

# **Educational Achievement and Family Structure: Evidence from Two Cohorts of Adolescents in Taiwan**

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## **PAPER PROPOSAL**

### **Research Question**

Strong evidence has emerged in various research findings that single-parent families have adverse effects on the child's educational achievement. Researchers hypothesized the mediating mechanisms being (1) deprivation of economic resources, (2) lesser parental involvement and monitoring in children's education, and (3) fewer network ties to obtain information and other supports related to learning. On the contrary, children living with two biological parents do not suffer such disadvantages because of the economic and social capital the extra parent brings. There was also evidence found in the U. S. that children of single-parent families with grandparent(s) cohabitating performed quite similarly to those of intact families. Thus, an additional adult relative at home seemed to compensate for the loss single-parent families experience. What remained unanswered is whether the cohabitation of grandparent(s) offers the same advantage to those who live with both biological parents and whether the mediating mechanisms hypothesized above work the same in this situation.

The question is not easy to answer with data of Western industrialized societies because few grandparent(s) live in their son's or daughter's intact families in Western countries. In contrast, owing to the cultural tradition, not only a great majority of the households in Taiwan are still nuclear intact families, but also multigenerational intact families compose a little over 10% of the households. However, several qualitative research findings in Taiwan suggest that multigenerational intact families might not be all beneficial. The extra economic resource demanded by a larger family size, and the tension and inconsistency of parenting behavior that likely exist between parents and grandparents might have negative effects as well. Hence, in this paper, we will try to answer the research question by comparing impacts of nuclear intact families, multigenerational intact families, multigenerational single-parent families, and other non-intact families on their children's educational achievement. In addition, because adolescents tend to gain more autonomy and schools involve parents less often when they enter high schools or beyond, the impact of family characteristics on the children's educational achievement would be reduced. Furthermore, the junior high students in the data are starting their 7<sup>th</sup> grade. The impacts of family characteristics at the level of senior high may well be different as the teenagers grow older. In light of these possibilities, we will compare two cohorts students at 7<sup>th</sup> and 11<sup>th</sup> grade, respectively, to examine if the impacts of family structure and functioning change.

### **Data and Method**

The data sets are samples of 7<sup>th</sup> graders and 11<sup>th</sup> graders of the Taiwan Education Panel Survey (TEPS) conducted in 2001. TEPS is a clustered, multistage stratified probability sample. The sample of 7<sup>th</sup> graders consisted of 13,978 students selected from 333 junior high schools. The sample of 11<sup>th</sup> graders has 13,509 students selected

from 234 regular senior high schools and vocational high schools and 26 five-year technical colleges.

TEPS administered two standardized tests, which consisted of items gauging students' reading, math and analytical abilities, one for the 7<sup>th</sup> graders and the other for the 11<sup>th</sup> graders. We use ability scores derived from the test results using the 1-P Item Response Model as the indicator of students' educational achievement.

Using items of the student's questionnaire concerning who presently resided in the family, we construct four types of family structure: (1) nuclear intact family: where only both biological parents were present, (2) multigenerational intact family: where both biological parents and grandparent(s) were present, (3) multigenerational single-parent family: where a single parent and grandparent(s) were present, (4) all other types of non-intact family. The last type is an all-inclusive category that comprises mainly those lived with a single parent only, though it also includes a fairly small percentage of students living with grandparent(s) only, with at least a stepparent only, or with at least a stepparent and grandparent(s). All forms of non-intact family occurred before either the 7<sup>th</sup> grade or the 10<sup>th</sup> grade depending on the sample analyzed.

We used data from both student's and parent's questionnaires to construct variables related to mediating mechanisms. From parent's survey, we use monthly family income as a measure of economic resources. From both student's and parent's questionnaires, we use parents' discussion with students about future schooling or employment, parents' listening to student's inner thoughts, parents' checking homework or examination results, and parents' educational expectation as indicators of parental monitoring and involvement of student's education and learning. Also from both questionnaires, we use parents' participation in school activities or parent-teacher association, the extent of knowing other parents, and students' frequency of visiting relatives with parents to measure the extent of network ties.

We also control other background variables related students' and family characteristics, which include the student's sex, sibling size, ethnicity, and parents' level of education in our analysis. We employ hierarchical regression analysis to examine the gross effects of family structure, the effects of backgrounds variables, the effects of economic resources, and the effects of parenting behavior and network ties.

