Learned Helplessness in Low-income Children:

Application of Economic Model of Social Status

Hyein Jeong*

November 2021

Abstract

Applying an economic model of social status to the achievement goal theory, this paper examines the relationship between parental income and formation of learned helplessness in their children. The primary finding is that as the rank of parents in the income distribution decreases, their children's achievement goal becomes performance-oriented. Moreover, the performance-oriented goal makes students underestimate their academic ability, which is a behavioral feature of learned helplessness. Theses findings indicate that in the society which bestows higher social status on academic ability, low-income students are more likely to acquire helpless behavior in learning process. Therefore, awarding social status on education could create an environment which impedes low-income students from perceiving higher education as an opportunity for upward social mobility.

Keywords: Positional Goods, Learned Helplessness, Social Mobility, Achievement Gap

JEL Codes: I24, D62

---

*Master's candidate. Department of Economics, University of Bonn, Regina-Pacis-Weg 3, 53113, Bonn, Germany; s6hyjeon@uni-bonn.de

1 Introduction

There has been debates on undermatching of students from low-income families to colleges. Chetty et al. (2020) postulated smaller estimates of undermatching than the estimates of Hoxby and Avery (2013), stressing that this was because low-income students mostly had insufficient SAT scores to be admitted to top-tier colleges. On the other hand, Hoxby and Avery (2013), which estimated a large number of high achieving low-income students, argued that the main reason of undermatching of low-income students to colleges is student's application behaviors; they did not apply for selective colleges despite their high enough SAT score and those colleges' willingness to offer financial aid. From the debates, low-income students are generally described to have 'Learned Helplessness' — a behavior to give up or avoid opportunities to surmount negative events. To elaborate, both of the behaviors of students in Chetty et al. (2020) who did not pursue higher education for upward social mobility and the students' risk-avoidance application behaviors described by Hoxby and Avery (2013) showed that students did not try to seize opportunities even when they can do. Therefore, this paper explores the relationship between parental income and learned helplessness in their children to explain achievement gaps between students from different family backgrounds. Growing literature has verified achievement gaps between students from low-income families and high-income families. However, there is little explanation on how parental income causes the gaps. This paper can contribute to adding elucidation to the matter.

Helplessness is known to be predicted by achievement goal orientation (Elliot and Dweck, 1988; Boggiano et al., 1992). According to the achievement goal theory, there are two conflicting achievement goals: learning goal and performance goal. Learning goal is defined as a motivation to master learning subjects while performance goal indicates a motivation to get others' favorable judgements or to avoid negative judgements on their outcomes. The literature stressed that the orientation to performance goal predicted helplessness of children. In order to quantify performance goal orientation, this paper introduced an economic model of social status (Frank, 1985) which assumed interdependent preferences and used terminology of positional goods — goods that consumers care how much others consume and the relative status in the positional consumption affects utility. The model demonstrated that demands for positional goods in a noncooperative case are higher than in a cooperative case, which implied divergence between individual interests and social collective interests. In addition, it suggests that the budget share for non-positional goods is a increasing function of the rank of individual in the income distribution; the budget share of positional goods is a decreasing function of the income rank of individuals. Therefore, this

research investigated the performance goal by setting it as positional goods. Accordingly, the orientation to performance goal was measured by its ratio to the total scale of achievement goals, and considered as the budget share of positional goods.

In sum, the study set three hypothesis. First, *the scale of motivation in learning, defined as mental resource, is allocated by parental income.* This is to define budget from the perspective of achievement goals. Second, *the achievement goal is less oriented to performance goal as parental income increases.* Lastly, *learned helplessness increases as the achievement goal is oriented to performance goal.* The analysis consisted of three parts on the hypotheses. For the second part and third part, parents' region of origin was used as an instrument variable in two stage least squares (2SLS) regression. To measure learned helplessness, I used self-perception on academic ability which is a behavioral feature of learned helplessness (Brown and Inouye, 1978; Valås, 2001). The self-perception is defined by the difference between self-reported academic ability and Korean SAT scores.

The primary finding was that the sign of coefficient of parental income was consistent with the first and second hypotheses, although they were not statistically significant with p-values between 0.1 and 0.2. Furthermore, the third hypothesis was confirmed by the positive and statistically significant coefficient of performance goal orientation (p-value < 0.001). Learned helplessness was measured by the subtraction of Korean SAT score from self-reported academic ability. A larger value of the test score or self-reported academic ability indicated lower competence on academic outcomes. Therefore, the positive coefficient of performance goal orientation in the third part of the analysis suggested that as the achievement goal was more oriented to performance goal, students are more likely to underestimate their academic ability. Some policy implications of this analysis are to alter goal structure of learning environment (Kaplan et al., 1998; Wolters, 2004; Pulkka and Niemivirta, 2013)[1]. Of control variables, 'teacher effect' which represented student's positive interaction with teachers might have a role. The analysis demonstrated that it increases self-perception on their academic ability. Moreover, teacher effect showed negative and statistically significant effects on formation of performance-oriented goal.

