# The Educational Effects of Corporal Punishment

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**Abstract**

This paper provides the first empirical evidence on the existence of negative spillover effects from children exposed to corporal punishment in the home (CPH). We find that interactions with peers suffering from CPH depress achievement in both math and language among Vietnamese fifth graders. Specifically, a one standard deviation increase in the Peers' Violence Index is associated with a reduction in the math and the language test scores by 0.11 and 0.14 standard deviations, respectively. These adverse impacts could potentially be attributed to the unfavorable changes in student academic aspirations, student actual learning efforts, and the inter-student relationships.

Keywords: Corporal Punishment, Student Achievement, Peer Effects

## Introduction

Corporal punishment of children is a common child-rearing practice in many countries, and the legality of such practice differs in various settings (Global Initiative to End All Corporal Punishment of Children, 2016). Corporal punishment or physical punishment is defined as \any punishment in which physical force is used and intended to cause some degree of pain or discomfort, however light" (Pinheiro, 2006). The corporal punishment of children or teenagers, exercised by their parents or other lawful guardians, is referred to as corporal punishment in the home (CPH hereafter). CPH is considered primordial and is the child's first experience with violence (Straus et al., 2013). Previous studies show that such punitive practices hinder child development (Becker, 1964; Patterson, 1982; Gershoff, 2002). For example, CPH can lead to declined social competence as well as failing academic achievement (Straus et al., 1997; Straus and Paschal, 2009; Simons and Wurtele, 2010; Straus et al., 2013). However, parental use of corporal punishment of children remains a prevalent practice in developing countries (Monyooe, 1996; Oburu and Palmeru, 2003; Alyahri and Goodman, 2008; Rimal and Pokharel, 2014). The direct damage of CPH to academic achievement has been documented in the literature. In particular, both Cherian (1994) and Adesope et al. (2017) report a negative association between CPH and school performance. Moreover, other studies point to the adverse impacts on children's cognitive development. In particular, CPH leads to lower IQ scores, poorer cognitive abilities, and smaller vocabularies (Straus and Paschall, 2009; MacKenzie et al., 2013). Nevertheless, the indirect consequences of CPH, such as the spillover effects to other children with whom the victim children interact, have been under-explored. Therefore, our study seeks to fill this gap in the literature. This paper contributes to the literature by providing the first empirical evidence for the achievement impacts that CPH has on the victim child's classmates through peer interactions.

Furthermore, the paper also sheds light on potential mechanisms driving these negative externalities. The closest research to ours are the studies on the spillover effects of domestic violence between spouses or partners. Specifically, children from families ridden with domestic violence tend to disrupt their classmates' learning (Carrell and Hoekstra, 2010; Carrell and Hoekstra, 2012). These works extensively analyze the consequences of domestic violence, which refers to the physical attack by one spouse or intimate partner on the other partner where the child is the witness to the assault. Our study, notwithstanding, focuses on the spillover effects of CPH, a violent disciplinary practice by parents that targets the children. We investigate how the victim children hamper their classmates' academic achievement. 1Our study integrates two strands of literature. The first strand emphasizes the direct impacts of CPH on child development. For instance, parental adoption of corporal punishment could lead to increased aggressive behaviors (Straus et al., 1997; Simons and Wurtele, 2010) and cognitive problems (Cherian, 1994; Straus and Paschal, 2009) among children. Another consequence is the erosion of the parents-child relationship (Hirschi, 1969; Parke, 1977; Van Houten, 1983). Early exposure to violent disciplinary practices is also predictive of adult abuse of own child and spouse (Fry, 1993; Holden and Miller, 1997; Swinford et al., 2000) as well as adult criminality (Glueck and Glueck, 1950; McCord, 1979; Straus, 2013; Straus et al., 2013). The second line of research concentrates on the existence of peer effects on educational outcomes following peer interactions. For example, peer ability exerts non-negligible influences on student achievement (Hanushek et al., 2003; Lavy et al., 2011; Lavy et al., 2012; Burke and Sass, 2013; Antecol et al., 2016). Peer gender composition could positively affect students' both cognitive and non-cognitive outcomes (Lavy and Schlosser, 2011; Lu and Anderson, 2015; Eren, 2017). Drawing on a sample where fifth-graders were randomly allocated to classrooms, we find that interactions with peers subject to CPH depress