## **Findings**

As expected, in comparison with nuclear intact family, three other types of family structure have significant gross effects on 7<sup>th</sup> graders' educational achievement. The result shows that living with grandparent(s) provides an additional advantage. Living with a grandparent can either increase slightly the positive effect of living in an intact family or reduce considerably (about one half of) the negative effect of living with a single parent. To live in a non-intact family of all other types is the most disadvantageous. Types of family structure alone explained about 5% of variance of educational achievement. The inclusion of background variables increases the  $R^2$  to 21%. The negative effect of non-intact family of all other types is reduced by 20%, while the effects of the other two types of multigenerational family change only slightly. With further inclusion of monthly family income, the explanatory power increases less than 1%, but the negative effect of multigenerational single parent

family decreases by about 22% and the negative effect of all other types of non-intact family also decreases somewhat. The inclusion of variables related to parenting behavior and network ties increases the  $R^2$  to about 30% and the positive effect of multigenerational intact family decreases by about 24%. The negative effects of other two types of family structure are also reduced considerably. In short, it seems that the negative effects of non-intact family of all forms are mediated by all three kinds of hypothesized mediating mechanisms. The positive effect of multigenerational intact family, however, is mainly mediated by parenting behavior and the extent of network ties. As far as our full model is concerned, there remains an independent effect of each type of family structure that cannot be explained away by mediating and background variables.

Overall, the findings of the analysis of 11<sup>th</sup> graders' educational achievement show that the impact of family structure has weakened. Only the negative effect of all other types of non-intact family is significant in the model with only variables of family structure included. The positive significant effect of multigenerational intact family emerges when the background variables are included in the model where the size of the coefficient is doubled. The negative effect of multigenerational single parent family increases even more but remains statistically insignificant. The significant negative effect of all other types of non-intact family remains almost the same. This model accounts for about 13% of variance of educational achievement. With the inclusion of monthly family income, the model's explanatory power increases by less than 3% and the negative effect of all other types of non-intact family is reduced by 25%. The effect of multigenerational single parent family turns into a positive effect but close to 0. Further inclusion of parenting behavior and network ties increases the  $R^2$  to about 24%. The positive effect of multigenerational intact family is reduced somewhat in this model but remains significant and the negative effect of all other types of non-intact family is reduced by nearly 34%. The positive effect of multigenerational single parent family also increases but remains statistically insignificant, which means that the academic performance of those living with grandparent(s) in single-parent families are not different from those living in nuclear intact families. It is interesting to note that, in the case of 11<sup>th</sup> graders' educational achievement, the hypothesized mediating mechanisms work more like suppressors for families with grandparent(s).

### **Conclusions**

While the adverse impact of single parent families on adolescents' educational achievement is fairly much consistent with previous research. Our research further reveals that the existence of grandparent(s) has qualitatively different effects on the offspring's educational achievement depending on whether the family is intact or not. In general, grandparents can assist their grandchildren to achieve or overcome their disadvantage incurred by the loss of a biological parent. The findings also suggest that effects of family characteristics do have differential effects on children of different developmental stages. Nevertheless, because of the special educational system in Taiwan, the somewhat reduced family effects found for the 11<sup>th</sup> graders might also be due to the powerful sorting mechanism of the high school entrance examinations.

# **Family in the Making of Educational Inequality: A Comparative Analysis of Taiwan and the U.S.**

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## **PAPER PROPOSAL**

This is the first paper of the proposed session on educational stratification and the family in Taiwan. As the first in five closely related papers, the objective is twofold: (1) To provide the conceptual and data frameworks for addressing the question, What does the family do? The frameworks will integrate and guide the empirical studies to be presented in this session, and facilitate the subsequent presentation of results by each paper. (2) To examine in the context of Taiwan one of the most central questions and findings of the Coleman Report – the role of the socioeconomic background in student academic achievement and how it compares with the role of school characteristics. In particular, the data analysis will critically examine the widely held belief that the schooling system in Taiwan facilitates *social exclusion by family wealth*. Although the analysis is of much interest in its own right, it also serves as the starting point of the other papers in the session.

### **Conceptual and Data Frameworks**

The first objective involves an argument for distinguishing different dimensions of family background, going beyond the common focus on socioeconomic status, and the need to specifically unpack the mechanisms by which family background becomes causally relevant and significant in the stratification process. The first half of the paper will serve as an introduction to the conceptual distinctions of family background in the other papers and how they usefully and collectively extend the traditional focus on socioeconomic status.

This objective would be simply cheap talk if there is no comprehensive survey data with large and representative samples of students. Fortunately, for the first time in a major Chinese society such a survey is publicly available – the Taiwan Education Panel Survey (TEPS). TEPS provides the ideal basis for studying the family effect question, with obvious potential for a wide range of other research problems. As the multi-phased public release of the survey has begun only recently and all documentations and internal labeling of data files are in Chinese, we will provide an extended overview of the survey.

### **Where Does Unequal Opportunity Come From?**

The second objective is to provide the beginning of a Coleman Report for Taiwan. The original Coleman Report (i.e., the Equal Educational Opportunity Report by Coleman et al. 1966) is a major accomplishment of empirical sociology and the source of many seminal findings about the structure of educational inequality in the United States. One of its most surprising and robust findings is the importance of family background and the apparent spurious importance of school characteristics. The Report's focus of family background was on socioeconomic status of parents and the focus of school characteristics was on observable resources that vary substantially across schools in the United States.

