Patterns of Korean Adolescents' Delinquent Behaviors: A Latent Class Analysis

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ABSTRACT

The present study identified distinct classes of delinquent adolescents as they relate to risk or protective factors at individual and contextual level. Latent class analysis was employed to examine the heterogeneity of delinquent adolescents by using a nationally representative sample of 1,979 1st year high school students from the 2016 Korean Children and Youth Panel Survey(KCYPS). The results show as follows. Three classes of delinquent adolescents were identified: 'low-level delinquency group'(91%), 'status offenses group'(4.5%) and 'cyber delinquency group'(4.5%). Additionally, the result of multinomial regression employed to examine the relations between risk or protective factors and latent delinquent classes showed that group membership was found to be associated differentially with adolescents' individual and contextual factors. In particular, aggression had a great impact on status offenses group, whereas depression was closely related with cyber delinquency group. Results from the current study imply that because delinquent adolescents present with different risk profiles, schools or communities should meet different service needs for differential prevention and intervention responses.

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I. Introduction

Juvenile delinquency and the resulting negative effects on youth, families, and society, are significant and long-standing problems in the South Korea. Even though the prevalence of juvenile delinquency is challenging to estimate due to a lack of agreements in definitions and reporting standards, recent statistics show that the number of delinquent adolescents is a non-ignorable portion of violent and anti-social crimes. According to 2016 statistics (Supreme Prosecutors' Office, 2017), total number of juvenile criminals aged 14 to 19 is 87,403 in 2016, representing 3.38% of all violent criminals. The persistently high rates of juvenile delinquency, along with the far-reaching life consequences of juvenile delinquency, imply the need for further research to better understand the nature of delinquent adolescents, in particular, the complex and heterogeneous characteristics of delinquent behaviors (Lee, Cho, & Choi, 2007). This study attempts to expand the current knowledge on juvenile delinquency through examining the potential different subgroups (i.e., latent classes) of delinquent adolescents and to provide potentially new avenues for intervention on juvenile delinquency.

II. Theoretical Background

A. Juvenile Delinquency

Juvenile delinquency is generally defined as antisocial or criminal behaviors by children and adolescents as juvenile delinquency has been found to be associated with serious behavioral and academic risk behaviors that can impact negatively the well-being and development of adolescents (Ha, Park, & Kim, 2014). Generally, Korean studies categorize juvenile delinquency into two types: a status offense and a criminal offense (Jung, Sun, & Jang, 2016). A status offense includes behaviors that would not, under the law in which the offense was committed, be a crime if committed by an adult. The most common examples of a status offense are chronic or persistent truancy, running away, and possessing alcohol or tobacco. On the other hand, a criminal offense means a criminal-type behavior which is punishable for breaking the law of the jurisdiction of the behavior. Examples of a criminal offense include violently beating others, stealing, or robbery.

Previous studies have found that students who do delinquent behaviors in school are more likely to have low academic achievement (Han & Lee, 2013), to drop out of school (Han & Jo, 2008) and less likely to be employed after the end of compulsory schooling, which in turn negatively impacts their lifetime. Most of these existing studies have

adapted and analyzed with a variable-centered approach. The methodological approach well-provides information about relationships among variables (e.g., delinquency experience is correlated negatively with achievement in school). In variable-centered studies of delinquency, delinquent adolescents have been defined as those who reported experience of delinquency on at least one of types of delinquency in a certain time period (e.g., past one year). This definition assumes that delinquent adolescents are a homogeneous group without consideration of degrees of delinquency or types of delinquency.

B. Heterogeneity of Delinquent Adolescents: A Person-Centered Approach

Recent studies indicate considerable heterogeneity existed among adolescents who report delinquency experience. Juvenile delinquency is seen as a complex and heterogeneous problem and thus delinquent youths may be distinguished based on divergent patterns of categories, types, or risk profiles. For example, there may be a group who are charged with status offense behaviors but not with any serious criminal offense. On the other hand, another group may include adolescents who are charged with both status offense and criminal offense behaviors. This complexity cannot be easily captured in variable-centered studies.