To conclude, this paper examined the relationship between parental income and learned helplessness of their children. It showed that parental income could affect students to form performance-oriented goals (p-value = 0.16) and the resultant goal orientation led students to learn helplessness. On the other hand, the effects of positive interaction with teachers on students were opposite to the effects of parental

---

[1] "*Goal structure* describes the type of achievement goal emphasized by the prevailing instructional practices and policies within a classroom, school, or other learning environments"(Wolters, 2004)

income. Thus, teachers might alleviate the relationship between parental income and learned helplessness of their children. The insight of this study is that when academic ability relates to social status, low-income students are prone to behave in helpless manner. This implies the society, which bestow higher social status on academic outcomes, inherently impedes low-income students from pursuing opportunities of higher education. Lastly, these findings reconcile debates on estimates of high achieving, low-income students by suggesting their consistent behavioral patterns. In addition, the analysis contributes the literature of achievement gaps between students with different levels of parental income by showing how parental income affects to the behaviors.

This article is organized as follows. Section 2 introduces theoretical backgrounds. Section 3 describes the data. Section 4 suggests identification strategies of OLS and 2SLS. Section 5 presents the results on the relationship between parental income and learned helplessness of their children thorough achievement goal orientation. Section 6 concludes.

2   Theoretical Backgrounds

2.1   Frank (1985) : A Economic Model of Social Status

The main theoretical framework of this paper is an economic model of social status postulated by Frank (1985). This model describes consumption decision behavior based on interdependent preferences. To describe interpersonal comparison between individuals, the author introduced terminologies of positional goods and nonpositional goods which are first generated by Hirsch (1977). Frank (1985) defines positional goods as goods where people care their relative status in the positional consumption distribution. Its utility function is as following.

$$U = U(x, y, R(x)), \tag{1}$$

where x is consumption on positional goods and y is consumption on non-positional goods. $R \in [0,1]$ indicates the rank acquired by consuming positional goods which is expressed by percentile at the distribution of positional consumption x. Suppose $f(x)$ be the density function of x and x_0 is the smallest value of x. Then, for $x = x_1$,

$$R(x_1) = \int_{x_0}^{x_1} f(x) \, dx \tag{2}$$

This means that an individual's rank in positional consumption distribution depends on how much others consume the positional goods. The model showed that if assume $U(x, y, R(x))$ is homothetic in x

3

and y when $R(x)$ is fixed and set saving as example of nonpositional consumption, then the budget share of the saving is an increasing function of the individual's rank in the income distribution. Put differently, budget share of positional consumption is a decreasing function of the individual's rank in the income distribution. It can be described with a numerical example.

Suppose that $U(\cdot)$ is Cobb-Douglas form which is,

$$U(x, y, R(x)) = x^{\alpha_1} y^{\alpha_2} R(x)^{\alpha_3}, \quad s.t. \ \frac{xP_x}{M} + \frac{yP_y}{M} = 1 \tag{3}$$

where α_1, α_2 and $\alpha_3 > 0$. Also, suppose the density function, $f(x)$, a uniform function defined on $[x_0, Kx_0]$ where K is some positive integer. Therefore $R(x_1) = \int_{x_0}^{x_1} \frac{1}{(K-1)x_0} dx = \frac{(x_1 - x_0)}{(K-1)x_0}$ for $x_1 \in [x_0, Kx_0]$. Firsorder conditions for maximization of utility in non-cooperative case and cooperative case is as following.

$$\frac{\alpha_1 y}{\alpha_2 x} + \frac{\alpha_3 y}{\alpha_2(x - x_0)} = \frac{P_x}{P_y} \tag{4}$$

$$\frac{\alpha_1 y}{\alpha_2 x} = \frac{P_x}{P_y} \tag{5}$$

That is, α_3 which indicates elasticity of utility with respect to $R(x)$ takes a significant role to make the first-order condition in noncooperative case, equation (4), equal to cooperative case, equation (5). For analytical convenience, assume that $\alpha_1 = \alpha_2 = \alpha_3$. By equation (4), budget share of positional goods becomes

$$1 - \frac{P_y y}{M} = 1 - \frac{P_x(x - x_0)}{M(2x - x_0)} \tag{6}$$

The salient insight of this model is that demands for positional goods in noncooperative case are higher than in cooperative case. To be specific, interdependent preference distorts individual's consumption behaviors and the distortion causes waste of money on conspicuous consumptions. The paper mentioned that the divergence between noncooperative and cooperative equilibrium do not necessarily mean loss of social welfare. However, in the following research (Frank, 2005), the author found out evidence that this divergence results in a society of sub-optimal status. Therfore, the author stresses the necessity of government intervention to prevent the divergence of individual pursuits from the entire social interests.

2.2   Achievement Goals and Learned Helplessness

In this part, I introduce two psychological backgrounds: achievement goals theory and learned helplessness. An *achievement goal* indicates the purposes of achievement behavior(Ames, 1992). To elaborate, it motivates people to pursue competence related tasks and also becomes a criteria to evaluate the consequent outcomes (Ames 1992; Elliot ,1997; Pintrich, 2000). There are two contrasting types of achievement

goals. The terminologies are varied by the literature[2]. In this research, I will use *learning goals* and *performance goals*(Elliot and Dweck, 1988). Learning goals is defined to describe mastery-oriented students' behaviors that individuals seek to increase their ability or master new tasks(Nicholls & Dweck, 1979). Performance goals is a motivation that individuals seek to maintain positive judgement of their ability and avoid negative judgments.

