Is It Better to Stay in the Academic Track for Taiwanese Youth? Change of Educational Status and Its Effect on the Psychological Well-Being

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ABSTRACT

This study takes a life-course approach to develop a conceptual framework for understanding the association of youth's educational status and psychological well-being. A scale of depressive symptoms as well as a four-category, time-varying educational status variable (stay in normal educational track, stay in vocational track, have a job and currently no job/study) are used to explore youth's developmental trajectories. Using data from Taiwan Youth Project that follow adolescents from age 15 through age 22, the authors employ a series of group-based trajectory modeling and identify six developmental trajectory groups for youth's depression: low level trajectory, moderate level trajectory, high declining trajectory, rising trajectory, a chronic trajectory and moderate declining trajectory. Their statuses are found to have significant effects on four developmental trajectory groups: low level trajectory, moderate level trajectory, a chronic trajectory and moderate declining trajectory. Comparing to youths in academic track, it is worthy to note that for those in chronic group, having a job increase their depression while staying in vocational track or currently have no job and not attending school decrease their risk of depression. However, for youths in rising group, the effects of educational careers are reverse. These results imply that staying in the academic track is not always a protective factor for Youth in Taiwan.

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1 Introduction

The World Health Organization has categorized depression as among the most disabling clinical diagnoses in the world, estimated to affect nearly 340 million people worldwide. Early-onset depression (before the age of 21) has been of particular concern because patients with early-onset tend to have longer first episodes, higher rates of recurrence, longer hospitalizations, and higher overall rates of comorbid disorders (Greden 2001). However, it is found that adolescents have low rates of recognition and diagnosis and the reasons for this low recognition are relatively unknown (Hirschfield et al. 1997).

Though relatively few trajectory analyses of the development of depression during adolescence and young adulthood have been conducted, past studies based on longitudinal data have shown that there is an inverted-U curvilinear trajectory of mental health which rises in early and middle adolescence and declines in late adolescence (Adkins, Wang and Elder Jr 2008; GE, NATSUAKI and CONGER 2006; Wight, SepÚlveda and Aneshensel 2004). In Taiwan, the overall course of youths' mental health is quite different from in the West. Yi et al. (2009) demonstrated that adolescents in Taiwan report more depressive symptoms in the third year of both junior high and senior high. These studies gave us a normative picture of youths' developmental routes, however, they showed no clues about those with different growth routes, especially about pathological developmental routes. Did these one type of curve models fit all youth?

Hence, in this research, our first goal is to identify clusters of individuals following similar progressions of depressive symptoms over time. We adopt the group-based trajectory model which allow us to measure and explain differences across population members in their developmental trajectories. By using this model, we can identify developmentally meaningful subgroups, especially identify one or more risk groups. By comparing the differences among these groups may give us some hints about the developmental processes of pathological development.

Previous studies have emphasized the close linkage between mental health problems and educational outcomes, especially the effect of childhood and adolescent depression on educational attainment (Alexander and et al. 1993; DiLalla,

Marcus and Wright-Phillips 2004; Doris R. Entwisle, Karl L. Alexander and Linda Steffel Olson 2005; Fletcher 2008). However, in Taiwan, because of the examination pressure from the competitive educational system, the association between education and mental health tends to be that the examination pressure is the common cause of this close linkage. As it has been mentioned above, two peaks of the depression trajectories of Taiwanese youth were observed (Yi et al. 2009) and the depression curve reach its peaks when entrance exams are approaching which demonstrate that the significant effects of educational system.

For a typical Taiwanese youth, the first educational tracking occurs at the end of the compulsory education, comprising 6 years of elementary school and 3years of junior high school. After taking the comprehensive entrance examination, students are allocated to two different tracks: general high schools and vocational high schools, with the former requiring better educational performance. The second educational tracking starts at the end of 3 years of high school and again leads to two different tracks: general college and vocational college. There are rare crossing tracking outcomes reported(Huang and Wu 2010). It is demonstrated that Taiwanese youth under different educational tracks have different growth patterns (Yi, Fan and Chang 2013) which implied that educational track significantly modified youths' growth curve.

Youth in Taiwan are assigned into normal educational track or vocational track or no schooling according to his/her academic performance. For those no-schooling youths, some may choose to enter job market while some may defer their decisions. Hence, there may be four types of career status for these youths, staying in academic track, staying in vocational track, having a job and currently no study and no job. Because youth's career status may be change over time, it is recoded as a time-varying variable. This time-varying variable in fact reflects youths' transitions across normal and vocational track, across study and work, and the timing of these transitions.

