**Research Article**

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# Endogenous Peer Group Effects on Adolescents' Crime Reporting Intentions

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**Abstract:** This paper provides an empirical analysis of the determinants of adolescents' crime reporting intentions with particular emphasis on the role of social interactions. The empirical strategy extends the discrete choice random utility model to allow preferences to be defined over the expected actions of an individual's peer group defined by his or her class at school. In this context, students choose whether to report instances of bullying, property theft, or academic cheating they may witness at or around school. Both endogenous and exogenous peer group effects on adolescents' crime reporting intentions are identified and estimated using a 1620-student dataset. Results lend support to the hypothesis that social interactions play a significant role in shaping adolescents' decisions to report wrongdoing they may witness. These group influences can strengthen, or temper school policies aimed at encouraging students to take a more active role in reducing school or community crime.

**Keywords:** discrete choice with social interactions, endogenous group effect, exogenous group effect, bullying, academic cheating, school crime, crime reporting

**JEL:** C25, C92, D91, H41, K42

## 1 Introduction

Student crime and misconduct, including but not limited to acts of violence, bullying, theft, and academic cheating, is a widespread problem faced by children and adolescents in or around schools throughout the world

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(Heilbrun, Cornell, and Konold 2018). When misconduct occurs, most students are not only aware of it, but are also present and bear witness to it. However, while most students genuinely sympathize with the victims as well as disapprove of offenders, many of them are often reluctant to intervene or to inform adults (Connell 2018; Lessne and Yanez 2016).

The behavior of bystanders has been shown to play an important initial role in bringing down the effects of crime and misconduct (hereafter referred to as crime) whether witnessed in or outside of school. First, their social support can attenuate the harm caused to the victim. Second, schools where bystanders defend rather than stand by passively are demonstrably safer and educationally more supportive (Gini et al. 2008; Kutsyuruba, Klinger, and Hussain 2015). These findings have spurred health professionals to try to increase positive bystander behavior (e.g., assertive defending, reporting, comforting, or not reinforcing offenders) as a way to decrease the occurrence and harm of student crime (Wood et al. 2016).

The purpose of this paper is to assess the role that adolescent peer groups have in increasing positive bystander behavior in or outside of school. Using a dataset of 1620 middle school students from the *National Evaluation of the Teens, Crime, and the Community/Community Works* (TCC/CW) program (Esbensen 2011), a two-step method developed by Shang and Lee (2011) is applied to separately identify and estimate endogenous and exogenous peer group effects on students' likelihood of reporting three types of crime they might witness in or outside of school: interpersonal violence/bullying, academic cheating, and property theft. As in Manski (1993) and others, if adolescents interact regularly with other students at school, the correlation between individual reporting intentions and peer group intentions could reflect endogenous peer effects (group reporting influences individual reporting) and/or exogenous or contextual peer effects (group characteristics influence individual reporting). However, identification and measurement of peer effects presents some well-known empirical issues (Bramoullé, Djebbari, and Fortin 2009; Lee, Liu, and Lin 2010). A rich literature has emerged focusing on issues raised by reflection, which is a particular case of simultaneity (Blume et al. 2013; Manski 1993); and endogeneity, which may arise for both peer self-selection and unobserved group-specific effects (Barrera-Osorio et al. 2011; Card and Giuliano 2013; Lin 2010; Liu, Patacchini, and Zenou 2013; Sacerdote 2011). Shang and Lee (2011) addressed these issues by developing a two-step instrumental variables method utilizing group fixed effects and a model-based instrument utilizing information from the nonlinear probit relationship between group choices and group characteristics. They confirm their two-step method meets the conditions outlined in Brock and Durlauf (2001b) under which endogenous peer effects are identified in binomial discrete choice models and can be separated from exogenous effects. While this present study embraces Shang and Lee's two-step

approach, identification of peer effects does not depend solely on parametric instrumentation. Information from the TCC/CW survey indicating whether students' families were currently active in Church are used to construct a second data-based instrument that is highly correlated with group reporting intentions but plausibly otherwise uncorrelated with class and school level group fixed effects. To empirically validate this identification strategy, extensive specification testing is undertaken to ensure that identifying model-based and data-based variables satisfy the requirements for excluded instruments.

This study is first to shed light on the role of peers in U.S. adolescents' crime reporting intentions across a spectrum of witnessed crime types as well as locations. While an adolescent's choice to report a crime is a discrete one, the nature and degree of peer influence on this choice could vary widely by crime type (i.e., situation) if in fact peers affect perceptions of risks, costs, and benefits of reporting (Becker 1968). This implies that, to better understand the role of peers in adolescents' crime reporting, we need to gain an understanding of the many ways in which peers exert situational influence on reporting decisions. Empirical results based on grouping at the class and school levels reveal significant and sometimes substantial endogenous and exogenous peer effects on sample students' crime reporting intentions. Estimated endogenous peer effects are larger for students' incentives to report crimes witnessed outside of school (acts of theft or violence witnessed in the local community) and are somewhat weaker for crimes witnessed at school (violence/bullying, theft, academic cheating). Endogenous peer effects also increase as group size increases from class to school level. Results for exogenous peer effects indicate that reporting intentions vary widely by crime type but are mostly higher among class/school level groups with higher proportions of younger or female students, and with lower proportions of students from households with a single parent or less educated mother or father.

Evidence of the existence of endogenous peer effects is important, as these effects can generate social multipliers – that is, an increase in the level of crime reporting among peers in a particular group leads to an increase in individual-level reporting intentions. Based on estimates grouped at the classroom level, social multipliers average 1.55 for general crime reporting at school and 2.0 for general crime reporting outside of school. This implies, for example, that if a school anti-crime program successfully raises students' crime reporting intentions by 1% point in the absence of endogenous peer group effects, then the same program will raise reporting intentions by approximately 1.5–2% points in the presence of these effects.

Traditionally, adolescents have been studied as the objects, not the administrators, of social control (Sharp, Green, and Lewis 2017). As a result, too little is known about the factors influencing adolescents' crime reporting intentions. Yet youths

comprise a nontrivial share of school and community offenders and victims (Johnson, Simons, and Conger 2004), making the study of adolescents' reporting intentions particularly relevant. Understanding the processes through which student peer groups influence active reporting can offer insights into the design of interventions that enhance school and community safety by effecting positive change at the peer group level.

The remainder of the paper is organized as follows. Section 2 outlines the empirical model and estimation strategy. Section 3 describes the TCC/CW data along with explanations of variables characterizing students and their crime reporting intentions. Section 4 analyzes the sample of 1620 junior high school students comprising 98 classrooms in 15 U.S. schools. Section 5 concludes.

## 2 Empirical Model and Estimation Strategy

Consider a latent dependent variable model of individual choice behavior with group effects. Specifically, an adolescent's preference to report a witnessed crime is shaped by his or her individual as well as peer group characteristics:

$$y_{ig}^{*} = \beta_0 + x_{ig}\beta_1 + \overline{x}_g\beta_2 + \theta E\left(y_g\right) + u_g + v_{ig} \tag{1}$$

for individuals $i = 1,\ldots, m_g$, where $m_g$ is the sample size of peer group $g$, and groups $g = 1,\ldots, G$. The latent variable $y_{ig}^{*}$ denotes the difference in utility between crime reporting and nonreporting. If $y_{ig}^{*} > 0$, an adolescent chooses to report, i.e., $y_{ig} = 1$ and 0 otherwise. Here, $x_{ig}$ denotes individual sociodemographic characteristics of adolescent $i$ in group $g$ defined in Section 4 below as $i$'s class or school. While adolescent behavior is plausibly influenced by many persons in as well as outside their respective schools, fellow students are likely to play a central role in shaping adolescents' preferences and behavior (Soetevent and Kooreman 2007; Yeung and Nguyen-Hoang 2016). For example, on any given weekday, the average junior high school student in the TCC/CW sample spends approximately 6.5 hours in his or her school.

Let $\overline{x}_g$ denote students' sociodemographic characteristics which are aggregated at the level of group $g$. The coefficients in $\beta_2$ measure the influence of "exogenous group effects" on $y_{ig}^{*}$, i.e., the impact of adolescent $i$'s reference group characteristics on his or her reporting choice. Individual sociodemographic characteristics used to describe $i$'s reference group include age (and its square), ethnicity, and family and household attributes.

As in Brock and Durlauf (2001a, 2001b), the endogenous group effect, $\theta$, is identified by the expected group crime reporting rate, $E(y_g)$. In expression (1), the

endogenous group effect measures the influence of the crime reporting decisions of one's peers upon one's own decisions, the central focus of this paper. The error term in (1) is made up of two parts: $u_g$ is an unobserved group variable, and $v_{ig}$ is an individual disturbance term. Error components $u_g$ and $v_{ig}$ are assumed orthogonal to the joint distribution of sociodemographic characteristics; $u_g$ has zero mean; and $v_{ig}$ follows a standard normal distribution.

The probability adolescent $i$ in group $g$ will choose to report a witnessed crime is given by

$$P\left(y_{ig} = 1 \middle| x_{ig}, \overline{x}_{ig}, u_g\right) = \Phi\left(\beta_0 + x_{ig}\beta_1 + \overline{x}_g\beta_2 + \theta E\left(y_g\right) + u_g\right) \tag{2}$$

where $\Phi$ is the standard normal distribution function. Following Shang and Lee (2011), under the assumption of rational expectations (RE), the endogenous peer group variable for a given group $g$ is

$$E\left(y_g\right) = \int \Phi\left(\beta_0 + x_{ig}\beta_1 + \overline{x}_g\beta_2 + \theta E\left(y_g\right) + u_g\right) dF_{x_{ig}|g} \tag{3}$$

where $dF_{x_{ig}|g}$ is the conditional distribution of individual characteristics, $x_{ig}$, given group $g$.

The above model can be estimated using a two-step method. This method serves to pin-point and identify the RE solution of expression (3), and thus the endogenous peer group effect, $\theta$, using observed sample average choices within each group. In the first step, the individual choice model in expression (1) is rewritten to substitute group fixed effects for all group variables:

$$y_{ig}^{*} = x_{ig}\beta_1 + \alpha_g + v_{ig} \tag{4}$$

where

$$\alpha_g = \beta_0 + \overline{x}_g\beta_2 + \theta E\left(y_g\right) + u_g \tag{5}$$

measures the total group fixed effect. Expression (5) includes the endogenous group, exogenous group, and unobserved group effects. Shang and Lee (2011) show that the individual parameters in (5) can be consistently estimated by replacing $\alpha_g$ with estimated fixed effects, $\widehat{\alpha}_g$, from the probit estimation of expression (4). Also in this second step, because the expected group reporting rate, $E(y_g)$, is unobserved, it is replaced with its consistent estimator—the observed average reporting rate in each group:

$$\widehat{E}\left(y_g\right) = \frac{1}{m_g}\sum_{g=1}^{m_g} y_{ig} \tag{6}$$

Finally, if not all members in group $g$ are observed, group characteristics, $\overline{x}_g$, can be estimated by mean characteristics, $\overline{x}_g = \frac{1}{m_g}\sum_{g=1}^{m_g} x_{ig}$. However, in the present

study, since every child in every TCC/CW program classroom participated in interviews, $\overline{x}_g$ denote group population characteristics.

