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Identifying Latent Classes of Antisocial Behavior Among Youth From Saudi Arabia: An Assessment of the Co-Occurrence Between Aggression, Psychopathy, Low Self-Control, and Delinquent Behavior

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Abstract

Despite the wealth of knowledge on subclass formation for antisocial behavior among youth from the United States and other Western industrialized countries, very little is known about the subclass structure for antisocial behavior among youth growing up in other geographical contexts. Using validated measures of aggression, psychopathy, and low self-control, we employ latent class analysis to identify latent subgroups of antisocial behavior from a sample of 324 Saudi Arabian youth. Three classes of antisocial behavior emerged and significant associations between latent class membership and different forms of delinquency were observed. The findings are the first to show a similar pattern of latent class formation for antisocial behavior and risk for violent and nonviolent delinquency among Saudi Arabian youth compared to U.S. youth.

Keywords

antisocial behavior, Saudi Arabia, aggression, psychopathy, low self-control, delinquency

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Introduction

The findings from life-course and developmental research during the past 20 years have revealed much about the subclass structure for youth antisocial behavioral development and the differences in risk for delinquency based on class membership (Farrington, 2003). A substantial amount of evidence from this body of research has shown that latent subgroups for antisocial behavior tend to emerge early in life (Lacourse et al., 2010), where youth who score the highest on measures of aggression, psychopathy, and low self-control often demonstrate the highest risk for engaging in serious forms of delinquent behavior during adolescence (Ray, Thornton, Frick, Steinberg, & Cauffman, 2015) and criminal behavior during adulthood (Mokros et al., 2015). The generalizability of these antisocial subgroups across different samples from heterogeneous populations has offered a great deal of support for the creation of theoretical perspectives focused on explaining differences between groups and common risk factors among individuals within the same group (Moffitt, 1993). Contemporary research examining the subgroup structure of antisocial behavior among youth suggests that a three- or four-class solution commonly underlies the cross-sectional and longitudinal patterns of antisocial behavior and risk for delinquency (Brame, Nagin, & Tremblay, 2001; Côté, Tremblay, Nagin, Zoccolillo, & Vitaro, 2002; Fergusson, Horwood, & Lynskey, 1994; Li & Lee, 2010; Maughan, Pickles, Rowe, Costello, & Angold, 2000; Moffitt, 1993; Shaw, Lacourse, & Nagin, 2005; Wiesner & Silbereisen, 2003).

While the accumulation of research on subgroup formation has offered important insight into the number and structure of antisocial subgroups, the majority of findings from this body of research are based on reports of antisocial personality traits from youth in the United States (Li & Lee, 2010) and other Western industrialized countries such as England (Nagin, Farrington, & Moffitt, 1995), Canada (Brame et al., 2001; Cote et al., 2002), and Germany (Wiesner & Silbereisen, 2003). Over time, many criminological theories have been created and supported based on this ever growing body of research that has informed criminologists about the co-occurrence of antisocial behaviors and delinquent involvement during adolescence (Moffitt, 1993; Sampson & Laub, 1995). For example, in addition to summarizing results on life-course patterns of antisocial behavior from many of these populations, Moffitt (1993) argued in her developmental taxonomy that youth tend to fall within one of two different antisocial subgroups. Specifically, youth who demonstrate a high level of irritably or aggression, callous-unemotional traits or psychopathy, and low self-control (due to neuropsychological deficits) are more likely to demonstrate conduct disorder problems during childhood, engage in serious (often violent) forms of delinquency during adolescence, and continue to offend well into adulthood. Moffitt identified members of this subgroup as life-course-persistent offenders and suggested that these individuals would commit serious forms of violent crime and cause the highest amount of social harm to societies. On the other hand, youth with low levels of aggression, low levels of psychopathy, and higher levels of self-control are less likely to demonstrate conduct disorder problems during childhood, more likely to engage in minor (often nonviolent) forms of delinquency during adolescence, and then desist from engaging in antisocial behavior in adulthood. Moffitt identified members of this subgroup as adolescence-limited offenders since their delinquent behavior was confined to adolescence. While several studies have assessed and found support for Moffitt's central arguments regarding distinct subclasses of antisocial behavior (Barnes, Boutwell, Morris, & Armstrong, 2012; Connell, Cook, Aklin, Vanderploeg, & Brex, 2011; Hasking, Scheier, & Abdallah, 2011; Vaughn et al., 2011), virtually no research has explored the subclass structure of antisocial behavior among youth from countries that are culturally distinct from many Western industrialized societies. As such, very little is known about whether similar patterns of antisocial behavior exist among youth growing up in other cultural contexts and if members of validated antisocial subclasses are more (or less) likely to commit certain violent and nonviolent acts of delinquency. One area of the world perhaps where this is

most apparent and where there is a particular lack of data on youth antisocial behavior is Saudi Arabia.

In contrast to many Western industrialized societies that have prioritized funding data collection projects aimed at monitoring human developmental patterns among citizens, such information is scarce in Middle Eastern countries such as Saudi Arabia. Only recently has Saudi Arabia begun to fund efforts aimed at collecting and analyzing data on young Saudi citizens (see, e.g., Beaver et al., 2015a, 2015b; Sacarellos et al., 2015). Given the paucity of social research in Saudi Arabia, not much is known about the prevalence, heterogeneity, and potential subclass structure of antisocial behavior among youth in Saudi Arabia. An examination of the general clustering of antisocial behaviors that form the basis for separate antisocial subclasses and the association between subclass membership and delinquency may illuminate fundamental differences in the development of antisocial behavior between Saudi Arabian youth and youth from other Western countries commonly examined by criminologists. With this in mind, the current study aimed to address this gap in the literature by analyzing a sample of Saudi Arabian youth to assess (1) the latent class structure of antisocial behavior among youth based on the co-occurrence of different elements of antisocial personal disorder such as aggression, psychopathy, and low self-control and (2) the associations between antisocial subgroup membership and different forms of violent and nonviolent delinquent behavior.

