PG rating in theme, violence, nudity, sensuality, language, adult activities or other elements, but does not reach the restricted R category. The theme of the motion picture by itself will not result in a rating greater than PG-13, although depictions of activities related to a mature theme may result in a restricted rating for the motion picture. Any drug use will initially require at least a PG-13 rating. More than brief nudity will require at least a PG-13 rating, but such nudity in a PG-13 rated motion picture generally will not be sexually oriented. There may be depictions of violence in a PG-13 movie, but generally not both realistic and extreme or persistent violence. A motion picture's single use of one of the harsher sexually-derived words, though only as an expletive initially requires at least a PG-13 rating. More than one such expletive requires an R rating, as must even one of those words used in a sexual context. The Rating Board nevertheless may rate such a motion picture PG-13 if, based on a special vote by a two-thirds majority, the Raters feel that most American parents would believe that a PG-13 rating is appropriate because of the context or manner in which the words are used or because the use of those words in the motion picture is inconspicuous.

(4)   R—Restricted. Children Under 17 Require Accompanying Parent or Adult Guardian

An R-rated motion, in the view of the Rating Board, contains some adult material. An R-rated motion picture may include adult themes, adult activity, hard language, intense or persistent violence, sexually-oriented nudity, drug abuse or other elements, so that parents are counseled to take this rating very seriously. Children under 17 are not allowed to attend R-rated motion pictures unaccompanied by a parent or adult guardian. Parents are strongly urged to find out more about R-rated motion pictures in determining their suitability for their children. Generally, it is not appropriate for parents to bring their young children with them to R-rated motion pictures.

(5)   NC-17—No One 17 and Under Admitted

An NC-17 rated motion picture is one that, in the view of the Rating Board, most parents would consider patently too adult for their children 17 and under. No children will be admitted. NC-17 does not mean "obscene" or "pornographic" in the common or legal meaning of those words, and should not be construed as negative judgment in any sense. The rating simply signals that the content is appropriate only for an adult audience. An NC-17 rating can be based on violence, sex, aberrational behavior, drug abuse or any other element that most parents would consider too strong and therefore off-limits for viewing by their children.

C.   Smoking in movies

James D. Sargent did a research about the impact of smoking in movies on adolescent smoking in 2005. Tobacco use typically increases with the "adultness" of the censorship rating (6). The background of this research is exposure to smoking in movies has been linked with adolescent smoking initiation in cross-sectional studies. This paper undertakes a prospective study to ascertain whether exposure to smoking in movies predicts smoking initiation. First, they assess exposure to smoking shown in movies in 3547 adolescents, aged 10-14 years, who reported in baseline survey that they had never tried smoking. Then exposure to smoking in movies was estimated for individual respondents on the basis of the number of smoking occurrences viewed in unique samples of 50 movies, which were randomly selected. After 13-26 months, they successfully re-contacted 2603 (73%) students for a follow-up interview to determine whether they had initiated smoking. Finally, they come to a conclusion that viewing smoking in movies promotes smoking initiation among adolescent.

D.   Violence and Sex in movies

This paper examines the effectiveness of MAPP's rating system in screening explicit violence and sex in films since the system's initiation and the introduction of the PG-13 category (2010). The research result shows that explicit violent and sexual content significantly increased following the rating system's initiation and the system did not differentiate violence content as well as sexual content (2). This paper draws the conclusion that the MPAA rating system is more concerned with the sexual content in movies and less concerned with the violence. This conclusion is also useful for my research result and has implications for my potential hypothesis.

Based on previous studies, I hypothesizes that because MPAA is much stricter with the sex in movies than violence and as a result, the "PG-13" rating rule that were introduced in 1984

would have an effective impact on reducing sex-related crime rate conducted by children from 10-12.

III.   Data

The "PG-13" rating rule was introduced in July 1984, with the advisory "Parents Are Strongly Cautioned to Give Special Guidance for Attendance of Children under 13 –Some Material May Be Inappropriate for Young Children". The first PG-13 movie ***Red Dawn*** was released in 1984. So this paper treats the introduction of "PG-13" rating in 1984 as a natural experiment and children under 13 as the effected population. The primary factor of interest here is the comparison between the crime rates of the effected population before and after the introduction of the "PG-13"rating policy.

The data I use to analyze the effects of "PG-13" rating policy on juvenile delinquency is ***the Uniform Crime Reporting Program Data [United States]: Arrests by Age, Sex, and Race, Summarized Yearly from 1981 to 1986***. The data is sponsored by ICPSR and the authoring entities are United States Department of Justice and Federal Bureau of Investigation. The data uses cross-section time method and is collected by United States Department of Commerce and Federal Bureau of Investigation. The data for the Uniform Crime Reports are submitted voluntarily by city, county and state law enforcement agencies. Some agencies receive forms directly from the FBI and return them directly to the FBI. Many others receive forms from state collecting programs and return the reports to those programs. The state programs, in turn, forward the reports to the FBI. Reports are sent out and collected on a monthly basis.

