Will Cognitive, Non-cognitive Performance and Appearance Affect Children's Decision of Making Friends? – Evidence from Rural China

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Abstract:

The main goal of this paper is to identify what will affect a child's decision of choosing someone as a good friend, and further, to identify why some children have been chosen as others' best friends more than once, which means popularity. We draw on a dataset with 11889 observations by conducting a series of standard tests in 2017 spanning 4 provinces in China. We use cognitive (standard math score) and non-cognitive performance (esteem, depression, and grit) and appearance (HAZ and whether the student is overweight) as our key explanatory variables, and we standardized these key variables to identify which factor contributes to the decision of choosing friends and which contributes more while choosing friends. Our first finding shows that math score, depression and whether the student is overweight significantly contribute to the decision of choosing friends. The children who do better in math, have lower tendency to depression and not overweight will have 4.9%, 2.2% and 2.4% higher possibility to be chosen as friends than their counterparts, respectively. Furthermore, when considering popularity of children, we find the similar results. The two main findings show that one may become more popular if he has higher cognitive ability and good appearance.

Acknowledegment: We gratefully acknowledge the financial support by National Science Foundation of China (Grants: 71603261); The Ministry of education of Humanities and Social Science project (Grants: 16YJC880107).

JEL Codes: I12, O53

#1264

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Keywords: peer effects, friends, cognitive, non-cognitive, appearance

Introduction

There are two types of relationships among people: vertical and horizontal relationships (Hartup, 1989). For children, vertical relationships are formed with their parents or teachers who are more knowledgeable and powerful, while horizontal relationships are formed with peers with equal status (Frostad & Pijl, 2007). These relationships with peers of equal status have great value in the development of children (Schaffer, 1996). A theory called "Attachment Theory (Bowlby, 1975)" provides some useful evidence to depict the role of these close relationships. Attachment theory addresses how human beings respond within relationships when hurt, separated from loved ones, or perceiving a threat (Wikipedia). When people getting hurt or separated, it is natural to find a haven for comfort. While the first attachment relationships are established with parents, individuals can also form attachment bonds with people other than their parents, for example, their peers especially close friends. When growing up, close friends become the major source of intimacy and disclosure and are key providers of both emotional and social support (Wilkinson, 2004).

Yet, how peer effects influence people have been studied widely. Zimmer and Toma (2000) indicated that peer effects were a significant determinant of educational achievement of children, and the effects of peers appeared to be greater for low-ability students than for high-ability students. But their finding is not robust across school type. McEwan and Patrick (2003) found that the classroom means of mothers' education had the strongest links to achievement of children, and this finding might explain the unsteady peer effects among different types of schools on account of the sorting behavior of families. Ammermueller and Pischke (2009) also found that peer effects in the European primary schools could be biased even controlling fixed effects, and this bias might be attributed to the presence of immigrant children because immigrants in these countries tend to be of lower socioeconomic status, part of the peer effects might be explained by the non-random allocation of immigrants.

Not only did peers have a significant impact on children's educational achievement, but also represented important actors within individuals' social network along the entire life span. Goldsmith-Pinkham and Imbens (2013) claimed that current friendships were not sufficient for capturing all correlations in outcomes, the effects of former friends as well as friends of friends might also matter. Sacerdote (2001) drew the conclusion that roommates had an impact on GPA and

on decisions to join social groups. Moreover, interestingly, peer effects could significantly influence individual's BMI. Several researches found a positive and significant casual effect of friends' mean BMI on adolescent BMI (Mora & Gil, 2013; Lim & Meer, 2018).

Keeping positive relationships with peers may make students' outcomes higher, otherwise may undermine them. A number of researchers (Barboza et al., 2009; Garandeau & Cillessen, 2006; Holt & Espelage, 2007; Rigby, 2005) suggested that peers play a significant role in bullying victimization and perpetration. Ali & Dwyer (2009) found that peer effects are important determinants of smoking. Mercken et al. (2012) pointed out that friends' influence on smoking might be crucial, more essential is adolescent's own choice of making friends. Lundborg (2005) found that peer effects in binge drinking, smoking and substance use were significant and positive. And roommates drinking alcohol might negatively influence students' GPA (Kremer & Levy, 2008). Higher levels of peer cheating resulted in a substantially increased probability that an individual would cheat (Carrell, Malmstrom & West, 2008).