Aggression, Psychopathy, and Low Self-Control as Key Elements of Antisocial Behavior

Antisocial personality disorder is characterized by hostile behavior, aggressiveness, impulsivity (or low self-control), callousness, egocentrism, and an overall disregard for right and wrong (American Psychiatric Association, 2013). Research has found that youth who display high levels of aggressiveness, callousness, and low levels of self-control are more likely to commit serious acts of violence during adolescence and in adulthood (Gretton, Hare, & Catchpole, 2004; Jennings & Reingle, 2012; Moffitt, 1993). Data from countries such as Canada, England, and the United States have consistently found robust links between early life aggression, psychopathy, low self-control, and variation in offending types (Piquero, 2008). The current section will provide a brief summary of each one of the aforementioned elements of antisocial personality disorder and discuss how all elements often co-occur to explain differences in antisocial behavior and risk for different forms of delinquency.

Aggression is defined by hostile and violent behavior, with a readiness to physically attack or confront another (Buss, 1961). Studies have shown that aggressive qualities tend to manifest at an early stage of development (Tremblay, 2000) and predict differences in offending during adolescence (Broidy et al., 2003). Longitudinal research analyzing samples of U.S. youth indicate that children who display higher levels of physically aggressive behavior (e.g., fighting and bullying), compared to their peers, are more likely to engage in serious acts of delinquency during adolescence and be classified as career criminals, since many of them follow life-course-persistent offending patterns (Moffitt, 1993). For example, Broidy et al. (2003) analyzed youth data from six different sites across three separate countries (Canada, New Zealand, and the United States) and found that boys with higher levels of physical aggression during childhood were more significantly likely to engage in physical violence and other nonviolent forms of delinquency later in adolescence compared to boys with lower levels of aggression during childhood. Studies also indicate that physically aggressive behaviors are associated with callous-unemotional traits during childhood (Barry et al., 2000), violent conduct disorder in adolescence (Piquero, 2008), and lower levels of self-control, suggesting that youth with depleted or overall low levels of self-control may be unable to override aggressive tendencies for violent behavior (DeWall, Finkel, & Denson, 2011).

Over the past decade, a related line of research has also found that psychopathic personality traits such as egocentrism, narcissism, and callousness are strongly associated with serious antisocial behavior (DeLisi, 2009; Larson, Vaughn, Salas-Wright, & DeLisi, 2015). For example, research has found moderate-to-strong associations between psychopathy and aggression with youth who report higher levels of callous-unemotional traits also demonstrating higher levels of proactive aggressive behavior (Frick, Cornell, Barry, Bodin, & Dane, 2003). Evidence from this line of research also indicates that youth with a higher level of narcissism and a lack of remorse for others are more likely to experience a host of issues directly related to antisocial behavior including poor performance in school (DeLisi et al., 2010), engaging in serious forms of delinquent behavior at an early age (Farrington, 2005), and experiencing criminal careers that extend well into adulthood (Vaughn & DeLisi, 2008). Recent estimates suggest that around 25% of the current U.S. inmate population satisfy the diagnostic criteria for psychopathic personality disorder (DeLisi & Vaughn, 2012), thus underscoring the prominent role that psychopathy plays in the development of antisocial behavior. As such, psychopathy has been argued by some to be one of the strongest predictors of serious antisocial and violent behavior (DeLisi, 2009).

In addition to aggression and psychopathy, a well-developed body of research has established that low self-control is one of the strongest predictors of crime and delinquency (Pratt & Cullen, 2000). Since the introduction of Gottfredson and Hirschi's *A General Theory of Crime* (1990), an impressive line of research has found that youth with lower levels of self-control are more likely to experience school problems (Duckworth, Gendler, & Gross, 2014), bully peers (Chui & Chan, 2013), commit both violent and nonviolent delinquent offenses during adolescence (Pratt & Cullen, 2000), and have contact with the criminal justice system in adulthood (Moffitt et al., 2011). Moreover, recent research has found that low self-control during early childhood predicts entry into delinquent subgroups during adolescence characterized by repeated violent behavior and callous-unemotional traits (Piquero, 2008). In perhaps the largest cross-cultural study examining self-control and deviant behavior, Rebellon, Straus, and Medeiros (2008) found that low self-control was one of the strongest predictors of violent criminal behavior in a sample of over 20,000 university students from 32 different countries. Interestingly, these results were found among individuals living even in countries that are known for enforcing strict cultural societal norms for deviance such as China, Iran, Japan, and Korea. Considered together, self-control has been regarded as one of the most important individual-level risk factors for child misconduct, adolescent delinquency/deviance, and adult offending.