achievement in both math and language. Our results indicate that a one standard deviation increase in the Peers' Violence Index is associated with a decrease of 0.11 and 0.14 standard deviations in the math and the language test scores, respectively. Our mechanism analysis suggests that these negative consequences could be transmitted through the decline in student academic aspirations, negative changes in student actual efforts and the deterioration in the inter-student relationships. Despite its private and social costs, violent child discipline remains common in developing countries (UNICEF, 2010). According to a UNICEF report in 2010, three out of four children suffer from violent disciplinary actions by their caregivers on a regular basis. Nonetheless, only 24 countries have adopted legislation that prohibits CPH, leaving so many children unprotected (Zolotor and Puzia, 2010). This paper provides support for the passage and implementation of such laws, by empirically documenting the adverse spillover impacts of CPH on educational outcomes. Furthermore, we extensively analyze the potential mechanisms through which CPH can hamper the learning of the victim children's classmates, thus offering meaningful implications on devising education policies.

## Data

To estimate the negative spillover effects coming from children exposed to CPH, we employ the \Young Lives: School Survey, Vietnam, 2011-2012" (YLSSV, 2011-2012). The School Survey, conducted by the University of Oxford - Department of International Development (2015), is one part of the Young Lives study on childhood poverty among children in Ethiopia, India, Peru, and Vietnam. Due to the inconsistency in the cross-country questionnaires, we are unable to conduct the same analysis in other countries. The \YLSSV, 2011-2012" provides us with a sample of fifth-grade students in five selected provinces of Vietnam.1 There are two rounds of the YLSSV, 2011-2012, and 2016-2017. We only adopt the former round because the item needed to construct our

explanatory variable of interest, the frequency of being hit by parents, is unavailable in the latter one. The smallest unit of observation in the \YLSSV, 2011-2012" is a student. At the beginning of the school year (October 2011), students completed a background questionnaire. Besides providing information on demographic characteristics and family backgrounds, students responded to a question on the frequency of being hit by parents at home. We use this item to construct our main explanatory variable, as described later in this section. At the end of the school year (April 2012), students were administered assessment tests in cognitive and non-cognitive domains, although these tests were initially implemented at the beginning of the school year. Cognitive tests cover mathematics and language (Vietnamese) knowledge that students were taught at school. Test scores in mathematics and language at the end of the school year constitute our outcome variables. In non-cognitive tests, students were inquired about their attitudes towards different aspects of their school life such as interactions with peers and teachers, how they perceive their interests in schoolwork, among others (see Appendix B for more details). In addition to students, the \YLSSV, 2011-2012" provides us with detailed information on teachers. We are able to draw on various teacher demographics and qualification characteristics such as teacher gender, educational attainment, teaching experience, qualifications (training) received from various institutions, and teaching awards granted by different levels of administration. Furthermore, an important feature of the \YLSSV, 2011-2012" is that students can be matched with their classroom teachers, thus enabling us to observe each student along with their classmates and their teacher. 1 These provinces include Ben Tre, Da Nang, Hung Yen, Lao Cai, and Phu Yen. 3The dataset allows us to identify classrooms with randomly assigned students. In the teacher questionnaire, teachers were asked to report whether students were assigned to classrooms randomly or by other characteristics (e.g. ability in math, residency, etc.).2 Because students tend to self-select into classrooms and