Thus, recent researchers have employed a person-centered approach that enables to describe the relations of variables as they combine into classes/profiles that define groups of homogeneous people within a sample (Magnusson & Vermunt, 2002). For example, the causal processes underlying the delinquency of juveniles will differ between those whose identified delinquency experience is limited to status offense behaviors and those whose identified delinquency behaviors include both status offense behaviors and criminal offense behaviors. Unfortunately, a person-center approach has been rarely employed to investigate possible differential types of delinquent adolescents, which could allow for more specific and targeted interventions designed for different types of delinquency.

Two Korean juvenile delinquency studies conducted using a person-centered approach have been found. Noh, Jung, and Hong (2014) found that there were four different latent classes for delinquent elementary school students (i.e., drinking/violence/gambling group, theft group, smoking/drinking group, and low-level delinquency group) and for middle school students (i.e., middle-level delinquency group, high delinquency and absence group, drinking/pornography group, and low-level delinquency group). Lim et al. (2015) found three different latent classes for middle

school students (i.e., low-level delinquency group, multiple-types delinquency group, and criminal offense group). However, because these two studies are limited for generalization by sample characteristics (i.e. limited to elementary and middle school students), as both studies suggested, there is a need for further empirical-based research to better understand latent classes of delinquent adolescents, in particular of high school students, in the establishment of specific prevention and treatment interventions for them.

C. Factors Associated with Juvenile Delinquency

Previous variable-centered studies of juvenile delinquency have been focused primarily on studying the causes and correlates of delinquency at various contextual levels (e.g., family, peer group, neighborhood, school) and at the individual level. These factors work as the risk or protective resources that constitute an individual's developmental environment. Risk factors predict subsequent problems including juvenile delinquency whereas protective factors decrease these kinds of problems. Protective factors also mediate or moderate the effect of exposure to risk factors, resulting in reduced incidence of the problem behavior (Garmezy, 1990).

At the individual level, risk or protective factors include demographic variables, such as gender, age, and socioeconomic status, as well as psycho-emotional characteristics such as depression (Kim & Kim, 1998), aggression (Kwak & Mun, 1993), or self-esteem (Gratz & Roemer, 2004). In general, male students and low SES students tend to engage in more delinquent behaviors than female students and high SES students (Kang, 2011). Adolescents with depression or aggression problems are more likely to show higher delinquency rates. In addition, lower self-esteem generally predicts higher level of delinquency. Tracy and Robins (2003) mentioned that children with low self-esteem are more likely to have feelings of hostility and anger toward other people in order to protect themselves against feelings of inferiority and shame, which in turn leads to delinquent behaviors.

At the contextual level, family-related and peer-related factors have been implicated as risk or protective factors for juvenile delinquency. Family factors include family conflicts, parental education, parental attitudes toward education and parental involvement (Jenkins, 1957; Park, Kim, & Han, 2003). For example, Hoeve et al.'s (2009) meta-analysis study suggested that the risk factors of delinquency include lack of parental supervision, parental rejection, and parent–child involvement whereas parental discipline appears to be a protective predictor. Peer factors associated with juvenile delinquency include delinquent peer affiliations, peer relationship, and peer alienation (Kearl & Gordon, 1992; Kim & Choi, 2009). Findings consistently have reported that good experience with friends works as an important protective factor to reduce the rates of

delinquent behaviors. Many studies have discussed the necessity of exploring risk or protective factors in order to draw a clear conclusion concerning the magnitude of relation between these factors and delinquency and to strengthen protective factors as well as to reduce risk factors in intervention programs.

D. Present Study

Recent literature on juvenile delinquency has led to an increased recognition that juvenile delinquency is a complex and heterogeneous problem that can be influenced by various individual and contextual factors. These studies have shown the potential discrepancy between the heterogeneity of juvenile delinquency and the presumed homogeneity of delinquent adolescents. However, limited studies employing a person-centered approach have been conducted in Korea.

This study expands the current knowledge based on delinquency by exploring the presence of heterogeneity among delinquent adolescents and examining the relations between subgroups of adolescents' delinquent behaviors and risk or protective factors to examine if different causal mechanisms may operate in different ways for each subgroup of juvenile delinquency. Identifying patterns of adolescents' delinquent behaviors may encourage to develop more specific and targeted interventions designed to meet the needs associated with the different types of delinquent adolescents. A nationally representative data set comprised of an array of variables were utilized in the current study.

