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Changes in Parental Control During Adolescence: A Latent Transition Analysis

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ABSTRACT

This paper attempts to investigate how Taiwanese parental control style, measured as a latent variable, changes along with their child's development from junior to senior high school years.

Latent transition model is employed to find out the latent classes of parental control and transition rates; multinomial logistic regression is used to investigate the determinants. Data are derived from a longitudinal survey conducted by TYP. The sample for the analyses consists 1042 male and 974 female adolescents.

The results indicate that parental control style is classified to four classes: coercive control, neglectful, distant control, and inductive control. The change occurred during the first transition period seems "upward". Determinants of parental control class are found to be parent's conflict, number of siblings, family income, maternal employment, and adolescent academic achievement. Results for male and female adolescents are slightly different.

STATEMENT OF THE PROBLEM

During the past three decades, typological parenting style, rather than any single parental practices such as parental control, has received more attention from researchers who are interested in children's or adolescents' development. Proponents of research into parenting styles argue that the influence of each parental practice on children is not independent; typology combining key parenting variables better explains the complexity of parenting than any single construct (Baumrind, 1991a & b, Dornbusch et al., 1987; Lamborn & Mount, 1991; Steinberg et al., 1992). They emphasize the interactive effects among several distinct elements. From their perspective, the influence of any one aspect of parenting is dependent on the configuration of all other aspects. For example, Baumrind (1971) combined five elements in the definition of "authoritativeness" and argued that no single aspect, but only the "authoritativeness" as a whole can contribute to optimal outcomes.

Many previous studies distinguish dimensions of parenting in theoretical discussion but failed to measure the related characteristics among dimensions. Typological measure, indeed, provides as a good solution. Due the limitation of statistical techniques, the conventional approach has drawbacks in practices. It usually reduced the number of cells of cross-classification by taking total score of related items to represent the characteristic of one dimension. The very different combinations of parenting indicators within one dimension may lead to the same total score, and then are classified to the same pattern. This paper, on the basis of typological perspective, will employ new statistical method and focus on one aspect of parenting style---parental control to probe latent traits of parenting.

Significant declines in parental control occur during the adolescent transition but the degree varies according to gender and ethnicity. Boys, as given normative

expectation, experience a greater drop in parental control across time than girls (Freeman & Newland, 2002). Girls, in contrast, expect more parental participation in their adolescent life (Peter, 1991). Research interested in adolescent psychological well-beings found that parental control is moderated by the association between parental gender, child's gender, and ethnicity (Finkelstein et al., 2001). These results highlight the importance of gender and stress the need for more culturally sensitive conceptualizations of parental control.

The Chinese saying "strict father, kind mother" indicates gender differentiation in parenting characteristics. Shek's research (2000) reveals that Chinese adolescents perceive that paternal parenting characteristics are more negative compared with maternal parenting characteristics. They reported more communication with mothers than with fathers, along with more positive feelings in relation to the communication. While girls perceived their parents to be more demanding, boys perceived more parental harshness. These gender differences are greater than those found in research based on western families (e.g. Dornbusch et al., 1987). Although these researches emphasized the difference between maternal and paternal characteristics, they paid no attention to the interactive effects.

This study will take the interactive effects into account and use panel data to investigate how Taiwanese parental control styles change during adolescent transition and further explore what measurable individual and familial variables determine the latent trait of parental control. In keeping with typological perspectives, the research purposes are specifically addressed as follows: (1) to investigate the latent classes of parental control emphasizing the categorical and related characteristics of measures (e.g. paternal and maternal characteristics) of parental control, (2) to compare the traits and proportion distribution of boys and

girls, (3) to find out the transition patterns of parental control style across years of junior high school, and (4) to estimate the determinants of parental control style.

LITERATURE REVIEW

By the early 1980s, Baumrind's authoritative-authoritarian-permissive parenting model was firmly established in the field of child development and served as the organizing heuristic for most discussions of parents' influence on children's development (Darling & Steinberg, 1993). Combining Baumrind's approach with the behaviorist focus on reinforcement, Maccoby and Martin (1983) bifurcated Baumrind's "permissive" style into "indulgent" and "neglectful" styles.