Learned helplessness indicates the failure of escape negative events. It is defined as a belief that outcomes are independent of their responses (Maier and Seligman, 2016). It especially related to deficit of motivation (Abramson et al, 1978). To elaborate, Repeated experiences of uncontrollable outcomes render people helpless that their responses cannot change the outcomes and it causes motivational deficits to initiate voluntary responses (Abramson et al, 1978). I assume that poverty should be considered as being uncontrollable especially for children who do not have financial ability. Therefore, poverty in childhoods let children to perceive financial difficulties as being irrelevant to their reactions and this perception persists to adulthood where they actually could make changes in their financial status.

To find a source of learned helplessness, I referred to findings of Elliot and Dweck (1988) and Boggiano et al. (1992) which demonstrated causality effect of performance goals on learned helplessness. The research was motivated by different reaction to obstacles in learning between same ability children. When they ran into negative outcomes, some of them were focused on solution and proceeded to improve their competence. However, other helpless student found the reason of negative outcomes on their low ability which is a stable factor not easy to be changed. The authors proved that this different reaction to the same situation came from differences in setting of motivation. Based on this theoretical backgrounds, this article assumes the relationship between helplessness and achievement goals.

$$Helpless = h(x, y), \tag{7}$$

subject to $\alpha x + \beta y \leq B$, where x is performance goals, y is learning goals and B is mental resources. α and β is costs of motivation. According to findings of reference that the function of $h(\cdot)$ is defined as follows.

$$\frac{\partial h}{\partial x} > 0 \tag{8}$$

$$\frac{\partial h}{\partial y} < 0 \tag{9}$$

$$\frac{d^2 h}{\partial x \cdot \partial y} < 0 \tag{10}$$

---

[2]Amre classroom structure: There are various classification of achievement goals. But they are consistent in that learning goals, mastery goals are oriented to learning the tasks and performance goals is focused on other's judgments on outcomes.

$h(\cdot)$ is a increasing function of performance goal and a decreasing function of learning goal. The effects of performance goals to learned helplessness are decreasing as learning goals are increasing. To quantify learned helplessness, this article uses *self-perception* as a proxy (Brown and Inouye, 1978; Valås, 2001). Low self-perception on competence is a behavioral feature of learned helplessness. Moreover, Elliot and Dweck (1988) found that perception of low ability reinforces learned helplessness in children. This interaction betweenself-perception on ability and learned helplessness made it difficult to clarify causality. Thus, this study put the self-perception at the same level of learned helplessness which means, self-perception is measurements of learned helplessness.

3 Data

3.1 Sample Selection

The data used in this article is Korean Education & Employment (KEEP) provided by Korean Research Institute for Vocational Education & Training (KRIVET). The primary sample consists of high school students who answered motivations in learning and their parents who answered their income. There are 1,704 observations who gave valid responses to the questionnaire. In the last part of analysis, I used Korean SAT scores to see the accuracy of students self-perception and it restricted the sample size to 875. The students were selected at the age between 16 and 18 in 2006 and 2007, who were in middle school at the first year of the survey. The middle schools were chosen by following steps. First, Out of 2,903 middle schools in South Korea, schools whose number of students at each years are less than 30 was excluded. Secondly, regions were categorized into 15 groups and according to the ratio of regional number of students to total number of students in the country, the number of schools was allocated by regions. For each middle schools out of chosen 100 middle schools, five students in a same classroom, a teacher of the classroom and the students' legal guardians were selected as the respondents. In 2007, the middle school cohorts was supplemented with new cohort due to churn rate.

3.2 Important Variables

A. Performance Goal Orientation

In the questionnaires of KEEP, there were 12 questions related to learning motivations. Out of 12 questions, I used 2 questions as a proxy for performance goals: "to avoid disregard from other students" and "to gain favorable judgements from parents or teachers". A proxy for achievement goals is a question, "to

Table 1: Summary statistics for Analysis Sample

	Accuracy of self-perception	Performance Goals	Ratio of Performance Goals	Income of New Cohort	Income in 2006	Income in 2007
count	1239	2747	2747	1123	330	1210
mean	2.17	5.33	0.64	320.96	222.18	351.50
std	1.35	1.73	0.10	238.95	137.70	261.65
min	0.00	2.00	0.29	30.00	20.00	5.00
25%	1.00	4.00	0.60	170.00	120.00	200.00
50%	2.00	5.00	0.67	270.00	200.00	300.00
75%	3.00	6.00	0.71	400.00	300.00	400.00
max	7.00	10.00	0.91	3000.00	1050.00	5000.00

Note: Accuracy of self-perception means difference between self-reported value of school attainments and Korean SAT scores. The currency for parental income is South Korean Won(KRW).