One estimation issue remains. Since (5) estimates the RE solution in (3), $E(y_g)$ is a function of $u_g$, therefore $\widehat{E}(y_g)$ and $u_g$ may be correlated. This issue is often referred to as the endogeneity problem (Sacerdote 2011) or the reflection problem (Manski 1993). In this case, unobserved group characteristics could affect within-group expected average crime reporting intentions. Shang and Lee (2011) propose an instrumental variable (IV) approach utilizing both nonlinearity of the probit model and observed intergroup variation among individual characteristics to construct an instrument for $E(y_g)$. To construct this instrument, individual reporting intentions in (4) with group fixed effects are estimated first. With group fixed effects, the probability adolescent $i$ in group $g$ with characteristics $x_{ig}$ will report a witnessed crime is

$$\widehat{P}\left(y_{ig} = 1 \middle| x_{ig}, \alpha_g\right) = \Phi\left(x_{ig}\widehat{\beta}_1 + \widehat{\alpha}_g\right) \tag{7}$$

where $\widehat{\beta}_1$ and $\widehat{\alpha}_g$ are the first-step probit estimates of (4). Given the RE assumption underlying (3), the group fixed effect, $\widehat{\alpha}_g$, may include unobserved group effects, $u_g$. In order to strip away any $u_g$ from $\widehat{\alpha}_g$, Shang and Lee (2011) replace $\widehat{\alpha}_g$ with $\overline{\alpha} = \frac{1}{G}\sum_{g=1}^{G}\widehat{\alpha}_g$, which is invariant across groups and uncorrelated with $u_g$ as group sizes become large. The model-based IV for $E(y_g)$ is then

$$IV_g = \frac{1}{m_g}\sum_{i=1}^{m_g}\Phi\left(x_{ig}\widehat{\beta}_1 + \overline{\alpha}\right) \tag{8}$$

$IV_g$ is a nonlinear function of exogenous sociodemographic variables, $x_{ig}$. Based on the assumption that the unobserved group variable, $u_g$, is orthogonal to the joint distribution of $x_{ig}$, $IV_g$ is asymptotically exogenous by construction.

In accordance with economic theory and works cited in the adolescent crime reporting literature, signs and magnitudes of estimated coefficients influencing students' individual reporting intentions,$\beta_1$ in expression (5), are expected to emulate past research on youths' reporting intentions (e.g., Brank et al. 2007) but vary, possibly widely, by crime type, as students with different backgrounds exhibit reporting attitudes and intentions which differ by crime type (e.g., Slocum et al. 2010). Based on individual patterns of reporting, expectations regarding exogenous peer effects estimates, $\beta_2$, should be consistent with peer group composition influencing individual behavior. Hence, students in a given peer group will more likely report a crime when, all else equal, a higher proportion of group peers possess characteristics conducive to reporting. Finally, estimated endogenous peer effects, $\theta$, on reporting intentions are expected to be positive but not necessarily equal across different crime types. If positive, as expected, these would be consistent with peers influencing individual behavior and hence,

students are more likely to report a witnessed crime if they expect their peers would do the same.

## 2.1 Finite Group Sizes and Sampling Properties

Shang and Lee (2011) used Monte Carlo simulations to assess the finite properties of the two-step IV estimator set forth by expressions (4), (7), and (10). They found endogenous group effect estimates ($\theta$) will be biased upward as average group size gets small (i.e., <25 members), although this bias is greatly moderated if instrument strength is high.[1] The TCC/CW sample consists of 98 class groups nested within 15 schools. Of the 98 class groups, mean class size is 17 students with a minimum of 6 and a maximum of 33. Of the 15 sample schools, mean group size is 108 with a minimum of 34 and a maximum of 226. Thus, if sample adolescents' social network is posited to be found in the vicinity of smaller groups (e.g., classrooms), the two-step estimator utilizing $IV_g$ in (5) may give rise to bias if this instrument lacks sufficient strength. To address this issue, $IV_g$ is supplemented with an additional sample-based instrument: a dichotomous indicator of whether a student's family is active in Church.[2] Students in church-active families are innate members of a group whose beliefs are correlated with $E(y_g)$, but orthogonal to $u_g$. This assumption should be valid because sample families' choices regarding Church participation are likely independent of neighbors' socioeconomic status, the degree of urbanization in the catchment area of sample schools, the type and size of the school and classes (all TCC/CW study schools are public/non-religious), and also of parallel differences in students' home conditions. For comparative purposes, Section 4 presents estimates of expression (5) specifying group effects at the class and school levels. Accompanying these estimates is a systematic set of diagnostic tests of instrument validity and strength (Andrews and Stock 2018). However, while all tests indicated good instrument strength with low associated relative bias, endogenous peer effect estimates interpreted and discussed later in Section 4 are assumed to be upper bounds on the true effects.

As is standard practice in the group effects literature (Brock and Durlauf 2001a; Manski 1993), group mean characteristics at the classroom level enter expression (5) to measure peer group variables. However, a second estimation issue stemming from possible nonindependence of $u_g$ and group characteristics $\bar{x}_g$ occurs because individuals, in various ways, self-select into groups (Ammermueller and Pischke 2009; Sacerdote 2011). In this case, if variation in group fixed effects is used to identify peer

1 Biases were not sensitive to the number of sample groups.

2 As in Shang (2014), family Church participation enters the two-step model of expressions (4) and (5) as an identifying excluded exogenous variable.

effects in (5), this method will give rise to bias if peer groups are subject to a common influence which is not modeled directly. The selection problem has typically been resolved using situations in which individuals are randomly assigned to groups (Boozer and Cacciola 2001; Foster 2006; Lyle 2007; Zimmerman 2003). For instance, if students and resources are randomly assigned to classes within schools, independence of $u_g$ and $\overline{x}_g$ is assured because random assignment breaks the link between peer characteristics and extraneous effects on the class, such as unobserved teacher quality. In the present study, as is typical in most U.S. public secondary schools, TCC/CW sample students enroll in class schedules where they take classes from several teachers in a given day. As such, the TCC/CW curriculum was offered as part of students' core health requirements; consequently, students were not grouped into classes on the basis of ability or family background, implying classes in the 15-school sample were formed more or less on a random basis. However, while the assumption of independence of $u_g$ and $\overline{x}_g$ is plausible at the class level, it may be less plausible at school level given the TCC/CW study's purposive sampling strategy. This issue will be discussed further in the next section following a description of the TCC/CW data and measures of students' crime reporting intentions and group characteristics.

# 3 Data

Data used in this study come from the *National Evaluation of the Teens, Crime, and the Community/Community Works* (TCC/CW) program, a school-based, law-related education curriculum (Esbensen 2011). The TCC/CW data served to evaluate the core curriculum using a purposive sample of schools offering the curriculum selected for inclusion in the study. Out of more than 250 U.S. schools identified as offering the curriculum, 18 schools met the criteria for evaluation, and 15 agreed to participate in the study. The final sample of schools (9 in Arizona, 1 in New Mexico, 2 in Massachusetts, and 3 in South Carolina) comprise the data. Because the curriculum was operating primarily in the southwestern U.S., Hispanic/Latino youth are overrepresented in the sample with White youth underrepresented. Classrooms were selected based on the grade in which the program was administered (ranging from sixth to ninth grade), and all students in selected classrooms participated in the evaluation, leading to an initial program sample of 1620 valid cases (Esbensen 2009). Excluding all missing data on one or more study variables, the final sample consists of 1540–1590 students.

Descriptive statistics of study variables are presented in Table 1. With the majority of sample schools in the southwest (Arizona and New Mexico), the sample contains a large percentage (42%) of students identifying themselves as Hispanic/Latino. White (31%) and Black/African American (11%) youths comprise the next

**Table 1:** Variable descriptions and summary statistics.

| Variable | Full sample mean (SD) | Student subsample with *Mother's* and/or *Father's education missing* mean (SD) |
|---|---|---|
| *Adolescent characteristics* | | |
| Black/African-American | 0.1118 (0.3152) | 0.1011 (0.2839) |
| Hispanic/Latino | 0.4234 (0.4942) | 0.4501 (0.495) |
| Other non-white | 0.1514 (0.3585) | 0.1421 (0.3461) |
| White | 0.3134 (0.4640) | 0.3154 (0.4731) |
| Male student | 0.4742 (0.4989) | 0.4767 (0.4979) |
| Student age in years | 12.23 (0.9695) | 12.21 (0.9633) |
| Student's family participates in Church/Church Activities: 1 = sometimes or more; 0 = otherwise. | 0.3828 (0.4862) | 0.3778 (0.4842) |
| *Parent/household characteristics* | | |
| Single parent household | 0.1662 (0.3824) | 0.1701 (0.3745) |
| Number of times family has relocated in past five years | 0.3937 (0.8102) | 0.3861 (0.7964) |
| *Father's highest education level:* | | |
| Did not complete high school | 0.0931 (0.2906) | |
| Completed high school | 0.3186 (0.4661) | |
| Completed some college or more | 0.2642 (0.4410) | |
| Father's education missing | 0.1215 (0.2986) | |
| *Mother's highest education level:* | | |
| Did not complete high school | 0.0892 (0.2851) | |
| Completed high school | 0.3670 (0.4818) | |
| Completed some college or more | 0.3741 (0.4840) | |
| Mother's education missing | 0.1379 (0.2731) | |

**Table 1:** (continued)

| Variable | Full sample mean (SD) | Student subsample with *Mother's* and/or *Father's education missing* mean (SD) |
|---|---|---|
| *Reporting intentions: Proportion of adolescents "Very Likely" to report if witnessed:* | | |
| Bullying at school | 0.2407 (0.4276) | 0.2288 (0.3979) |
| Theft: Breaking into lockers/other school property | 0.1768 (0.3816) | 0.1677 (0.3739) |
| Cheating or academic dishonesty | 0.1564 (0.3633) | 0.1612 (0.3727) |
| Theft in the community: Shoplifting/other property | 0.2495 (0.4329) | 0.2505 (0.4298) |
| Violence in the community: Physical assault or believable threa | 0.2797 (0.4489) | 0.2599 (0.4356) |

two largest race/ethnicities in the sample. Slightly more than half of the sample is female (53%) and the average student is 12 years old, reflecting the fact that most of the students were in sixth or seventh grade at the program's outset in fall 2004. Approximately 38% of students indicated their parents/family attend Church and/or unspecified Church activities, and 17% live in single parent households. Most students have at least one parent whose highest level of education is high-school completion (37%) or who, at a minimum, have attended some college or more (37%). With respect to residential mobility, approximately 19% of students reported having moved at least once in the past five years.

## 3.1 Reporting Intentions

The TCC/CW program design included pre-curriculum and post-curriculum questionnaires administered to sample students. The present study uses pre-curriculum questionnaire data (i.e., prior to the delivery of any TCC/ CW course material). The pre-curriculum questionnaire was intended to gather baseline information on students' individual experiences and attitudes regarding their schools and communities, their current family and social lives and friend networks, as well as their viewpoints about school and community safety and crime. Students answered survey questions individually as they were read aloud by members of the research team. One part of the questionnaire asked students about their likelihood of reporting various delinquent behaviors they hypothetically might observe in or outside of school. Students were asked to specify how likely

they would be to report someone (to qualified authorities) whom they witnessed: (1) beating up or bullying someone at school; (2) breaking into a locker or stealing something at school; (3) cheating on a test at school; (4) beating up someone in the community (outside of school); and (5) stealing something from a store in the community. Responses ranged from 1 (not at all likely to report) to 5 (very likely to report). The distribution of "very likely" responses for the five offence types is presented in Table 1. Approximately 24% of surveyed students indicated they were very likely to report school violence/bullying, followed by theft (18%) and cheating (16%). For crimes witnessed in the community, 25% of students were very likely to report theft while 28% were very likely to report violence. While a substantial percentage of students were "somewhat likely" to "likely" to report crimes they might observe, students "unlikely" to report crimes averaged 18% for crimes at school and 16% for crimes outside of school.