According to Maccoby & Martin and Baumrind, parenting styles are defined along two dimensions: parental demandingness and responsiveness.

Demandingness refers to the claims parents make on children to become integrated into the family system by their maturity demands, supervision, disciplinary efforts and willingness to confront the child who disobeys. Responsiveness refers to the extent to which parents intentionally foster individuality, self-regulation, and self-assertion by being attuned, supportive, and acquiescent to their children's special requirements. An authoritative parenting style, in which parents are generally described as both highly demanding and responsive, is defined as an optimal parenting style.

Although most researchers followed the lead of Baumrind in defining parenting styles, they conceptualized or measured the same parenting styles differently (e.g. Dornbusch et al., 1987; Lamborn et al., 1991; Steinberg, 1989). The inconsistency makes any explanation of the effects of parenting style ambiguous at best. Some researcher argued that parenting style may not a good predictor because it describes

parent-child interactions across a wide range of situations (Darling & Steinberg, 1993).

This study concentrates on parental control. On the basis of parents' intended goals of their control attempts, previous work conceptualizing and measuring parental control over adolescents can be categorized into two approaches: the first approach focuses on parents' intention to direct the behavior of the child in a manner desirable to the parent; the second approach is concerned with the skills which parents use to protect their children from negative outcomes and prevent their involvement in risky behaviors.

The first approach is represented by Rollins and Thomas (1979). Their conception of parental control focuses on parents' exertion of outcome-control power; three parental control attempts are proposed : coercive control, inductive control, and love withdrawal. Coercive control was defined as parental behaviors that result in considerable external pressure on the child's behavior according to parents' desire, e.g., physical punishment. Inductive control was defined as behavior by a parent with the intent of obtaining voluntary compliance with parental desires by avoiding a direct conflict of wills with the child. For example, parents explain why the curfew is set. Love withdrawal was defined as behavior manifested by the parent indicating disapproval of the child's behavior with the implication that love will not be restored until the child changes his behavior. This attempt is quite commonly used by parents with young children and early adolescents but not appropriate for middle or late adolescents, who expect the psychological independence from their parents.

The second approach conceptualizes parental control as parents' interests and involvement in children's day-to-day life and focuses on the skills used to protect

children from negative influence and prevent their involvement in risky behaviors. Among the various control attempts under this approach, parental monitoring has received the most attention and found to be the most effective way parents can carry out their protective function (e.g. Crouter, 1990; Patterson & Stouthamer-Loeber, 1984; Small, 1993 & 1994). The measure of parental monitoring in their studies includes: (1) child's reports on the amount of information shared with his/her parents regarding his/her activities, (2) parent's perception of the importance of monitoring, (3) a comparison between the child's and parent's reports of the child's whereabouts. In their view, effective parental monitoring of adolescents does not mean that parents must always be present or that parents should be overly intrusive in their child's lives. Rather, it implies that parents show an active interest in the lives of their child and a willingness to enforce family rules and raise issues that concern them. It denotes keeping track of children's activities, whereabouts, and companions even when the parent and child are not together.

Although there are different goals between the two research approaches, they both conceptualize parental control in the purview of parents by focusing on the exertion of parental authority. Since adolescents perceive paternal and maternal parenting characteristics differently (Dornbusch et al., 1987; Shek, 2000), parental control is better conceptualized as a relationship property rather than a maternal or paternal behavior. In a dyadic relationship, both mothers and fathers contribute to the quality of parental control. Furthermore, a relationship property refers to observable rules, control attempts, but also latent traits such as norms, goals and interaction quality. This study conceptualizes parental control as a relationship property and expects it has fundamental and long term influence on child development.

DATA AND METHOD

The Sample

To examine how parental control changes across different educational stages, we conducted a 3-wave dataset derived from a longitudinal survey conducted by “Taiwan Youth Project” (the Institute of Sociology, Academic Sinica, Taiwan). The survey consists of 2852 students at the first wave (time 1, March 2000), 2542 of them at second wave (time 2, October 2000 to June 2001), and 2450 at third wave (time 3, October 2001 to June 2002). About eighty six percent gave complete interviews in the three waves. Analyses for the current study is based on reports of adolescents who completed the three consecutive surveys as junior high third graders, and again as senior high first and second graders. Since our focus is to classify maternal and paternal control practices into qualitatively distinct classes, subjects whose reports for either maternal or paternal control items were incomplete are excluded. The sample for the current analyses consists 1042 male and 974 female adolescents.