The primary factors of interest in this paper are crime rates and year, respectively considered as the dependent variable and the independent variable in later regressions. This data is organized by different categories of crime. Thus, the dependent variable will be one specific crime's rate.

IV.   Empirical Strategy

A. Empirical Method

The methodology I use is shown as below:

	Pre	Post
Age 10-12	a	b
Age 13-14	c	d

Children from age 10 to 12 are the affected population and children from age 13-14 are served as a standard population.

Pre: before the introduction of PG-13, for which I choose year from 1981-1983

Post: after the introduction of PG-13, for which I choose year from 1984-1986

The main outcome of interest of this study will be the difference the amount of crime conducted by age 10-12 before and after the introduction of "PG-13" (a-b) and that difference

should exclude the standard difference caused by time (c-d). Thus, the impact of introducing PG-13 equals to [(a-b)-(c-d)].

Table 1 and Figure 1 compare the number of total crime conducted by age 10-12 and age 13-14 in year 1981-1986.

B. OLS

The set of regressions includes models that are using Ordinary Least Square (OLS) method. Model (1) and (2) use crime "rate", the crime rate of different types from year 1981 to 1986, as the dependent variable. Table 2 lists the type of different crime.

OLS measures the linear relationship among the variables and thus is easier to interpret. Y_i represents the crime rate of one specific crime that are listed at the first row from Table 3 to Table 10.The treatment here is denoted by "policy * age 10-12" as independent variable. The adoption of "PG-13" in 1984 is represented by "policy" and therefore policy is devoted to 1 when the year is 1984 or after while running the regression model in STATA. "Age 10-12" is the affected population and is devoted as 1 when the age is between 10 and 12 whiling running the regression the model in STATA. As a result, I can generate the treatment by having the result that age*year equals to 1.

The possible numerical effects of the "PG-13" rating policy on the effected population (10-12) are represented as the value of β_1. I am running this model for each type of crime in order to find out whether the policy has positive or negative influence on the crime rate. OLS model in this paper can be expressed by the formulas shown below:

$$y_i = \beta_1 \text{ policy} * \text{age 0-12} + \beta_2 \text{ age 0-12} + \sum \Theta \ldots (1)$$

$$y_i = \beta_1 \text{ policy} * \text{age 0-12} + \beta_2 \text{ age 0-12} + \beta_3 \text{ age 13-14} + \beta_4 \text{ age 13} + \beta_5 \text{ age 14} + \sum \Theta \ldots (2)$$

If β_1 is smaller than 0.05, then there is a statistically significant coefficient between crime

rate and the treatment, which suggests that the introduction of "PG-13" in 1984 has a significant

effect on the crime rate of this particular offense conducted by age 10-12. Positive significant

coefficient represents that the adoption of "PG-13" has a positive influence on the crime rate,

which means that more crime are conducted by the age group of 10-12 after the PG-13 policy.

On the contrary, negative significant coefficient represents that the adoption of "PG-13" has a

negative influence on the crime rate, which means that the PG-13 policy efficiently decreases the

type of crime that are conducted by age group 10-12.

V.   Results and Discussion

In Table 3-10, each models yields different coefficient for the impacts of the adoption of

"PG-13" rating policy. The β_1 values with highlight represents that crime of that category is

significantly coefficient with the policy. According to the tables, the adoption of "PG-13" policy

has a negative effect on offense: rape, assault, other assault, vandalism, prostitution, and sex

offenses and a positive effect on offense robbery and driving under influence: holding everything

else constant, a decrease in rape, assault, other assault, vandalism, prostitution, and sex offenses

due to the adoption of the "PG-13" rating policy and an increase in robbery and driving under

influence. For other 19 out of 27 types of crime, the introduction of "PG-13"rating policy does not have a significant effect.

Rape, assault, other assault, vandalism, prostitution, and sex offenses are offenses that can be categorized as sex-related crime. Robbery and driving under influence are offenses that can be considered as violence-related crime. According to the results from the regression model, it is obvious that "PG-13 rating" rating policy has a positive influence in reducing juvenile crime related to sex and has negative impact on reducing crime associated with violence.

My results confirms my previous hypothesis that "PG-13"is more focuses on the sex content in movies and less on violent content while rating films. As a result, children from age 10-12 had less chance to see nudity and other sex related content in film and thus conducted less sex-related crime. On the contrary, the violent content is not being strictly prevented from children age 10-12 and they are having more chance viewing the violence in films. Therefore, the adoption of "PG-13" rating rule in 1984 increases the violence related crime conducted by children from 10-12.