Although friends may not have positive effects on children's outcome and social behavior, lacking friends can result a sense of isolation. Sullivan (1953) drew specific attention to the putative links between friendship and loneliness, ascribing special significance to preadolescent friendship as a means of staving off feelings of loneliness and isolation. Asher et al. (1990) found that loneliness was correlated with low group acceptance or rejection as measured by sociometric ratings or a combination of positive and negative sociometric nominations.

Consequently, it is apparently to address the essentiality of the effects of friends. Rather than most previous researches were focused on the causal effects of friends on individuals, we estimate what will affect a child's decision of making friends. In other words, what traits a child has would attract others to choose him or her as best friend and why some children were not chosen as others' best friends. Since a considerable body of literature has found the causal effects of peers on educational achievement (Cooley, 2007; Burke & Sass, 2013), cognitive and non-cognitive ability (Tudge & Rogoff, 1999; King, 2010), and body image (Jones et al., 2004; Trogdon et al., 2008), that is why we decide to use these personal traits, including math test score, esteem, depression, grit, height-for-age z-score (HAZ), and overweight, as our explanatory variables. Moreover, we standardize these variables to find out how much they will contribute to the children's decision-making of making friends, respectively.

After comparing the differences between the children who have been chosen as best friends and their counterpart, we further estimate whether there are any differences among the children-have-been-chosen. By dividing these children into two groups: children who have been chosen only once and more than once, namely children with only one friend and the ones with more than one friends, we then can observe why some children are more popular than their counterpart. In order to get the purest result as we can, friends' individual characteristics (such as age, gender) and household background (such as age and years of schooling of parents, family fixed asset) were also controlled. We also control fixed effects at both school and grade level to rule out the heterogeneity among different schools and grades. Considering the potential heterogeneity among different types of children, we further do some heterogeneity check.

The rest of the paper is organized as follows. We specify our empirical model in Section 2. Our data is depicted in Section 3. Section 4 presents the empirical results, as well as the robustness check. Section 5 concludes the paper and gives discussion.

Data and Empirical Framework

Sampling

This paper draws on a cross-section dataset, which was collected among 11889 primary school students in 59 migrant and 60 rural primary schools in four provinces/cities: Beijing, Suzhou, Anhui, and Henan in 2017. Each school only requires one class in grade three and one in grade four respectively. Sampling took place in May and June 2017.

Firstly, we conducted sampling in Beijing and Suzhou on account of these two cities having a large number of migrant workers, as well as migrant children. 30 and 29 primary schools were randomly selected in Beijing and Suzhou respectively. We randomly selected one class in grade three and one in grade four in each sample school.

We then conducted sampling in Henan and Anhui province. we selected 6 rural primary schools from 6 different villages in each county. Two classes were selected, with one class in grade three and one in grade four for each sample school. In the end, our rural sample included 60 primary schools, 120 classes, aged 8 to 13 years old. All students in each sample class participated in our survey.

Survey Administration and Variable Generation

Our survey, administrated in May and June 2017 in Beijing, Suzhou, Anhui and Henan, consisted of three blocks, which will be described in more details below. All students participated in these three blocks, a standardized math test, a set of non-cognitive evaluations, and a questionnaire of personal information of these participants.

In the first block, all sample students (11889) were given a standardized math test which level is based on grade, so there are two different levels of math test: one for grade three and another for grade four. The test for grade three has 30 questions including 14 algebra questions, 7 geometry questions, 2 probability questions and 7 application questions. For grade four, there are 15 algebra questions, 6 geometry questions, 1 probability questions and 7 application questions. A time limit of 30 minutes was strictly enforced. The students were closely proctored to prevent cheating during the test. To generate a performance variable that could be used in our analysis, we also standardized the test scores using the score distributions at each survey. We generated the variable *Standardized math score*, which we present in terms of standard deviation.