Variables and Measurement

The main measures used in this study are parental control indicators and its latent structure. According to Belsky’s (1994) review, the determinants of parenting are commonly identified from three general sources---parent’s personal resources, child’s characteristics and contextual sources of stress and support. We, therefore, use measures of academic performance, parental education, maternal employment status, parents’ conflict, family income, number of siblings, and residential area as determinants of parental control.

Parental Control Indicators

Previous work conceptualizing and measuring parental control have paid

much attention to the effects of monitoring, harsh punishment and communications exerted by parents during adolescence. This study uses explanation, monitoring, shouting, and hitting as indicators of parental control attempts. Paternal and maternal attempts are measured separately. Questions used to measure are as follows:

1. Do your mother/father explain why she/he made such a decision for you or your family? (Maternal Explanation, Paternal Explanation)
2. Do your mother/father know your companions and activities when you were not at home? (Maternal Monitoring, Paternal Monitoring)
3. Do your mother/father shout to you when you made mistakes? (Maternal Shouting, Paternal Shouting)
4. Do your mother/father hit you when you made mistakes? (Maternal Hitting, Paternal Hitting)

The possible responses for these questions are “never,” “rarely,” “sometimes,” “most of the time,” and “always”.

In the latent class analysis, we recode these responses categories into dichotomous pattern because the use of ordered categories is likely to generate latent classes with mixed and unclear characteristics (Yamaguchi, 2000). The first three indicators (explanation, monitoring and shouting) are created by combining “always” with “most of the time,” (renamed to be “often”) and “never,” with “rarely” as well as “sometimes” (renamed to be “not often”); the last indicator, maternal and paternal “hitting” is recoded combining “always” with “most of the time” as well as “sometimes” and “never,” with “rarely.” Frequencies of the eight dichotomized indicators (four maternal and four paternal indicators) are presented as Table 1.

(Table 1 about here)

Table 1 shows that the male and female samples reported less parental shouting and hitting but more monitoring and inductive control attempts after they went through the entrance examination. Compared with fathers, mothers were perceived to be more active in use of parental control attempts. Regarding adolescent gender differences, adolescent girls reported more parental explanation & monitoring and less shouting & hitting than their counterparts did.

Variables of Determinant

1. Academic Performance : class ranking

Adolescent child's academic performance is indicated by his/her grade in terms of class ranking. The question asked is "What grades did you get comparing with your classmates last semester?" when the adolescents were junior high 3rd graders (at time 1).

2. Parental Factors (Mother's education, Father's education, and Maternal Employment Status)

Mother's and father's education are measured as continuous variables ranging from "primary school or under" to "graduate school", then entered as covariates in the following logistic regression analyses. Since effects of maternal employment on child's outcomes are apt to mix with familial economy, we operationalize "maternal employment status" to be a variable measuring interaction between family economic status and maternal employment. If respondents reported their family economical status provides no help for their development at all and their mothers currently have jobs, we code the variable of "maternal employment status" as "1", otherwise, "0".

3. Contextual Factors (Parent's conflict, Number of Siblings, Family Income,

and Residential Area)

“Parent’s conflicts” is measured by asking “How often do your parents quarrel with each other ?” Same as “number of siblings” and “family income”, it is entered as covariates in following logistic regression analyses. “Residential area” indicates which city or county respondents resides. The response category includes Taipei city, Taipei county, and Yi-lan county. Distribution of the predictors is presented as Table 2.