## 3.2 Individual and Group Characteristics

Several exogenous variables known in the literature to influence reporting intentions at the individual and/or peer group level are included in empirical models. First, individual variables—specifically student age, gender, and ethnicity—have been strongly related to youths' reporting intentions (Bersani and Piquero 2017; Triplett, Sun, and Gainey 2005). Racial/ethnic group membership is specified using three variables indicating Black/African American, Hispanic/Latino, and Other. The "Other" category consists of those reporting ethnic backgrounds as Native American/American Indian, Asian/Pacific Islander, or other self-described nonwhite racial heritages. Also included is a set of household and parent variables intended to measure individual socioeconomic and religious status. Three of these variables, *Single Parent Household, Student's Parents/Family Attend Church*, and *Times Moved*, speak to household structure, religiosity, and residential tenure/mobility. A remaining set of dichotomous mother and father education variables (indicating threshold levels completed) speak to socioeconomic status. The TCC/CW data contain no information on parental labor supply or household income. Approximately 13% of surveyed students were unable to report the highest level of education completed by one or both of their parents (missing data for all other model variables is <5%). Table 1 lists variable means based on the full sample (column 1) as well as the subsample (column 2) of students with one or more missing responses for mother's or father's education. Table 1 subsample means are very close to those of the full sample. In all empirical specifications reported in Section 4 below, dummy indicators for missing mother's and/or father's education are included. These variables were insignificant in all specifications estimated, and their inclusion or exclusion did not influence any other

coefficient estimates. Given the difficulty of measuring parental education using youth self-reports, this level of missing data is not unusual. Younger adolescents as represented in the TCC/CW data often have limited or no knowledge of sociodemographic characteristics of their parents, including the amount of formal education completed (Currie et al. 1997).

## 3.3 Self-Selection into Schools

Important to the analysis of peer effects at the school level is the possibility of selection into sample schools based on unobserved characteristics. The selection of TCC/CW sample schools was clearly purposive and reflects the fact that sample inclusion was more pronounced in southwest U.S. schools (9 in Arizona and 1 in New Mexico) where the program was better established. An indication of potential systematic selection bias would be one or more schools with consistently more or fewer students indicating "very likely" reporting intentions relative to the other sample schools. To assess this likelihood, Figure 1 plots the percentage of very likely responses by school and by crime type for each of the 15 sample schools. Note in this Figure that for all schools, reporting intentions appear to be higher for crimes witnessed outside of school. However, there also appear to be some systematic reporting differences across the 15 schools. In particular, looking at all crime types, the highest (lowest) reporting percentages are observed among roughly one-third (two-thirds) of the 15 schools. Whether regional or other residence-specific differences account for these discrepancies is an empirical question the TCC/CW data cannot address. The restricted-use data do not contain geographic information

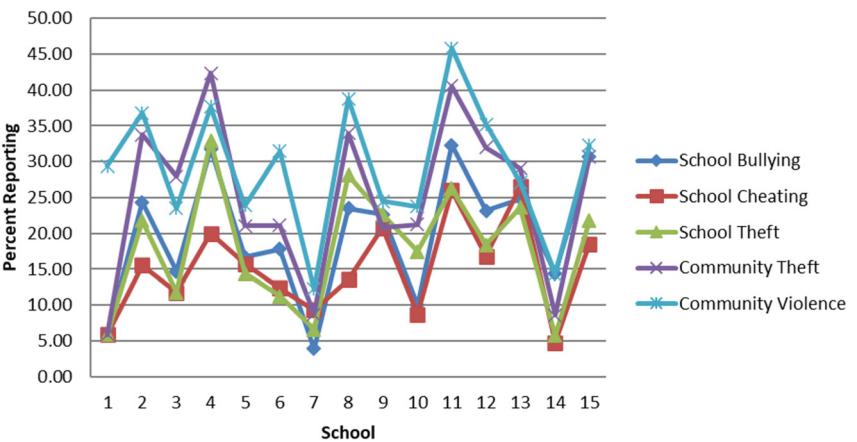


**Figure 1:** Percent of students reporting by school and crime type.

linked to individual-level variables. As a result, part of the covariance between unobserved group effects and school-level groups that might otherwise be eliminated by residence-specific controls, remains in Table 4 specifications of expressions (4) and (5). Although estimation results in Tables 3–4 reveal small, if any, differences in exogenous and endogenous peer effects by class and school-level groupings, below, discussion and inferences regarding these effects will focus mostly on class-level estimates.

# 4 Results

Tables 2–4 present two-step estimation results of sample students' reporting intentions for bullying, theft, and cheating witnessed at school. Results of the first-step maximum likelihood probit estimation of expression (4) are displayed in Table 2 (excluding class fixed effects). Coefficient estimates displayed in Table 2 are average marginal effects. Because results for the individual choice specifications were similar regardless of whether class or school-level fixed effects were included, Table 2 presents results for class-level groupings. For all five choice specifications, many of the individual and family characteristics have significant associations with students' crime reporting intentions. Spanning these results across specifications 1–5, sample students who are male or are older age, especially 12 years or older, are less likely to report crimes of any type, whereas students whose families participate in Church are more likely to report. Although slightly less robust, students who are Hispanic, or who reside in households comprised of a single parent or less educated parent(s) are less likely to report some or most of the crime types. Hispanic students are less likely to report all crime types except school cheating; students with less educated mothers are less likely to report bullying or cheating, while students with less educated fathers are less likely to report violence or theft outside of school. Notably, estimated marginal effects for students whose mothers or fathers are less educated exceed other Table 2 estimates, suggesting this student subsample is particularly less inclined to report school bullying and cheating along with community theft and violence. And while students with college educated mothers are more likely to report violence witnessed outside of school, they are less likely to report cheating at school. Sample students who are Black are more likely to report school bullying and cheating, but less likely to report theft in the community. Finally, students who have relocated one or more times in the last five years are more likely to report crimes involving cheating or school or community theft but are less inclined to report violence/bullying at school. Many of these results are consistent with prior studies examining relationships between individual characteristics and reporting intentions while controlling for fixed effects at the class or school level. This literature identifies several characteristics relevant to

**Table 2:** Individual reporting intentions with class fixed effects.

| | (1) Report school bullying | (2) Report school theft | (3) Report school cheating | (4) Report violence in community | (5) Report theft in community |
|---|---|---|---|---|---|
| *Individual characteristics:* | | | | | |
| Male | −0.0752** | −0.0330*** | −0.0704*** | −0.0677*** | −0.0445* |
| | (0.032) | (0.002) | (0.016) | (0.017) | (0.024) |
| Age | 0.0347** | 0.0197* | 0.0077* | 0.0329*** | 0.0481*** |
| | (0.016) | (0.012) | (0.004) | (0.008) | (0.008) |
| Age squared | −0.0042*** | −0.0030*** | −0.0032*** | −0.0036*** | −0.0051*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Black | 0.0219** | 0.0073 | 0.0847** | −0.0262 | −0.0916** |
| | (0.009) | (0.050) | (0.035) | (0.034) | (0.041) |
| Hispanic | −0.0467** | −0.0473** | 0.0278 | −0.0691*** | −0.0828*** |
| | (0.008) | (0.022) | (0.018) | (0.014) | (0.028) |
| Other | −0.0090 | −0.0196 | 0.0304 | −0.0120 | −0.0384 |
| | (0.019) | (0.035) | (0.041) | (0.041) | (0.064) |
| Single parent household | −0.0478*** | −0.0662*** | −0.0382*** | −0.0666 | −0.0566*** |
| | (0.013) | (0.009) | (0.007) | (0.042) | (0.006) |
| Dad no high school | 0.0108 | −0.0135 | 0.0445 | −0.0956*** | −0.0990*** |
| | (0.047) | (0.023) | (0.028) | (0.025) | (0.034) |
| Mom no high school | −0.1628*** | −0.0182 | −0.1226*** | −0.0290 | 0.0073 |
| | (0.029) | (0.018) | (0.010) | (0.030) | (0.030) |
| Dad some college or more | −0.0199 | −0.0024 | 0.0372 | 0.0236 | 0.0096 |
| | (0.031) | (0.032) | (0.026) | (0.031) | (0.026) |
| Mom some college or more | 0.0242 | 0.0251 | −0.0379** | 0.0279*** | 0.0354 |
| | (0.049) | (0.029) | (0.015) | (0.010) | (0.032) |
| One or more times moved | −0.0132** | 0.0236*** | 0.0194*** | 0.0190 | 0.0200*** |
| | (0.006) | (0.006) | (0.007) | (0.012) | (0.006) |
| Dad education missing | 0.0317 | −0.0138 | 0.0287 | −0.0132 | −0.0149 |
| | (0.048) | (0.045) | (0.028) | (0.028) | (0.018) |
| Mom education missing | −0.0250 | 0.0182 | −0.0151 | −0.0088 | 0.0433 |
| | (0.019) | (0.049) | (0.010) | (0.024) | (0.041) |
| Family Church participation | 0.0688*** | 0.0219** | 0.0144*** | 0.0474*** | 0.0560*** |
| | (0.007) | (0.011) | (0.005) | (0.010) | (0.007) |
| Number of observations | 1565 | 1590 | 1547 | 1540 | 1580 |
| Log likelihood | −638.4 | −701.2 | −658.4 | −657.9 | −701.7 |
| LR chi-squared | 159.8*** | 155.4*** | 181.5*** | 158.1*** | 182.3*** |
| Pseudo $R^2$ | 0.1 | 0.12 | 0.11 | 0.11 | 0.12 |

Probit MLE of equation (4). Coefficient estimates displayed as average marginal effects. Robust standard errors are in parentheses. Class fixed effects and constant terms are not reported. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

youths' underreporting of crimes, including low socioeconomic status (Warner 2007), single-parent family structure (Schnebly 2008), community ethnic, racial and immigrant concentrations (Solis, Portillos, and Brunson 2009), and residential mobility (Goudriaan, Wittebrood, and Nieuwbeerta 2006). This literature asserts that background characteristics influence youths' reporting intentions by shaping their experiences and attitudes regarding adult authorities, delinquency, victimization risk, and perceptions of their community. For example, Menjívar and Bejarano (2004) found youth crime underreporting to be more pronounced in Latino communities with higher concentrations of immigrants because they were more likely to have undocumented friends or family members. Wells et al. (2006) found individuals new to an area were more likely to report crimes involving theft rather than violence because the latter posed a more realistic risk of retaliation.

Tables 3a–c and 4a–c present estimated class and school-level group effects on sample students' reporting intentions for violence/bullying, theft, and cheating witnessed at school, and violence and theft witnessed outside of school. IV estimates reported in columns 3 and 6 in Tables 3–4 are the result of second step estimation of expression (5). All reported specifications use the observed mean group (class or school) reporting rate, displayed in row one, as an estimate of students' expected peer reporting rate for the respective crimes. Columns 1 and 3 in Tables 3–4 report OLS estimates of expression (5) with no account taken for endogeneity of students' expected peer reporting. As is apparent in the Tables, all OLS estimates of students' expected peer reporting significantly exceed their IV counterparts, which are likely to be biased upward if peer reporting rates positively correlate with unobserved group variables (Shang and Lee 2011). A series of Hausman tests reject the null hypothesis that expected group reporting rates are exogenous with $p$-values < 0.001. Reported at the bottom of Tables 3–4, Hansen's (1982) J-test statistics fail to reject the null hypothesis of zero correlation of the overidentifying instruments with the error term. Also reported in Tables 3–4 are Olea and Pflueger (2013) effective F-statistics together with critical values for the null hypothesis that the two-stage least squares bias exceeds 5% of the OLS bias. For each IV specification in Tables 3–4, effective F-statistics exceed their respective critical values, rejecting the null hypothesis with $p < 0.05$. As in Pflueger and Wang (2015), based on these results we can conclude that the instruments are strong.