In the second survey block, all students in our sample were asked to answer a series of questions about their individual and family characteristics. At the same time, the math teachers and class teachers of each sample class and the headmasters of the sample school were asked to respond to several questions about teacher and school characteristics. The same questions were asked to both students and teachers during all two surveys. From these questionnaires, we generated variables for individual student *gender (1=boy, 0=girl), age (months),* and *migrating status (1=in rural areas, 0=migrating to urban areas)*. We also generated variables to describe family characteristics, including *father's education yeas (years), mother's education years (years), father's age (years)* and *mother's age (years)*. Teacher and school characteristics were also collected in order to allow us to control for the impact on student performance in subsequent analysis, such as *school ID (number)*. Particularly, a specific question was given to all sample students in the questionnaire: *Do you have any friends in the classroom? Write down one of the name of your friends if you have*. Two things must be clear. First of all, it was possible that some sample students were chosen as friends more than once, while some might not be chosen, and we define these students who have not been chosen as *having no friends*, while define their counterparts as *having at least one friend*. Secondly, the definition of *friends* we give is a unidirectional friendship: A choose B as a friend does not mean B

treating A as a friend. Consequently, we generated the dependent variables *whether or not having friends (1=having friends, 0=having no friends)* and *whether or not having more than one friend (1=having more than one friend, 0=having only one friend)* based on this specific question.

In the third blocks, we evaluated the non-cognitive skills of all sample students. All cognitive and non-cognitive variables consist simply of the relevant score for each evaluation scale. All students (11889) in our sample were evaluated for non-cognitive skills using both the Big Five personality traits scale (BFI), the Esteem scale (RSES), the Depression scale (CES-D) and the Grit scale (Grit-S). Consequently, we generated key independent variables *Esteem*, *Not depression*, and *Grit* respectively.

Non-cognitive skill evaluation

To measure non-cognitive skills, we used the Center for Epidemiologic Studies Depression (CES-D), Rosenberg Self-esteem Scale (RSES) and the Grit scale. The CES-D scale, compiled by Radloff (1977), is one of the most widely used in the world to measure depressive symptoms. At present, CES-D is widely used in international large-scale surveys such as HRS (Health and Retirement Study), NHANES (National Health and Nutrition Examination Survey), and NLS (National Longitudinal Survey-Mature Women, NLS-Older Men, NLS-Youth) Wait. The RSES scale, compiled by Rosenberg, was originally used to assess teenagers' overall feelings about self-worth and acceptance (Rosenberg, 1965). At present, the scale is one of the most widely used self-esteem measurement tools in psychology. The original version consists of five forward scoring and five reverse scoring questions and each question is divided into four levels. We use the questionnaire after adjusting from the China Family Panel Studies (CFPS, 2012). In the CFPS (2012), the M1 section was the RSES scale, including the M101M to M114M 13 questions; each question was divided into five grades. Grit is defined as perseverance and passion for long-term goals by Duckworth in 2007. Grit entails working strenuously toward challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress (Duckworth et., 2007). Individuals high in grit characteristically do not swerve from their goals, even in the absence of positive feedback (McClelland, 1985). The Short Grit Scale (Grit–S) retains the 2-factor structure of the original Grit Scale (Duckworth, Peterson, Matthews, & Kelly, 2007) with 4 fewer items and improved psychometric properties.

3. Method and result

3.1 Statistics analysis

Our statistical analysis consists of three parts. Firstly, we give summary statistics including means of key variables, individual characteristics, and household characteristics by dividing all sample students into two subgroups: whether or not having friends, and whether or not having more than one friend with two types of students in each subgroup. See more details in table 1.

Secondly, we construct a probit model in order to find out why some students have not been chosen as friends while others have:

$$\mathrm{P}(\mathrm{y}=1|\mathbf{x},\mathbf{c},\mathbf{s}) = \mathrm{P}(y^{*}>0|\mathbf{x},\mathbf{c},\mathbf{s}) = \mathrm{P}[\mathrm{e}>-(\mathbf{x\beta}+\mathbf{c\gamma}+\mathbf{s})|\mathbf{x},\mathbf{c},\mathbf{s}]$$

$$= 1-\mathrm{G}[-(\mathbf{x\beta}+\mathbf{c\gamma}+\mathbf{s})] = \mathrm{G}(\mathbf{x\beta}+\mathbf{c\gamma}+\mathbf{s})$$