From the life course perspective, life-course transitions, such as entry into employment, may be "turning points" and the effect of a turning point on a specified behavior depends upon the individual's developmental history of that behavior and the timing of the turning point (Elder 1985). For all Taiwanese youth, the educational tracking outcome undoubtedly presents different life chances though it is difficult to determine whether such transitions are causes or correlates of changes in depression.

Bachman and Schulenberg (1993) documented that early or "precocious" transition to adult roles, such as entry into marriage or employment, appears to worsen problem behavior, suggesting that work and marriage have age-specific

effects. Work appears to be a turning point for older but not younger offenders (Uggen 2000). Huang and Chien (2013)found, for mental disorder, working between the ages of 19-24 serve as a protective factor while working during 16-18 might be a risk factor which also implied the age-specific effect of work on psychological well-being. Also, because youth in Taiwan were expected to stay in academic track in order to advance into higher education, those who enter vocational track might suffer higher academic pressure. The effect of educational tracking system might have age-specific effect on youth since students who stay in academic track in senior high school years may have higher opportunities to enter normal university. Hence, in this study, according to life course perspective on life transitions and turning points, we include the time-varying career status into our model to test if the transitions between normal and vocational track and between study and work and the timing of these transitions significantly influence Taiwanese youths' psychological well-being.

1.1 The current study

In this paper, we traced the development of the schooling and working behaviors of Taiwanese youths between the ages of 15 and 22 and examine the association of these behaviors with their psychological well-being. We delineated various growth trajectories during the transition to young adulthood. We intend to provide a whole picture about the trajectories of youth psychological well-being across their important life turning points since junior high school until the end of their college lives. We choose 4 important turning points for youth in Taiwan, the timing when they advance into senior high school, the timing when they advance into college, the second year of their college lives and the final year in their college. We recoded their status transition dynamics between a student and a worker. We asked two questions: 1. how many types of depressive trajectories in a Taiwanese youth sample? 2. How the change of career status influences depressive trajectories under the transition from adolescent to young adulthood? Are these effects uniform across different trajectory groups and across different age groups? To achieve these aims, we used a longitudinal data set in Taiwan. We used PROC TRAJ, developed by JONES, NAGIN and ROEDER (2001) to explore types of depressive trajectories in four waves of the data in Taiwan. PROC TRAJ also provided options to incorporate career status as a time-varying variable to predict depressive trajectories over time. Therefore, we can explore the dynamic relationships between educational career status and depression over time with the program's capacity. The results should add to the existing literature and help us understand types of depression and its related covariates.

2 Data and Method

2.1 Research Sample

Data are taken from the Taiwan Youth Project (TYP), a panel study based at the Institute of Sociology, Academia Sinica, Taiwan. This project was started in the year 2000 and has conducted eleven waves of interviews since then. The original respondents of this project include 2,800 seventh graders and 2,800 ninth graders as well as one of their parents and their designated teacher of the class. The goal of the comprehensive research design is to examine various aspects of the interplay among family, school, and community, which shape adolescents' future development.

Students were sampled from junior high schools located in the northern part of Taiwan: Taipei City, Taipei County, and Yilan County. Since Taipei is the largest metropolitan city in Taiwan, the economic activities in Yilan are mostly agriculture-based, and Taipei County is in between these two regions, the sample covers various levels of urbanization and economic structure. The specific sampling method applied by TYP was the multistage-stratified cluster method. We used the ratio of sampling number of each stratum and mean student numbers of the class in each county/city to derive needed classes and schools. Forty junior high schools – 16 from Taipei City, 15 from Taipei County, and 9 from Yilan County – were randomly selected. In each of the schools, two classes were randomly chosen and all the students and their parents in the 80 classes were surveyed. In each class, the designated teacher was asked to report the school-related performance of each students in his or her class in each year. In this paper, we used the original 9^{th} graders from the 1^{st} to 7^{th} waves. The size of the student sample successfully interviewed in the first wave was 2,693.