peer groups similar to them (Hoxby 2000), we need to rely on the sample of classrooms with randomly assigned students, so as to credibly estimate the negative spillover effects of CPH. It is worth noting that parents can choose the school where they send their children, but they have no control over the classroom assignment. Our identification strategy hinges upon the random placement of students to classrooms within a school. We return to the random student allocation later in Section 2.2 after discussing important variables in the analysis. In our final sample, there are 60 schools, 130 classrooms (corresponding to 130 teachers), and 2,506 students.3 Table 1 presents the descriptive statistics of selected variables at both the student and the teacher level. The average end-of-year language and math achievement scores are approximately 0.04 of a standard deviation.4 Variable Own Violence-Original Response is recoded from the student's original response to the question \Are you hit by parents". The range of Own Violence-Original Response includes 1-never/rarely, 2-sometimes, and 3-always, with the higher value corresponding to the higher frequency of being exposed to corporal punishment. The mean value of Own Violence-Original Response is 1.731. From the original response above, we construct the z-score of the variable Own ViolenceOriginal Response by standardizing the responses across all students, to form a new variable named as Own Violence Index. By construction, Own Violence Index has zero mean and unit standard deviation. Another way to measure CPH is to create a dummy variable (Exposed to Violence) that takes the value of one if the student is ever hit by his/her parents (i.e. Own Violence-Original Response equals either 2 or 3) and zero otherwise (i.e. Own Violence-Original Response equals 1). This way, on average, 68% of students in our sample are subject to CPH, slightly less than the percentage of children who experience any violent discipline in developing countries (74%), based on the data from UNICEF (2017).

Because our identification of the impacts of CPH-inflicted peers relies on the random allocation of students, we conduct multiple tests to verify this randomness. First, to make sure that both students and teachers were randomly assigned to classrooms, we employ a re-sampling technique as in Carrell and West (2010) and Feld and Zolitz (2017). Specifically, for each school, we randomly draw 10,000 classes of equal size without replacement. We calculate the sums of student baseline characteristics. These characteristics include whether the student repeats any grade (Grade Repetition), student gender (Being Female), whether the student belongs to an ethnic minority group (Being Minority), and his/her mother has a college education (Mother Has College Degree).7 The last baseline characteristic is the student's Own Violence Index. The fraction of simulated classes with values less than that of the observed class gives us the empirical p-values for each class. If students were indeed randomly assigned to classrooms, empirical p-values should be uniformly distributed. The uniform distribution of empirical p-values is tested using the Kolmogorov-Smirnov one-sample equality of distribution test and the $\chi 2$ goodness-of-fit test. As reported in Panel A of Table 2, we fail to reject the null hypothesis of the uniform distribution of empirical p-values, suggesting that students were not selectively assigned to classrooms. Next, to show that teachers were also randomly allocated with respect to student characteristics, we regress the empirical p-values from re-sampling by class on each of the teacher characteristics, conditional on school fixed effects. Teacher characteristics include education, qualifications, whether the teacher receives the \Excellent Teacher" Award, and experience.8 The results from these 20 regressions are reported in Panel B of Table 2. Coefficients on all teacher characteristics are small and statistically insignificant, suggesting no trace of non-random allocation of teachers to classrooms.

To further demonstrate that not only were students randomly placed into classrooms, but they were also randomly assigned to peers with various levels of exposure to CPH, we conduct a balancing test.9 Specifically, we regress each of the student baseline characteristics on the Peers' Violence Index, conditional on school fixed effects. As shown in Panel A of Table 3, the Peers' Violence Index is statistically insignificant in explaining these baseline characteristics. We further conduct teacher-level regressions where student characteristics are replaced with teacher observables as dependent variables. The results reported in Panel B suggest that teachers were randomly allocated to students with different levels of violence exposure. As an additional randomness check, for each school in our sample, we run a regression of each of the student baseline characteristics on class fixed effects and test for the (joint and individual) significance of these dummies. The joint tests are intended to evaluate whether at least one of the classroom fixed effects is statistically significant in explaining student baseline characteristics. The top panel of Table A3 reports the fraction of p-values from the joint tests being lower than 5%. The lower panel of Table A3 provides the proportion of classroom fixed effects having individual p-values less than 5%. These results lend some evidence to the random assignment of students to classrooms. Having said that, we call for some caution 9 This is also known as the left-hand side balancing test (Pei et al., 2019). 8in relying on this test due to the possibility of negative bias involved when the number of classes is small (Wang, 2010). While the sample is restricted to randomly assigned classrooms (as reported by the teacher), we further conduct a series of randomization tests. Taken together, these analyses lend support to two important points: (i) students were randomly allocated to classrooms and peer groups, and (ii) the placement of teachers into classrooms and groups of students with different levels of CPH exposure are random.