Where

$$\mathrm{G}(\mathrm{z}) = \Phi(\mathrm{z}) \equiv \int_{-\infty}^{z} \phi(v)dv$$

Where y is the probability of 1. whether or not having friends, 2. whether or not having more than one friend; $\mathbf{x}$ is a vector of our key independent variables, including math score, esteem, not depression, grit, HAZ, and not overweight, and all these key variables are standardized; $\mathbf{c}$ is a vector of control variables, including individual characteristics (grade, gender, and age of month of sample students) and household characteristics (ages and years of schooling of their parents, household fixed assets). We also include school-level dummy variables to control for all fixed school effects (represented by $\mathbf{s}$ in the model).

Because of the nonlinear nature of $\mathrm{E}(\mathrm{y}|\mathbf{x},\mathbf{c},\mathbf{s})$, OLS and WLS are not applicable, we use maximum likelihood estimation (MLE) to estimate the probit model.

Thirdly, we add some variables in the probit model to observe the robustness of the empirical results we have. Furthermore, we try to find some possible mechanisms behind the black box of decision of choosing friends, that is, what really attracts students to choose someone as friends.

3.2 What matters when students choose friends

Table 2 reports our main results[1] for the differences between the students with friends and the

[1] All coefficients from empirical results in tables in this paper present marginal effects.

ones who have no friends. Column (1) represents the probit regression with no control variables but school fixed effects, and the result shows that with one standard deviation increasing in math score, not depression, and grit significantly increase 4.9%, 2.3%, and 1.6% possibility of having friends, while with one deviation increasing in HAZ significantly decreases 1.3% possibility. When controlling individual and household characteristics, as column (2) represents, HAZ turns to insignificant, while math score, not depression, and grit are consistent with result in column (1), with one standard deviation increasing increases 5%, 2.2%, and 1.2% possibility that students are chosen as friends. We further control not overweight in both regression, and as the results showing in column (3) and (4), after controlling not overweight, grit turns to insignificant, while not overweight shows significant and positive, increasing 2.4% possibility of having friends with one standard deviation increasing. The coefficients of math score and not depression is consistent with the ones in column (2) with little change.

Table 3 reports the differences between students with one friend and the ones with more than one friend. As we can see in column (5), when considering the number of friends, only math score and grit matters, with one standard deviation increasing increases 5.1% and 2.8% possibility of having more friends, while esteem, not depression and HAZ does not matter. The result in column (6) is consistent even controlling individual and household characteristics. When further controlling not overweight in both regressions as column (7) and (8) present, the coefficients are still consistent. Furthermore, the result also means that students who are not overweight are more likely to have more friends.

We can find, if we compare results of column (4) and (8), some differences from the empirical results above. One is that not depressed students are more likely to be chosen as friends of someone, while depression contributes nothing to the number of friends someone has. In other words, students who are popular among their classmates, which means having been chosen more than once, may not depend on their depression status, but their depression status matters if they do not have any friends. Another difference is that grit only matters when considering the number of friends, which means that the reason why some students are more popular among classmate than their counterparts is partly that they are more persistent than their counterparts. But surprisingly, grit has no causal impact on formation of friendship.

3.3 Robustness and heterogeneity check

As result shows above, the cognitive (math score) and non-cognitive (not depression, grit) performance, and body image (not overweight) of students have significant and positive impacts on the foundation of friendship. In addition, we introduce some dummy variables in the model such as whether the students have pocket money (which equals 1 if they have), whether they are from rural area (which equals 1 if they are), and whether they are only child (which equals 1 if they are) to observe the robustness of our empirical results, as well as to observe the impacts of these variables on students' decision of making friends. Moreover, we do heterogeneity check hence the possible heterogeneity among different types of students.

Table 4 shows the results after introducing the variables mentioned above in the model. Comparing the results of column (10), (11), and (12) with (9), we can see the results after introducing new variables are consistent with those before, and none of these introduced variables are significant. In addition, the results are also robust in column (13) to (16). Particularly, pocket money is positively significant at 10% level, with a marginal coefficient of 0.018, which means that the students having pocket money have 1.8% higher possibility to having friends than their counterparts. Other two variables we mentioned are still insignificant.