have fun in learning and acquiring knowledge". The scale of each question is from 1 to 5. Answering '1' means that the respondent is not motivated by the mentioned goals in the question and '5' means that the goals is strongly motivating the student. To be specific, if a student answered '1' to the question of disregard from others, it means that the student thinks that the disregard from others is not a consideration in learning for him or her. According to the definition of performance goals, performance goals are represented by the sum of two questions of favorable judgement and negative judgement. Also, the scale of total achievement goals is defined by adding up responses of performance goals and learning goals. Performance goal orientation is defined as ratio of performance goals to the total achievement goals. It can be restated by budget share of positional goods, x, as below.

$$\frac{P_x x}{M} = \frac{ax}{ax + by},$$

(11)

where P_x is price of positional goods, M is budget, y is mastery goals – non positional goods, and a and b are weights of performance goals and mastery goals respectively.

B. Parental Income

Information about parental income was collected every year. There were three questions related to parental income: question for income of male legal guardian, question for income of female legal guardian and question for income of a household. I used household level income information. Its currency is South Korean

Table 2: Summary of Differences between Self-Assessments and Korean SAT scores

	Korean	Math	English
count	1239	1239	1239
mean	-2.01	-1.63	-1.88
std	2.04	1.88	1.89
min	-8.00	-8.00	-8.00
25%	-3.00	-3.00	-3.00
50%	-2.00	-2.00	-2.00
75%	-1.00	0.00	-1.00
max	4.00	4.00	3.00

Note: Each estimate is subtraction of test scores from self-reported scores.

Won (KRW) which is 1 USD is approximately equal to 1,200 KRW. For each survey year, households whose income is above 10 million KRW were detected as a outlier. However, since the analysis used rank of parents in the income distribution as a proxy for parental income. The outlier does not matter. It also implies interdependent preferences because relative income is more important to individuals than absolute amount of income. Moreover, it is to investigate the finding of models that budget share of positional goods increases as the rank decreases.

C. Self-perception

self-perception is measured by self-reported ability at the three mandatory subjects in Korean SAT: Korean, Math and English. The evaluation was scaled by 5 and '5' means 'I am not good at that subject'. I gained the absolute value of differences between each evaluations and actual Korean SAT scores. Then, the average of the deviation from Korean SAT scores was used as a proxy of accuracy of self-perceptions. Additionally, the non absolute value of the differences is provided in Table 2. Out of 1,239 senior high school students, most of them underestimate their abilities which means subtraction test score from self-reported ability is smaller than zero for 75% of students over three subjects.

3.3 Control Variables

Achievement goal orientations are known to be affected by the goal structure of an environment. *Goal structure* indicates the achievement goal which is emphasized within a classroom, or other learning environment such as grading procedure (Wolters, 2007; Anderman and Anderman, 1999). According to the literature, the analysis introduced three primary control variables. First, *School Type* indicates 9 different types of high schools. There are two category of school: vocational high school and general high school. Then the general high school is divided into 8 different types by curriculum which means the difference in curriculum can form different learning environments to students. Moreover, since some schools who require entrance exam, such as science high schools and foreign language high schools, are relatively competitive to other schools, performance goals orientation might be more likely to observed at those competitive schools. Therefore, the analysis counts in the school types.

Secondly, the survey asked students about positive interaction with their class teacher. In Korean high schools, students are allocated into a classroom which differs every year and there is a teacher in charge of each classroom. The survey provides four questions for students to evaluate their classroom teachers with the scale of 5. As the values is larger, it implies students have positive interaction with their teachers. The average of the responses is defined as *Teacher Effects*. Lastly, the control variable of *Parents Effects* represents the degree of parents' effects related to performance goals orientation. A question in the survey measures whether their parents evaluate the students' achievements compared to others. However, since this question was only available in 2007, the analysis used term $D_t PE_{ij}$ where D_t is a dummy variable which equals to 1 if the year is 2007 and where PE_{ij} represents parents effects with the scale of 5.

4 Identification Strategy

The research consists of three parts of analysis. The first analysis provides the relationship between parental income and mental resource. The second part of analysis provides the relationship between achievement goal orientation and parental income. Then, the third part will demonstrate the effects of performance oriented-goals on students self-perception.

To use the theoretical framework to achievement goals, the analysis requires an assumption that the entire motivation in learning increases as parental income increases because the entire motivation represents individual's budget in the economic model. Mani et al. (2013) stressed that due to limited capacity of human cognitive system, budgetary concerns of the low-income people reduces their available

9

mental resources. I considered the eleven questions related to motivation in learning as indicators of mental resources and investigated whether the each questions are related to parental income. Although increasing scale of motivation by income is not applicable for every single individuals, the relationship between the scale of motivation and income turned out positively correlated for all questions of interest. Moreover, since the main interest of this analysis is the ratio of performance goals to the entire achievement goals, whether the scale of motivation is exactly allocated by income does not harm the significance of results. Therefore, this research was carried out under the assumption that the entire motivation is allocated by income.