Results

Before providing the main results on the spillover effects, we briefly examine the direct impacts of being subject to CPH on student achievement in Table 4. We regress endline achievement scores in math (Column 1 through 3) and language (Column 4 through 6) on student Own Violence Index and other student as well as teacher characteristics (captured in SC0 ics and TCcs 0 in equation (1) to (3)). We report the coefficient estimates on the Own 12 Average peer achievement in math (language) is the class-level mean of the beginning-of-year test scores in math (language), excluding student i. Peer gender composition is measured by the fraction of female students in a class, excluding student i. In constructing peer parental education, we calculate the mean of the two indicators, Mother Has College Degree and Father Has College Degree for each student, then take the class-level average of that measure excluding that of student i. 11Violence Index in Table 4. The estimating results suggest that students exposed to CPH are more likely to underperform at school. Specifically, a one standard deviation increase in the Own Violence Index is associated with a decrease in math and language achievement by around 0.04 standard deviations. The inclusion of student gender and parental education leaves the estimated effects of CPH virtually unchanged (Column 2, 3, 5, and 6). The findings are in line with previous studies which show that CPH is negatively associated with student academic performance and cognitive ability (Straus and Paschall, 2009; MacKenzie et al., 2013; Adesope et al., 2017).

We proceed to our main analysis. The linear-in-means estimates of the effects that peers' exposure to CPH has on student achievement are presented in Table 5. Column 1 through 4 reports the effects on the math test score while Column 5 through 8 presents the impacts on the language test score. In Column 1 and 5, we present the baseline results from estimating equation (1) without the inclusion of other peer measures. We detect negative and significant impacts of interacting with CPH-inflicted peers on student achievement. Particularly, a one standard deviation increase in the

Peers' Violence Index is associated with a reduction in the math and language test scores by 0.11 and 0.14 standard deviations, respectively. Not only is violent discipline by parents bad for the academic performance of the victim children (Table 4), but interactions with classmates who fall victim to such discipline also lower student achievement. The magnitude of the spillover effects is larger than that of the direct effects, as reported in Table 4. It seems that the negative repercussions of corporal punishment are magnified through peer interactions. Our finding is consistent with prior studies which report peer effects are greater than parental influences in multiple domains. 12For example, Flay et al. (1994) uncover that friends' smoking produces a larger effect on adolescents' smoking behavior than parents. Allen et al. (2003) document that peers play a more important role than parents in adolescents' drug use behavior.

Next, we gradually control for a variety of peer measures that could potentially be correlated with the Peers' Violence Index and student achievement at the same time. Reported in Column 2 and 6 of Table 5, once we add the average baseline peer achievement as a regressor to rule out the direct academic channel, our estimated effects of peers' exposure to CPH become more statistically and economically significant. A one standard deviation increase in the Peers' Violence Index is associated with a decline in math and language achievement by 0.13 and 0.14 standard deviations, respectively. The coefficient on the average peer achievement is significant for the math test score but not the language test score. In Column 3 and 7, we add the fraction of female students in the class to our regressions. The inclusion of peer gender composition leaves our estimates virtually unchanged in terms of magnitude and the significant level. Finally, Column 4 and 8 report the estimating results of our most extensive specifications. Here, we control for peer parental education in addition to the Peers' Violence Index, peer achievement, and peer gender composition. With the inclusion of these peer measures, 13 We replicate Column 1 and 5 of Table