Remarkably, after almost four decades, public discourse in Taiwan is only beginning to catch on to the classic question of educational stratification, Does family inequality determine

educational inequality? Spearheaded by an education reform advocate and backed up by privately conducted surveys, the most pointed charges suggest that family wealth is a major mechanism of social exclusion that determines educational opportunity in Taiwan. Ironically, it is during one of the most rapid expansion of educational opportunities in Taiwan that the public starts to echo one of the most central American concerns prevalent in the era of the Coleman Report. The public seems to have concluded that educational opportunity is far from unequal, family wealth inequality is a main culprit, and that government subsidy is essential for leveling the playing field. We are not so sure. After all, the public discourse is based on casual empiricism rather than rigorous analysis of reliable data. It is high time that sociologists produce an equivalent of the Coleman Report for Taiwan. The papers of this session will offer a modest step toward this goal by the elaboration and extension of the family focus of the original Coleman Report with a landmark survey of high school students.

Does a comparable set of findings hold among high school students in Taiwan? This is the central empirical question of the paper. The other papers in the session will successively extend this question by attending to different aspects of family background. As a starting point of this collective effort, we will address three questions in this paper. (1) How does socioeconomic background, measured in terms of family income and parental education, matter for the cognitive achievement of students? (2) How do the socioeconomic background effects vary from the start to the end of high school education? (3) How does socioeconomic background relate to and compare with the effect of school?

To address the first question, we will start with the junior high cohort in the 7<sup>th</sup> grade. To address the second question, we will additionally analyze data on the senior high cohort while they are in the 11<sup>th</sup> and 12<sup>th</sup> grades and their equivalents in the vocational track. The first question requires data on school affiliation of students and the use of fixed-effects models. The second and third questions together will provide evidence on how resilient the educational consequences of socioeconomic background are -- whether schooling reinforces, reproduces, or reduces socioeconomic differences that students bring to school.

## **Findings**

The first and most basic finding is that socioeconomic background, even if measured with simple indicators of family income and parental education, is a major predictor of cognitive achievement. Interestingly, about half of the income effects are spurious of parental education effects whereas only a fraction of the parental education effects are mediated by family income. This finding stands in stark contrast to the public presumption that family income is the most crucial aspect of family inequality that diminishes equal educational opportunity. If socioeconomic background signifies resource inequality, then financial resources are substantially less relevant than parental human capital resources.

The second central finding is that the family effects are strikingly persistent through high school (from 7<sup>th</sup> grade to 11<sup>th</sup> and 12<sup>th</sup> grades). The persistence is not just in the qualitative patterns but in the absolute magnitude of the effects. The third and related finding is that secondary schools in Taiwan do not aggravate or diminish the consequences of socioeconomic differences among students. Using panel data on the senior high cohort, socioeconomic background has no effect on cognitive achievement within schools or, equivalently, no effect on learning growth.

# **Cram Schooling Matters? Who Goes to Cram School?**

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## **ABSTRACT**

A great deal of literature has focused on educational stratification in Taiwan. While some have emphasized on the importance of family backgrounds and have attempted to estimate their effects on learning achievement, others have investigated the importance of the number of schooling years on socioeconomic status and further analyzed the related patterns of social mobility. However, “cram schooling” which is attached to and/or embedded in the formal educational system has yet to receive much attention.

It is well known that, in Taiwan, cram schooling is a very popular educational activity and treated by many students and their parents as a necessary investment. The effectiveness of cram schooling and the stratified opportunity of cram school participation, therefore, are important topics and worth studying by sociologists and educational researchers.

In this paper, we start by illustrating the development of cram schools in Taiwan, and demonstrate the important changes on institutional factors and legitimacy of cram schools. The discussion is followed by theoretical consideration pertaining to credentialism and cultural capital. The present research tries to answer two basic questions: (1) does cram school matter? And (2) who goes to cram school? To answer the first question, we use data collected by Taiwan Education Panel Survey (TEPS, hereafter) in 2001 to investigate the net effect of cram schooling on student’s analytical ability and mathematical performance. The second question is answered by

testing the hypotheses that the opportunity of cram school participation reflects patterns of stratification by gender, regular/vocational high school, and family backgrounds.

According to our preliminary results from analyzing TEPS data, first of all, cram schooling does matter: attending cram schools has significantly positive effect on a student's academic performance, for both general analytical ability and mathematical comprehension. Furthermore, cram schooling increases the explanatory power of our statistical model regarding the variation of students' general and mathematical performance. Secondly, cram school participation does reflect the patterns of stratification in different ways: (1) *Ceteris paribus*, the opportunity of going to cram school for a male student is significantly higher than that of females; (2) compared with vocational high school students, regular high school students participate more cram schooling, in terms of subjects studied and time spent; (3) family backgrounds also affect student's cram school participation: the higher the family monthly income, the higher the probability going to cram school. However, the effect of parents' education on children's cram school participation is not stable.

**Key Words:** Cram Schooling, Cultural Capital, Expectation and Aspiration, Structural Change