Specific research questions are followed: 1) which latent classes of adolescents' delinquent behaviors can be identified among Korean 1st-year high school students? ; 2) to what extent can differences between latent classes of delinquent adolescents be identified in terms of risk or protective factors?

Ⅲ. Methods

A. Participants

Data for this study were derived from the 2016 Korean Children and Youth Panel Survey(KCYPS), a longitudinal data set conducted by the National Youth Policy Institute in Korea. KCYPS is designed to track three panels: first graders in elementary school, fourth graders in elementary school, and first graders in middle school each year since 2010. We used the 7th wave of the fourth grade student panel; and accordingly, a total of

1,979 students who were in first-grade high school in 2016 were included in the analysis. Male and female adolescents comprised 52% and 48% of the participants respectively.

B. Measures

1. Delinquent Behaviors

Twenty items measured adolescents' experience of delinquent behaviors including real world delinquency and cyber delinquency. Participants were asked, "During this school year, have you ever experienced the following delinquent behaviors?": 'smoking', 'drinking', 'absenteeism', 'running away', 'making fun of others or mocking them', 'school alienation', 'gang fights', 'violently beating others', 'threatening others', 'taking away others' money or property', 'stealing others' money or property', 'having sexual relationship', 'sexual abuse or harassment', 'gambling', 'posting false information intentionally on chatting or bulletin boards', 'downloading and using illegal software', 'using others' ID without authorization', 'using deceptive sex or age on chatting', 'hacking other's computers or websites', and 'using violent language online'. All response choices were binary (1=yes, 2=no).

2. Predictive Variables

On the individual characteristics, students' gender and psycho-emotional traits were included. Gender was dummy coded 0 for female participants and 1 for male participants. Regarding psycho-emotional characteristics, self-esteem, depression, and aggression were measured using 4-scale Likert scale (1=strongly agree; 4=strongly disagree). Self-esteem was measured by ten items related to students' positive and negative perceptions of themselves. (e.g., "I am satisfied with myself" , "I sometimes feel that I am worthless"). Depression was measured by averaging 10 items regarding worries, anxiety, loneliness, and sorrow(e.g., "I am not interested in anything at all" , "I think my future is hopeless"). Lastly, aggression was measured by 6 items (e.g., "I nitpick or attack others when I am not able to do what I want to", "I often fight over trivial things").

On the family characteristics, the family social-economic status (SES), adolescents' negative parenting practice, and parents' educational expectations were used. First, the family SES was derived by calculating the mean of z-scores of parents' level of education, which was transformed into the years of education, and the natural log value of average family income. Second, both parental neglect and abuse were measured by four items respectively. Questionnaire regarding parental neglect included "My parents think me more important than their work" and "My parents ask me about my school life". Items

related to parental abuse included "My parents beat me very often when I do something wrong" and "My parents often sweat at me". Third, parents' educational expectations were measured by a single question which was transformed into the years of education.

On the school characteristics, variables regarding peer relationship and student-teacher relationship were included. Peer relationship was measured by five items (e.g., "I get along with my classmates", "I apologize first when I quarrel with friends"). Additionally, student-teacher relationship was assessed by five items (e.g., "I like to talk with my teacher", "My teacher is kind to me"). Students indicated the extent to which they agreed with each item except for gender, SES, and parents' educational expectations. Some items were reverse coded and response ranged from 1(strongly agree) to 4(strongly disagree).

C. Statistical Analysis

The study used latent class analysis(LCA) to identify classes of adolescents' delinquent behaviors. Using LCA, similar participants were classified into subgroups based on observed indicators without making traditional modeling assumptions (Heather et al., 2012). Whether or not students had experiences of twenty specified delinquent behaviors was used as indicators of class membership. Numbers of latent classes were determined by using the Bayesian information criteria(BIC) (Schwartz, 1978), the sample-size adjusted BIC(SSABIC) (Sclove,1987), the bootstrapped likelihood ratio test (BLRT, Arminger, Stein, & Wittenberg, 1999), the Lo, Mendell, and Rubin likelihood ratio test (LMR-LRT, Lo, Mendell & Roubin, 2001), and the entropy value(Hix-Small et al., 2004). In general, a model with smaller BIC and SSABIC statistics indicates a better fitting model. We also used the LMR-LRT and BLRT statistics which compare model fits by testing for a statistically significant difference between the current class specification (k) and the model with one less class(k-1). If each p value of the LMR-LRT and BLRT statistics is significant, the selected class model(k) has relatively improved from k-1 class model (Jung & Wickrama, 2008). Additionally, a model with higher entropy, which is a measure of the appropriateness of classification, represents greater precision of classification. For successful convergence in model, no less than 1% of total count in each class was also examined (Jung & Wickram, 2008).