5 but replace the Peers' Violence Index with the average peer baseline achievement, the fraction of female students and peer parental education as explanatory variables in Column 1 through 3 and 5 through 7 of Table A4. Unlike the Peers' Violence Index, we do not find consistent and statistical evidence on the impacts of these peer measures. 13our estimates reflect the effects of CPH-inflicted peers through channels other than peer achievement, peer parental education, and peer gender composition. According to the most extensive specifications, interacting with CPH-inflicted peers still has negative and significant impacts on both math and language achievement. A one standard deviation increase in the Peers' Violence Index leads to a 0.13 standard deviation decrease in the math test score and a 0.14 standard deviation reduction in the language test score. Overall, Table 5 provides suggestive evidence for the existence of peer effects driven by CPH on student academic performance. As a robustness exercise, we estimate the same specifications as Table 5 but replace the Peers' Violence Index with the fraction of peers exposed to CPH (Fraction Exposed to Violence). The results are reported in Table A5. We still find negative and significant impacts of CPH-inflicted peers on student achievement. Specifically, a ten percentage point increase in the proportion of peers exposed to CPH is associated with a decrease in the math and language test scores by approximately 0.08 and 0.09 standard deviations, respectively. The inclusion of other peer measures does not change our conclusion. Taken together, the results in Table 5 indicate that interactions with CPH-inflicted peers have non-negligible ramifications on student achievement.14 To put these estimates into perspective, the effect of interacting with peers subject to CPH is approximately half of the effect observed from decreasing teacher quality by one standard deviation (Nye et al., 2004; Kane and Staiger, 2008; Hanushek, 2011). These results underline the negative externalities of CPH, in a sense that such practice generates adverse spillover effects on the achievement of the student's classmates, which goes beyond the

consequences on the victim child. Our finding is consonant with Carrell and Hoekstra (2010) who document that children from troubled families depress their classmates' performance. Our next exercise explores the non-linear impacts of peers' exposure to CPH on student achievement. First, we ask whether these negative effects are more pronounced on students at the bottom than those at the top of the baseline achievement distributions. Here, students are divided into terciles based on their position in the school-level baseline achievement distribution (i.e. whether he/she belongs to the top third, middle third, or bottom third of the distribution). The results from this analysis are presented in Panel A of Table 6. Second, we are also interested in the heterogeneous effects of CPH-inflicted peers in terms of student 14 We also estimate the effects of CPH-inflicted peers using the same specification as our baseline model on different samples: (i) schools where all classrooms have students randomly assigned, (ii) schools where students are not randomly allocated, and (iii) schools with only one fifth-grade classroom. We still observe the negative spillover effects of CPH (Table A6). 14Own Violence Index. In other words, the negative spillover effects may differ depending on the extent to which a student is subject to violent disciplinary actions by their parents. Analogous to baseline achievement, we group students into terciles based on their position in the school-level distribution of the Own Violence Index. We report the results from this analysis in Panel B of Table 6. Point estimates in Table 6 suggest weak heterogeneity in the effects of CPH-inflicted peers along the lines of student ability and Own Violence Index. Students in the middle third of the test score distribution seem to be affected the least, while those in the middle third of the Own Violence Index distribution appear to bear the most consequences.

## Discussion

In this section, we examine the potential pathways to the impacts of CPH-inflicted peers. Prior studies put forward multiple mechanisms underlying peer effects. For example, the composition