2.2 Measurements

2.2.1 Adolescent Depressive Symptoms

The dependent variable in this study, depressive symptoms, is adopted from the short version of the Symptom Checklist-90-Revised (SCL-90-R, Derogatis, 1983), which measures the frequency of 16 symptoms occurring during the past week: including 1) headaches, 2) dizziness, 3) feeling lonely, 4) feeling blue, 5) worrying too much about things, 6) soreness of your muscles, 7) trouble falling asleep or insomnia, 8) numbness or tingling in parts of your body, 9) a lump in your throat, 10) feeling weak in parts of your body, 11) having urges to beat, injure or harm someone, 12) awakening in the early morning and cannot fall asleep thereafter, 13) unstable sleep or wake up often, 14) getting into frequent arguments, 15) shouting or throwing things, and 16) thoughts of death or dying. Each item is rated on a 5-point scale from

1(not at all) to 5(extremely). The Cronbach alpha for the scale over the four waves ranged from .87 to .90.

2.2.2 Educational status

According to youths' schooling or working status, four types of time-varying educational status were characterised in this study: stay in normal educational track, stay in vocational track, have a job and currently no job/study.

2.2.3 Control Variables

In this study, we included youth's gender (male=1, female=0) and their fathers' educational level (college and above=1, else=0) as control variables.

2.3 Data Analysis

In order to model the variability of adolescent depressive trajectories of Taiwanese youth, in this paper, we applied group-based trajectory modeling developed (GBTM) by Nagin (1999, 2005). We first presented the group-based model for the trajectories of youths' psychological well-being. We then added the time-varying variable, youths' educational status, to model how change of educational status modify their trajectories. The advantage of this approach is that it provides a formal basis for determining the number of groups that best fit the data and also provides an explicit metric, the posterior probability of group member, for evaluation the precision of group assignments (NAGIN 1999).

We used PROC TRAJ (JONES, NAGIN and ROEDER 2001) to estimate the group-based model. We first fitted the same shape of trajectory across groups as the baseline model. AICs and BICs were used as indices of model fit for comparing two models. Then, we allowed the shapes of the trajectories to be different across groups. And at the final stage, we included all explanatory and control variables into our model to examine our research hypotheses.

3 Results

According to past findings of Taiwan Youth project, the growth curves of Taiwanese youths' depressive trajectories had two peaks (Yi, Fan and Chang 2013; Yi et al. 2009), so we fitted the cubic functions of youths' depressive curves. For every group in our model, there were four choices of the shape, flat line, linear line, quadratic and cubic curve. We first fitted cubic curves for all groups, and then, according to the significance of these shape parameters and model fitting indices, we decided the shape for every group. We tried to fit the model as parsimonious as possible, so, if the linear form could fit the data as well as the quadratic form in terms of BICs and AICs, then we chose the linear form. The model fitting indices for 2

to 7 classes were presented in Table 1. According to BICs and AICs, 7 classes model have the best model fit, however, considering parsimony of model and the number of cases for each group, we chose the 6-groups model as the study's optimal model.

After deciding the group number and the shape of all groups, we added control variables and the explanatory variable, time-varying educational statuses, into the model. The result was shown in Table 2. According to the shape of the growth trajectory for different groups, the groups were named as follows: low, moderate, high declining, rising, chronic and moderate declining. Sixty-one percent of the subjects were classified into low group, while twenty-six percent of the subjects were classified into moderate group. For youths in these two groups, 87% of the subjects, their depression development stay relative stable. There are two groups of subjects showed relatively low level of depression at age 15 and high level of depression at age 22, one is chronic, including 3 percent of the subjects, and the other is rising, including 2 percent of the subjects. The final two groups of subjects had relatively high level of depression at age 15 but low level of depression at age 22, which are moderate declining, including 3.79% of the subjects, and high declining, including 3.15% of the subjects. From these findings, we found most Taiwanese youth remain low and stable of depression development. Only about 13% of youth might suffer high level of depression at some transition points of lives. All the developmental trajectories of these groups were shown in Figure 1.

Among these groups, only four groups of subjects were influenced by their changing educational statuses, which were low, moderate, chronic and moderate declining. For low level trajectory group, youth who stay in academic track have the highest level of depression. For moderate and chronic group, youth who have a job have the highest level of depression, comparing to others in the same group. However, for youths in moderate declining groups, the stories are different. Having a job became a protective factor for these youths.

Figure 2 presented the status transition and the changes of youths' depressive trajectories. The dotted line represents the depressive growth curve of youth who stay in academic track, while the solid line represent the depression curve of youth who change their status from academic track to others, such as vocational track, have a job, and etc. So the top panel represents the depression change of youth who change their status from academic track to have a job. The middle panel represents youth's depression change if they change their status from academic track to currently no job and no study. The bottom panel represents the status change of academic track to vocational track. The timings of status transitions also are indicated in figure 2. From the left panel to the right panel, they represent the timing of change are youth at age 18, youth at age 20, and youth at age 22.