VI. Conclusion

In this paper, I uses regression models and "policy* age 10-12" treatment to test the effect of the adoption of "PG-13" film rating policy on juvenile crime rates. The "PG-13"policy fares relatively well in informing parents' potential youth exposure to explicit sex and as a result, the rate of juvenile crime related to sex was decreasing after the introduction of the policy. The

"PG-13" policy is less strictly with violent content in films and thus, the rate of juvenile crime relates to violence was slightly increasing after the introduction of the policy.

This paper contributes to studies by proposing an interesting topic about the correlation between film rating rule and crime rate, and by offering numerical evidence to support a well-organized yet unproven hypothesis that MPAA rating rule focuses more on sexual content and less on violent content in movies. As result, this rating system is more effective in reducing teenagers' sex-related crime than in violence-related crime.

As mentioned in Nalkur's paper, this paper also signals a demand for MPAA to treat violence as equally important as sex in its rating standards. The lenient rating treatment of violence allows teenagers to a larger amount of harmful violent content. It would be helpful for MPAA board to include health care and social science experts on the board and to pay more attention on the violent content in movies.

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VIII. Figures and Tables

Figure 1: Griswold's Cultural Diamond (Wendy 16)

Social world

Creator
(Producer)

Receiver
(Consumer)

Cultural object itself
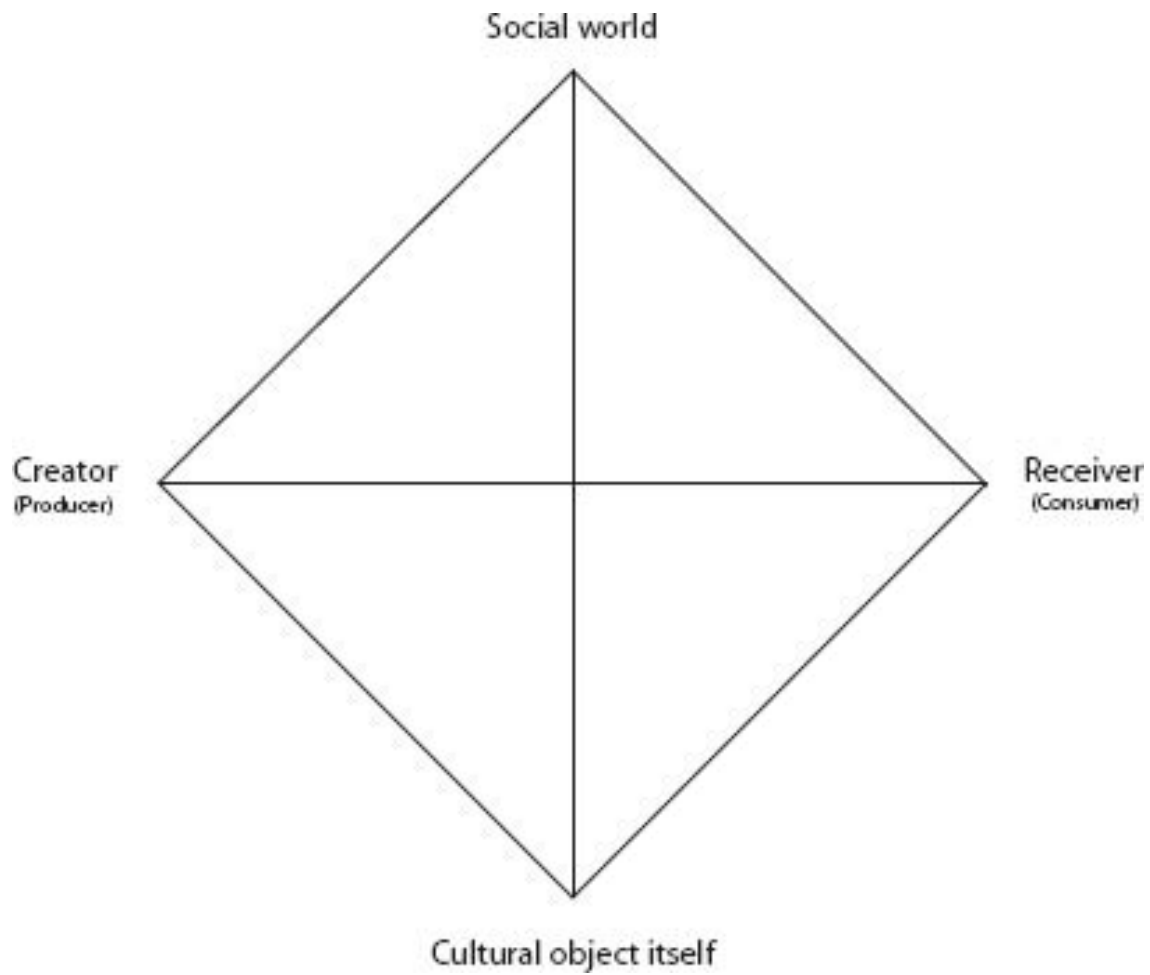
Figure 2: The number of total crime conducted by in different age groups (age 10-12 and age13-14) in Year 1981-1986