Although aggression, psychopathy, and self-control have all been found to independently predict different forms of delinquent behavior, an emerging body of research has also found that these constructs are often strongly associated with one another (Hyde, Burt, Shaw, Donnellan, & Forbes, 2015; Larson et al., 2015; Ray et al., 2015). Specifically, research analyzing data from U.S. samples show that aggression, psychopathic personality traits, and self-control tend to co-occur and predict different levels of antisocial behavior where individuals who report higher levels of aggression, higher levels of psychopathic personality traits, and lower levels of self-control are more likely to commit violent forms of antisocial behavior (Larson et al., 2015; Vaughn & DeLisi, 2008). This co-occurrence of antisocial behaviors can perhaps be viewed in the context of "pushes" and "pulls" for delinquency. For example, youth with strong pushes toward engaging in delinquent behavior such as aggressive urges and callous-unemotional tendencies may be more likely to commit violent delinquent acts especially when coupled with a limited supply of self-control which would operate as a pull away from delinquency. As a result, low self-control, in this scenario, would not be able to disinhibit aggressive tendencies and the lack of remorse for violent and/or nonviolent delinquency. Youth with high levels of self-control and moderate levels of aggression and psychopathy, on the other hand, may be better equipped to override aggressive tendencies for delinquent behavior. To illustrate, youth in this group may be more likely to engage in nonviolent forms of delinquency since

they would be better able to control aggressive urges for delinquent behavior even when confronted with high levels of conflict or stress. The formation of these different subgroups of antisocial behavior based on variation in aggression, psychopathy, and self-control would conform to the number of offending subclasses argued by Moffitt in her developmental taxonomic theory (1993). However, empirical support for this argument from many countries located in the Middle East is scarce, thus leaving much unknown about whether youth growing up in Middle Eastern societies demonstrate similar patterns of antisocial behavior compared to youth commonly represented in many of the findings summarized in this section.

Saudi Arabian Culture and the Latent Class Structure of Antisocial Behavior

While many Western cultures prioritize the importance of individuality and freedom of expression, other national cultures emphasize the importance of abiding by a singular code of conduct and ethics based upon religious principles. Cultures that place a great deal of emphasis on conformity may therefore create homogenous societies that ultimately reduce the creation of individual differences in attitudes, behaviors, and other life outcomes among members of society. The adherence to strict forms of social control may be especially prevalent in countries located in the Middle East where laws are based on Islamic principles and are regularly enforced by several state and local authorities (Shah, 2010). One Middle Eastern country that employs strict enforcement of Islamic law is Saudi Arabia.

The Kingdom of Saudi Arabia is a monarchy and religious theocracy that incorporates Islamic principles into legal and cultural aspects of their society (Souryal, 1987). In contrast to many other Middle Eastern nations where Islam is integrated into culture and society, Saudi Arabia sets itself apart by employing strict punishments for crimes committed against the Kingdom and using religious police, known as the Mutaween, to enforce religious expectations among the citizens of Saudi Arabia (Souryal, 1987). For instance, agents of the Mutaween are responsible for enforcing specific dress codes for Saudi citizens, making sure appropriate opposite sex relationships are formed, and punishing any antisocial behavior that deviates from the behavioral expectations based on principles of Islam found in the Quran. The Kingdom of Saudi Arabia has also been known for taking a strong stance on serious delinquent and/or criminal behavior that violate Islamic codes of conduct where members of society are often subjected to harsh physical punishment (Souryal, 1988).

The use of strong formal social controls in Saudi society may have an impact on the development of individual differences, especially youth antisocial behavior. While many Western societies have a separate system to address and punish juvenile delinquency, Saudi Arabia does not formally distinguish between youth and adult offending. Moreover, whereas police officers are the prime agents of formal social control in Western societies, Saudi Arabia employs police officers and religious enforcement officers to detect and punish antisocial transgressions against both the Kingdom and tenets of Islam. As a result, Saudi Arabian culture may suppress individual variability in antisocial behavior because youth are expected to abide by not only the same legal doctrine but also the same set of values and beliefs. Exposure to this type of culture may reduce the prevalence of certain antisocial behaviors among youth which, in turn, may result in the absence of subclass formation for antisocial behavior or differences in the number of subclasses. A lack of variation in the development of antisocial subclass formation in a society such as Saudi Arabia would deal a heavy blow to much of the research that has found evidence for a three- or four-class structure of antisocial behavior among youth in Western societies. Unfortunately, no research to date has conducted a cross-cultural study to assess this possibility.

The Current Study

Criminological research has found that subclasses tend to underlie observed heterogeneity in antisocial behavior among youth growing up in Western countries. While this finding has helped support theoretical frameworks and advance contemporary knowledge on the development of antisocial behavior, virtually nothing is known about whether antisocial subgroups exist among youth growing up in areas of the world where there are exceedingly different cultural and societal norms. One geographic location in which such differences are particularly salient and where there is a substantial lack of information on the prevalence and heterogeneity of youth antisocial behavior is the Middle East. An examination of antisocial subclass formation among youth from the Middle East would offer a unique opportunity to evaluate whether the well-supported three- or four-subclass solution for antisocial behavior among youth in Western nations generalizes to youth in Middle Eastern nations. With this in mind, the present study aims to begin to answer this question by analyzing a sample of Middle Eastern youth from Saudi Arabia, a country with vastly different cultural and societal expectations compared to Western industrialized countries. Structural equation modeling is used to assess the subclass structure of antisocial behavior among youth and the associations between subgroup membership and self-reported delinquency. Importantly, the present study conducts the first empirical analysis evaluating the subclass structure of antisocial behavior and associated risk for violent and nonviolent delinquency among adolescent youth living in Saudi Arabia.