How persuasive are class peers on sample students' individual reporting intentions? The numbers in brackets reported in row one of Tables 3–4 columns 3 and 6 present estimated endogenous peer effects calculated using the sample means of observed class reporting rates for the respective crimes (Shang 2014, p. 655). As is observed in Tables 3–4, all endogenous peer effect estimates are positive and highly significant. Starting with school violence/bullying in Table 3a column 3, the mean endogenous class-level peer effect on individual reporting intentions

**Table 3a:** Endogenous and exogenous class-level group effects on school violence/bullying reporting.

| **Dependent variable: Estimated class group fixed effect** | **Violence/bullying at school** | | |
|---|---|---|---|
| | **(1)** | **(2)** | **(3)** |
| | | **IV estimation** | |
| | **OLS** | **First stage** | **Second stage** |
| Expected class reporting rate | 3.3621*** | | 1.9044*** |
| | (0.032) | | (0.174) |
| | | | [0.38] |
| *Class group variables:* | | | |
| Male student proportion | 0.2272*** | −0.1467*** | 0.0744 |
| | (0.023) | (0.023) | (0.141) |
| Class average age | 1.1093*** | −0.0615 | −0.0021 |
| | (0.118) | (0.108) | (0.025) |
| Average age squared | −0.0399*** | −0.0005 | −0.003** |
| | (0.005) | (0.004) | (0.001) |
| Black student proportion | −0.4736*** | −0.0632* | −0.4774*** |
| | (0.034) | (0.036) | (0.099) |
| Hispanic student proportion | −0.0887*** | −0.0875*** | −0.1619* |
| | (0.015) | (0.017) | (0.088) |
| Other non-white proportion | −0.0480 | −0.0260 | −0.1171 |
| | (0.034) | (0.029) | (0.134) |
| *Class proportion from/with:* | | | |
| Single parent household | 0.2728*** | 0.0044 | −0.1906*** |
| | (0.046) | (0.039) | (0.060) |
| Dad no high school | 0.4377*** | 0.1100** | −0.8826*** |
| | (0.052) | (0.055) | (0.250) |
| Mom no high school | 0.2273*** | −0.1633* | −0.2184*** |
| | (0.054) | (0.091) | (0.082) |
| Dad some college or more | 0.0476 | 0.0084 | 0.0582 |
| | (0.035) | (0.028) | (0.069) |
| Mom some college or more | −0.0893*** | −0.0102 | −0.0378 |
| | (0.031) | (0.025) | (0.042) |
| One or more times moved | −0.0128 | 0.0170 | −0.0148* |
| | (0.015) | (0.016) | (0.008) |
| Mom education missing | −0.0055 | −0.0037 | −0.0114 |
| | (0.009) | (0.006) | (0.007) |
| Dad education missing | −0.0025 | 0.0054 | 0.0084 |
| | (0.009) | (0.007) | (0.009) |
| $IV_g$ | | −1.4739** | |
| | | (0.704) | |
| Family Church participation | | 0.0365** | |
| | | (0.018) | |
| Constant term | −7.9650*** | 1.1302* | −0.0246 |
| | (0.732) | (0.680) | (0.042) |

**Table 3a:** (continued)

| Dependent variable: Estimated class group fixed effect | Violence/bullying at school | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| | | IV estimation | |
| | OLS | First stage | Second stage |
| Number of observations | 1565 | 1565 | 1565 |
| Adj. *R*-squared | 0.93 | 0.92 | 0.73 |
| Montiel olea-pflueger *F*-statistic | | | 57.99 |
| *Montiel Olea-Pflueger critical values:* | | | |
| 5% maximal IV relative bias | | | 26.31 |
| Hansen *J*-statistic | | | 1.85 |

Equation (5) estimates. Standard errors are in parentheses. Second stage standard errors are based on 450 bootstrap replications. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. The observed class group reporting rate is used as an estimator of the expected class group reporting rate. The estimated endogenous group effect [in brackets] is evaluated at the sample mean.

**Table 3b:** Endogenous and exogenous class-level group effects on school offence reporting.

| Dependent variable: Estimated class group fixed effect | Theft at school | | | Cheating at school | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | IV estimation | | | V estimation | | |
| | OLS | First stage | Second stage | OLS | First stage | Second stage |
| Expected class reporting rate | 3.6238*** (0.040) | | 1.0760*** (0.199) [0.25] | 3.8555*** (0.054) | | 2.5794*** (0.248) [0.41] |
| *Class group variables:* | | | | | | |
| Male student proportion | 0.1309*** (0.030) | −0.0538** (0.022) | −0.3201*** (0.118) | 0.2600*** (0.028) | −0.1177*** (0.016) | 0.0706 (0.080) |
| Class average age | 0.1738 (0.138) | −0.6474*** (0.097) | −0.0510* (0.030) | 0.3970*** (0.131) | −0.5690*** (0.086) | 0.0208 (0.018) |
| Average age squared | 0.0011 (0.006) | −0.0234*** (0.004) | −0.0042** (0.002) | −0.0134** (0.005) | −0.0209*** (0.003) | −0.0021** (0.001) |
| Black student proportion | 0.0591* (0.032) | 0.1288*** (0.028) | −0.1409** (0.061) | −0.4637*** (0.035) | 0.1188*** (0.023) | 0.3094*** (0.078) |
| Hispanic student proportion | 0.1230*** (0.016) | −0.0424*** (0.015) | −0.0687* (0.040) | −0.0776*** (0.017) | 0.0685*** (0.011) | −0.0535 (0.052) |
| Other non-white proportion | −0.0416 (0.032) | −0.0379 (0.025) | −0.1498 (0.099) | −0.3377*** (0.037) | −0.0217 (0.018) | −0.4147 (0.419) |

**Table 3b:** (continued)

| **Dependent variable: Estimated class group fixed effect** | **Theft at school** | | | **Cheating at school** | | |
|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** |
| | **IV estimation** | | | **V estimation** | | |
| | **OLS** | **First stage** | **Second stage** | **OLS** | **First stage** | **Second stage** |
| *Class proportion from/with:* | | | | | | |
| Single parent household | 0.2946*** | −0.2914*** | −0.4678** | 0.0417 | −0.0685** | −0.1324*** |
| | (0.041) | (0.035) | (0.186) | (0.040) | (0.028) | (0.036) |
| Dad no high school | 0.1502*** | −0.0479 | −0.3928*** | −0.2258*** | −0.1438*** | −0.2992** |
| | (0.055) | (0.045) | (0.106) | (0.060) | (0.036) | (0.143) |
| Mom no high school | −0.0640 | −0.0033 | −0.1468** | −0.4756*** | 0.0102 | −0.5192*** |
| | (0.044) | (0.042) | (0.065) | (0.065) | (0.035) | (0.057) |
| Dad some college or more | 0.1717*** | 0.0498* | 0.2276** | −0.0833* | −0.0427* | −0.1389 |
| | (0.029) | (0.028) | (0.099) | (0.048) | (0.022) | (0.132) |
| Mom some college or more | −0.3458*** | −0.0198 | 0.2214** | 0.0624 | 0.0107 | −0.1386* |
| | (0.033) | (0.024) | (0.100) | (0.045) | (0.020) | (0.077) |
| One or more times moved | −0.1279*** | −0.0285** | 0.1378* | −0.0329** | 0.0350*** | 0.0239 |
| | (0.015) | (0.013) | (0.071) | (0.015) | (0.011) | (0.037) |
| Mom education missing | −0.0020 | 0.0006 | 0.0003 | −0.0069 | −0.0014 | −0.0113 |
| | (0.008) | (0.006) | (0.011) | (0.009) | (0.005) | (0.016) |
| Dad education missing | 0.0004 | 0.0026 | 0.0132 | 0.0037 | −0.0044 | 0.0013 |
| | (0.008) | (0.006) | (0.019) | (0.009) | (0.005) | (0.009) |
| $IV_g$ | | 0.0054*** | | | 0.0073*** | |
| | | (0.001) | | | (0.001) | |
| Family Church participation | | −0.0323** | | | 0.0842*** | |
| | | (0.016) | | | (0.018) | |
| Constant term | −2.6870*** | 4.6315*** | 0.1331*** | −3.1291*** | 3.9790*** | −0.0724 |
| | (0.858) | (0.600) | (0.036) | (0.816) | (0.534) | (0.054) |
| Number of observations | 1590 | 1590 | 1590 | 1547 | 1547 | 1547 |
| Adj. *R*-squared | 0.9 | 0.89 | 0.74 | 0.91 | 0.87 | 0.85 |
| Montiel olea-pflueger *F*-statistic | | | 59.04 | | | 68.78 |
| *Montiel Olea-Pflueger critical values:* | | | | | | |
| 5% maximal IV relative bias | | | 28.04 | | | 26.34 |
| Hansen *J*-statistic | | | 1.55 | | | 1.92 |

Equation (5) estimates. Standard errors are in parentheses. Second stage standard errors are based on 450 bootstrap replications. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. The observed class group reporting rate is used as an estimator of the expected class group reporting rate. The estimated endogenous group effect [in brackets] is evaluated at the sample mean.