The number of total crime conducted by in different age groups (age10-12 and age 13-14) in Year 1981-1986
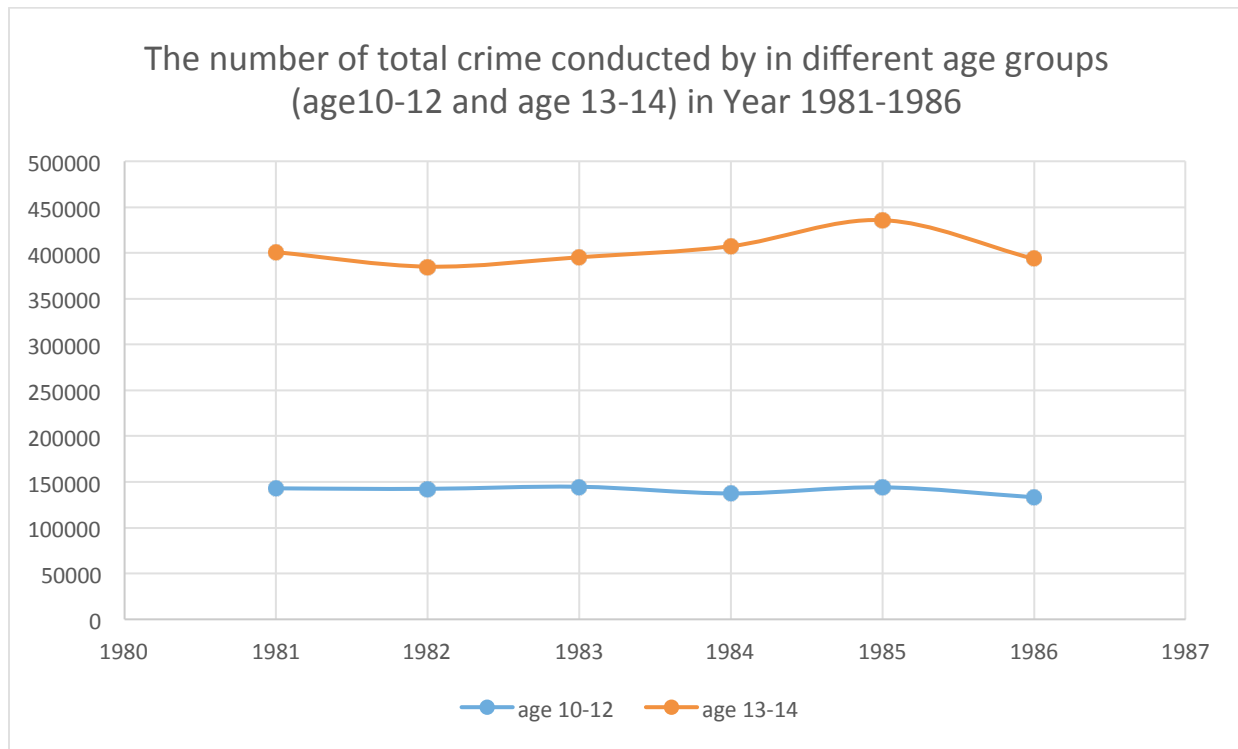
Table 1: The number of total crime conducted by different age groups (age 10-12 and age 13-14) in year 1981-1986

	pre			post		
Year	1981	1982	1983	1984	1985	1986
Age 10-12	142767	142461	144732	137442	144100	133260
		429960			414802	
Age 13-14	400943	385022	395284	407321	435759	393499
		1181249			1236579	

Table 2: The list of types of different crimes

	Crime
1	Murder
2	Manslaughter
3	Rape
4	Robbery
5	Assault
6	Burglary
7	Larceny theft
8	Vehicle theft
9	Other assault
10	Arson
11	Forgery
12	Fraud
13	Embezzlement
14	Stolen property
15	Vandalism
16	Prostitution
17	Sex offenses
18	Drug abuse
19	Gambling
20	Offenses against family and children
21	Driving under influence
22	Liquor laws
23	Drunkenness
24	Disorderly conduct
25	Vagrancy
26	All other offenses
27	Suspicion