Data Analysis

The focus of this study is to investigate latent classes of parental control and their changing patterns. We employed Mplus 3.0 (Muthé'n & Muthé'n, 2004) to run latent transition analyses for boys and girls separately. Since we assume that the classes of parental control at one time point are only influenced by their previous one, first-order transition model is adopted for the analyses. For general latent class model fitting test, fit statistics, likelihood-ratio (L^2) and BIC values, are recommended (Clog, 1995). The best fitting model of this study is identified based on the fit statistics. The proportions of parental control class at each time point and transition rates of each class from a time point (time t) to the next one (time t+1) are estimated and compared. It is hypothesized that parental control classes vary according to child’s gender, so that there is no constraint imposed across boy’s and girl’s data sets. At last, we use multinomial logistic regression for boys and girls separately to investigate determinants of parental control.

RESULTS

Model Fit

Table 3 shows that the model with three latent classes at each time point

seems satisfactory but the BIC values and likelihood-ratio statistics (L^2) decrease by increasing the number of latent classes from three to four (from model 1 to 2). In other words, the model improvement from model 1 to 2 is significant. The BIC values, on the other hand, indicate that the four-class at each time point rather than three-class model is fitting for the data. As we imposed constraints stated above (model 3), the BIC value is quite stable. This study, therefore, consider model 3 as the best fitting and parsimonious model for both boy's and girl's dataset. This model indicates that there are four latent classes at each time point, that probabilities of having high occurrence in each parenting indicator keep same and that transition of parental control types rely only on that of the previous one time point.

(Table 3 about here)

Latent Classes of Parental Control

Table 4 displays conditional probabilities of response patterns in each class for both boys and girls. Due to the conditional probabilities among 3 time points are remained consistent, only one set of conditional probabilities estimates is listed. Boys in the 1st class reported high probabilities of “often” with paternal and maternal hitting, as well as high maternal monitoring but low with explanation. We name this class to be “coercive parental control” and expect parents of adolescents in this class are likely to exert coercive power. Compared with boys, the quality of parental control for girls in the 1st class is characterized by maternal rather than paternal coercive control. Adolescents belonging to 2nd class reported low probabilities of “often” in each parenting indicator. We label this class as “neglectful” indicating lack of parental control. Respondents in 3rd class reported that they were highly monitored by their parents, but other practices were rarely employed. In other words, these parents are quite aware of their child's

whereabouts although they do not adopt any specific influence strategy. We label this class of parental control as “distant control”. Respondents in 4th class reported high probabilities of “often” with parental monitoring as well as parental explanation. It means that the parents of adolescents belonging to this class intent to obtain voluntary compliance with parental desires by adopting indirect rather than direct influence strategies. We call it “inductive control”.

(Table 4 about here)

On the basis of adolescent children’s reports, we classify parental control into four types---*coercive control, neglectful style, distant control, and inductive control*. The proportion of each type (class) for consecutive three years is presented in Table 5. At time 1 when the respondents are surveyed as third grader of junior high school, more than one third (37.1%) of boys are classified to “neglectful style”, 24.2% to “coercive control”, 20.6% to “inductive control”, and only 18.2% to “distant control”. It is noteworthy that more than 60% of parents exert coercive power or are neglectful toward their adolescent boys. The proportion of “neglectful” is the largest among four types at time1 (37.1% for boys and 33.5% for girls). As predicted, the proportion of “coercive control” for girls (17.7%) is smaller than that for boys (24.2%).

(Table 5 about here)

While the proportion of coercive control and neglectful style decrease over years, the sum of distant and inductive control have increased from 38.8% in the last year of junior high school to 70% or more in senior years. The change patterns found for boys are quite similar to those for girls.

The Transition of Parental Control Style Across Junior Years

On the basis of our estimate model, the transition probability matrix (as Table 6-1 & 6-2) is provided to indicate how each parental control style at year t+1 changes depending on that at year t. For boys, as shown in Table 6-1, more than 90% of parents exerting coercive control at the last year of junior high school (time1) withdraw the practice of physical punishment at the following year when their adolescent boys get through the entrance examination. The majority goes to either “inductive control“ (37.5%) or “distant control” (34.6%). There is about one fifth transferring to “neglectful” (20.4%). Similarly, the majority of those who are in “neglectful” class at time1 transfer to either “distant control“ (35.4%) or “inductive control” (38.2%), about one quarter (26.5%) remain the same class, and very small proportion go to “coercive” at time2. Parents who exerted “distant” or “inductive” control at time1 made less change on their control style than those who are either “coercive” or “neglectful”. It is obvious that parents move their path toward “distant” or “inductive” direction rather than toward “coercive” or “neglectful” at the first transition period (time1 to time2). We call the former change patten as “upward move” and the latter as “downward”. The change pattern at the second transition period (time2 to time3) is slightly different from that at the first transition period. Compared with the first time period, the proportion of “upward move” at the second time period is smaller, while the proportion of “downward” is greater. The difference is more pronounced for “neglectful” class than the other classes.