**Table 3c:** Endogenous and exogenous class-level group effects on non-school offence reporting.

| **Dependent variable:** | **Violence in the community** | | | **Theft in the community** | | |
|---|---|---|---|---|---|---|
| **Estimated class group fixed effect** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** |
| | | **IV estimation** | | | **IV estimation** | |
| | **OLS** | **First stage** | **Second stage** | **OLS** | **First stage** | **Second stage** |
| Expected class reporting rate | 3.1497*** | | 1.8188*** | 3.3758*** | | 1.9954*** |
| | (0.033) | | (0.114) | (0.035) | | (0.043) |
| | | | [0.49] | | | [0.51] |
| *Class group variables:* | | | | | | |
| Male student proportion | 0.2143*** | −0.1401*** | −0.0889** | 0.2552*** | −0.1532*** | −0.0676* |
| | (0.032) | (0.025) | (0.044) | (0.023) | (0.020) | (0.040) |
| Class average age | 0.1226 | −0.3948*** | −0.0672*** | 0.9986*** | 0.6036*** | −0.0427* |
| | (0.152) | (0.115) | (0.014) | (0.148) | (0.113) | (0.023) |
| Average age squared | 0.0008 | −0.0132*** | −0.0053*** | −0.0332*** | −0.0282*** | −0.0038*** |
| | (0.006) | (0.005) | (0.001) | (0.006) | (0.005) | (0.001) |
| Black student proportion | −0.0168 | 0.2612*** | −0.2644** | 0.5242*** | −0.0251 | −0.5983*** |
| | (0.038) | (0.040) | (0.104) | (0.035) | (0.033) | (0.094) |
| Hispanic student proportion | 0.0896*** | 0.0225 | −0.1128* | 0.0940*** | −0.0891*** | −0.0204 |
| | (0.018) | (0.021) | (0.063) | (0.017) | (0.018) | (0.045) |
| Other non-white proportion | −0.1350*** | −0.0827*** | −0.2144*** | 0.1562*** | −0.1584*** | 0.0086 |
| | (0.032) | (0.032) | (0.073) | (0.035) | (0.032) | (0.085) |
| *Class proportion from/with:* | | | | | | |
| Single parent household | 0.3944*** | −0.2085*** | 0.0562 | 0.3052*** | −0.2869*** | −0.2445*** |
| | (0.047) | (0.038) | (0.094) | (0.047) | (0.037) | (0.053) |
| Dad no high school | −0.0013 | −0.0103 | −0.0371 | −0.1323** | −0.2341*** | −0.3669*** |
| | (0.048) | (0.057) | (0.260) | (0.057) | (0.050) | (0.098) |
| Mom no high school | 0.3920*** | −0.2062*** | −0.2256** | 0.2408*** | −0.0866 | −0.1530 |
| | (0.052) | (0.049) | (0.100) | (0.047) | (0.055) | (0.138) |
| Dad some college or more | 0.0218 | 0.2066*** | 0.2467** | −0.0484 | 0.0982*** | 0.0465 |
| | (0.036) | (0.034) | (0.118) | (0.035) | (0.028) | (0.192) |
| Mom some college or more | −0.2237*** | 0.0306 | 0.1439** | −0.1943*** | 0.1095*** | 0.0083 |
| | (0.036) | (0.033) | (0.071) | (0.034) | (0.029) | (0.077) |
| One or more times moved | −0.0926*** | −0.1240*** | −0.2567*** | −0.0642*** | −0.0487*** | −0.2238*** |
| | (0.020) | (0.016) | (0.034) | (0.015) | (0.014) | (0.028) |
| Mom education missing | −0.0082 | 0.0001 | −0.0058 | −0.0096 | −0.0006 | −0.0116 |
| | (0.009) | (0.007) | (0.010) | (0.010) | (0.006) | (0.008) |
| Dad education missing | −0.0006 | 0.0009 | 0.0032 | 0.0003 | 0.0012 | 0.0028 |
| | (0.010) | (0.008) | (0.013) | (0.010) | (0.007) | (0.012) |
| $IV_g$ | | 0.0331*** | | | 0.0258*** | |
| | | (0.004) | | | (0.002) | |
| Family Church participation | | 0.0134** | | | −0.0387** | |
| | | (0.003) | | | (0.016) | |
| Constant term | −2.4694*** | 3.1988*** | −0.3714*** | −7.6225*** | −2.7110*** | 0.1279*** |
| | (0.943) | (0.705) | (0.037) | (0.909) | (0.698) | (0.020) |

**Table 3c:** (continued)

| Dependent variable: Estimated class group fixed effect | Violence in the community | | | Theft in the community | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | IV estimation | | | IV estimation | | |
| | OLS | First stage | Second stage | OLS | First stage | Second stage |
| Number of observations | 1540 | 1540 | 1540 | 1580 | 1580 | 1580 |
| Adj. *R*-squared | 0.93 | 0.88 | 0.72 | 0.91 | 0.87 | 0.84 |
| Montiel olea-pflueger *F*-statistic | | | 113.07 | | | 62.33 |
| *Montiel Olea-Pflueger critical values:* | | | | | | |
| 5% maximal IV relative bias | | | 26.37 | | | 25.74 |
| Hansen *J*-statistic | | | 0.56 | | | 1.07 |

Equation (5) estimates. Standard errors are in parentheses. Second stage standard errors are based on 450 bootstrap replications. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. The observed class group reporting rate is used as an estimator of the expected class group reporting rate. The estimated endogenous group effect [in brackets] is evaluated at the sample mean.

**Table 4a:** Endogenous and exogenous school-level group effects on school violence/bullying reporting.

| Dependent variable: Estimated class group fixed effect | Violence/bullying at school | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| | IV estimation | | |
| | OLS | First stage | Second stage |
| Expected class reporting rate | 3.7659*** | | 2.0001*** |
| | (0.001) | | (0.258) |
| | | | [0.59] |
| *Class group variables:* | | | |
| Male student proportion | 0.178*** | −0.161*** | 0.0367 |
| | (0.022) | (0.022) | (0.139) |
| Class average age | 1.190*** | −0.129 | −0.0129 |
| | (0.116) | (0.104) | (0.020) |
| Average age squared | −0.0431*** | 0.00204 | −0.002** |
| | (0.005) | (0.004) | (0.001) |
| Black student proportion | −0.366*** | −0.00903 | −0.374*** |
| | (0.031) | (0.035) | (0.098) |
| Hispanic student proportion | −0.0901*** | −0.0678*** | −0.156** |
| | (0.014) | (0.016) | (0.067) |
| Other non-white proportion | −0.0433 | −0.0270 | −0.111 |
| | (0.032) | (0.029) | (0.118) |

**Table 4a:** (continued)

| **Dependent variable: Estimated class group fixed effect** | **Violence/bullying at school** | | |
|---|---|---|---|
| | **(1)** | **(2)** | **(3)** |
| | | **IV estimation** | |
| | **OLS** | **First stage** | **Second stage** |
| *Class proportion from/with:* | | | |
| Single parent household | 0.198*** | −0.0106 | −0.110** |
| | (0.043) | (0.039) | (0.056) |
| Dad no high school | 0.335*** | 0.118** | −0.784*** |
| | (0.049) | (0.053) | (0.174) |
| Mom no high school | 0.297*** | −0.339*** | −0.137*** |
| | (0.054) | (0.045) | (0.042) |
| Dad some college or more | 0.0628* | 0.0194 | 0.0745 |
| | (0.033) | (0.027) | (0.060) |
| Mom some college or more | −0.0287 | 0.0218 | 0.0172 |
| | (0.028) | (0.024) | (0.050) |
| One or more times moved | −0.0142 | 0.0169 | 0.0369 |
| | (0.015) | (0.016) | (0.029) |
| Mom education missing | −0.00914 | −0.00250 | −0.0142 |
| | (0.008) | (0.006) | (0.070) |
| Dad education missing | 0.00268 | 0.00528 | 0.0136 |
| | (0.009) | (0.007) | (0.050) |
| $IV_g$ | | −0.0204*** | |
| | | (0.003) | |
| Family Church participation | | 0.0816*** | |
| | | (0.009) | |
| Constant term | −8.420*** | 1.580** | 0.0094 |
| | (0.721) | (0.652) | (0.046) |
| Number of observations | 1565 | 1565 | 1565 |
| Adj. *R*-squared | 0.91 | 0.87 | 0.85 |
| Montiel olea-pflueger *F*-statistic | | | 60.97 |
| *Montiel Olea-Pflueger critical values:* | | | |
| 5% maximal IV relative bias | | | 30.74 |
| Hansen *J*-statistic | | | 2.14 |

Equation (5) estimates. Standard errors are in parentheses. Second stage standard errors are based on 450 bootstrap replications. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. The observed class group reporting rate is used as an estimator of the expected class group reporting rate. The estimated endogenous group effect [in brackets] is evaluated at the sample mean.

**Table 4b:** Endogenous and exogenous school-level group effects on school offence reporting.

| **Dependent variable: estimated class group fixed effect** | **Theft at school** | | | **Cheating at school** | | |
|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** |
| | | **IV estimation** | | | **IV estimation** | |
| | **OLS** | **First stage** | **Second stage** | **OLS** | **First stage** | **Second stage** |
| Expected class reporting rate | 4.2719*** | | 2.7948*** | 3.8078*** | | 2.6130*** |
| | (0.014) | | (0.088) | (0.236) | | (0.012) |
| | | | [0.49] | | | [0.60] |
| *Class group variables:* | | | | | | |
| Male student proportion | 0.180*** | 0.0588*** | 0.372*** | 0.225*** | −0.126*** | 0.0478 |
| | (0.028) | (0.021) | (0.123) | (0.026) | (0.016) | (0.066) |
| Class average age | 0.477*** | −0.652*** | −0.0719*** | 0.321** | −0.542*** | 0.0282 |
| | (0.126) | (0.096) | (0.023) | (0.128) | (0.086) | (0.017) |
| Average age squared | −0.0106** | 0.0236*** | 0.00556*** | −0.0106** | 0.0196*** | −0.00150 |
| | (0.005) | (0.004) | (0.002) | (0.005) | (0.003) | (0.001) |
| Black student proportion | 0.0340 | 0.116*** | −0.0619** | −0.465*** | 0.155*** | 0.345*** |
| | (0.029) | (0.026) | (0.029) | (0.034) | (0.022) | (0.054) |
| Hispanic student proportion | 0.112*** | −0.0426*** | −0.0785** | −0.0963*** | 0.0718*** | 0.0773* |
| | (0.016) | (0.015) | (0.034) | (0.016) | (0.011) | (0.046) |
| Other non-white proportion | −0.0587** | −0.0367 | −0.193** | −0.377*** | −0.0202 | −0.455 |
| | (0.030) | (0.025) | (0.093) | (0.035) | (0.018) | (0.409) |
| *Class proportion from/with:* | | | | | | |
| Single parent household | 0.319*** | −0.279*** | −0.460** | 0.00484 | −0.0965*** | −0.151*** |
| | (0.039) | (0.036) | (0.199) | (0.039) | (0.028) | (0.044) |
| Dad no high school | 0.107** | −0.0422 | −0.458*** | −0.241*** | −0.156*** | −0.282** |
| | (0.053) | (0.045) | (0.043) | (0.058) | (0.034) | (0.116) |
| Mom no high school | −0.0464 | −0.00382 | −0.218 | 0.501*** | 0.00364 | −0.516*** |
| | (0.045) | (0.043) | (0.172) | (0.062) | (0.034) | (0.043) |
| Dad some college or more | 0.192*** | 0.0449 | 0.296*** | −0.0964** | −0.0286 | 0.128 |
| | (0.030) | (0.028) | (0.059) | (0.046) | (0.021) | (0.132) |
| Mom some college or more | −0.382*** | −0.0279 | 0.282*** | 0.0512 | 0.0353* | −0.105* |
| | (0.032) | (0.023) | (0.097) | (0.043) | (0.020) | (0.061) |
| One or more times moved | −0.0874*** | 0.0253** | 0.1781* | −0.0400*** | 0.0283** | 0.0913 |
| | (0.014) | (0.013) | (0.292) | (0.015) | (0.011) | (0.053) |
| Mom education missing | 0.00118 | 0.0013 | 0.0055 | −0.0063 | −0.0020 | −0.0100 |
| | (0.007) | (0.006) | (0.011) | (0.009) | (0.005) | (0.05) |
| Dad education missing | −0.0012 | 0.0031 | 0.0130 | 0.00630 | −0.0026 | 0.0050 |
| | (0.007) | (0.006) | (0.019) | (0.009) | (0.005) | (0.008) |
| $IV_g$ | | 0.0051*** | | | 0.0088*** | |
| | | (0.001) | | | (0.001) | |
| Family Church participation | | 0.1668*** | | | 0.1935*** | |
| | | (0.024) | | | (0.016) | |
| Constant term | −1.0680*** | −2.2429*** | −0.1800*** | −0.2956*** | −1.4604*** | −1.2086*** |
| | (0.203) | (0.210) | (0.023) | (0.114) | (0.153) | (0.055) |

**Table 4b:** (continued)

| Dependent variable: estimated class group fixed effect | Theft at school | | | Cheating at school | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | | IV estimation | | | IV estimation | |
| | OLS | First stage | Second stage | OLS | First stage | Second stage |
| Number of observations | 1590 | 1590 | 1590 | 1547 | 1547 | 1547 |
| Adj. *R*-squared | 0.85 | 0.87 | 0.73 | 0.88 | 0.89 | 0.89 |
| Montiel olea-pflueger *F*-statistic | | | 50.42 | | | 96.65 |
| *Montiel Olea-Pflueger critical values:* | | | | | | |
| 5% maximal IV relative bias | | | 30.3 | | | 30.74 |
| Hansen *J*-statistic | | | 1.26 | | | 1.07 |

Equation (5) estimates. Standard errors are in parentheses. Second stage standard errors are based on 450 bootstrap replications. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. The observed class group reporting rate is used as an estimator of the expected class group reporting rate. The estimated endogenous group effect [in brackets] is evaluated at the sample mean.