Once the final model was determined, we also examined the influence of adolescents' risk or protective factors over the latent class membership by using multinomial logistic regressions. All statistical analysis in this study was conducted with SPSS 22.0 and Mplus 7.11.

Ⅳ. Results

A. Descriptive Characteristics

Descriptive statistics of adolescents' background variables are provided in Table 1. The overall reliability of each background variable was acceptable measured by Cronbach's alpha (0.63 - 0.90). The absolute value of skewness was ranged from 0.08 to 1.66 less than 2.0 and kurtosis was from 0.00 to 1.99 less than 5, which indicated no significant violation of normal distribution (Ghiselli et al., 1981).

\<Table 1\> Descriptive Statistics for Background Variables

Variables	M	SD	skewness(s.e)	kurtosis(s.e)	cronbach's α
male	0.52	0.50	-0.09(.06)	-1.99(.11)	-
self-esteem	2.96	0.46	-0.16(.06)	0.25(.11)	0.85
depression	1.79	0.55	0.41(.06)	-0.10(.11)	0.90
aggression	1.83	0.54	0.19(.06)	-0.55(.11)	0.82
SES	-0.05	0.87	-0.53(.06)	1.07(.11)	0.78
parental neglect	1.80	0.51	0.08(.06)	-0.08(.11)	0.71
parental abuse	1.58	0.57	1.10(.06)	1.09(.11)	0.84
parents' educational expectation	11.70	9.37	-1.66(.06)	1.02(.11)	-
peer relationship	3.19	0.39	0.28(.06)	-0.22(.11)	0.63
student-teacher relationship	3.03	0.56	-0.08(.06)	0.00(.11)	0.81

B. Latent Classes of Juvenile Delinquency

Latent class analysis was conducted on the 19 variables related to juvenile delinquency estimating model fit for one, two, three, four and five classes. Experiences related to sexual abuse or harassment were excluded in the final analysis because no participants

reported the experience. The model fit statistics are displayed in Table 2.

<Table 2> Descriptive Statistics for Background Variables

Model	BIC	SSABIC	BLRT p value	LMRLRT p value	Entropy	n for each class
1 class	6191.396	6131.032				C1=1979(100%)
2 class	5693.929	5570.024	0.000	0.000	0.858	C1=164(8.3%),C2=1815(91.7%)
3 class	5687.121	5499.675	0.000	0.000	0.881	C1=1801(91.0%), C2=89(4.5%), C3=89(4.5%)
4 class	5793.200	5542.213	0.000	0.161	0.901	C1=5(p<1%), C2=78(4.0%), C3=1799(91.0%), C4=97(5.0%)
5 class	5904.766	5590.238	0.013	0.583	0.865	C1=104(5.0%), C2=7(p<1%), C3=71(4.0%), C4=21(1.0%), C5=1776(90.0%)

The best fitting model as indicated by the BIC, SSABIC, BLRT and LMR-LRT values was the 3-class model even though the entropy supported the 4-class model. In addition, every subgroup in the 3-class model had more than 1% of total count.

To identify the characteristics of latent classes, item response probabilities for the three-class model were examined (Table 3).

<Table 3> Percentages of juvenile delinquency within classes

Types of juvenile delinquency	class1(91.0%) (N=1,801)	class2(4.5%) (N=89)	class3(4.5%) (N=89)
smoking	1.22%	92.13%	3.37%
drinking	5.11%	94.38%	34.83%
absenteeism	0.94%	33.71%	8.99%
running away	0.11%	19.10%	2.25%
having sexual relationship	0.00%	6.74%	6.74%
school alienation	0.00%	2.25%	0.00%
gang fights	0.06%	2.25%	0.00%

violently beating others	0.11%	2.25%	3.37%
threatening others	0.00%	1.12%	2.25%
taking away others' money or property'	0.00%	2.20%	0.00%
stealing others' money or property	0.06%	2.25%	0.00%
gambling	0.00%	12.36%	7.87%
posting false information intentionally on chatting or bulletin boards	0.17%	1.12%	2.25%
downloading and using illegal software	4.00%	5.62%	57.30%
using others' ID without authorization	0.61%	8.99%	20.22%
using deceptive sex or age on chatting	0.00%	2.25%	29.21%
hacking other's computers or websites	0.00%	0.00%	3.37%
using violent language online	0.94%	3.37%	37.08%
making fun of others or mocking them	0.28%	8.99%	15.73%