When considering robustness of the impact on numbers of friends which imposed by students' cognitive and non-cognitive performance, and body image, we also introduce variables of pocket money, rural area, and only child. Table 5 presents the results, and we can draw a conclusion that the results are robust after introducing three variables, and none of these introduced variables are significant.

After confirming that our empirical results are robust, we further test whether there are any differences in the decision of making friends among different types of students. We, on the one hand, divide them into three groups: left-behind students[2], non-left-behind students, and migrant students, and run the model in each subsample. Table 6 presents the results. Results in full sample, which shows in column (25) and (26), that math score, not depression, grit, and not overweight have positively significant impact on decision of making friends, while results of left-behind sample are not consistent with results in full sample: math score is still positively significant, depression is not

[2] The definition of left-behind students here is the students whose parents are both going out for working, which means none of parents are at home.

significant any more, and not overweight is only significant at 10% level. Moreover, the coefficient of grit in column (29) is insignificant while that is positively significant in the full sample. Therefore, these differences suggest a kind of heterogeneity among different types of children.

We, on the other hand, divide full sample into two groups: only child and children with siblings. As table 7 shows, the results of only-child sample are not consistent with the results of children-with-siblings sample, as well as the results of full sample. In only-children sample, not depression and grit have no impact on the decision of making friends, while math score is still stay significant. Consequently, these findings show that there exists heterogeneity among different types of students.

4. Conclusion and discussion

The decision of choosing friend, according to the results above, relies on math score, depression status, and grit, while grit turns to insignificant if we consider not overweight. This change may imply a potential mechanism: grit does not directly affect decision of making friends, it acts on the decision through variable- not overweight, namely grit plays a role of the mediator variable. It seems to make sense: grit may not be observable, but it can show up through overweight that is visible, so students can decide to make friends with others by watching whether they are overweight. Results in table 8 exemplify that: after controlling individual and household characteristics, and school fixed effects, grit has a positively significant effect on not overweight.

Another interesting finding, as table 2 and 3 show, is that, on the one hand, depression status matters a lot on whether a student can have friends, but it turns to insignificant when considering the numbers of friends; on the other hand, grit plays an important role in numbers of friends, while turns to insignificant when considering whether a student can have friends. so, it exists a difference between "qualitative change" and "quantitative change". "Qualitative change" here means the change from no friends to having friends, while "quantitative change" represents the change from one to more. This difference is also reasonable: on the one hand, a student looks depressed may be harder to get close to, as well as more introverted, so others may stay far away from him and choose not to talking or playing with him; on the other hand, students are likely to make friends with the one who are more persevering, hence the bound of friendship needs patient and repeated communication, and in order to maintain this bound, grit is necessary.

Although we have drawn some conclusions, one inevitable problem of this paper is potential

endogeneity problem. Measurement error of our key dependent variable, and inevitable omission of some variables in the model may lead to the correlation between dependent variables and error term. In order to solve this endogeneity problem, one strategy is find feasible instrument variables. Unfortunately, we cannot solve this problem by now, because there are six key endogeneity variables in our model, trying to solve the problem means to find more than six instrument variables which we cannot find by now. Furthermore, limited in the structure of our dataset, which is a cross section dataset, we cannot use difference-in-difference strategy to solve this endogeneity problem. Therefore, further research need to be carried on to try our best to solve this problem.

Reference:

Ali MM, and Dwyer DS. Estimating peer effects in adolescent smoking behavior: a longitudinal analysis. Journal of Adolescent Health, 45(4): 402-408, 2009

Andreas Ammermueller, and Jrn-Steffen Pischke. Peer effects in European primary schools: Evidence from the progress in international reading literacy study. Journal of Labor Economics, 27(3): 315-348, 2009

Asher SR., and Coie JD. Peer rejection in childhood. Cambridge University Press, 1990

Barboza Gia Elise, Schiamberg Lawrence B., Korzeniewski, Steven J., Post, Lori A. Individual characteristics and the multiple contexts of adolescent bullying: An ecological perspective. Journal of Youth and Adolescence, 38(1): 101-121, 2009

Bowlby John. Attachment and loss. Penguin, 1975

Bruce Sacerdote. Peer effects with random assignment: Results for Dartmouth roommates. The Quarterly Journal of Economics, 116(2): 681-704, 2001

Carrell Scott E., Malmstrom Frederick V., and West James E. Peer effects in academic cheating. Journal of Human Resources, 43(1): 173-207, 2008

Frostad Perl, and Pijl Sip. Does being friendly help in making friends? The relation between the social position and social skills of pupils with special needs in mainstream education. European Journal of Special Needs Education, 22(1): 15-30, 2007.