Method

Data Collection and Sample

Data for the current study were drawn from a convenience sample of youth attending government-sponsored high schools in Jeddah, Saudi Arabia. Six high schools (three all-boy schools and three all-girl schools) located within the city limits of Jeddah were selected to participate in the present study. Respondents had to be of Saudi Arabian nationality or residing in Jeddah during the time of data collection. Before agreeing to participate in the study, youth were instructed to receive written permission from their parent(s) or legal guardian(s) in order to be included in the sample. Students were informed that participation was voluntary and refusal would not result in any type of punishment. All parents and students were assured of confidentiality and anonymity. The surveys were administered to a sample of 800 male and female youth who were asked to complete the survey to the best of their ability. The self-report surveys were created in English, translated into Arabic, and then translated back into English by research team members who are bilingual in both English and Arabic. Overall, 494 students (61.75% response rate) received permission and agreed to participate in the study. Respondents who had a valid score on each of the measures assessed in the current study were included in the final analytic sample. The final analytic sample included 324 Saudi Arabian youth (65.58% of the total sample). The survey design, content, data collection plans, and overall research project were reviewed and approved by the institutional review board at King Abdulaziz University. Further information about data collection methods and generalizability of the sample can be found in previously published reports (Beaver et al., 2015a, 2015b).

Measures

Aggression. Aggression was assessed by a 12-item subscale of the Aggression Questionnaire (Buss & Perry, 1992; Buss & Warren, 2000) and was utilized to measure overall levels of aggression among respondents. Respondents indicated on a 4-point scale ranging from 1 (*almost never*) to 4 (*almost always*) how well each statement described them or showed how they usually felt (i.e., "I feel like breaking things" and "I have a bad temper"). The internal consistency of this scale in the sample

Table 1. Descriptive Statistics.

Variables	Mean	Standard Deviation	Minimum	Maximum
Aggression	26.54	8.10	12	48
Psychopathy	58.58	19.26	26	104
Self-control				
Impulsivity/risk-taking	19.21	5.94	8	32
Impulsivity/simple tasks	13.14	3.78	5	20
Physical activities	7.8	2.64	3	12
Self-centered	10.51	4.09	5	20
Temper	7.19	2.59	3	12
Overall	57.23	15.03	24	87
Delinquency				
Skipped school	0.36	0.48	0	1
Run away from home	0.12	0.33	0	1
Damaged other's property	0.13	0.34	0	1
Gotten into fight	0.26	0.44	0	1
Taken something without paying	0.12	0.32	0	1
Used force to get money	0.03	0.27	0	1
Hit or seriously threaten someone	0.17	0.37	0	1
Attacked someone	0.12	0.33	0	1
Taken vehicle without permission	0.08	0.28	0	1
Broke into a building to steal	0.03	0.24	0	1
Held or sold stolen goods	0.08	0.27	0	1
Hurt someone bad enough	0.12	0.33	0	1
Demographics				
Gender (0 = *female*, 1= *male*)	0.59	0.49	0	1
Age	16.71	1.25	14	19
Nationality	0.96	0.18	0	1

was excellent (Cronbach's $\alpha = .90$). As expected, initial confirmatory factor analysis (CFA) estimates revealed that items tapping physical or overt aggression loaded on one factor, while items tapping nonaggressive or covert aggression loaded on a separate factor, and reverse worded items loaded on a third factor. However, model fit indices indicated that the three-factor model did not fit the data well. Second-order factor analysis was therefore conducted to assess whether all three first-order factors loaded on a second-order higher common factor. Results from the second-order factor analysis revealed that all three factors did indeed load on a second-order common factor and provided a better fit to the data ($\Delta\chi^2 = 268.30$, $p < .01$, comparative fit index [CFI] = .98, Tucker–Lewis index [TLI] = .96, root mean square error of approximation [RMSEA] = .05), which aligns with other research using the 12-item shortened version of the Aggression Questionnaire (Bryant & Smith, 2001). As such, the second-order factor was used as an indicator of group assignment, where higher scores reflected higher levels of aggression. Descriptive statistics for the summed measure of aggression are presented in Table 1, and CFA factor loadings are presented in Table 2.

Psychopathy. The Levenson Self-Report Psychopathy (LSRP) Scale (Levenson, Kiehl, & Fitzpatrick, 1995) was used to assess psychopathy. The LSRP is a well-validated 26-item scale measuring a range of behavioral tendencies and traits commonly associated with psychopathy. Previous research has shown that the scale demonstrates strong construct validity and reliability and is highly correlated with the commonly used Psychopathy Checklist–Revised (Brinkley, Schmitt, Smith, & Newman, 2001). Respondents were asked to report on a 4-point scale ranging from 1 (*strongly disagree*)

Table 2. Factor Loadings for Aggression.

Scale Items	Factor 1	Factor 2	Factor 3
I feel like yelling at someone	**.61**	.39	.32
I feel like breaking things	**.78**	.25	.13
I feel grouchy or irritable	**.76**	.33	.18
I have a bad temper	**.69**	.42	.22
I get very angry if my parent or teacher criticizes me	**.46**	.43	.33
Feel angry	.50	**.53**	.37
I get very impatient if I have to wait for something	.32	**.65**	.29
I lose my temper easily	.52	**.54**	.14
I get into a bad mood when things don't go my way	.37	**.69**	.24
I get in a bad mood easily	.48	**.66**	.20
I'm easy going and don't let things bother me	.13	.29	**.70**
It takes a lot to get me upset	.29	.16	**.65**
Loadings on second-order factor	.92	.99	.75

Note. Bolded estimates indicate strongest factor loading.