Table 3: Difference-in-difference regression estimating the effect of adoption of "PG-13" policy on juvenile crime (model 1)

types of offense	(1) murder	(2) manslaughter	(3) rape	(4) robbery	(5) assault	(6) burglary
policy*age 10-12	-0.001	0.015	-0.069**	0.378***	-0.296**	2.586***
	(0.013)	(0.019)	(0.030)	(0.116)	(0.119)	(0.287)
age 0-12	-0.138***	-0.055***	-0.451***	-2.698***	-2.385***	-13.347***
	(0.016)	(0.017)	(0.036)	(0.387)	(0.211)	(0.636)
1982	0.000	0.003	0.056*	-0.243	-0.070	-1.649***
	(0.014)	(0.013)	(0.032)	(0.228)	(0.128)	(0.298)
1983	0.009	-0.024**	0.042*	-0.220*	-0.046	-3.428***
	(0.021)	(0.010)	(0.022)	(0.110)	(0.072)	(0.331)
1984	0.005	-0.018	0.165***	-0.460***	0.231	-5.305***
	(0.016)	(0.019)	(0.044)	(0.154)	(0.142)	(0.464)
1985	-0.005	-0.010	0.140***	-0.603***	0.332*	-5.063***
	(0.014)	(0.018)	(0.047)	(0.214)	(0.190)	(0.473)
1986	0.009	-0.026	0.133***	-0.740***	0.333*	-5.978***
	(0.017)	(0.019)	(0.036)	(0.204)	(0.175)	(0.582)
Constant	0.145***	0.067***	0.515***	3.305***	3.184***	20.485***
	(0.017)	(0.018)	(0.038)	(0.503)	(0.286)	(0.969)
Observations	1,520	1,480	1,515	1,515	1,515	1,515
R-squared	0.122	0.027	0.312	0.201	0.327	0.551

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4: Difference-in-difference regression estimating the effect of adoption of "PG-13" policy on juvenile crime (model 1)

	(7)	(8)	(9)	(10)	(11)	(12)
types of offense	larceny theft	vehicle theft	other assault	arson	forgery	fraud
policy*age 10-12	-1.412	-0.537	-0.980***	0.074	0.020	-0.016
	(0.909)	(0.336)	(0.171)	(0.091)	(0.062)	(0.065)
age 0-12	-25.650***	-4.935***	-5.198***	0.069	-0.942***	-0.931**
	(1.441)	(0.302)	(0.466)	(0.114)	(0.100)	(0.441)
1982	-2.046	-0.776***	0.133	-0.365*	-0.091*	0.118
	(1.787)	(0.167)	(0.244)	(0.204)	(0.053)	(0.131)
1983	-3.880**	-1.127***	0.219	-0.365*	-0.213***	0.178
	(1.682)	(0.161)	(0.199)	(0.198)	(0.048)	(0.229)
1984	-2.085	-0.692**	1.103***	-0.321	-0.214***	0.073
	(2.005)	(0.298)	(0.333)	(0.232)	(0.066)	(0.125)
1985	-1.076	-0.096	1.484***	-0.246	-0.112	0.110
	(1.871)	(0.346)	(0.275)	(0.250)	(0.080)	(0.100)
1986	-1.279	0.451	1.604***	-0.399	-0.165*	0.175
	(1.851)	(0.511)	(0.292)	(0.245)	(0.085)	(0.124)
Constant	48.755***	6.059***	7.380***	1.229***	1.206***	1.028**
	(3.518)	(0.384)	(0.642)	(0.233)	(0.135)	(0.405)
Observations	1,515	1,515	1,515	1,510	1,515	1,515
R-squared	0.240	0.426	0.293	0.016	0.221	0.018

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Difference-in-difference regression estimating the effect of adoption of "PG-13" policy on juvenile crime (model 1)