Garandeau, Claire F., Cillessen, Antonius H.N. From indirect aggression to invisible aggression: A conceptual view on bullying and peer group manipulation. Aggression and Violent Behavior, 11(6): 612-625, 2006

Goldsmith-Pinkham Paul, and Imbens Guido W. Social networks and the identification of peer effects. Journal of Business and Economic Statistics, 31(3): 253-264, 2013

Jaegeum Lim, and Jonathan Meer. How do peers influence BMI? Evidence from randomly assigned classrooms in South Korea. Social Science and Medicine, 19(7): 17-23, 2018

Jones Diane Carlson. Body image among adolescent girls and boys: a longitudinal study. Developmental Psychology, 40(5): 823-835, 2004

Justin G. Trogdon, James Nonnemaker, and Joanne Pais. Peer effects in adolescent overweight. Journal of Health Economics, 27(5): 1388-1399, 2008

Ken Rigby. Bullying in schools and the mental health of children. Australian Journal of Guidance and Counselling, 15: 195-208, 2005

Kremer Michael, and Levy Dan. Peer effects and alcohol use among college students. The Journal of Economic Perspectives, 22(3): 189, 2008

Lundborg Petter. Social capital and substance use among Swedish adolescents—an explorative study. Social Science and Medicine, 61(6): 1151-1158, 2005

Mary A. Burke, and Tim R. Sass. Classroom peer effects and student achievement. Journal of Labor Economics, 31(1): 51-82, 2013

McEwan, and Patrick J. Peer effects on student achievement: Evidence from Chile. Economics of Education Review, 22(2): 131-141, 2003

Melissa K. Holt, and Dorothy L. Espelage. Perceived social support among bullies, victims, and bully-victims. Journal of Youth and Adolescence, 36(8): 984-994, 2007

Mercken Liesbeth, Steglich Christian, Sinclair Philip, Holliday Jo, and Moore Laurence. A longitudinal social network analysis of peer influence, peer selection, and smoking behavior among adolescents in British schools. Health Psychology, 31, 2012

Ross B. Wilkinson. The role of parental and peer attachment in the psychological health and self-esteem of adolescents. Journal of Youth and Adolescence, 33(6): 479-493, 2004

Rudolph H. Schaffer. Social development. Wiley-Blackwell, 1996

Sullivan H.S. The interpersonal theory of psychiatry. New York: Norton, 1953

Toni Mora, and Joan Gil. Peer effects in adolescent BMI: evidence from Spain. Health Economics, 22(5): 501-516, 2013

Tudg, Jonathan, and Rogoff Barbara. Peer influences on cognitive development: Piagetian and Vygotskian perspectives. Lev Vygotsky: Critical assessments, 1999

Vigdor J., Timmins C., Taber C., Scholz K., Ryan S., Durlauf S. and Cooley J. Desegregation and the achievement gap: Do diverse peers help? Unpublished manuscript

Willard W. Hartup. Social relationships and their developmental significance. American Psychologist, 44(2): 120-126, 1989.

Zimmer RW, and Toma EF. Peer effects in private and public schools across countries. Journal of Policy Analysis & Management, 19(1): 75-92, 2010

Table 1. Descriptive statistics

Variable	Kids without friends (1)	Kids with at least one friend (2)	Diff (1) - (2)
Key variables:			
Standardized mathscore	-0.135	0.094	-0.229***
Standardized esteem	-0.074	0.050	-0.124***
Standardized not depress	-0.084	0.056	-0.140***
Standardized grit	-0.093	0.062	-0.155***
Standardized HAZ	0.018	-0.012	0.030
Standardized not overweight	0.811	0.856	-0.044***
Individual characteristics:			
Grade	3.490	3.513	-0.022**
Boys	0.585	0.514	0.071***
Age of months	126.284	126.485	-0.201
Having pocket money	0.589	0.614	-0.026***
From rural area	0.506	0.564	-0.058***
Only child	0.134	0.128	0.006
Household characteristics:			
Age of fathers	37.715	37.454	0.260***
Years of schooling of fathers	9.751	9.784	-0.033
Age of mothers	35.875	35.765	0.110
Years of schooling of mothers	9.121	9.218	-0.097
Asset	-0.067	0.047	-0.114***

Source: author's own research

Table 2. Each key variable contributes to a child's choice of being friends.