$$S_{ijt} = a_t + b_i + \beta_1 PI_{ijt} + \beta_2 D_t PE_{ij} + \beta_3 \sum_{n=1}^{N} Cov_{ijt} + \epsilon_{ijt}, \tag{12}$$

where i and j indicate students and their parents, respectively,and t indicates the year. The coefficient of interest is $beta_1$, the effect on the dependent variable of the rank of parents in the income distribution, PI, conditional on fixed effects for time(a_t) and the type of schools (b_i)

In the second part and third part, the analysis uses an instrumental variable (IV) to limit endogeneity. The instrumental variable is parental region of origin. This is motivated by different social mobility between commuting zones (CZs) and its effects on children's future earning (Chetty et al., 2014; Chetty and Hendren, 2018). Also, the data were collected by the location of schools where students attend, which can be differed from their parents current residence and, thus, would be less related to the parental origin region. However, since the answer was restricted to the respondents, the reported origin region can be mother's, father's or other legal guidance's.
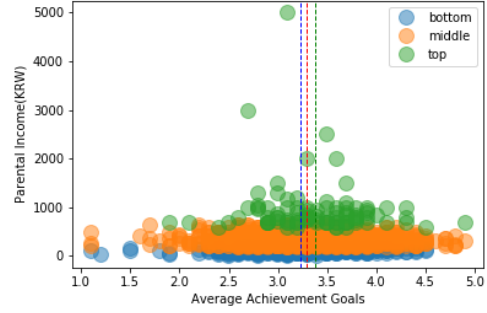
$$PI_{ijt} = \gamma_1 + \gamma_2 Z_{ij} + \mu_{ijt} \tag{13}$$

$$Perf_{it} = a_t + b_i + \beta_1 \hat{PI}_{ijt} + \beta_2 D_t PE_{ijt} + \beta_3 \sum_{n=1}^{N} Cov_{ijt} + \epsilon_{ijt} \tag{14}$$

where i and j indicates students and their parents, respectively. PI is the rank of parents in the income distribution and Z_{ij} is parents region of origin. The baseline analysis uses a simple ratio of performance goals to total achievement goals. I added same analysis with three different measurement of performance goal orientation. The second proxy for performance goals include responses to 'competition' which indicate students' motivation to win the academic competition. The other two proxies weighted each response with its variance. They used same structure to the first proxy used in baseline analysis and to the second proxy. In addition, I conducted the same analysis with different sample which removed mental resources outliers.
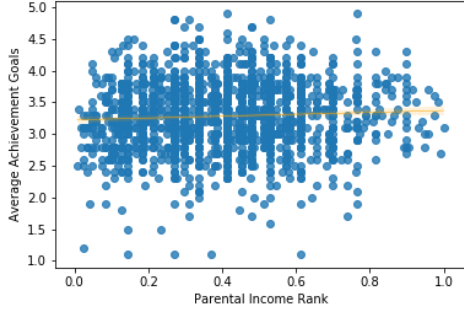
(a) Mental resources and parental income rank   (b) Mental resources and amounts of parental income

Figure 1: The average of mental resources and parental income

5 Results

5.1 Parental Income and Achievement Goals

The first part of analysis shows the relationship between parental income and 11 questions of motivations in learning. By the characteristics of OLS, the average of each coefficient is same with the coefficient of the average of proxies. Shown in Table 3, if the average of responses to motivation set as a proxy for mental resource, effects of parental income on it is approximately 0.054. Although each coefficient is rarely significant, the direction of the average is consistent with the hypothesis that children's mental resource can be aligned by parental income.

To elaborate, these 11 motivations are scaled by 5 and the question is how much does that motivation motivate the respondents. As the response is close to 5, it implies that motivation is significant for the respondents. Three questions will be used as proxies for achievement goals: Learning, Positive Judgements and Negative Judgements. Responses to 'learning' question means that learning to the subject is an important motivation. Thus, it would represent learning goal. Positive judgments was asked by, a question of being complimented by teachers or parents and negative judgments was asked by not being ignored by friends. These two judgment questions will be used as a proxy for performance goals.

Figure 1 shows the trend of mental resources according to the level of parental income. The scatter plot shows that metal resource is slightly increasing by parental income. The second plot shows that mental resource by income class. The bottom class is people whose income rank is smaller than 0.25. From 0.25 to 0.75 are classified as the middle class. Top 25% was considered as top class. The average of mental resource is increased by income class.

	Learning	Better Person	Better Job	Future Opportunities	For Society
Parental Income	0.064	0.151	0.159	0.200*	0.072
	(0.111)	(0.109)	(0.108)	(0.111)	(0.124)
Parents Education	0.035**	0.023	-0.017	-0.000	0.019
	(0.018)	(0.018)	(0.017)	(0.018)	(0.020)
Academic Ability	0.106***	0.086***	0.084***	0.065***	0.056***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Teacher Effect	0.169***	0.084***	0.069***	0.103***	0.158***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.026)
Parents Effect	0.037***	0.042***	0.004	0.001	0.027*
	(0.014)	(0.013)	(0.013)	(0.014)	(0.015)
R^2	0.123	0.070	0.053	0.070	0.044