of peers could lead to changes in the classroom/learning environment, interstudent and teacher-student relationships (Lavy and Schlosser, 2011; Eren, 2017). Gershoff and Grogan-Kaylor (2016) report that exposure to CPH is associated with internalizing behavioral problems. Students with these problems can further instill the negativity in the 15classroom environment. Moreover, violent disciplinary actions by parents increase children's externalizing behavioral problems, making them more likely to exhibit aggressive behaviors toward their peers (Becker, 1964; Patterson, 1982; Gershoff and Grogan-Kaylor, 2016). Either way, the presence of CPH-inflicted classmates could generate a toxic environment, as a result, disrupt the learning of the class and unfavorably influence other students' schooling aspirations (Lavy et al., 2011; Lavy and Schlosser, 2011; Eren, 2017). Besides, since troubled children are more liable to disciplinary problems, they tend to have low-quality inter-student relationships (Lavy et al., 2011). These violence-prone children could exhaust teachers, thus deteriorate the teacher-student relationships and lower student academic performance (Lavy et al., 2011; Lavy and Schlosser, 2011). It is important in policy design to understand the mechanisms behind the spillover effects of CPH. In exploring the underlying mechanisms, we draw on the student questionnaire. Students were asked to rate their assessment of the schooling environment, their emotion and attitude toward classmates, teachers, as well as their own learning. We estimate our baseline regression given in equation (1) but use mechanism variables as outcomes. We categorize potential mechanisms into three groups: (i) changes in academic aspirations, (ii) changes in student actual efforts, and (iii) changes in inter-student and teacher-student relationships. All the mechanism variables except Physical Bully are indicators re-coded from students' original responses to take the value of one if the student agrees or strongly agrees with the statement, and zero if the student disagrees or strongly disagrees with the statement. Physical Bully is a dummy variable derived from student response to the question \Are you

physically bullied at school?". Physical Bully takes the value of one if the student is either always or sometimes physically bullied in the school environment and zero if he/she is never/rarely bullied. We capture the changes in academic aspirations by three dummy variables, including whether the student is willing to do his/her best to pass all subjects (Willingness to Do Best), whether the student thinks he/she can go to college if working hard (College Expectations), and whether the student often feels like quitting school (Feel like Quitting School). Changes in student actual efforts are represented by whether the student studies hard for exams (Study Hard), whether the student can follow the lessons easily (Follow Lessons), whether the student daydreams a lot in class (Daydream in Class), and whether the student persists when faced with difficult questions (Not Give Up). We capture the changes in inter-student and teacher-student relationships by whether the student is able to help his/her classmates in schoolwork if permitted (Help Classmates), whether the student is physically bullied at school (Physical Bully), and whether the student thinks his/her teacher considers him/her a low achiever (Low Teacher Expectation). 16The estimating results for student academic aspirations are reported in Panel A of Table 7. It is evident that children exposed to violent discipline by parents generate unfavorable impacts on their classmates' schooling aspirations. Specifically, the Peers' Violence Index is statistically and economically significant in explaining student intentions to drop out and the low college expectations, although it is insignificant in predicting the student's willingness to do best in school. It is possible that the presence of CPH-inflicted peers could depress student academic aspirations for staying in schools and college expectations, thus affecting test scores.

Moving to student actual efforts, Panel B shows that a rise in the Peers' Violence Index is associated with a reduction in the probability that the student studies hard for exams and follows the lessons easily. An increase in the Peers' Violence Index makes the student more likely to

daydream in class, but it is not statistically significant in explaining the student's persistence when faced with difficulties in schoolwork. It appears that the changes in student actual efforts, especially in preparing for tests and paying attention to lectures, could be one pathway to the effects of CPH-inflicted peers on student achievement. 17Regarding the changes in inter-student and teacher-student relationships, as evident in Panel C, a higher Peers' Violence Index is significantly correlated with the increased incidence of physical bullies at school. There is no significant effect of the Peers' Violence Index on the probability of the student helping classmates or having low expectations from teachers. The result implies that the impacts of CPH-inflicted peers could potentially be transmitted through the deterioration in the inter-student relationships proxied by the increased incidence of physical bullies at school. We do not have enough statistical evidence for the impact on the teacher-student relationship quality. While previous studies underscore the immense private costs of the parental adoption of violent child discipline (Becker, 1964; Patterson, 1982; Whipple and Richey, 1997; Gershoff, 2002), our results emphasize the negative externalities of such practice. We provide compelling evidence that students subject to CPH hurt their classmates' learning. Particularly, we detect a reduction of 0.11 standard deviations in math achievement and a decline of 0.14 standard deviations in language achievement in response to a one standard deviation increase in the Peers' Violence Index. These effects are commensurate with those of increasing class size by five to ten students per class (Fredriksson et al., 2012), or decreasing per-pupil expenditure by 500 USD (Greenwald et al., 1996). While our results show how students subject to CPH affect their classmates at school, they may understate the full extent of the negative spillover effects on others. It is because students are likely to interact with peers outside of their classroom and in their neighborhood. The presented results have important implications for social policies. CPH imposes a social cost that goes beyond the private