Marginal effects	Having been chosen as friends at least once or not been chosen			
	(1)	(2)	(3)	(4)
Standardized math score	0.049***	0.050***	0.048***	0.049***
	(0.006)	(0.006)	(0.006)	(0.006)
Standardized esteem	0.008	0.007	0.007	0.006
	(0.006)	(0.006)	(0.006)	(0.006)
Standardized not depress	0.023***	0.022***	0.022***	0.022***
	(0.005)	(0.005)	(0.005)	(0.005)
Standardized grit	0.016***	0.012**	0.012**	0.008
	(0.005)	(0.005)	(0.006)	(0.006)
Standardized HAZ	-0.013***	-0.007	-0.004	0.001
	(0.005)	(0.006)	(0.005)	(0.006)
Standardized not overweight			0.026***	0.024***
			(0.005)	(0.005)
Control variables	No	Yes	No	Yes
School effects	Yes	Yes	Yes	Yes
Pseudo R2	0.020	0.023	0.022	0.025
Observations	10276	10276	9399	9399

Note: that the observations in column (1) and (2) are 10276 rather than 11889 due to the missing value of some variables in the regression; the observations in column (3) and (4) are 9399 because we rule out the sample students whose BMI z-score is less than -2 standard deviation.

Source: Author's own research

Table 3. Each key variable contributes to numbers of friends.

Marginal effects	Having been chosen as friends once or more than once			
	(5)	(6)	(7)	(8)
Standardized math score	0.051***	0.051***	0.051***	0.051***
	(0.007)	(0.007)	(0.008)	(0.008)
Standardized esteem	0.002	0.002	0.003	0.002
	(0.007)	(0.007)	(0.008)	(0.008)
Standardized not depress	0.009	0.009	0.009	0.009
	(0.006)	(0.006)	(0.007)	(0.007)
Standardized grit	0.028***	0.028***	0.026***	0.026***
	(0.007)	(0.007)	(0.007)	(0.007)
Standardized HAZ	-0.007	-0.002	-0.006	-0.002
	(0.006)	(0.007)	(0.007)	(0.008)
Standardized not overweight			0.015**	0.017**
			(0.007)	(0.007)
Control variables	No	Yes	No	Yes
School effects	Yes	Yes	Yes	Yes
Pseudo R2	0.025	0.026	0.026	0.028
Observations	6281	6281	5730	5730

Note: the observations in column (5) and (6) are nearly half of the total sample because we focus on the students who already have friends, and further, to find out what affect the students' popularity among their classmates. Sample size in column (7) and (8) are smaller than those in column (5) and (6) because we rule out the sample students whose BMI z-score is less than -2 standard deviation.

Source: Author's own research

Table 4. Robustness check

Marginal effects	Having been chosen as friends at least once or not been chosen							
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Standardized math score	0.050***	0.050***	0.050***	0.047***	0.049***	0.050***	0.049***	0.046***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Standardized esteem	0.007	0.007	0.007	0.008	0.006	0.006	0.006	0.006
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Standardized not depress	0.022***	0.022***	0.022***	0.021***	0.022***	0.022***	0.022***	0.020***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Standardized grit	0.012**	0.012**	0.012**	0.013**	0.008	0.009	0.008	0.009
	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Standardized HAZ	-0.007	-0.007	-0.007	-0.006	0.001	0.001	0.001	0.003
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Standardized not overweight					0.024***	0.024***	0.024***	0.027***
					(0.005)	(0.005)	(0.005)	(0.005)
Having pocket money		0.012				0.018*		
		(0.010)				(0.011)		
Children from rural areas			0.025				-0.004	
			(0.082)				(0.091)	
Only-child				0.006				0.011
				(0.015)				(0.015)
Gap of math score								
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.023	0.024	0.023	0.022	0.025	0.025	0.025	0.024
Observations	10276	10276	10276	9809	9399	9399	9399	8971

Note: that the observations in column (9), (10) and (11) are 10276 rather than 11889 due to the missing value of some variables in the regression; the observations in column (13), (14) and (15) are 9399 because we rule out the sample students whose BMI z-score is less than -2 standard deviation. Sample size in column (12) and (16) are smaller than before respectively because of the missing value in variable only-child.