	Positive Judgements	Popular	Competition	Forced	Negative Judgement	Penalty
Parental Income	0.189	0.052	-0.078	-0.159	0.135	-0.190
	(0.137)	(0.121)	(0.150)	(0.143)	(0.151)	(0.120)
Parents Education	0.012	-0.001	0.028	-0.006	-0.016	0.007
	(0.022)	(0.020)	(0.024)	(0.023)	(0.025)	(0.019)
Academic Ability	0.043***	0.037***	0.054***	-0.042***	0.012	-0.032***
	(0.013)	(0.012)	(0.015)	(0.014)	(0.015)	(0.012)
Teacher Effect	0.090***	0.078***	0.015	-0.063**	0.004	-0.013
	(0.029)	(0.026)	(0.032)	(0.030)	(0.032)	(0.025)
Parents Effect	0.065***	0.085***	0.117***	0.094***	0.082***	0.051***
	(0.017)	(0.015)	(0.018)	(0.017)	(0.018)	(0.015)
R^2	0.040	0.033	0.039	0.028	0.022	0.038

Note: The independent variables are responses to motivation with the scale of 5. These eleven answers are from sub-questions under a main question, 'For what are you studying?'. Therefore, Reporting 5 to 'Learning' means that the student is highly motivated by learning itself. Differences between 'Better Job' and 'Future Opportunities' is that the latter one is a motivation, 'to do what I want to do in the future'. 'Forced' means that the students are forced by teachers or parents. 'Penalty' means that the students study to avoid the punishment which are following if they do not.

Table 3: Parental Income and Mental Resource

	Performance	Performance and Competition	Performance: Variance Weights	Performance and Competition: Variance Weights
	(1)	(2)	(3)	(4)
Sample A: Full Population				
Parental Income	-0.225	-0.165	-0.235	-0.156
	(0.164)	(0.134)	(0.149)	(0.111)
Parents Education	0.013	0.009	0.013	0.009
	(0.011)	(0.009)	(0.010)	(0.008)
Academic Ability	-0.006***	-0.005***	-0.006***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Teacher Effect	-0.009***	-0.009***	-0.008***	-0.007***
	(0.003)	(0.003)	(0.003)	(0.002)
Parents Effect	0.004*	0.004**	0.004*	0.003**
	(0.002)	(0.002)	(0.002)	(0.002)
Sample B: Mental Resource				
Parental Income	-0.237	-0.170	-0.241	-0.157
	(0.169)	(0.138)	(0.154)	(0.114)
Parents Education	0.014	0.010	0.014	0.009
	(0.011)	(0.009)	(0.010)	(0.008)
Academic Ability	-0.007***	-0.005***	-0.006***	-0.004***
	(0.002)	(0.001)	(0.001)	(0.001)
Teacher Effect	-0.009***	-0.009***	-0.008***	-0.007***
	(0.003)	(0.003)	(0.003)	(0.002)
Parents Effect	0.004*	0.004**	0.004*	0.003**
	(0.002)	(0.002)	(0.002)	(0.002)

Note: This table shows main analysis of this paper, which is the relationship between parental income rank and students' achievements goals orientation to performance goals. The regression is conducted by 2SLS. The instrument variable is parental original residence. There are four different proxies for performance goal orientation. The baseline proxy is the ratio of performance goals to the sum of learning goals and performance goals. The second row added responses related 'competition' question to the baseline proxy because a motivation of 'to win competition' also has interdependent characteristics. The third and fourth rows weighted the previous proxies with variance of each question. The analysis is repeated with adjusted sample where outliers in mental resource values are removed.

Table 4: Parental Income and Achievement Goals Orientation

5.2 Parental Income and Performance Goal Orientation

Table 4 shows main analysis of this article which is the relationship between parental income and their children's achievement goal orientation. The baseline analysis shows consistent with the second hypothesis that decrease in rank of parental income result in their children to tend to have performance goal orientation (p-value 0.16). To be specific, a child with lower parental income rank are 22% more like to be performance oriented than the the child whose parental income is one rank ahead. For the repeated analysis with different proxies for goal orientation, the sign of coefficients stays negative. P-values are varied from 0.115 to 0.219. Parents effect is smaller than the effects of parental income but it is statistically significant. Moreover, the direction of effects sounds plausible in that as parents compare their children's outcomes to other children, the children are likely to be performance oriented.

Teacher effect turns out statistically significant and negative over all measurements. The negative sign of teacher effect implies that decrease in positive interaction with teacher makes students be performance oriented. In addition, the coefficients of academic ability shows strong statistically significance and the direction of effects is reasonable. However, when it comes to academic ability, there is possibility of reverse causality. Thus, it should be interpreted with care.

5.3 Performance Goal Orientation and Self-Perception

Table 5 shows the relationship between achievement goal orientation and self-perception. Technically, self-perception is quantified by the average of differences between self-reported academic ability on required subjects for Korean SAT and actual test scores. As the value of self-perception is larger, it indicates underestimation in self-perception which measures higher chances of learned helplessness in students. According to Table 5, performance oriented goal has positive impacts on self-perception which means higher probability of learned helplessness in their children. The effects of performance oriented goal are statistically significant across samples.