types of offense	(13) embezzlement	(14) stolen property	(15) vandalism	(16) prostitution	(17) sex offenses	(18) drug abuse
policy*age 10-12	-0.002	-0.048	-1.017***	-0.275***	-0.148***	0.005
	(0.022)	(0.110)	(0.230)	(0.081)	(0.042)	(0.004)
age 0-12	-0.114***	-2.596***	-3.307***	-1.782***	-0.897***	-0.075***
	(0.020)	(0.243)	(0.381)	(0.176)	(0.073)	(0.006)
1982	-0.080***	-0.183*	-1.527***	-0.011	0.031	-0.010***
	(0.024)	(0.102)	(0.502)	(0.062)	(0.037)	(0.002)
1983	-0.072***	-0.294**	-1.383**	-0.093	0.082**	-0.013***
	(0.024)	(0.119)	(0.548)	(0.069)	(0.040)	(0.002)
1984	-0.049	-0.363**	-0.741	0.159	0.380***	-0.013***
	(0.031)	(0.151)	(0.449)	(0.105)	(0.072)	(0.005)
1985	-0.045	-0.056	-0.188	0.339***	0.443***	-0.008
	(0.034)	(0.200)	(0.594)	(0.117)	(0.078)	(0.005)
1986	-0.038	-0.043	-0.287	0.307**	0.333***	-0.018***
	(0.037)	(0.183)	(0.561)	(0.119)	(0.067)	(0.006)
Constant	0.179***	3.362***	11.480***	2.238***	1.276***	0.087***
	(0.034)	(0.322)	(0.963)	(0.209)	(0.102)	(0.007)
Observations	1,495	1,515	1,515	1,505	1,515	1,515
R-squared	0.056	0.323	0.089	0.339	0.240	0.362

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 6: Difference-in-difference regression estimating the effect of adoption of "PG-13" policy on juvenile crime (model 1)

types of offense	(19) gambling	(20) offenses agasint family and children	(21) driving under influence	(22) liquor laws	(23) drunkenness	(24) disorderly conduct	(25) vagrancy	(26) all other offenses	(27) suspicion
policy*age 10-12	0.059	-0.157	0.277**	-0.677	0.434	0.705	-0.003	-1.242	-1.038
	(0.059)	(0.119)	(0.114)	(0.801)	(0.312)	(0.670)	(0.123)	(1.096)	(1.637)
age 0-12	-0.232***	-0.057	-1.618***	-14.851***	-3.137***	-7.299***	-0.702***	-18.957***	-3.891***
	(0.084)	(0.098)	(0.154)	(1.841)	(0.469)	(1.269)	(0.139)	(2.192)	(0.955)
1982	0.144	-0.171*	-0.033	-0.869*	0.001	0.565	-0.143	-1.118	-0.328
	(0.123)	(0.090)	(0.075)	(0.509)	(0.259)	(0.742)	(0.096)	(0.865)	(0.948)
1983	0.037	-0.206**	-0.038	1.408***	-0.407	-0.613***	0.255**	2.789***	-1.058
	(0.029)	(0.099)	(0.075)	(0.427)	(0.274)	(0.205)	(0.110)	(0.905)	(0.841)
1984	0.080	-0.110	-0.370***	-1.556	-0.779**	-0.877*	-0.173	-1.444	0.748
	(0.075)	(0.119)	(0.115)	(0.960)	(0.367)	(0.472)	(0.156)	(1.473)	(2.258)
1985	0.037	-0.036	-0.278**	0.815	-0.437	-0.937	-0.130	-0.173	3.065
	(0.055)	(0.139)	(0.135)	(1.113)	(0.393)	(0.649)	(0.161)	(1.661)	(4.154)
1986	-0.035	-0.009	-0.184	0.945	-0.280	-0.660	0.010	-0.014	-0.841
	(0.038)	(0.167)	(0.144)	(1.230)	(0.491)	(0.702)	(0.171)	(1.798)	(1.147)
Constant	0.189***	0.380***	1.694***	15.916***	3.496***	9.305***	0.986***	26.799***	5.481***
	(0.053)	(0.106)	(0.153)	(2.015)	(0.555)	(1.468)	(0.177)	(2.731)	(1.403)
Observations	1,445	1,490	1,490	1,515	1,245	1,505	1,305	1,515	860
R-squared	0.021	0.016	0.142	0.202	0.158	0.148	0.088	0.266	0.033

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 7: Difference-in-difference regression estimating the effect of adoption of "PG-13" policy on juvenile crime (model 2)