**Table 4c:** Endogenous and exogenous school-level group effects on non-school offence reporting.

| Dependent variable: Estimated class group fixed effect | Violence in the community | | | Theft in the community | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | | IV estimation | | | IV estimation | |
| | OLS | First stage | Second stage | OLS | First stage | Second stage |
| Expected class reporting rate | 3.9069*** | | 1.9078*** | 3.1968*** | | 2.1605*** |
| | (0.048) | | (0.092) | (0.018) | | (0.123) |
| | | | [0.53] | | | [0.54] |
| *Class group variables:* | | | | | | |
| Male student proportion | 0.234*** | −0.141*** | −0.942*** | 0.240*** | −0.148*** | −0.0529* |
| | (0.027) | (0.025) | (0.065) | (0.022) | (0.019) | (0.031) |
| Class average age | 0.396*** | −0.389*** | −0.0965*** | 1.135*** | 0.587*** | −0.0616*** |
| | (0.133) | (0.113) | (0.008) | (0.143) | (0.111) | (0.017) |
| Average age squared | −0.00972* | 0.0129*** | −0.0012*** | −0.0387*** | −0.0274*** | 0.0051*** |
| | (0.005) | (0.005) | (0.000) | (0.006) | (0.004) | (0.001) |
| Black student proportion | 0.00848 | 0.271*** | 0.0751 | 0.566*** | −0.0381 | −0.482*** |
| | (0.034) | (0.039) | (0.072) | (0.033) | (0.032) | (0.086) |

**Table 4c:** (continued)

| **Dependent variable:** | **Violence in the community** | | | **Theft in the community** | | |
|---|---|---|---|---|---|---|
| **Estimated class group fixed effect** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** |
| | | **IV estimation** | | | **IV estimation** | |
| | **OLS** | **First stage** | **Second stage** | **OLS** | **First stage** | **Second stage** |
| Hispanic student proportion | 0.0847*** | 0.0233 | −0.282*** | 0.0797*** | −0.0903*** | −0.0095 |
| | (0.017) | (0.021) | (0.017) | (0.017) | (0.018) | (0.036) |
| Other non-white proportion | −0.149*** | −0.0803** | −0.490*** | 0.162*** | −0.156*** | −0.0532 |
| | (0.029) | (0.032) | (0.032) | (0.032) | (0.031) | (0.081) |
| *Class proportion from/with:* | | | | | | |
| Single parent household | 0.340*** | −0.214*** | −1.692*** | 0.253*** | −0.273*** | −0.236*** |
| | (0.042) | (0.038) | (0.267) | (0.046) | (0.037) | (0.054) |
| Dad no high school | 0.0351 | −0.0154 | −1.422*** | −0.184*** | −0.231*** | −0.173** |
| | (0.045) | (0.057) | (0.134) | (0.057) | (0.051) | (0.069) |
| Mom no high school | 0.413*** | −0.203*** | −1.461*** | 0.236*** | −0.0788 | −0.0594 |
| | (0.048) | (0.049) | (0.089) | (0.048) | (0.055) | (0.128) |
| Dad some college or more | 0.0506 | 0.205*** | 0.825*** | −0.0274 | 0.0882*** | 0.108 |
| | (0.034) | (0.033) | (0.118) | (0.034) | (0.028) | (0.170) |
| Mom some college or more | −0.223*** | 0.0387 | 0.279** | −0.210*** | 0.103*** | −0.133 |
| | (0.034) | (0.033) | (0.111) | (0.032) | (0.028) | (0.095) |
| One or more times moved | −0.0603*** | −0.127*** | −0.1411*** | −0.0663*** | −0.0473*** | −0.1265*** |
| | (0.017) | (0.016) | (0.036) | (0.014) | (0.014) | (0.041) |
| Mom education missing | −0.0073 | −0.0001 | −0.0007 | −0.0098 | −0.0004 | −0.0098 |
| | (0.008) | (0.007) | (0.001) | (0.009) | (0.006) | (0.009) |
| Dad education missing | 0.0004 | 0.0021 | 0.0007 | 0.0028 | 0.0012 | 0.0061 |
| | (0.009) | (0.008) | (0.001) | (0.010) | (0.007) | (0.010) |
| $IV_g$ | | 0.0348*** | | | 0.0263*** | |
| | | (0.003) | | | (0.002) | |
| Family Church participation | | 0.0341*** | | | 0.7085*** | |
| | | (0.009) | | | (0.031) | |
| Constant term | −1.6840*** | −0.2024*** | −0.6142*** | −1.1674*** | −1.8773*** | 0.0694** |
| | (0.157) | (0.055) | (0.033) | (0.126) | (0.193) | (0.032) |
| Number of observations | 1540 | 1540 | 1540 | 1580 | 1580 | 1580 |
| Adj. *R*-squared | 0.91 | 0.92 | 0.73 | 0.91 | 0.89 | 0.88 |
| Montiel olea-pflueger *F*-statistic | | | 70.33 | | | 91.46 |
| *Montiel Olea-Pflueger critical values:* | | | | | | |
| 5% maximal IV relative bias | | | 32.49 | | | 31.68 |
| Hansen *J*-statistic | | | 1.71 | | | 1.78 |

Equation (5) estimates. Standard errors are in parentheses. Second stage standard errors are based on 450 bootstrap replications. Significance levels: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. The observed class group reporting rate is used as an estimator of the expected class group reporting rate. The estimated endogenous group effect [in brackets] is evaluated at the sample mean.

is 0.38. This estimate indicates that for every 2.6 classmates who decide to report a witnessed incident of bullying, one additional student will also choose to report. The magnitudes of estimated class-level peer effects in Tables 3a–c vary according to crime types as expected. The smallest peer effect appears for school theft (0.25) followed by cheating (0.41) and community violence (0.49) and theft (0.51). With respect to peer influence on crime reporting, the general pattern of the results in Tables 3a–c suggests students more readily follow peers' behavior when it comes to reporting school cheating and/or community crimes as opposed to school bullying and theft. This is consistent with literature studying the effects of adolescent bystanders' outcome expectancies on their reporting decisions (Verlinden, Hersen, and Thomas 2000). When adolescents were asked why they failed to notify teachers or school administrators about incidents involving school violence or property (e.g., vandalism, theft), they cited a variety of reasons for maintaining their silence including: they were afraid of personal or victims' retribution (Mulvey and Cauffman 2001); did not know where to go to safely or confidentially ask for assistance (Rosenfeld, Jacobs, and Wright 2003), or feared that sharing information might reflect negatively on them or result in unfair social or disciplinary repercussions (Ajzen 2002). By comparison, adolescents also indicated they were more likely to report a crime if they knew, or believed, they could tell a parent, teacher, or community authority who could intervene on their behalf and not have to be actively involved (Wells et al. 2006), such as crimes witnessed in public places perpetrated by individuals with no social ties to the witnesses (Stueve et al. 2006).

As in Yarnell et al. (2014), Graham (2008), Fortin and Yazbeck (2015) and others, presence of endogenous peer effects implies existence of a social multiplier. A social multiplier can be a desirable aspect for a social policy or intervention, as this multiplier can amplify the positive behavioral effects of the intervention (Becker and Murphy 2000; Glaeser, Sacerdote, and Scheinkman 2003). In the present context, the estimated mean endogenous peer effect (in column 3 of Table 3a) for school bullying reporting implies a social multiplier of $1.61 = 1/(1 - 0.38)$. This tells us that, all else equal, if an exogenous school policy increases the class bullying reporting rate by one percentage point in the absence of endogenous social interactions, then this same policy would increase class bullying reporting by 1.6% points in the presence of endogenous social interactions. Overall, this policy effect is magnified because the endogenous interactions among classmates produce a spillover in which the effect of the school policy on individual students is reinforced by the effect of classmates upon each other. This peer effect amplifies the policy outcome at the group level—a resulting social multiplier whereby observed aggregate coefficients exceed individual coefficients (e.g., Katz, Kling, and Leibman 2001; Ludwig, Hirschfeld, and Duncan 2001).

Based on estimates in Tables 3b and c columns 3 and 6, implied social multipliers associated with reporting of school theft and cheating are respectively 1.33 and 1.7, and reporting of community violence and theft are respectively 1.96 and 2.04. Statistically, multipliers associated with community crime reporting differ significantly from multipliers associated with school crime reporting with $p$-values < 0.05, suggesting classroom-level peer influences on students' own crime reporting intentions are stronger for crimes witnessed in the community versus crimes witnessed at school. As mentioned above, these disparities might reflect, in part, students' differential outcome expectations of reporting (and thus differential intentions to report) witnessed crimes of distinct types with different perpetrators, locations, and social contexts. However, disparities may also reflect an aggregation or "scope" effect, described in the literature as an increase in the social multiplier that results from an increase (or widening) of the size/scope of the social group/network (Glaeser, Sacerdote, and Scheinkman 2003). Presumably, the larger the group/network, the larger will be the social multiplier because the scope of potential social influences is expanded. While the data and estimators employed in this study cannot speak to the exact mechanisms linking group size to social influence, they suggest a moderate, positive aggregation effect as defined by an increase, all else equal, in sample group sizes. In Tables 4a–c for example, upon replacing class fixed effects with school fixed effects and reestimating expressions (4) and (5), results (similar in most regards to Tables 3a–c figures) produce social multipliers of respectively 2.44, 1.96, and 2.5 for reporting of school bullying, theft, and cheating, and 2.13 and 2.17 for reporting of community violence and theft. Notably, for all crime types, estimated multipliers emerged as greater in magnitude and uniformity (i.e., all multiplier differences exhibit $p$-values > 0.1). While not directly comparable, estimated multipliers reported in Tables 3–4 are similar in size to other studies in the social interactions literature (Carrell, Malmstrom, and West 2008; Galbiati and Zanella 2012; Graham 2008; Lucifora and Tonello 2012), which found multipliers between 2 and 3 in magnitude. Carrell, Malmstrom, and West (2008) and Lucifora and Tonello (2012) estimated social multipliers between 2 and 2.5 associated with students' choices to cheat. Galbiati and Zanella (2012) found multipliers associated with tax evasion in the range of 3.0. Graham (2008), examining peer quality on kindergarten achievement, found social multipliers—based on the total peer effect (exogenous plus endogenous effects) ranging from 1.9 for math to 2.4 for reading.

The remaining rows in Tables 3–4 columns 3 and 6 display coefficient estimates for mean group characteristics, holding constant expected class and school reporting rates. These "exogenous group effects" capture observed differences in individual reporting intentions due to differences in group-wide characteristics, i.e., contextual or reference group characteristics. Differences in reference group characteristics identify basic contextual influences on individuals' observed choices

or produced outcomes. As expected, exogenous group effects estimates generally follow individual reporting intentions in Table 2. In Tables 3–4, sample groups (class or school) comprised of higher proportions of older or male students are less likely to report witnessed crimes at school and in the community. Groups with higher proportions of Black, Hispanic, or Other nonwhite students are less likely to report school and community bullying/violence and theft but are more likely to report school cheating. In addition, groups with higher proportions of students who have relocated residence are more likely to report school theft and cheating, but less likely report community violence and theft. Lastly, groups with higher (lower) proportions of students with educated (less educated) parents are more likely to report (not report) most of the crime types.