Except parental income, other coefficients shows strong statistically significance. Moreover, their directions are intuitive. Teacher effect, academic ability and parents' education backgrounds can reduce learned helplessness in students. However, parents effect seems counter-intuitive in that its direction is opposite to the effects of performance goal orientation. To elaborate, the analysis suggests that parental comparison of their children's outcomes to others also lowers helplessness of children even though this parental behavior positively relates to performance goal orientation. It might be evidence of omitted

variables. Table 6 manifests the relationship between achievement goal orientation and self-perception at subjects-level. I used different self reported test score with this analysis. The effects of achievements goal orientation is only statistically significant at Korean subject.

6   Conclusion

This paper investigated the causal effect of parental income on the formation of learned helplessness in their children. For the analysis, I introduced an economic model of social status, which verified the relationship between aspiration for social status and individual's decision-makings. The terminology of positional goods described the aspiration for social status. Consumption on positional goods affect utility through two channels: direct and indirect effects. The direct effects explain changes in utility by the amounts of consumption. Indirect effects are defined as a gain or loss in utility by the relative status in the consumption distribution. The analysis uses the concept of positional goods and consumption behaviors under the independent preference assumption to explain how children acquire learned helplessness in the learning process depending on their parental income. Among achievement goals, performance goal − a motivation from concerns about judgments on outcomes by others − is known to be a predictor of learned helplessness. Accordingly, performance goal is used as an application of positional goods.

The results show that parental income have negative impacts on their children's performance-oriented goal. A child whose parental income is one rank ahead is 22% less likely to be performance oriented than a child whose parental income is one rank behind (p-value = 0.16). Moreover, low self-perception on academic competence, a proxy for learned helplessness, is statistically significantly and positively affected by the performance-oriented goal. A unit change in the goal orientation towards performance goal implies 2 units increase in learned helplessness. To reconcile these findings, children whose parents are one rank behind in the income distribution are 44% more likely to acquire learned helplessness than the child whose parental income rank is ahead. Therefore, the analysis shows that children from low-income families are more likely to acquire learned helplessness in pursuing academic achievements. This implies that the society which awards social status on academic ability inherently restricts low-income students from perceiving education as an opportunity for upward mobility. On the other hand, positive interaction with teacher has an 8% of deterrent effect on learned helplessness. The teacher effects were statistically significant over the second part and the third part of analysis. This indicates the importance of teachers' role in deterring low-income students' acquisition of learned helplessness.

Performance Goals Measurements	Self-Assessment on Academic Ability			
	Performance	Performance and Competition	Performance: Variance Weights	Performance and Competition: Variance Weights
	(1)	(2)	(3)	(4)
Sample A: Full Population				
Performance Oriented	2.682***	2.598***	2.434***	2.414***
	(0.769)	(0.724)	(0.678)	(0.658)
Parental Income	-0.023	-0.026	-0.033	-0.036
	(0.113)	(0.110)	(0.110)	(0.108)
Parents Education	-0.092***	-0.100***	-0.093***	-0.102***
	(0.029)	(0.031)	(0.029)	(0.030)
Academic Ability	-0.194***	-0.202***	-0.199***	-0.207***
	(0.017)	(0.018)	(0.017)	(0.019)
Teacher Effect	-0.084**	-0.094**	-0.089**	-0.100**
	(0.039)	(0.040)	(0.039)	(0.041)
Parents Effect	-0.096***	-0.100***	-0.092***	-0.094***
	(0.035)	(0.035)	(0.033)	(0.033)
Sample B: Mental Resource				
Performance Oriented	2.657***	2.588***	2.421***	2.412***
	(0.798)	(0.756)	(0.707)	(0.690)
Parental Income	-0.020	-0.024	-0.032	-0.036
	(0.113)	(0.110)	(0.110)	(0.108)
Parents Education	-0.092***	-0.100***	-0.094***	-0.102***
	(0.030)	(0.031)	(0.029)	(0.031)
Academic Ability	-0.192***	-0.201***	-0.198***	-0.207***
	(0.017)	(0.019)	(0.018)	(0.020)
Teacher Effect	-0.087**	-0.096**	-0.092**	-0.103**
	(0.040)	(0.042)	(0.041)	(0.043)
Parents Effect	-0.091**	-0.095**	-0.087**	-0.090**
	(0.037)	(0.037)	(0.035)	(0.035)

Note: Self-assessment on academic ability is measured by the subtraction of self-reported academic ability from actual average of KSAT scores of mandatory subjects: Korean, Math and English. With the scale of 5, larger value of responses implies lower academic ability. Therefore, the greater values of self-assessment indicates, the student underestimates his/her academic ability.