types of offense	(1) murder	(2) manslaughter	(3) rape	(4) robbery	(5) assault	(6) burglary
policy*age 10-12	-0.001	0.015	-0.069**	0.378***	-0.296**	2.586***
	(0.013)	(0.019)	(0.030)	(0.117)	(0.119)	(0.288)
age 10-12	0.015***	0.001	0.142***	0.594***	0.818***	4.886***
	(0.003)	(0.005)	(0.019)	(0.091)	(0.083)	(0.307)
age 13-14	0.074***	0.040***	0.590***	2.641***	2.739***	17.510***
	(0.010)	(0.014)	(0.049)	(0.411)	(0.257)	(0.938)
age15	0.119***	0.028**	0.432***	2.774***	2.337***	13.800***
	(0.013)	(0.011)	(0.039)	(0.405)	(0.220)	(0.718)
age16	0.243***	0.099***	0.546***	3.571***	3.305***	16.062***
	(0.027)	(0.028)	(0.042)	(0.482)	(0.276)	(0.686)
1982	0.000	0.003	0.056*	-0.243	-0.070	-1.649***
	(0.014)	(0.013)	(0.032)	(0.228)	(0.128)	(0.298)
1983	0.009	-0.024**	0.042*	-0.220*	-0.046	-3.428***
	(0.021)	(0.010)	(0.022)	(0.110)	(0.072)	(0.331)
1984	0.005	-0.018	0.165***	-0.460***	0.231	-5.305***
	(0.016)	(0.019)	(0.044)	(0.154)	(0.142)	(0.464)
1985	-0.005	-0.010	0.140***	-0.603***	0.332*	-5.063***
	(0.014)	(0.018)	(0.047)	(0.215)	(0.190)	(0.474)
1986	0.009	-0.026	0.133***	-0.740***	0.333*	-5.978***
	(0.017)	(0.019)	(0.036)	(0.204)	(0.175)	(0.582)
Constant	-0.000	0.012*	-0.007	0.310**	0.390***	4.695***
	(0.010)	(0.007)	(0.018)	(0.119)	(0.079)	(0.289)
Observations	1,520	1,480	1,515	1,515	1,515	1,515
R-squared	0.203	0.051	0.337	0.218	0.361	0.606

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8: Difference-in-difference regression estimating the effect of adoption of "PG-13" policy on juvenile crime (model 2)

types of offense	(7) larceny theft	(8) vehicle theft	(9) other assault	(10) arson	(11) forgery	(12) fraud
policy*age 10-12	-1.412	-0.537	-0.980***	0.074	0.020	-0.016
	(0.910)	(0.337)	(0.171)	(0.091)	(0.062)	(0.065)
age 10-12	19.453***	0.684***	2.498***	-0.026	0.199***	0.185
	(1.601)	(0.050)	(0.254)	(0.076)	(0.036)	(0.162)
age 13-14	47.531***	4.650***	7.443***	0.378**	0.778***	1.074
	(3.286)	(0.327)	(0.722)	(0.150)	(0.109)	(0.724)
age15	27.733***	5.160***	5.313***	-0.280*	0.904***	1.182
	(1.704)	(0.326)	(0.503)	(0.147)	(0.102)	(0.761)
age16	30.866***	6.021***	6.584***	-0.345**	1.440***	0.817***
	(1.565)	(0.406)	(0.545)	(0.134)	(0.143)	(0.103)
1982	-2.046	-0.776***	0.133	-0.365*	-0.091*	0.118
	(1.789)	(0.167)	(0.244)	(0.204)	(0.053)	(0.131)
1983	-3.880**	-1.127***	0.219	-0.365*	-0.213***	0.178
	(1.684)	(0.161)	(0.199)	(0.199)	(0.048)	(0.229)
1984	-2.085	-0.692**	1.103***	-0.321	-0.214***	0.073
	(2.007)	(0.298)	(0.334)	(0.232)	(0.066)	(0.126)
1985	-1.076	-0.096	1.484***	-0.246	-0.112	0.110
	(1.873)	(0.346)	(0.276)	(0.250)	(0.080)	(0.101)
1986	-1.279	0.451	1.604***	-0.399	-0.165*	0.175
	(1.853)	(0.512)	(0.292)	(0.245)	(0.085)	(0.124)
Constant	13.378***	0.782***	0.933***	1.312***	0.165***	0.004
	(2.171)	(0.104)	(0.136)	(0.193)	(0.038)	(0.122)
Observations	1,515	1,515	1,515	1,510	1,515	1,515
R-squared	0.359	0.441	0.333	0.067	0.276	0.020

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9: Difference-in-difference regression estimating the effect of adoption of "PG-13" policy on juvenile crime (model 2)