(Table 6-1 about here)

Compared with male adolescents, the change patters of parental control across two transition periods are quite similar. It is noteworthy that larger proportions of female adolescents whose parents exert coercive control at time1 are

likely to stay in the same class at time2 than those of boys. In other words, parental coercive control over female adolescents is more persistent than over male adolescents.

(Table 6-2 about here)

Determinants of Parental Control Style

We employ multinomial logistic regression analysis to investigate the determinants of parental control. The latent class labeled as “coercive control” is assigned to be the baseline category for both boys’ and girls’ analysis. The results are presented in Table 7. For boys, the results show that maternal employment status, conflict between parents, number of siblings, and family income are significant predictors for the class of parental control. In contrast to “coercive control” style, adolescent boys who are with harmony parent’s relationship have more siblings and higher family income is more likely to classified to “distant control” than their counterparts. Maternal employment status, parents’ conflict, and family income are determinant for the distinction between “inductive” and ‘coercive” class. Number of siblings is an important variable for the comparison of “neglectful” and “coercive control” styles. Totally speaking, mother working not for the family economical difficult, harmony parents’ relationships, more siblings and higher family income have positive effects on preventing parents from exerting coercive control. Child’s school performance indicated as grade percentile seems not a significant determinant for boys.

(Table 7 about here)

Gender difference is found comparing the determinants between boy’s and girl’s model. For girls, school performance is an important factor influencing parental control style. Female adolescents with higher academic achievement

indicated by grade percentile are much more likely to experience “distant” or “inductive” in contrast to “coercive” parental control style. In addition, maternal employment status and parents relationship have significant effects on these comparison. Unlike the clear results for boys in comparison of “neglectful” and “coercive” control style, our hypothesized determinants for girls at this regard are not strongly confirmed.

CONCLUSION AND DISCUSSION

There are several conclusions and research suggestions derived from the findings. First, parental control style is classified to four distinctive classes on the basis of latent transition analysis (LTA). They are coercive control, neglectful, distant control, and inductive control. Parental control, as a latent variable with several classes, is different from a conventional variable measured directly by observable indicators. The distinction among the four classes is not only in quantitative but also in qualitative aspects. As Yamaguchi (2000) claimed that a latent variable is more reliable in measurement and valid in conceptualization. The future researches on parenting need to pay more attention to the application of LTA

Second, parental control did not decline but changed for both male and female adolescents. The finding is different from those found in Hong Kong and western samples. Taiwanese parents, in general, move their control pattern toward “distant” or “inductive” control. The transition pattern, however, is slightly different between two transition periods. If we call “decline” as “upward”, the transition rate of “upward” is greater than that of “downward” at the first transition period (from the last year of junior high school to the first year of senior high school). Compared with the first transition period, the “upward” declined and

“downward” increased at the second transition period. It implies that entrance examination or educational stage (junior or senior high school) may play an important role in the transition of parental control. More waves of longitudinal data need to be employed for further studies.

Third, gender differentiation between parents has not been found in this study. One possibility is that traditional parenting pattern such as “strict father, kind mother” idea has been dismissed due to the rapid growth of maternal employment or the prevalence of feminist ideology. Another possibility is that the measures are based on adolescent reports. The result may reveal child’s perception of parental authority rather than parent’s actual behaviors. Further researches need to employ parent-child dyadic data to enhance the reliability of measurement.