Table 1 AIC and BIC by Model Type

	2 classes	3 classes	4 classes	5 classes	6 classes	7 classes
BIC	-28170.3	-28026.9	-27968.2	-27896.3	-27879.4	-27820.1
AIC	-28128.6	-27964.3	-27884.8	-27792.2	-27754.4	-27674.2

Table 2 Influence of individual status on trajectories of depression

	Low		Moderate		High Declining		Rising		Chronic		Moderate Declining	
	Estimate	s.e.	Estimate	s.e.	Estimate	s.e.	Estimate	s.e.	Estimate	s.e.	Estimate	s.e.
Trajectory												
Intercept	20.977 ***	0.199	28.244 ***	0.533	45.028 ***	1.059	23.942 ***	0.935	31.309 ***	1.624	47.700 ***	1.027
Linear					-17.599 ***	2.204	5.513 **	2.042	-1.998	2.238	-1.742 ***	0.209
Quadratic					4.179 ***	0.839	-3.166 ***	0.773	2.212 **	0.851		
Cubic					-0.310 ***	0.079	0.399 ***	0.072	-0.241 ***	0.078		
Status(Academic track=0)												
Vocational Track	-1.254 ***	0.240	0.255	0.484	-0.237	1.551	-1.857	1.488	-6.619 ***	1.716	3.114 *	1.341
Have a job	-1.136 ***	0.346	1.499 *	0.717	-1.217	2.345	-1.934	2.306	5.187 **	1.964	-5.975 ***	1.572
No job/study	-2.666 ***	0.572	0.562	1.089	2.134	2.767	-1.528	2.402	-6.162 *	3.110	8.636 ***	2.367