to 4 (*strongly agree*) of how each statement applied to them personally (i.e., "My main purpose in life is getting as many goodies as I can" and "Looking out for myself is my top priority"). The internal consistency of this scale was excellent (Cronbach's $\alpha = .94$). First-order CFA revealed that items from the LSRP scale loaded on four separate factors. Second-order CFA, however, showed that all four first-order factors loaded on a second-order common factor and provided a better fit to the data ($\Delta\chi^2 = 587.30$, $p < .01$, CFI = .97, TLI = .95, RMSEA = .06). CFA evidence does not align with evidence evaluating the factor structure of the LSRP among noninstitutionalized respondents from Western societies where many studies find support for a two- or three-factor model (Sellbom, 2011). However, we decided to rely on the latent factor estimates for the LSRP from the analytic sample and use the second-order factor as an indicator of group assignment, where higher scores reflected higher levels of endorsement for psychopathic personality traits. Descriptive statistics for the summed measure of psychopathy are presented in Table 1, and CFA factor loadings are presented in Table 3.

Low self-control. The Self-control Scale created by Grasmick, Tittle, Bursik, and Arneklev (1993) was used to assess low self-control among respondents in the sample. The Grasmick et al. Self-control Scale asks respondents 24 questions about different dimensions of self-control (i.e., impulsivity, simple tasks, risk-taking, physical activities, self-centeredness, and overall temper), which if summed together can be used to examine variation in overall levels of self-control. Respondents were asked to report on a 4-point scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*) how much each statement characterized their usual behavior (e.g., "I often act on the spur of the moment without thinking" and "I sometimes find it exciting to do things for which I might get into trouble"). Previous research has found that the six dimensions of self-control outlined above emerge when assessing U.S. youth (Arneklev, Grasmick, & Bursik, 1999). CFA results offered partial support for these findings showing that five dimensions emerged. Specifically, 5 items loaded on a self-centered component, 7 items loaded on an impulsivity/risk-taking component, 5 items loaded on an impulsivity/simple tasks component, 3 items loaded on a physical activities component, and 3 items loaded on a temper component. In line with previous research assessing the dimensionality of the Grasmick et al. scale among U.S. youth (Arneklev et al., 1999), a second-order factor model fits the data better than a five first-order factor model ($\Delta\chi^2 = 1{,}320.56$, $p < .05$, CFI = .96, TLI = .94, RMSEA = .06). Consequently, the second-order factor was used as an indicator of group

Table 3. Factor Loadings for Psychopathy.

Scale Items	Factor 1	Factor 2	Factor 3	Factor 4
In today's world, I feel justified in doing anything I can get away with to succeed	**.52**	.35	.11	.35
My main purpose in life is getting as many goodies as I can	**.65**	.36	.14	.21
People who are stupid enough to get ripped off usually deserve it	**.47**	.35	.31	.28
Looking out for the myself is my top priority	**.68**	.29	.23	.20
I would be upset if my success came at someone else's expense	**.67**	.25	.24	.04
I make a point of trying not to hurt others in pursuit of my goals	**.85**	.12	.21	.07
I feel bad if my words or actions cause someone else to feel emotional pain	**.76**	.08	.35	.06
Even if I were trying hard to sell something, I wouldn't lie about it	**.84**	.12	.16	.08
Cheating is not justified because it is unfair to others	**.84**	.11	.27	.06
I find that I am able to pursue one goal for a long time	**.65**	.31	.47	.14
Before I do anything, I carefully consider the possible consequences	**.78**	.22	.11	.10
Love is overrated	**.55**	.37	.32	.07
Making a lot of money is my most important goal	.40	**.56**	.25	.20
I let others worry about higher values; my main concern is with the bottom line	.35	**.51**	.28	.20
I tell other people what they want to hear so they will let me do what I want	.43	**.54**	.15	.18
I often admire a really clever scam	.24	**.68**	.24	.13
I enjoy manipulating other people's feelings	.04	**.74**	.27	.16
I have been in a lot of shouting matches with other people	.29	**.50**	.46	.13
I find myself in the same kinds of trouble, time after time	.39	.40	**.51**	.10
I am often bored	.48	.27	**.66**	.12
I don't plan anything very far in advance	.39	.31	**.48**	.14
I quickly lose interest in a task I start	.42	.42	**.49**	.07
Most of my problems are due to the fact that other people just don't understand me	.46	.27	**.59**	.05
When I get frustrated, I often "let off steam" by blowing my top	.30	.44	**.53**	.13
Success is based on survival of the fittest; I am not concerned about losers	.07	.21	.05	**.70**
For me, what's right is whatever I can get away with	.17	.14	.13	**.69**
Loadings on second-order factor	.86	.96	.71	.91

Note. Bolded estimates indicate strongest factor loading.

assignment, where higher scores reflected lower levels of self-control. Descriptive statistics for the summed subcomponent measures of self-control as well as the overall measure of self-control are presented in Table 1, and CFA factor loadings are presented in Table 4.

Delinquency. Items from the Self-Report of Offending Scale (Huizinga, Esbenson, & Weiher, 1991) were used to examine the delinquent behavior among Saudi Arabian youth. Specifically, respondents were asked to report how often in the past 12 months they had engaged in a series of violent and nonviolent delinquent behaviors (i.e., "Hit or seriously threaten someone" and "Broke into a building or vehicle to steal or look inside"). Respondents were asked to report on a 4-point scale ranging from 0 (*never*) to 3 (*more than twice*). Inspection of the data revealed that many of the self-report measures were positively skewed with less than 5% of the sample endorsing specific delinquent behaviors. As such, items were transformed into dichotomous variables where 0 = *no* and 1 = *yes*, and items that were endorsed by less than 5% of the sample were excluded because of their

Table 4. Factor Loadings for Self-Control.