## 4.1 Mechanisms Driving Peer Effects on Reporting Intentions

Results in Tables 3–4 imply a strong amplifying role played by social interactions within students in the classroom. A less studied area is the extent at which different mechanisms underlying adolescents' expectations about the attitudes of others can lead to different multiplier effects of school or other policies intended to increase positive youth bystander behavior. To the extent that informal mechanisms (or complementarities) are stronger for a given level of youth crime reporting, these mechanisms will increase effectiveness of a given policy (Van der Weele 2012) by way of a larger social multiplier effect. This means that a relatively small policy-induced increase in youth reporting could lead to a larger overall group increase in reporting (Funk 2006; Traxler 2010). Many kinds of mechanisms have a pervasive influence on social interactions (e.g., Patacchini and Zenou 2011). Examples include conformism, stigmatization, and, in the present context, learning about shared beliefs and attitudes supporting positive bystander behavior. The literature on youth and community networks contends that adolescent involvement with institutional and social networks within their communities (e.g., afterschool programs, recreation centers, community organizations) is related to many positive youth outcomes (Durlak and Weissberg 2007; Mahoney, Harris, and Eccles 2006) including utilizing more defending bystander responses (Saarento, Garandeau, and Salmivalli 2015), and increased likelihood of reporting school (O'Brennan, Wassdorp, and Bradshaw 2014) and community (Hymel et al. 2015) crimes. Adolescents who participate in afterschool programs develop more positive, pro-social connections to their peers and to program adults (Coleman 1987) resulting in increased conformity to social and behavioral norms (Coleman 1987; Hirschi 1971; Lamborn and Nguyen 2004), and

are less likely to be affiliated with peers involved in delinquent activities (Dodge, Dishion, and Lansford 2006).

Given the above literature results, information from the TCC/CW data can be used to examine whether peer influence on reporting intentions, measured by the social multiplier estimates in Tables 3a–c, is in fact greater among sample students with stronger social ties as measured by participation school or community activities or students' stated level of conformity with the views of their friends. The TCC/CW survey measured students' participation in extracurricular activities with the question:

> *"During the past year, were you involved in school or community activities or athletics such as scouts, clubs, athletic leagues, community centers, or religious activities?"*

where 1 indicated yes, and 0 no. Sample responses ranged from 0 (no participation) to 4 (highest participation) with a mean of 1.8 and standard deviation of 1.5. Students' stated level of peer conformity is based on the question:

> *"If things I do upset other people, it's their problem not mine."*

using the five point Likert scale (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree), indicating higher non-conformity with a higher number response. Student responses ranged from 1 (strong conformity) to 5 (strong non-conformity) with a mean of 2.7 and a standard deviation of 1.1.

Figures 2 and 3 plot mean social multipliers (based on Table 3 specifications) by sample student responses (i.e., 1–4 or 1–5) pertaining to extracurricular activities and friend conformity. Social multipliers for each response-based student subsample are calculated as described above in this section using endogenous peer effects based on means of observed class reporting rates for the respective student subsamples, i.e., using $\widehat{\theta}_C\widehat{E}(\overline{y}_L)$, where $C$ is crime type, and $\overline{y}_L$ is the mean observed class reporting rate for the student subsample with participation level (or Likert response), $L$. In Figure 2, subsample mean social multipliers for community and school crime reporting increase as students' extracurricular activities increase, supporting the hypothesis that peer effects, and thus social multipliers, are higher for students who participate more in extracurricular activities. This suggests that outside school activities with peers are considered complementary to the social links that are useful to support crime reporting intentions. Moreover, this complementarity appears particularly supportive of students' intentions to report crimes witnessed in the community. For example, over Figure 2's 0–4 participation range, mean multipliers associated with community crime reporting increase at a rate nearly double that of multipliers associated with school crime reporting. Along similar lines, Figure 3 supports the hypothesis that higher levels of student

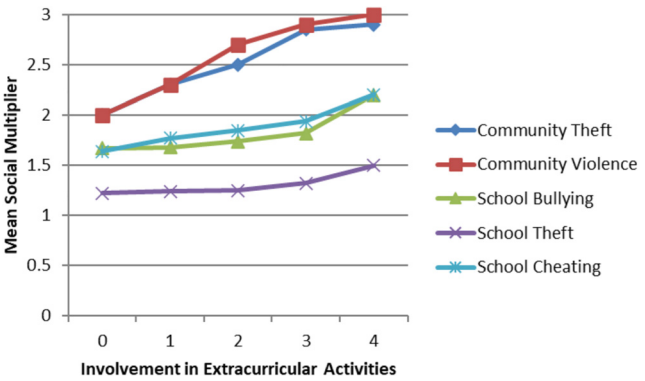


**Figure 2:** Mean social multipliers by extracurricular activity level.

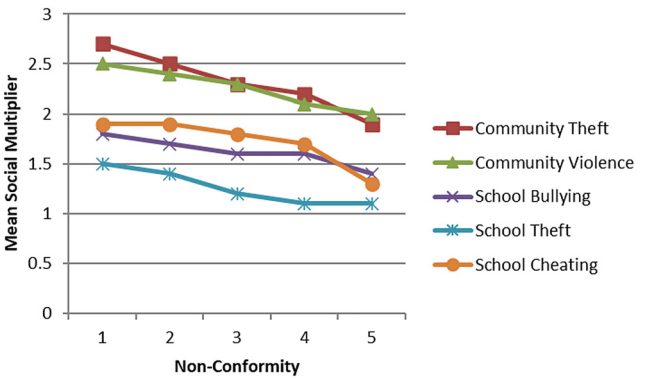


**Figure 3:** Mean social multipliers by conformity level.

conformity imply stronger peer ties and thus higher social multipliers. Figure 3 lends support to studies like Johnson et al. (2013) which find school crime and safety programs that focus more holistically on developing stronger more supportive peer relationships result in increased proactive bystander responses to bullying as well as other forms of peer misconduct.

# 5 Conclusions

This paper used a two-step method to identify and estimate endogenous and exogenous peer group effects on adolescents' crime reporting intentions in

accordance with the Manski (1993) and Brock and Durlauf (2001a, 2001b) discrete choice models with unobserved group variables. Expected behaviors of peers within a given social group are assumed heterogeneous and determined by rational expectations. Thus, individual choice functions take account of expected peer behaviors conditional on observed individual and group characteristics. Upon specifying adolescent peer groups at the class and school levels, binary probit models were first estimated with group fixed-effects, and then a data-augmented form of the Shang and Lee (2011) instrumental variables estimator was applied to consistently estimate endogenous and exogenous peer group effects via the group fixed-effects.

The analysis examined individual crime reporting intentions of 1540–1590 junior high school teenagers from 98 classes within 15 U.S. schools using the *National Evaluation of the Teens, Crime, and the Community/Community Works* (TCC/CW) pre-curriculum survey. Results indicated that student reporting rates of school bullying, theft, and cheating, as well as community violence and theft, revealed highly significant, positive yet variable endogenous peer effects across the crime types. In addition, numerous exogenous group/contextual variables emerged as significant determinants of adolescents' crime reporting intentions. At the class group level, estimated endogenous peer effects yielded social multipliers ranged from 1.33 to 1.7 for school offence reporting and 1.96 to 2.04 for community offence reporting. When sample groups were aggregated at the school level, estimated social multipliers increased; school-level group multipliers ranged from 1.96 to 2.5 for school offence reporting and 2.13 to 2.17 for community offence reporting.

Evidence of the existence of social multipliers on adolescents' crime reporting intentions is important since these effects can amplify, or temper effectiveness of school or community policies aimed at encouraging students' proactive responses to witnessed crimes or misbehavior. The foregoing results also indicate that sample students who are connected to appropriately structured community resources providing extracurricular recreational, community, and faith-based experiences are more likely to be engaged with peers who share positive goals and objectives, and thus exhibit greater social ties and social multipliers. This study contributes to the literature by finding that youth perceptions of peers' bystander behavior, connectedness, and individual and peer group characteristics are all associated with bystander behavior. From a policy perspective, school environments where students perceive that peers and school adults will intervene and thus positively influence their own perceived benefits of intervening, may play a significant role in changing students' normative expectations as well as their feelings of self-efficacy about reducing crime in and around their schools.

# References

Ajzen, I. 2002. "The Theory of Planned Behavior." *Organizational Behavior and Human Decision Processes* 50: 179–211.

Ammermueller, A., and J.-S. Pischke. 2009. "Peer Effects in European Primary Schools: Evidence from the Progress in International Reading Literacy Study." *Journal of Labor Economics* 27 (3): 315–47.

Andrews, I., and J. H. Stock. 2018. "Weak Instruments and what to Do about Them." In *NBER Summer Institute Methods Lectures*. Boston, MA: Harvard University.

Barrera-Osorio, F., M. Bertrand, L. L Linden, and F. Perez-Calle. 2011. "Improving the Design of Conditional Transfer Programs: Evidence from a Randomized Education Experiment in Colombia." *American Economic Journal: Applied Economics* 3 (2): 167–95.

Becker, G. S. 1968. "Crime and Punishment: An Economic Approach." *Journal of Political Economy* 76 (2): 169–217.

Becker, G., and K. Murphy. 2000. *Social Economics*. Cambridge, MA: Harvard University Press.

Bersani, B. E., and A. R. Piquero. 2017. "Examining Systematic Crime Reporting Bias across Three Immigrant Generations: Prevalence, Trends, and Divergence in Self-Reported and Official Reported Arrests." *Journal of Quantitative Criminology* 33: 835–57.

Blume, L. E., W. A. Brock, S. N. Durlauf, and R. Jayaraman. 2013. *Linear Social Interactions Models*. Working Paper no. w19212. Cambridge, MA: National Bureau of Economic Research.

Brank, E. M., J. L. Woolard, V. E. Brown, M. Fondacaro, J. L. Luescher, R. G. Chinn, and S. A. Miller. 2007. "Will They Tell? Weapons Reporting by Middle-School Youth." *Youth Violence and Juvenile Justice* 5: 125–46.

Brock, W. A., and S. N. Durlauf. 2001a. "Interactions-Based Models,." In *Handbook of Econometrics*, Vol. 5, edited by J. Heckman, and E. Leamer, 3463–568. Amsterdam: North Holland.

Brock, W. A., and S. N. Durlauf. 2001b. "Discrete Choice with Social Interactions." *The Review of Economic Studies* 68: 235–60.

Boozer, M., and S. E. Cacciola. 2001. *Inside the Black Box of Project STAR: Estimation of Peer Effects using Experimental Data*. Discussion Paper no. 832. New Haven, CT: Economic Growth Center, Yale University.

Bramoullé, T., H. Djebbari, and B. Fortin. 2009. "Identification of Peer Effects through Social Networks." *Journal of Econometrics* 150 (1): 41–55.

Card, D., and L. Giuliano. 2013. "Peer Effects and Multiple Equilibria in the Risky Behavior of Friends." *The Review of Economics and Statistics* 95 (4): 1130–49.

Carrell, S. E., F. V. Malmstrom, and J. E. West. 2008. "Peer Effects in Academic Cheating." *Journal of Human Resources* 43 (1): 173–207.

Coleman, J. S. 1987. "Families and Schools." *Educational Researcher* 16 (6): 32–8.