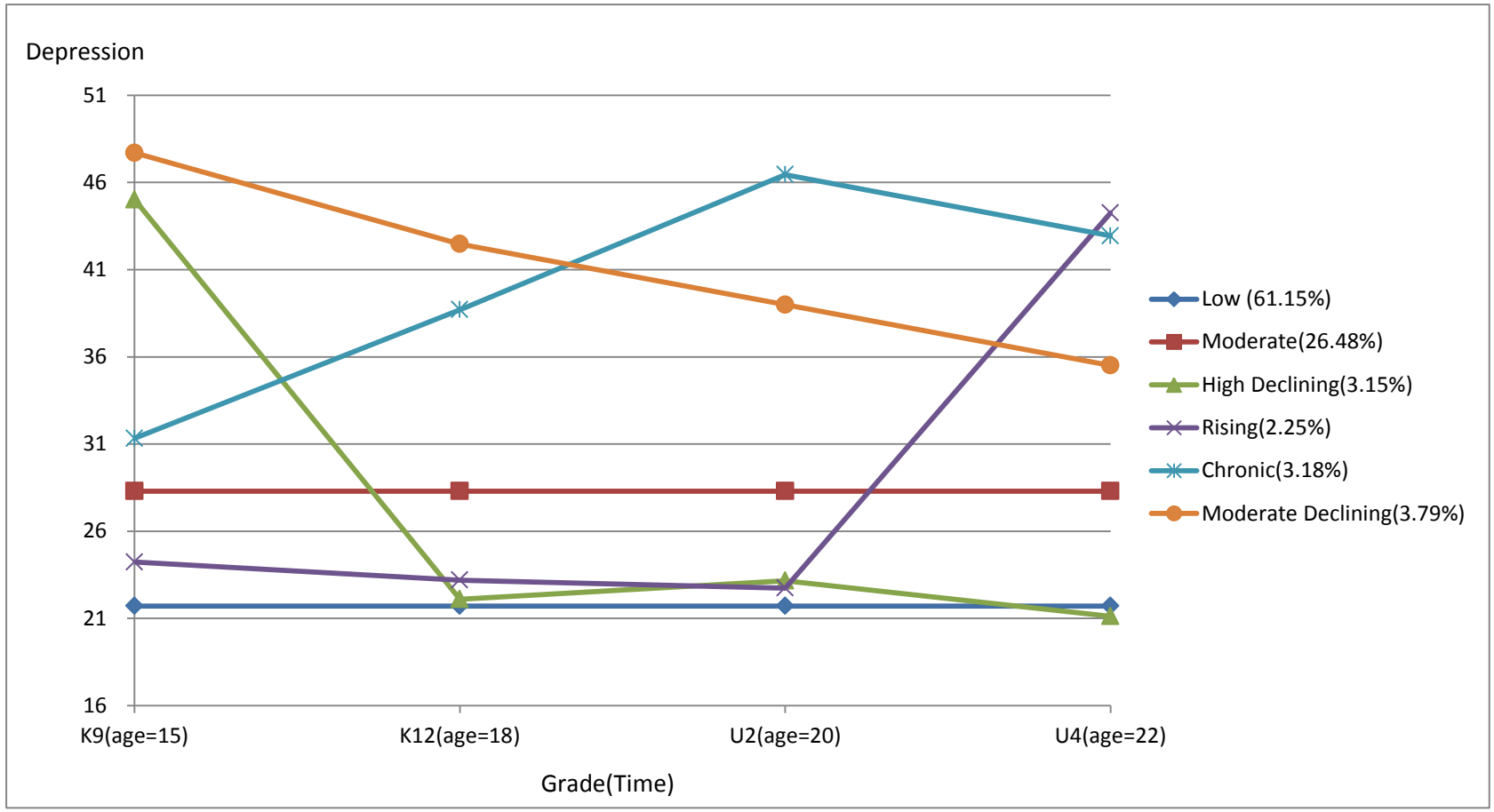

Figure 1 Trajectories of youth's depression from age 15 to 22 by trajectory groups