Finally, the results of multinomial logistic regression identify the determinants of parent control as a latent dependent variable. Adolescent gender difference is found in these analyses. Female adolescents with higher academic achievement are much more likely to experience “distant” or “inductive” in contrast to “coercive” control style. Academic achievement for male adolescents, in contrast, is not determinant for their parental control style. “Having a high grade” is more rewarding for female than male adolescents. This finding also implies the complexity of parent-daughter relationships. Future studies interested in gender issues should use more indicators focusing on adolescent characteristics to foster the understanding for gender effects on parenting.

Table 1: Frequency of Parental Control Indicators

Indicator of Parental Control (Boys, N=1042)	<u>Time1</u>		<u>Time2</u>		<u>Time 3</u>	
	N	%	N	%	N	%
Maternal explanation						
Often	380	36.5	571	54.8	536	51.4
Not often	662	63.5	471	45.2	506	48.6
Paternal explanation						
Often	349	33.5	511	49.0	456	43.8
Not often	693	66.5	531	51.0	586	56.2
Maternal monitoring						
Often	575	55.2	863	82.8	786	75.4
Not often	467	44.8	179	17.2	256	24.6
Paternal monitoring						
Often	433	41.6	729	70.0	667	64.0
Not often	609	58.4	313	30.0	375	36.0
Maternal shouting						
Often	177	17.0	38	3.6	45	4.3
Not often	865	83.0	1004	96.4	997	95.7
Paternal shouting						
Often	143	13.7	26	2.5	28	2.7
Not often	899	86.3	1016	97.5	1014	97.3
Maternal hitting						
Ever	178	17.1	17	1.6	34	3.3
Never	864	82.9	1025	98.4	1008	96.7
Paternal hitting						
Ever	186	17.9	26	2.5	36	3.5
Never	856	82.1	1016	97.5	1006	96.5
(Girls, N=974)						
Maternal explanation						
Often	378	38.8	519	53.3	530	54.4
Not often	596	61.2	455	46.7	444	45.6
Paternal explanation						
Often	301	30.9	425	43.6	371	38.1
Not often	673	69.1	549	56.4	603	61.9
Maternal monitoring						
Often	692	71.0	843	86.6	785	80.6
Not often	282	29.0	131	13.4	189	19.4
Paternal monitoring						
Often	482	49.5	721	74.0	597	61.3
Not often	492	50.5	253	26.0	377	38.7
Maternal shouting						
Often	127	13.0	39	4.0	54	5.5
Not often	847	87.0	935	96.0	920	94.5
Paternal shouting						
Often	100	10.3	32	3.3	31	3.2
Not often	874	89.7	942	96.7	943	96.8
Maternal hitting						
Ever	113	11.6	27	2.8	31	3.2
Never	861	88.4	947	97.2	943	96.8
Paternal hitting						
Ever	90	9.2	24	2.5	24	2.5
Never	884	90.8	950	97.5	950	97.5

Table 2: Frequency of Determinant Variables

Variables	Boys		Girls	
	N	%	N	%
Grade (class rank)	1042	100	974	100
Rank 6-10 in the class	156	15.0	99	10.2
Rank 11-20	228	21.9	209	21.5
Rank 11-20 in the class	294	28.2	307	31.5
Rank 6-10 in the class	198	19.0	196	20.1
Within rank 5 in the class	164	15.7	161	16.5
Father's education				
Primary school or below	162	15.9	177	18.5
Junior High school	272	26.7	222	23.3
Senior High school	345	33.9	324	34.0
College	87	8.5	88	9.2
University	112	11.0	118	12.4
Graduate school	40	3.9	25	2.6
Mother's education				
Primary school or below	223	22.0	234	24.5
Junior High school	280	27.6	236	24.7
Senior High school	359	35.3	324	34.0
College	57	5.6	79	8.3
University	82	8.1	75	7.9
Graduate school	14	1.4	6	0.6
Maternal employment status				
Not	921	88.4	810	83.2
Yes	121	11.6	164	16.8
Conflicts b/w mom and dad				
Never	173	16.6	123	12.6
Seldom	605	58.1	482	49.5
Sometimes	225	21.6	302	31.0
Always	37	3.6	66	6.8
How many sibling do you have				
0	55	5.3	43	4.4
1	483	46.4	351	36.0
2	382	36.7	411	42.2
3	94	9.0	142	14.6
4	20	1.9	21	2.2
5	8	0.8	6	0.6
Family income (monthly)				
Under NT30,000	92	8.8	94	9.7
NT30,000-NT49,999	232	22.3	250	25.7
NT50,000-NT59,999	219	21.0	201	20.6
NT60,000-NT69,999	103	9.9	74	7.6
NT70,000-NT79,999	109	10.5	87	8.9
NT80,000-NT89,999	50	4.8	37	3.8
NT90,000-NT99,999	44	4.2	53	5.4
NT100,000-NT109,999	40	3.8	43	4.4
NT110,000-NT119,999	37	3.6	29	3.0
NT120,000-NT129,999	19	1.8	19	2.0
NT130,000-NT139,999	16	1.5	15	1.5
NT140,000-NT149,000	11	1.1	7	0.7
NT150,000 以上	37	3.6	24	2.5
City of residence				
Taipei city	396	38.0	357	36.7
Taipei county	406	29.0	415	42.6
YYI-LAN	240	23.0	202	20.7