Source: author's own research

Table 5. Robustness check

Marginal effects	Having been chosen as friends once or more than once							
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Standardized math score	0.051***	0.051***	0.051***	0.051***	0.051***	0.051***	0.051***	0.051***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)
Standardized esteem	0.002	0.002	0.002	0.004	0.002	0.002	0.002	0.005
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Standardized not depress	0.009	0.009	0.009	0.008	0.009	0.009	0.009	0.009
	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Standardized grit	0.028***	0.028***	0.028***	0.028***	0.026***	0.026***	0.026***	0.026***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Standardized HAZ	-0.002	-0.003	-0.002	-0.003	-0.002	-0.002	-0.002	-0.003
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)
Standardized not overweight					0.017**	0.017**	0.017**	0.015**
					(0.007)	(0.007)	(0.007)	(0.007)
Having pocket money		0.020				0.018		
		(0.013)				(0.014)		
Children from rural areas			-0.056				-0.001	
			(0.099)				(0.109)	
Only-child				-0.008				-0.004
				(0.019)				(0.020)
Gap of math score								
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.026	0.026	0.026	0.026	0.028	0.028	0.028	0.028
Observations	6281	6281	6281	6026	5730	5730	5730	5496

Note: the observations in column (17), (18) and (19) are nearly half of the total sample because we focus on the students who already have friends, and further, to find out what affect the students' popularity among their classmates. Sample size in column (21), (22) and (23) are smaller than those in column (17), (18) and (19) because we rule out the sample students whose BMI z-score is less than -2 standard deviation. Sample size in column (20) and (24) are smaller than before respectively because of the missing value in variable only-child.

Source: author's own research

Table 6. Heterogeneity check

Marginal effects	Having been chosen as friends at least once or not been chosen							
	Total		Left-behind Children		Non-left-behind children		Migrant Children	
	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
Standardized math score	0.050***	0.049***	0.034***	0.034***	0.048***	0.046***	0.063***	0.063***
	(0.006)	(0.007)	(0.010)	(0.011)	(0.010)	(0.010)	(0.009)	(0.009)
Standardized esteem	0.007	0.003	0.005	0.009	0.016	0.013	0.001	-0.001
	(0.006)	(0.007)	(0.011)	(0.012)	(0.010)	(0.011)	(0.009)	(0.009)
Standardized not depress	0.022***	0.022***	0.017*	0.015	0.023**	0.024**	0.023***	0.021***
	(0.005)	(0.006)	(0.009)	(0.010)	(0.009)	(0.009)	(0.008)	(0.008)
Standardized grit	0.012**	0.008	0.013	0.007	0.005	-0.003	0.015*	0.016*
	(0.005)	(0.007)	(0.010)	(0.011)	(0.010)	(0.011)	(0.008)	(0.008)
Standardized HAZ	-0.007	-0.004	-0.013	0.001	-0.003	0.0004	-0.005	0.004
	(0.006)	(0.007)	(0.011)	(0.012)	(0.010)	(0.011)	(0.008)	(0.009)
Standardized not overweight		0.025***		0.020*		0.030***		0.024***
		(0.006)		(0.011)		(0.010)		(0.007)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.023	0.027	0.025	0.026	0.032	0.035	0.029	0.030
Observations	10276	7072	2756	2471	2936	2651	4584	4277

Note: the observations in latter columns are smaller than those in former ones because we rule out the sample students whose BMI z-score is less than -2 standard deviation.

Source: author's own research

Table 7. The relationship between grit and overweight

	Standardized not overweight
Standardized grit	0.020*
	(0,011)
Control variables	Yes
School effects	Yes
R-squared	0.058
Observations	9478

Source: Author's own research