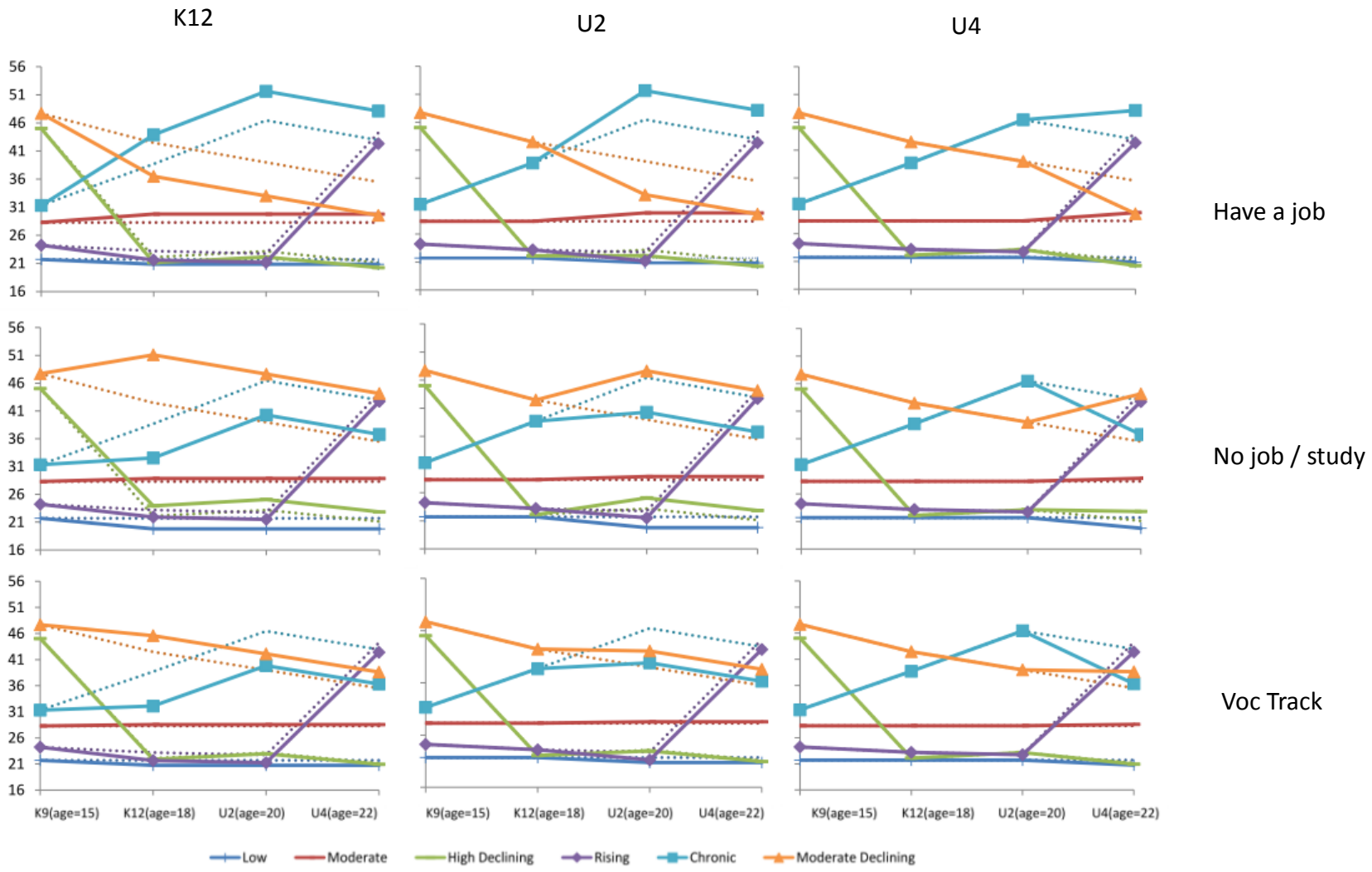

Figure 2 Status Transition and Youth's Depressive Trajectories

Table 3 Youth's characteristics and status by trajectory groups

Variables	Trajectory Groups					
	Low	Moderate	High Declining	Rising	Chronic	Moderate Declining
N	1711	741	88	63	89	106
Background(%)						
Boy	60.43	25.10	61.36	77.78	44.94	33.96
Father=College	14.44	10.39	25.00	30.16	19.10	10.38
Career Status(%)						
K12						
Voc Track	49.96	53.74	50.00	57.69	52.05	44.62
Have a job	4.50	2.85	4.69	1.92	5.48	9.23
No job/study	4.91	4.63	4.69	3.85	5.48	7.69
U2						
Voc Track	39.39	40.49	47.73	42.86	47.95	39.13
Have a job	15.63	14.87	13.64	14.29	12.33	23.19
No job/study	6.68	5.26	4.55	8.16	8.22	8.70
U4						
Voc Track	28.87	28.14	27.66	31.75	29.23	28.79
Have a job	24.75	24.49	21.28	17.46	33.85	28.76
No job/study	4.47	4.25	17.89	15.87	6.15	4.55

As can be seen in the top panel of figure 2, having a job increased the level of depression of youth in chronic group but decreased the level of depression for youth in moderate decline group, no matter the timing of status transition. From the middle and bottom panel, we found that the status of no job and no study and the status of vocational track is a risk factor for moderate decline group, but a protective factor for chronic group. These results imply that staying in the academic track is not always a protective factor for Youth in Taiwan and the risk/protective factors for different trajectory groups might be different.

Table 3 demonstrated mean profile of youths' characteristics and statuses across trajectory groups. Though educational status had no effect for youth in rising group and high declining, it should be noted that most youth in these groups are boys, and are coming from higher status families. Most of youth in moderate group and moderate declining group are girls and are coming from lower status families. These findings imply that gender and family background significantly influence youths' depression development.

4 Conclusions

The current study tried to fill the gaps in literature of types of youths' depression trajectories by using a non-western longitudinal data and incorporating the time-varying covariates longitudinally. We used group-based trajectory modeling (GBTM) developed by Nagin (1999, 2005) to help us achieve two research aims. First, we found six trajectory groups of depression developments for youth in Taiwan. We found most youth remain stable of their depression level over time. Only about 13% of youth in the sample may reach a risk level of depression when transiting across different career status at important life turning points. Some of them reach the highest level of depression when the first educational tracking occurs, while some reach the highest level of depression at the final year of college. These results imply that only one class of depression trajectory might be not enough to characterize youths' developmental patterns. Besides, by comparing the growth patterns of youths from different groups (e.g. by comparing youths from high declining and moderate declining), we might be able to find some protective factors which make them have different routes.

Second, following the life course perspective, we found that not only the change of career status but the timing of the transitions modified the depressive curves across trajectory groups. Career status transitions have not only the age-specific effects but also the group-specific effects on Taiwanese youth. For some groups, having a job increased the level of depression of youth but decreased the level of depression for youth in some other groups. Stay in vocational track might increase the level of depression for some youth groups while decrease the level of depression for youth in some other trajectory groups. The timing of these transitions also is a crucial factor for youths' depression development. For different timing of these transitions, we found different shapes of depression curves. The results supported the argument of life course perspectives that life-course transitions may be "turning points" and the effect of a turning point on a specified behavior depends upon the individual's developmental history of that behavior and the timing of the turning point (Elder 1985).

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