Table 5: Performance Goal Orientation and Self-Assessment

	Korean	Math	English
Performance Oriented	0.801**	-0.074	-0.304
	(0.335)	(0.368)	(0.334)
Parental Income	0.353*	0.039	0.294
	(0.186)	(0.204)	(0.185)
Parents Education	0.047	-0.035	0.028
	(0.030)	(0.032)	(0.029)
Academic Ability	0.087***	-0.039*	-0.024
	(0.021)	(0.023)	(0.021)
Teacher Effect	-0.011	-0.061	-0.084**
	(0.040)	(0.044)	(0.040)
Parents Effect	-0.010	-0.032	-0.078**
	(0.032)	(0.035)	(0.032)
Constant	-1.815***	0.716*	0.246
	(0.357)	(0.391)	(0.355)
Observations	875	875	875
R^2	0.053	0.044	0.039

Note: The three dependent variables are manadatory subjects of Korean SAT.

Table 6: Self Assessments by Subjects

This study is motivated by achievement gaps between students from low and high-income families. There has been active research on the relationship between parental income and their children's achievements gap but limited explanation on how the parental income affects the achievement gap. Although this article does not explore the extent to which learned helplessness lowers achievements, the great body of literature has verified the negative impacts of learned helplessness on outcomes. Thus, this research contribute to the literature by explaining the relationship between parents' income and their children's behaviors regarding to achievement. For the future research, I plan to explore the effects of interpersonal comparisons in learning environment on the formation of performance oriented goal to add robust evidence on the interdependent preference assumption. To use the interpersonal comparisons as a treatment, I aim to compare two societies where higher education is strongly considered as an indicator of social status, such as United States or South Korea and where higher education less representative of social status like Germany.

References

[1] Abramson, L. Y., Seligman, M. E., Teasdale, J. D. (1978). Learned helplessness in humans: critique and reformulation. Journal of abnormal psychology, 87(1), 49.

[2] Ames, C. (1992). Classrooms: Goals, structures, and student motivation. Journal of educational psychology, 84(3), 261.

[3] Anderman, L. H., Anderman, E. M. (1999). Social predictors of changes in students' achievement goal orientations. Contemporary educational psychology, 24(1), 21-37.

[4] Boggiano, A. K., Shields, A., Barrett, M., Kellam, T., Thompson, E., Simons, J., Katz, P. (1992). Helplessness deficits in students: The role of motivational orientation. Motivation and Emotion, 16(3), 271-296.

[5] Brown, I., Inouye, D. K. (1978). Learned helplessness through modeling: The role of perceived similarity in competence. Journal of personality and Social Psychology, 36(8), 900.

[6] Chetty, R., Hendren, N., Kline, P., Saez, E. (2014). Where is the land of opportunity? The geography of intergenerational mobility in the United States. The Quarterly Journal of Economics, 129(4), 1553-1623.

[7] Chetty, R., Hendren, N. (2018). The impacts of neighborhoods on intergenerational mobility I: Childhood exposure effects. The Quarterly Journal of Economics, 133(3), 1107-1162.

[8] Dizon-Ross, R. (2019). Parents' beliefs about their children's academic ability: Implications for educational investments. American Economic Review, 109(8), 2728-65.

[9] Nicholls, J. G., Dweck, C. S. (1979). A definition of achievement motivation. Unpublished manuscript, University of Illinois.

[10] Elliot, A. J., Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. Journal of personality and social psychology, 72(1), 218.

[11] Elliott, E. S., Dweck, C. S. (1988). Goals: An approach to motivation and achievement. Journal of Personality and Social Psychology, 54(1), 5–12. https://doi.org/10.1037/0022-3514.54.1.5

[12] Frank, R. H. (1985). The Demand for Unobservable and Other Nonpositional Goods. The American Economic Review, 75(1), 101–116. http://www.jstor.org/stable/1812706

[13] Graybill, F. A., Deal, R. B. (1959). Combining unbiased estimators. Biometrics, 15(4), 543-550.

[14] Hoxby, C. M., Avery, C. (2012). The missing" one-offs": The hidden supply of high-achieving, low income students (No. w18586). National Bureau of Economic Research.

[15] Midgley, C., Kaplan, A., Middleton, M., Maehr, M. L., Urdan, T., Anderman, L. H., ... Roeser, R. (1998). The development and validation of scales assessing students' achievement goal orientations. Contemporary educational psychology, 23(2), 113-131.

[16] Mani, A., Mullainathan, S., Shafir, E., Zhao, J. (2013). Poverty impedes cognitive function. science, 341(6149), 976-980.

[17] Maier, S. F., Seligman, M. E. (1976). Learned helplessness: theory and evidence. Journal of experimental psychology: general, 105(1), 3.

[18] Pintrich, P. R. (2000). An achievement goal theory perspective on issues in motivation terminology, theory, and research. Contemporary educational psychology, 25(1), 92-104.

[19] Pulkka, A. T., Niemivirta, M. (2013). Adult students' achievement goal orientations and evaluations of the learning environment: A person-centred longitudinal analysis. Educational Research and Evaluation, 19(4), 297-322.

[20] Valås, H. (2001). Learned helplessness and psychological adjustment II: Effects of learning disabilities and low achievement. Scandinavian Journal of Educational Research, 45(2), 101-114.

[21] Wolters, C. A. (2004). Advancing achievement goal theory: Using goal structures and goal orientations to predict students' motivation, cognition, and achievement. Journal of educational psychology, 96(2), 236.