cost borne by the victim children. Although the United Nations adopted the Convention on the Rights of the Child in 1989, only 24 countries pass legislation that bans corporal punishment of children (Zolotor and Puzia, 2010). Despite both the private and social costs, CPH remains common in developing countries where the probability of being exposed to corporal punishment is three out of four among children aged 2 to 14 (UNICEF, 2010). The prevalence of physical punishment is highest among the 5-9 age group. Alyahri and Goodman (2008) show that over 50% of Yemeni caregivers and around 25% of urban Yemeni caregivers reported using harsh corporal punishment as a way of disciplining children. The endorsement of physical punishment of children is also prevalent in sub-Saharan Africa (Monyooe, 1996; Oburu and Palmerus, 2003). Our study provides support for the passage and implementation of laws that prohibit the corporal punishment of children. Given the adverse spillover effects of violent child discipline, interventions that target improvements in the family environment may produce larger favorable gains than previously estimated. 18The findings of this paper are also relevant to education policies, with a suggestion that changing the classroom composition of students may adversely affect the academic performance of those exposed to peers who are CPH victims. Careful consideration should be given to any decision on the allocation of students to classrooms. In light of the negative externalities of CPH, getting disadvantaged students exposed to CPH-inflicted peers could potentially perpetuate the achievement gap. This is consistent with the suggestions in Carrell and Hoekstra (2010) who focus on children living in domestic violence ridden families.

## Conclusion

This paper contributes to the literature by presenting the first empirical evidence on the adverse spillover effects of CPH on the achievement of other students in elementary classrooms. The studied context is a developing country, Vietnam, where the adoption of violent child discipline is

still a prevalent problem. Our findings suggest that fifth-grade students exposed to CPH harm their classmates' learning. In other words, interacting with peers who suffer from CPH lowers student achievement. Specifically, a one standard deviation increase in the Peers' Violence Index is associated with a reduction in the math and the language test scores by 0.11 and 0.14 standard deviations, respectively. These effects are comparable to those of increasing class size by approximately five to ten students per class (Fredriksson et al., 2012), or decreasing per-pupil expenditure by 500 USD (Greenwald et al., 1996), or decreasing teacher quality by half of a standard deviation (Nye et al., 2004; Kane and Staiger, 2008; Hanushek, 2011). The negative spillover effects on achievement could be transmitted through the unfavorable changes in student academic aspirations, student actual efforts, and the deterioration in the inter-student relationships. Particularly, interactions with CPH-inflicted peers make students less likely to expect to go to college but more likely to feel like quitting schools. It is possible that these troubled peers also decrease the probability of the student studying hard for tests and paying attention to lectures. Moreover, we present suggestive evidence that the presence of more peers exposed to CPH erodes the quality of the inter-student relationships by increasing the incidence of physical bullies. Collectively, our results have meaningful implications for education and social policies. We present the first concrete empirical evidence for the existence of a \bad apple" peer effect where students exposed to CPH hamper their classmates' academic performance. Education policies that alter the student composition across classrooms/schools may hurt the achievement of those exposed to CPH-inflicted children. Our findings justify the allocation of more resources to tackle the CPH problem in developing countries. It is necessary for policymakers to take 19into account the social cost of such violent practice that exceeds the private cost faced by the victim children. According to UNICEF (UNICEF, 2010), three out of four children suffer from corporal

punishment by their caregivers on a regular basis, meaning that many children are left unprotected. Our results lend support to the passage of legislation that prohibits the corporal punishment of children.