Table 3: Goodness of Fit of Latent Classes Models of Parental Control

Models	Adjusted BIC	L^2	d.f.	L^2	d.f.	p
BOYS						
(1) 3LC	18708.475	2705.367	16776942			1.000
(1) vs. (2)				351.190	20	0.000
(2) 4LC	18209.190	2354.177	16776922			
(3) 4LC	18309.296	2515.921	16776965			
($\tau_1 = \tau_2 = \tau_3$)						
GIRLS						
(1) 3LC	16908.128	2314.229	16776968			1.000
(1) vs. (2)				170.795	23	.000
(2) 4LC	16672.343	2143.434	16776945			
(3) 4LC	16459.589	2062.480	16776994			
($\tau_1 = \tau_2 = \tau_3$)						

Note: $\tau_1 = \tau_2 = \tau_3$ conditional probability of response pattern does not change over time.

Table 4: Conditional Probabilities of Latent Classes of Parental Control

Indicators of Parental Control	Latent Class				Latent Class			
	BOYS				GIRLS			
	L1	L2	L3	L4	L1	L2	L3	L4
Maternal Explanation								
Often	.288	.319	.116	.956	.282	.330	.051	.980
Not often	.712	.681	.884	.046	.718	.670	.949	.020
Paternal Explanation								
Often	.268	.245	.007	.949	.201	.193	.011	.821
Not often	.732	.755	.993	.051	.799	.807	.989	.179
Maternal Monitoring								
Often	.543	.136	.997	.982	.730	.292	1.000	.989
Not often	.457	.864	.003	.018	.270	.708	.000	.011
Paternal Monitoring								
Often	.406	.027	.853	.860	.472	.045	.852	.853
Not often	.594	.973	.147	.140	.528	.955	.148	.147
Maternal Shouting								
Often	.354	.084	.045	.035	.415	.074	.032	.033
Not often	.646	.916	.995	.965	.585	.926	.968	.967
Paternal Shouting								
Often	.302	.055	.033	.025	.306	.055	.024	.025
Not often	.698	.945	.967	.975	.694	.945	.976	.975
Maternal Hitting								
Ever	.675	.009	.008	.003	.610	.006	.006	.011
Never	.325	.991	.992	.997	.390	.994	.994	.989
Paternal Hitting								
Never	.710	.014	.007	.009	.500	.008	.000	.009
Ever	.290	.986	.993	.991	.500	.992	1.000	.991

L1: coercive control style
L2: neglectful style
L3: distant control style
L4: inductive control style

Table 5: Estimated Proportion of Latent Class Membership

Latent Class	Boys			Girls		
	Time1	2	3	Time1	2	3
Coercive control	.242	.021	.036	.177	.034	.040
Neglectful	.371	.187	.262	.335	.157	.268
Distant control	.182	.350	.322	.238	.353	.277
Inductive control	.206	.442	.381	.250	.456	.415
TOTAL	1.000	1.000	1.000	1.000	1.000	1.000