Scale Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Self-Centered Component					
I try to look out for myself first, even if it means making things difficult for other people	**.57**	.19	.21	.26	.21
I'm not very sympathetic to other people when they are having problems	**.73**	.21	.08	.07	.01
If things I do upset people, it's their problem, not mine	**.67**	.17	.14	.12	.13
I will try to get things I want even when I know it's causing problems for other people	**.79**	.24	.14	.12	.13
Often, when I'm angry at people I feel more like hurting them than talking to them about why I am angry	**.69**	.25	.14	.22	.18
Impulsivity/risk-taking component					
I often act on the spur of the moment	.21	**.51**	.34	.21	.40
I don't devote much thought and effort to preparing for the future	.34	**.52**	.38	.15	.01
I like to test myself every now and then by doing something a little risky	.20	**.44**	.29	.18	.12
Sometimes I will take a risk just for the fun of it	.09	**.48**	.35	.40	.10
I sometimes find it exciting to do things for which I might get in trouble	.29	**.75**	.21	.06	.09
Excitement and adventure are more important to me than security	.31	**.73**	.19	.06	.07
If I had a choice, I would almost always rather do something physical than something mental	.14	**.48**	.40	.34	.03
Impulsivity/simple tasks component					
I'm more concerned with what happens to me in the short run than in the long run	.27	.39	**.56**	.11	.13
I frequently try to avoid things that I know will be difficult	.25	.26	**.61**	.24	.03
When things get complicated, I tend to quit or withdraw	.26	.36	**.52**	.12	.17
The things in life that are easiest to do bring me the most pleasure	.07	.20	**.59**	.41	.09
I dislike really hard tasks that stretch my abilities to the limit	.21	.29	**.60**	.16	.22
Physical activities component					
I almost always feel better when I am on the move than when I am sitting	.14	.07	.21	**.70**	.13
I like to get out and do things more than I like to read or contemplate ideas	.22	.12	.19	**.67**	.22
I seem to have more energy and a greater need for activity than most other people my age	.32	.14	.19	**.65**	.09
Temper component					
I lose my temper pretty easily	.35	.20	.14	.40	**.54**
When I am really angry, other people better stay away from me	.37	.15	.14	.39	**.55**
When I have serious disagreement with someone, it's usually hard from me to talk about it without getting upset	.38	.05	.20	.46	**.53**
Loadings on second-order factor	.81	.85	.87	.81	.84

Note. Bolded estimates indicate strongest factor loading.

potential negative effects on the employed analytic models (described in more detail below; Vaughn et al., 2011). Ultimately, the delinquent behaviors that were used as outcomes in the present study were skipping school (36.87%), running away from home (12.63%), damaging someone else's property (13.86%), getting into a fight at school (26.36%), taking something without paying for it (12.30%), hitting or seriously threatening someone (17.23%), attacking someone with the intention to hurt them (12.68%), taking a vehicle without permission of the owner (8.62%), knowingly holding or selling stolen goods (8.03%), and hurting someone bad enough to need a doctor (12.70%). Items that were excluded were using physical force to get money from someone (3.21%) and breaking into a building or vehicle to steal or look inside (3.76%). Although speculative, some potential reasons why many respondents did not endorse these two behaviors could be because both involve a clear violation of Islamic law that may be easily detected in public and punished by either state or Mutaween authorities. Additional analyses suggested that missing data for delinquency occurred at random and did not result in a biased analytic sample. Descriptive statistics for the self-reported delinquency items are presented in Table 1.

Control variables. Respondents were asked to provide information on a range of demographic information in the self-report survey. As such, the following demographic control variables were included in all models as controls: gender (0 = *female*, 1 = *male*), age (M = 16.78 years), and nationality (0 = *non-Saudi Arabian*, 1 = *Saudi Arabian*). The sample included 111 female respondents (34.25% of the sample) and 213 male respondents (65.74% of the sample), with the majority of respondents reporting that they were Saudi nationals (97.34% of the sample).

Plan of Analysis

Latent class analysis **(**LCA) and binary logistic regression analyses were employed in a series of linked steps. First, LCA was used to identify and validate latent subgroups. LCA is a statistical procedure designed to assign individual cases to their most likely latent subgroup based on observed data and probability estimation (McLachlan & Peel, 2000). LCA was conducted using the statistical software program Mplus Version 7.11 (Muthén & Muthén, 1998–2011) using full information maximum likelihood estimation. Model fit and suitability of solutions were assessed using four statistical model fit criteria: sample size–adjusted BIC (adjusted BIC), where the lowest adjusted BIC is the preferred solution; Lo–Mendell–Rubin tests, which test statistically significant differences in model fit between the $k - 1$ class and the k class where a significant change indicates a better fitting model for the inclusion of more classes (Lo, Mendell, & Rubin, 2001); a bootstrap likelihood ratio test (BLRT), which uses bootstrap samples to estimate the distribution of the log-likelihood statistics and provides a p value that can also be used to determine the improvement in model fit between $k - 1$ and k class models (Nylund, Asparouhov, & Muthén, 2007); and entropy values, which provide information on the average probability of class membership where values closer to 1.00 indicate a clearer discrimination between estimated classes (Celeux & Soromenho, 1996). Once the best fitting latent class model was selected, posterior probabilities were used to assign individuals to their respected classes where higher probabilities indicated a higher probability of belonging to a certain latent class. Previous research has also suggested that model parsimony, interpretability, and underlying theoretical logic should be used in final model selection.