Connell, N. M. 2018. "Fear of Crime at School: Understanding Student Perceptions of Safety as Function of Historical Context." *Youth Violence and Juvenile Justice* 16: 124–36.

Currie, C. E., R. A. Elton, J. Todd, and S. Platt. 1997. "Indicators of Socioeconomic Status for Adolescents: The WHO Health Behavior in School-Aged Children Survey." *Health Education Research* 12: 385–97.

Dodge, K., T. Dishion, and J. Lansford. 2006. *Deviant Peer Influences in Programs for Youth: Problems and Solutions*. New York, NY: Guilford Press.

Durlak, J., and R. Weissberg. 2007. *The Impact of After-School Programs that Promote Personal and Social Skills*. Chicago, IL: Collaborative for Academic, Social and Emotional Learning.

Esbensen, F. A. 2009. *Final Report: Evaluation of the Teens, Crime and the Community and Community Works Program*. Washington, DC: U.S. Department of Justice, National Institute of Justice.

Esbensen, F. A. 2011. *Outcome Evaluation of the Teens, Crime, and the Community/ Community Works (TCC/CW) Training Program in Nine Cities across Four States, 2004–2005*. Ann Arbor, MI: Inter-University Consortium for Political and Social Research, https://doi.org/10.3886/ICPSR25865.

Fortin, B., and M. Yazbeck. 2015. "Peer Effects, Fast Food Consumption and Adolescent Weight Gain." *Journal of Health Economics* 42: 125–38.

Foster, G. 2006. "It's Not Your Peers, and It's Not Your Friends: Some Progress towards Understanding Educational Peer Effects." *Journal of Public Economics* 90 (8–9): 1455–75.

Funk, P. 2006. "Governmental Action, Social Norms, and Criminal Behavior." *Journal of Institutional and Theoretical Economics* 161 (3): 522–35.

Galbiati, R., and G. Zanella. 2012. "The Tax Evasion Social Multiplier: Evidence from Italy." *Journal of Public Economics* 96 (5): 485–94.

Gini, G., P. Albiero, B. Benelli, and G. Altoè. 2008. "Determinants of Adolescents' Active Defending and Passive Bystanding Behavior in Bullying." *Journal of Adolescence* 31: 93–105.

Glaeser, E. L., B. I. Sacerdote, and J. A. Scheinkman. 2003. "The Social Multiplier." *Journal of the European Economic Association* 1: 345–53.

Goudriaan, H., K. Wittebrood, and P. Nieuwbeerta. 2006. "Neighbourhood Characteristics and Reporting Crime." *British Journal of Criminology* 46: 719–42.

Graham, B. S. 2008. "Identifying Social Interactions through Conditional Variance Restrictions." *Econometrica* 76 (3): 643–60.

Hansen, L. P. 1982. "Large Sample Properties of Generalized Method of Moments Estimators." *Econometrica* 50 (4): 1029–54.

Heilbrun, A., D. Cornell, and T. Konold. 2018. "Authoritative School Climate and Suspension Rates in Middle Schools: Implications for Reducing the Racial Disparity in School Discipline." *Journal of School Violence* 17: 324–38.

Hirschi, T. 1971. *Causes of Delinquency*. Berkley, CA: University of California Press.

Hymel, S., R. McClure, M. Miller, E. Shumka, and J. Trach. 2015. "Addressing School Bullying: Insights from Theories of Group Processes." *Journal of Applied Developmental Psychology* 37 (1): 16–24.

Johnson, L. M., R. L. Simons, and R. D. Conger. 2004. "Criminal Justice System Involvement and Continuity of Youth Crime: A Longitudinal Analysis." *Youth & Society* 36: 3–29.

Johnson, S. L., T. E. Waasdorp, K. Debnam, and C. P. Bradshaw. 2013. "The Role of Bystander Perceptions and School Climate in Influencing Victims' Responses to Bullying: To Retaliate or Seek Support?" *Journal of Criminology* 2013: 1–10.

Katz, L., J. Kling, and J. Leibman. 2001. "Moving to Opportunity in Boston: Early Results of a Randomized Mobility Experiment." *Quarterly Journal of Economics* 116: 607–54.

Kutsyuruba, B., D. A. Klinger, and A. Hussain. 2015. "Relationships Among School Climate, School Safety, and Student Achievement and Well-Being: A Review of the Literature." *The Review of Education* 3: 103–35.

Lamborn, S. D., and D. T. Nguyen. 2004. "African American Adolescents' Perceptions of Family Interactions: Kinship Support, Parent-Child Relationships, and Teen Adjustment." *Journal of Youth and Adolescence* 33: 547–58.

Lee, L.-F., X. Liu, and X. Lin. 2010. "Specification and Estimation of Social Interaction Models with Network Structures." *The Econometrics Journal* 13 (2): 145–76.

Lin, X. 2010. "Identifying Peer Effects in Student Academic Achievement by Spatial Autoregressive Models with Group Unobservables." *Journal of Labor Economics* 28 (4): 825–60.

Lessne, D., and C. Yanez. 2016. *Student Reports of Bullying: Results from the 2015 School Crime Supplement to the National Crime Victimization Survey*. Washington, DC: National Center for Education Statistics.

Liu, X., E. Patacchini, and Y. Zenou. 2013. "Social Multiplier or Social Norms?" CEPR Discussion Paper no. DP9366, Available at SSRN: https://ssrn.com/abstract=2224291.

Lucifora, C., and M. Tonello. 2012. *Students' Cheating as a Social Interaction: Evidence from a Randomized Experiment in a National Evaluation Program*. IZA Discussion Papers, No. 6967. Bonn: Institute for the Study of Labor (IZA).

Ludwig, J., P. Hirschfeld, and G. Duncan. 2001. "Urban Poverty and Juvenile Crime: Evidence from a Randomized Housing-Mobility Experiment." *Quarterly Journal of Economics* 116: 665–79.

Lyle, D. S. 2007. "Estimating and Interpreting Peer and Role Model Effects from Randomly Assigned Social Groups at West Point." *The Review of Economics and Statistics* 89 (2): 289–99.

Mahoney, J. L., A. L. Harris, and J. S. Eccles. 2006. "Organized Activity Participation, Positive Youth Development, and the Over-Scheduling Hypothesis." *Social Policy Report* 20 (4): 1–32.

Manski, C. F. 1993. "Identification of Endogenous Social Effects: The Reflection Problem." *The Review of Economic Studies* 60: 531–42.

Menjívar, C., and C. L. Bejarano. 2004. "Latino Immigrants' Perceptions of Crime and Police Autorities in the United States: A Case Study from the Phoenix Metropolitan Area." *Ethnic and Racial Studies* 27: 120–48.

Mulvey, E. P., and E. Cauffman. 2001. "The Inherent Limits of Predicting School Violence." *American Psychologist* 56: 797–802.

O'Brennan, L. M., T. E. Wassdorp, and C. P. Bradshaw. 2014. "Strengthening Bullying Prevention through School Staff Connectedness." *Journal of Educational Psychology* 106: 870–80.

Olea, J. L. M., and C. Pflueger. 2013. "A Robust Test for Weak Instruments." *Journal of Business & Economic Statistics* 31 (3): 358–69.

Patacchini, E., and Y. Zenou. 2011. "Juvenile Delinquency and Conformism." *Journal of Law, Economics, and Organization* 28 (1): 1–31.

Pflueger, C. E., and S. Wang. 2015. "A Robust Test for Weak Instruments in Stata." *The Stata Journal* 15 (1): 216–25.

Rosenfeld, R., B. A. Jacobs, and R. Wright. 2003. "Snitching and the Code of the Street." *British Journal of Criminology* 43: 291–309.

Saarento, S., C. F. Garandeau, and C. Salmivalli. 2015. "Classroom- and School-Level Contributions to Bullying and Victimization: A Review." *Journal of Community & Applied Social Psychology* 25 (3): 204–18.

Sacerdote, B. 2011. "Peer Effects in Education: How Might They Work, How Big are They and How Much Do we Know Thus Far?" In *Handbook of the Economics of Education*, Vol. 3, 249–77. Amsterdam, Netherlands: Elsevier.

Schnebly, S. M. 2008. "The Influence of Community-Oriented Policing on Crime-Reporting Behavior." *Justice Quarterly* 25: 223–50.

Shang, Q. 2014. "Endogenous Neighborhood Effects on Welfare Participation." *Empirical Economics* 47: 639–67.

Shang, Q., and L.-F. Lee. 2011. "Two-Step Estimation of Endogenous and Exogenous Group Effects." *Econometric Reviews* 30: 173–207.

Sharp, R., A. Green, and J. Lewis. 2017. *Education and Social Control: A Study in Progressive Primary Education*. London, UK: Routledge.

Slocum, L. A., T. J. Taylor, B. T. Brick, and F.-A. Esbensen. 2010. "Neighborhood Structural Characteristics, Individual-Level Attitudes, and Youths' Crime Reporting Intentions." *Criminology* 48: 1063–100.

Soetevent, A. R., and P. Kooreman. 2007. "A Discrete-Choice Model with Social Interactions: With an Application to High School Teen Behavior." *Journal of Applied Econometrics* 22: 599–624.

Solis, C., E. L. Portillos, and R. K. Brunson. 2009. "Latino Youth's Experiences with and Perceptions of Involuntary Police Encounters." *The Annals of the American Academy of Political and Social Science* 623: 39–51.

Stueve, A., K. Dash, L. O'Donnell, P. Tehranifar, R. Wilson-Simmons, R. G. Slaby, and B. G. Link. 2006. "Rethinking the Bystander Role in School Violence Prevention." *Health Promotion Practice* 7 (1): 117–24.

Traxler, C. 2010. "Social Norms and Conditional Cooperative Taxpayers." *European Journal of Political Economy* 26: 89–103.

Triplett, R. A., I. Y. Sun, and R. R. Gainey. 2005. "Social Disorganization and the Ability and Willingness to Enact Control: A Preliminary Test." *Western Criminology Review* 6 (1): 89–103.

Van der Weele, J. 2012. "Beyond the State of Nature: Introducing Social Interactions in the Economic Model of Crime." *Review of Law & Economics* 8 (2): 401–31.

Verlinden, S., M. Hersen, and J. Thomas. 2000. "Risk Factors in School Shootings." *Clinical Psychology Review* 20: 3–56.

Warner, B. D. 2007. "Directly Intervene or Call the Authorities? A Study of Forms of Neighborhood Social Control within a Social Disorganization Framework." *Criminology* 45: 99–129.

Wells, W., J. A. Schafer, S. P. Varano, and T. Bynum. 2006. "Neighborhood Residents' Production of Order: The Effects of Collective Efficacy on Responses to Neighborhood Problems." *Crime & Delinquency* 52: 523–50.

Wood, L., J. Smith, K. Varjas, and J. Meyers. 2016. "Engaging Upstanders: Class-wide Approach to Promoting Positive Bystander Behavior." *School Psychology Forum* 10 (1): 66–77.

Yarnell, L. M., K. E. Pasch, H. S. Brown, C. L. Perry, and K. A. Komro. 2014. "Cross-Gender Social Normative Effects for Violence in Middle School: Do Girls Carry a Social Multiplier Effect for At-Risk Boys?" *Journal of Youth and Adolescence* 43 (9): 1465–85.

Yeung, R., and P. Nguyen-Hoang. 2016. "Endogenous Peer Effects: Fact or Fiction?" *Journal of Educational Research* 109: 37–49.

Zimmerman, D. J. 2003. "Peer Effects in Academic Outcomes: Evidence from a Natural Experiment." *The Review of Economics and Statistics* 85 (1): 9–23.