types of offense	(13) embezzlement	(14) stolen porperty	(15) vandalism	(16) prostitution	(17) sex offenses	(18) drug abuse	(19) gambling	(20) offenses agasint family and children
policy*age 10-12	-0.002	-0.048	1.017***	-0.275***	-0.148***	0.005	0.059	-0.157
	(0.022)	(0.110)	(0.230)	(0.081)	(0.042)	(0.004)	(0.059)	(0.119)
age 10-12	0.020***	0.690***	4.003***	0.542***	0.516***	0.006**	0.003	-0.147
	(0.007)	(0.070)	(0.423)	(0.068)	(0.047)	(0.001)	(0.019)	(0.090)
age 13-14	0.071***	2.945***	8.658***	1.975***	1.661***	0.056**	0.147**	-0.040
	(0.016)	(0.273)	(0.803)	(0.207)	(0.147)	(0.006)	(0.066)	(0.136)
age15	0.082***	2.578***	3.353***	1.783***	0.919***	0.071**	0.194***	-0.022
	(0.016)	(0.249)	(0.511)	(0.185)	(0.074)	(0.006)	(0.071)	(0.143)
age16	0.220***	3.301***	3.914***	2.401***	0.887***	0.108**	0.359**	0.013
	(0.039)	(0.316)	(0.423)	(0.213)	(0.063)	(0.008)	(0.141)	(0.144)
1982	-0.080***	-0.183*	1.527***	-0.011	0.031	-0.010***	0.144	-0.171*
	(0.024)	(0.102)	(0.502)	(0.062)	(0.037)	(0.002)	(0.123)	(0.091)
1983	-0.072***	-0.294**	-1.383**	-0.093	0.082**	-0.013***	0.037	-0.206**
	(0.024)	(0.119)	(0.549)	(0.069)	(0.040)	(0.003)	(0.029)	(0.100)
1984	-0.049	-0.363**	-0.741	0.159	0.380***	-0.013***	0.080	-0.110
	(0.031)	(0.151)	(0.449)	(0.105)	(0.072)	(0.005)	(0.075)	(0.119)
1985	-0.045	-0.056	-0.188	0.339***	0.443***	-0.008	0.037	-0.036

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(0.035)	(0.200)	(0.595)	(0.117)	(0.078)	(0.005)	(0.055)	(0.139)
1986	-0.038	-0.043	-0.287	0.307**	0.333***	-0.018***	-0.035	-0.009
	(0.037)	(0.183)	(0.561)	(0.119)	(0.068)	(0.006)	(0.038)	(0.167)
Constant	0.055***	0.421***	6.172***	0.184***	0.120***	0.009***	-0.045	0.396*
	(0.017)	(0.076)	(0.768)	(0.048)	(0.030)	(0.001)	(0.034)	(0.201)
Observations	1,495	1,515	1,515	1,505	1,515	1,515	1,445	1,490
R-squared	0.098	0.342	0.205	0.365	0.339	0.443	0.029	0.020

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 10: Difference-in-difference regression estimating the effect of adoption of "PG-13" policy on juvenile crime (model 2)

types of offense	(21) driving under influence	(22) liquor laws	(23) drunkenness	(24) disorderly conduct	(25) vagrancy	(26) all other	(27) suspicion
policy*age 10-12	0.277**	-0.677	0.434	0.705	-0.003	-1.242	-1.038
	(0.114)	(0.802)	(0.312)	(0.670)	(0.123)	(1.097)	(1.640)
age 10-12	-0.073***	0.260	-0.124	1.868***	0.103**	4.321***	0.944*
	(0.023)	(0.172)	(0.196)	(0.370)	(0.044)	(0.536)	(0.478)
age 13-14	0.210***	6.103***	1.637***	7.773***	0.596***	20.310***	3.133**
	(0.052)	(1.022)	(0.346)	(1.377)	(0.134)	(1.790)	(1.439)
age15	0.684***	12.287***	2.595***	7.162***	0.721***	17.865***	5.335***
	(0.085)	(1.637)	(0.464)	(1.360)	(0.141)	(1.688)	(1.460)
age16	3.850***	26.552***	4.993***	9.763***	0.944***	25.178***	4.622***
	(0.349)	(3.089)	(0.773)	(1.563)	(0.183)	(4.097)	(1.348)
1982	-0.033	-0.869*	0.001	0.565	-0.143	-1.118	-0.328
	(0.075)	(0.509)	(0.260)	(0.742)	(0.096)	(0.866)	(0.950)
1983	-0.038	-1.408***	-0.407	-0.613***	-0.255**	-2.789***	-1.058
	(0.075)	(0.427)	(0.275)	(0.206)	(0.110)	(0.906)	(0.843)
1984	-0.370***	-1.556	-0.779**	-0.877*	-0.173	-1.444	0.748
	(0.116)	(0.961)	(0.368)	(0.472)	(0.156)	(1.474)	(2.262)
1985	-0.278**	0.815	-0.437	-0.937	-0.130	-0.173	3.065
	(0.136)	(1.114)	(0.393)	(0.650)	(0.161)	(1.663)	(4.162)
1986	-0.184	0.945	-0.280	-0.660	0.010	-0.014	-0.841
	(0.145)	(1.231)	(0.492)	(0.703)	(0.172)	(1.800)	(1.149)
Constant	0.113**	0.935***	0.421*	1.072***	0.232**	5.681***	1.118*
	(0.053)	(0.286)	(0.223)	(0.216)	(0.088)	(0.831)	(0.632)

Observations	1,490	1,515	1,245	1,505	1,305	1,515	860
R-squared	0.556	0.359	0.247	0.161	0.098	0.287	0.036

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1