Second, after identifying latent classes and assigning respondents to antisocial subgroups based on probability estimation, binary logistic regression was used to predict a dichotomous indicator of delinquent behavior (0 = *did not commit a delinquent act in the past 12 months*, 1 = *committed a delinquent act in the past 12 months*) across each of the latent subgroups. Given that delinquency items were the outcome, logistic regression was used to examine the association between validated subgroup membership for antisocial behavior and delinquency. Using logistic regression, odds ratios

Table 5. Model Fit Statistics and Entropy for Different Latent Class Solutions.

		Lo–Mendell–Rubin Test			
Class Solution	Adjusted BIC	Value	*p* Value	BLRT	Entropy
One class	13,001.20	NA	NA	NA	NA
Two class	12,779.37	2,241.05	0	0	.82
Three class	12,753.00	861.66	.032	.019	.87
Four class	12,873.05	992.41	.075	.061	.84
Five class	12,882.13	2,563.29	.180	.152	.72

Note. BIC = Bayesian information criterion; BLRT = bootstrap likelihood ratio test; NA = not applicable.

(*OR*s) and 95% confidence intervals were estimated. The resulting *OR*s can be interpreted as the likelihood of engaging in a delinquent act when belonging to one subgroup of antisocial behavior compared to other validated subgroups. In order to assess significant differences in delinquency across validated subgroups, subgroup membership was coded categorically.

Results

Table 5 presents the model fit indices for each class model. As can be seen, the statistical criteria suggested that a three-class solution provided the best modeling of the data. Specifically, the fit indices revealed that the three-class solution was more parsimonious (adjusted Bayesian information criteria = 12,753.00), an improvement over the two-class model (Lo–Mendell–Rubin value = 861.66, $p = .010$; BLRT, $p = .019$), and offered a clear delineation between latent classes (entropy = .87). Moreover, the conceptual fit of the latent class models was examined by plotting the mean posterior probability values of the three indicator latent constructs (i.e., aggression, psychopathy, self-control) across each of the latent classes. As illustrated in Figure 1, the three-class solution provided a clear and coherent modeling of the data, providing further support for favoring the three-class model. The three-class solution was composed of the following latent classes: Class 1: Low Aggression (AGGR)/Low Psychopathy (PSYC)/High Self-Control (SC), Class 2: Mid AGGR/Mid PSYC/High SC, and Class 3: High AGGR/High PSYCH/Low SC. Low AGGR/Low PSYCH/High SC, which is the largest subgroup identified (53.39% of the sample), is characterized by high levels of self-control in combination with low levels of aggression and psychopathy. The Mid AGGR/Mid PSYC/High SC subgroup is slightly different, as it is characterized by generally high levels of self-control in combination with middle levels of aggression and psychopathy. Lastly, the lowest levels of self-control observed in the sample as well as high levels of aggression and psychopathy characterize the High AGGR/High PSYCH/Low SC subgroup.

Table 6 presents the binary logistic regression results where group assignment was used to predict involvement in different types of delinquent behavior. As is shown, self-reported delinquency items involving physical violence were the most consistent delinquent behaviors associated with membership in the High AGGR/High PSYCH/Low SC subgroup. Specifically, compared to other subgroups, members of the Low SC/High PSYCH/High AGGR subgroup were more likely to have damaged someone else's property, gotten into a fight at school, hit or seriously threaten someone, attacked someone with the intent to seriously hurt them, and hurt someone bad enough that they needed medical attention. In contrast to the delinquent items most strongly associated with the High AGGR/High PSYCH/Low SC subgroup, delinquent behaviors that were more closely linked to membership in the Mid AGGR/Mid PSYC/High SC subgroup included skipping school, running away from home, taking a vehicle without permission of the owner, taking something without paying for it, and knowingly holding or selling stolen goods. Results from the binary logistic