Class 1 was comprised of adolescents who had very low probabilities of almost every delinquency. This class was labeled the 'low-level delinquency group'. On the other hand, the distinguishing feature of class 2 was relatively higher likelihoods across the measures of status offenses including smoking (92.13%), drinking (94.38%), absenteeism (33.71%), and running away (19.10%). The class was therefore labeled the 'status offenses group'. The third class was named the 'cyber delinquency group' because this class had relatively higher probabilities of cyber delinquency compared with the real world delinquency such as downloading and using illegal software (57.30%), using others' ID or password without authorization (20.22%), using deceptive sex or age on chatting (29.21%), and using violent language online (37.08%). Given that the cyber delinquency group is likely to send or receive text messages or chat online more frequently, the group also had relatively higher probabilities of verbal abuse including making fun of others or mocking them(15.73%).

C. Prediction of Class Membership

To examine predictors of latent class membership of juvenile delinquency, multinomial logistic regression analysis was performed. The latent class membership served as the dependent variables and adolescents' individual characteristics, home background and

school life variables were included as covariates. The results of multinomial logistic regression models are reported in Table 4.

<Table 4> Multinomial logistic regression model to predict class membership

Predictors	low delinquency group vs status offenses group		low delinquency group vs cyber delinquency group		cyber delinquency group vs status offenses group	
	Exp(B)	95% CI	Exp(B)	95% CI	Exp(B)	95% CI
male	6.07***	3.16-11.64	2.81***	1.71-4.61	2.16	0.97-4.83
self-esteem	1.09	0.53-2.27	1.82	0.92-3.62	0.60	0.23-1.58
depression	0.77	0.42-1.44	2.24*	1.21-4.12	0.35*	0.15-0.80
aggression	3.72***	2.17-6.40	1.12	0.66-1.89	3.33**	1.61-6.87
SES	0.78	0.60-1.00	0.83	0.65-1.07	0.94	0.66-1.32
parental neglect	1.31	0.76-2.26	0.68	0.41-1.15	1.92	0.93-3.97
parental abuse	1.42	0.95-2.12	0.65	0.40-1.05	2.18*	1.19-3.99
parents' educational expectation	1.00	0.97-1.03	1.00	0.97-1.03	1.00	0.96-1.04
peer relationship	1.20	0.52-2.80	0.43*	0.20-0.91	2.83	0.94-8.50
student-teacher relationship	0.73	0.44-1.22	0.70	0.44-1.13	1.04	0.53-2.03

* $p<.05$, **$p<.01$, ***$p<.001$

The comparisons were with respect to membership in low-level delinquency group, which had very low likelihoods of delinquent behaviors. Membership in status offenses group was predicted by adolescents' gender and level of aggression. Membership in cyber delinquency group was predicted by gender, depression, and peer relationship at school. Specifically, on the student level, male adolescents had greater odds of being members of the status offenses group (Exp(B)=6.07) compared with the low-level delinquency group when controlling for covariates. As students' level of aggression increases, the likelihood of being in the status offenses group increases (Exp(B)=3.72) when controlling for

covariates.

Next, similarly to the membership in status offenses group, male participants had greater odds of being members of the cyber delinquency group (Exp(B)=2.81) compared with low-level delinquency group. As participants' level of depression increases, the probability of being in the cyber delinquency group also increases (Exp(B)= 2.24) compared with the low-level delinquency group when controlling for covariates. On the school level, participants with good peer relationship had lower odds of being members of the cyber delinquency group (Exp(B)=0.43) when controlling for covariates. No significant differences in self-esteem, family background variables (SES, parental neglect and abuse, and parents' educational expectations) and student-teacher relationship were shown with respect to being members of either status offenses group or cyber delinquency group relative to being in the low-level delinquency group.