Table 6-1: Latent Transition Probabilities (For Boys)

	TIME 2				TIME 3			
	Coercive Control	Neglectful	Distant Control	Inductive Control	Coercive Control	Neglectful	Distant Control	Inductive Control
	L1	L2	L3	L4	L1	L2	L3	L4
TIME1								
L1	.075	.204	.375	.346				
L2	.000	.265	.354	.382				
L3	.005	.086	.554	.355				
L4	.004	.099	.220	.677				
TIME2								
L1					.450	.200	.300	.050
L2					.031	.555	.204	.209
L3					.034	.236	.509	.220
L4					.013	.158	.233	.596

Table 6-2: Latent Transition Probabilities (For Girls)

	TIME 2				TIME 3			
	Coercive Control	Neglectful	Distant Control	Inductive Control	Coercive Control	Neglectful	Distant Control	Inductive Control
	L1	L2	L3	L4	L1	L2	L3	L4
TIME1								
L1	.129	.135	.394	.342				
L2	.012	.265	.375	.349				
L3	.000	.066	.469	.465				
L4	.008	.053	.205	.734				
TIME2								
L1					.385	.269	.192	.154
L2					.035	.574	.128	.262
L3					.029	.241	.474	.256
L4					.020	.200	.174	.606

Table 7-1: Multinomial Logistic Regression on Parental Control (Boys)

VARIABLES	L2 vs. L1		L3 vs. L1		L4 vs. L1	
	β	Exp(β)	β	Exp(β)	β	Exp(β)
Intercept	-.265		-.932		-1.332*	
Grade percentile	-2.982E-02	.971	7.669E-02	1.080	.115	1.122
Father's education	-3.088E-02	.970	1.034E-03	1.001	2.628E-02	1.027
Mother's education	-2.649E-02	.974	-.109	.897	-5.340E-02	.948
Maternal employment#						
Not	.624*	1.867	.447	1.563	1.431***	4.185
Yes ^a						
Parent's conflict	-.206 ⁺	.814	-.300*	.740	-.483**	.617
Sibling number	.382**	1.466	.276*	1.318		
Family income	6.014E-02 ⁺	1.062	7.580e-02*	1.079	.114**	1.120
Residential area						
Taipei city	.219	1.245	.511 ⁺	1.667	.247	1.280
Taipei county	3.145E-02	1.032	.363	1.437	.156	1.169
Yi-Lan county ^a						
X ²	78.624***					

L1: coercive control style

L2: neglectful style

L3: distant control style

L4: inductive control style

Maternal employment status

^a Reference category of the dummy variable.

⁺ p<.1 * p<.05 ** p<.01 *** p<.001

Table 7-2: Multinomial Logistic Regression on Parental Control (Girls)

VARIABLES	L2 vs. L1		L3 vs. L1		L4 vs. L1	
	β	Exp(β)	β	Exp(β)	β	Exp(β)
Intercept	1.004 ⁺		-.276		.571	
Grade percentile	7.215E-02	1.075	.455***	1.906	.379***	1.460
Father's education	-3.088E-02	.970	1.034E-03	1.001	2.628E-02	1.027
Mother's education	1.023E-02	1.010	-3.656E-02	.964	7.727E-03	1.008
Maternal Employment#						
Not	.380	1.462	.652*	1.919	.638*	1.892
Yes ^a						
Parent's conflict	-.234 ⁺	1.021	-.529***	.589	-.849***	.428
Sibling numbers	.153	1.484	.187	1.206	-5.466E-02	.947
Family income	9.143E-03	1.087	-6.690E-02	.935	2.801E-02	1.113
URBAN3						
Taipei city	-.581 ⁺	1.012	3.097E-02	1.031	.101	1.106
Taipei county	-.465	1.104	.192	1.212	.264	1.302
Yi-Lan county ^a						
X ²	123.666***					

L1: coercive control style

L2: neglectful style

L3: distant control style

L4: inductive control style

Maternal disadvantageous employment

^a Reference category of the dummy variable.

⁺ p<.1 * p<.05 ** p<.01 *** p<.001

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