Appendix 1

To estimate the negative spillover effects coming from children exposed to CPH, we employ the \Young Lives: School Survey, Vietnam, 2011-2012" (YLSSV, 2011-2012). The School Survey, conducted by the University of Oxford - Department of International Development (2015), is one part of the Young Lives study on childhood poverty among children in Ethiopia, India, Peru, and Vietnam. Due to the inconsistency in the cross-country questionnaires, we are unable to conduct the same analysis in other countries. The \YLSSV, 2011-2012" provides us with a sample of fifth-grade students in five selected provinces of Vietnam.1 There are two rounds of the YLSSV, 2011-2012, and 2016-2017. We only adopt the former round because the item needed to construct our explanatory variable of interest, the frequency of being hit by parents, is unavailable in the latter one. The smallest unit of observation in the \YLSSV, 2011-2012" is a student. At the beginning of the school year (October 2011), students completed a background questionnaire. Besides providing information on demographic characteristics and family backgrounds, students responded to a question on the frequency of being hit by parents at home. We use this item to construct our main explanatory variable, as described later in this section. At the end of the school year (April 2012), students were administered assessment tests in cognitive and non-cognitive domains, although these tests were initially implemented at the beginning of the school year. Cognitive tests cover mathematics and language (Vietnamese) knowledge that students were taught at school. Test scores in mathematics and language at the end of the school year constitute our outcome variables. In non-cognitive tests, students were inquired about their attitudes towards different aspects of their school life such as interactions with peers and teachers, how they perceive their interests in schoolwork, among others (see Appendix B for more details). In addition to students, the \YLSSV, 2011-2012" provides us with detailed information on teachers. We are able to draw on various

teacher demographics and qualification characteristics such as teacher gender, educational attainment, teaching experience, qualifications (training) received from various institutions, and teaching awards granted by different levels of administration. Furthermore, an important feature of the \YLSSV, 2011-2012" is that students can be matched with their classroom teachers, thus enabling us to observe each student along with their classmates and their teacher. 1 These provinces include Ben Tre, Da Nang, Hung Yen, Lao Cai, and Phu Yen. 3The dataset allows us to identify classrooms with randomly assigned students. In the teacher questionnaire, teachers were asked to report whether students were assigned to classrooms randomly or by other characteristics (e.g. ability in math, residency, etc.).2 Because students tend to self-select into classrooms and peer groups similar to them (Hoxby 2000), we need to rely on the sample of classrooms with randomly assigned students, so as to credibly estimate the negative spillover effects of CPH. It is worth noting that parents can choose the school where they send their children, but they have no control over the classroom assignment. Our identification strategy hinges upon the random placement of students to classrooms within a school. We return to the random student allocation later in Section 2.2 after discussing important variables in the analysis. In our final sample, there are 60 schools, 130 classrooms (corresponding to 130 teachers), and 2,506 students.3 Table 1 presents the descriptive statistics of selected variables at both the student and the teacher level. The average end-of-year language and math achievement scores are approximately 0.04 of a standard deviation.4 Variable Own Violence-Original Response is recoded from the student's original response to the question \Are you hit by parents". The range of Own Violence-Original Response includes 1-never/rarely, 2-sometimes, and 3-always, with the higher value corresponding to the higher frequency of being exposed to corporal punishment. The mean value of Own Violence-Original Response is 1.731. From the original response above, we construct the

z-score of the variable Own ViolenceOriginal Response by standardizing the responses across all students, to form a new variable named as Own Violence Index. By construction, Own Violence Index has zero mean and unit standard deviation. Another way to measure CPH is to create a dummy variable (Exposed to Violence) that takes the value of one if the student is ever hit by his/her parents (i.e. Own Violence-Original Response equals either 2 or 3) and zero otherwise (i.e. Own Violence-Original Response equals 1). This way, on average, 68% of students in our sample are subject to CPH, slightly less than the percentage of children who experience any violent discipline in developing countries (74%), based on the data from UNICEF (2017).