Compared to being in the cyber delinquency group, students with aggression had greater odds of being members of the status offenses group (Exp(B)=3.33). On the other hand, participants with depression were likely to belong to the cyber delinquency group relative to being in the status offenses group. As students' parental abuse increases, the likelihood of being in the status offenses group also increases relative to the cyber delinquency group (Exp(B)=2.18).

V. Discussion

The purpose of current study is to examine natures and characteristics of adolescents' delinquency based on multidimensional understandings of high school students' delinquency patterns by using a latent class analysis. By analyzing the indicators regarding their experiences of conventional and cyber delinquent behaviors simultaneously, our findings revealed three subgroups of delinquent adolescents, low-level delinquency group(91%), status offenses group(4.5%) and cyber delinquency group(4.5%).

In consistent with previous findings (e.g., Lim et al., 2005), the vast majority of Korean 1st year high school students belongs to the low-level delinquency group. However, other classifications were somewhat different from previous related literature. For example, in the Lim et al.'s (2015) study using middle school student samples, except low-level delinquency group, other two subgroups of delinquent adolescents are characterized by the great likelihoods of doing criminal offenses; multiple-types delinquency group is characterized as the high rates of status offenses and criminal offenses behaviors simultaneously and crime offenses group characterized as high rates of a criminal-type

behavior which is punishable for breaking the law are identified. However, interestingly, this study identified status offenses group and cyber delinquency group and no subgroup related to criminal offense was found. The result may imply that compared to middle school students, criminal offenses or violent delinquency behaviors have decreased among high school students. Due to the beneficial influence of recent school intervention programs for violence prevention, high school students may better understand the negative influence of criminal-related behaviors on the rest of the life trajectory, probably resulting in reduction of criminal offense rates.

With regard to the occurrence of cyber delinquency group in this study, we interpret that the result reflects the current trend due to the increase in the use of digital technologies including smart phones and computers. With many teenagers using digital devices for educational, recreational, and communicational purposes, there has been an increase in exposition to different forms of cyber-violence.

Looking at the predictors of membership in the latent classes, students' gender, aggression, depression and peer relationship were significantly associated with their subgroup membership. Specifically, our findings that male students were more likely to belong to either status-offense group or cyber-delinquency group compared to female counterparts are in accordance with the previous research (e.g., Kim & Lim, 2004; Nam, 2011; Lee, 2011; Lim et al., 2015). As risk factors for delinquent behaviors, aggression had a great impact on students' status offenses, whereas depression was closely related to cyber delinquent behaviors. It is also supported by previous findings examining the correlations between adolescents' aggression/depression and their delinquent behaviors (e.g., Kwon, 1998; Jin & Bae, 2011). In addition, peer relationship had a significant effect on cyber delinquency, which is in line with related research reporting that delinquent behaviors in late adolescence are significantly affected by peer relationship (e.g., Hwang, 2012).

The results offer educational implications. To date, limited school or policy approaches which consider the complexity of delinquent adolescents have been utilized. Understanding the nature of delinquent adolescents that are not a homogenous group who share the same risk profiles and are not affected by same risk or protective factors is important for practice and policy. This heterogeneity of delinquency suggests different service needs for delinquent adolescents. Specializing programs for the prevention and treatment of problem behaviors is important because the greatest reduction is likely to be realized only if the right program is offered to the right individual/group. The findings of this study provide evidence for targeting individuals and risk or protective factors that may be predictive of a stronger treatment response for each targeting individual.

There are several limitations of the study. First, the data was established with self-reporting responses so thus validity of self-reported of problem behaviors or

psychological functioning, particularly in children and adolescents is affected by social desirability, a tendency to present oneself favorably (Logan, Claar, & Scharff, 2008). Adolescents strongly influenced by social desirability may deny to express negative thoughts and delinquency behaviors in an effort to look good. Second, the data is cross-sectional in nature, and thus, directions of any possible causal relations cannot be ascertained with these data. Thus, we cannot explain the causal explanation of risk or protective factors on subgroups of delinquent adolescents. Longitudinal data is required to formulate more exact predictions concerning the causality of the implicated processes.

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