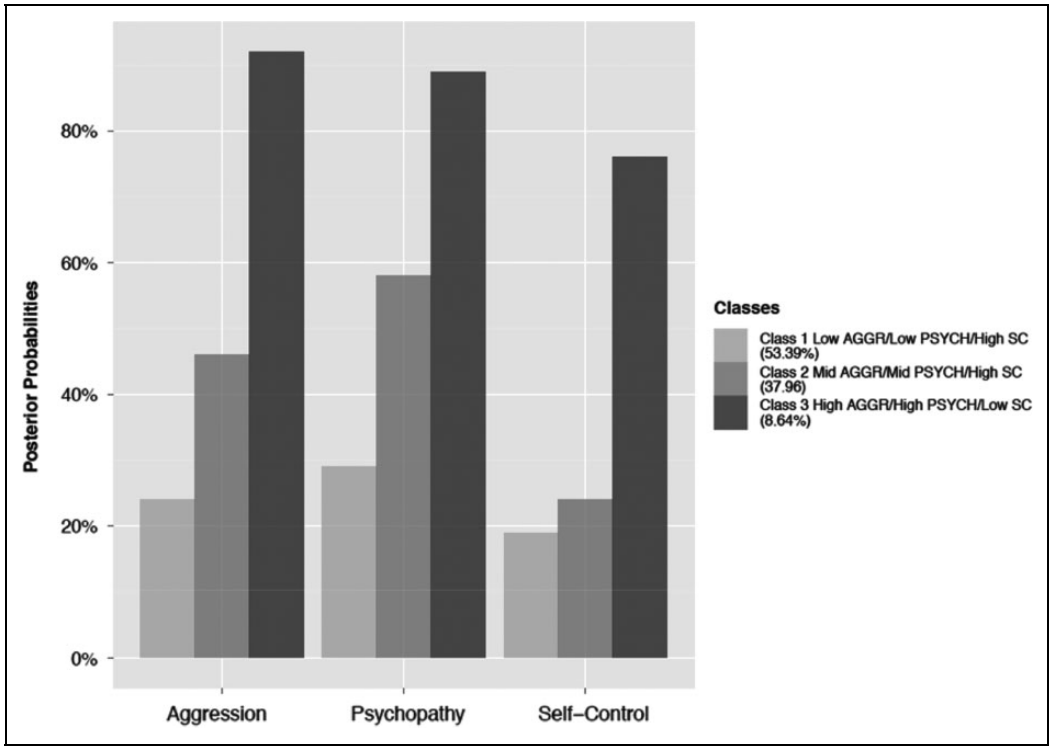

Figure 1. Posterior probabilities for latent classes of aggression, psychopathy, and self-control.

regression models also revealed that members of Low AGGR/Low PSYC/High SC subgroup were more likely to have taken something without paying for it in the past 12 months. However, the *OR* for this association ($OR = 1.03$, $p < .05$) was much smaller than the *OR*s for the High AGGR/High PSYCH/Low SC and Mid AGGR/Mid PSYC/High SC groups.

Based on the results from the binary logistic regression results, members of the Low AGGR/Low PSYC/High SC subgroup did not demonstrate a higher risk for delinquent behavior compared to other subgroup members. As such, the results show relatively strong associations between members of the High AGGR/High PSYCH/Low SC subgroup and violent delinquent behavior, while non-violent property delinquent behaviors were more likely to be reported by members of the Mid AGGR/Mid PSYC/High SC subgroup.[1] Importantly, and as will be discussed in the next section, these associations align with other research that has used LCA and regression-based approaches to examine the co-occurrence of antisocial behavior and juvenile delinquency among youth from other countries.

Supplemental Analysis

In order to further investigate the associations between antisocial subgroup membership and delinquent behaviors, supplemental analyses were conducted to examine whether and to what extent any of the associations were moderated by demographic characteristics. To investigate this possibility, interaction terms were created between subgroup membership and demographic variables to assess whether *OR*s were moderated by age, gender, or nationality. While no significant interaction effects

Table 6. Binary Logistic Regression Models Predicting Odds of Delinquent Involvement Based on Group Membership.

	Low AGGR/Low PSYCH/High SC (n = 173; 53.39% of the sample)			M id AGGR/Mid PSYCH/High SC (n = 123; 37.96% of the sample)			High AGGR/High PSYCH/Low SC (n = 28; 8.64% of the sample)		
Delinquent Behaviors	*OR*	*SE*	95% CI	*OR*	*SE*	95% CI	*OR*	*SE*	95% CI
Self-reported delinquency									
Skipped school	1.01	.09	[0.97, 1.12]	2.96*	.01	[2.78, 3.15]	2.34*	.01	[2.25, 2.54]
Run away from home	1.02	.08	[0.98, 1.13]	2.45*	.02	[2.31, 2.61]	2.21*	.01	[2.12, 2.32]
Damaged other's property	1.01	.02	[0.96, 1.04]	1.13*	.02	[1.05, 1.23]	3.45*	.01	[3.32, 3.61]
Gotten into fight	1.00	.01	[0.96, 1.02]	1.01	.08	[0.97, 1.11]	5.14*	.01	[4.79, 5.52]
Taken something without paying	1.03*	.03	[1.01, 1.07]	3.32*	.01	[3.18, 3.52]	2.03*	.03	[1.97, 2.11]
Hit or seriously threaten someone	1.01	.01	[0.98, 1.04]	1.21*	.05	[1.13, 1.39]	3.54*	.01	[3.40, 3.62]
Attacked someone	1.00	.01	[0.96, 1.04]	1.13*	.06	[1.07, 1.26]	4.24*	.01	[4.17, 4.34]
Taken vehicle without permission	1.02	.03	[0.98, 1.08]	1.97*	.03	[1.84, 2.13]	2.51*	.01	[2.41, 2.65]
Held or sold stolen goods	1.00	.02	[0.97, 1.03]	2.92*	.01	[2.77, 3.09]	2.09*	.02	[1.99, 2.13]
Hurt someone bad enough	1.00	.01	[0.96, 1.03]	1.02	.05	[0.97, 1.09]	4.87*	.01	[4.72, 4.96]
Demographic covariates									
Male	1.09	.01	[0.99, 1.12]	1.59*	.01	[1.54, 1.65]	2.87*	.01	[2.78, 2.97]
Age	0.96*	.03	[0.96, .97]	0.98*	.03	[0.98, 0.98]	0.99*	.01	[0.98, .1.00]
Nationality	1.03	.01	[0.98, 1.05]	1.01	.01	[0.96, 1.06]	1.02	.01	[0.97, 1.08]

Note. *OR* = odds ratio; *SE* = standard error; CI = confidence intervals.
*$p < .05$.

were detected for the Low AGGR/Low PSYC/High SC or Mid AGGR/Mid PSYC/High SC in predicting different forms of delinquent behavior, gender significantly moderated the effect of group assignment in the High AGGR/High PSYCH/Low SC group on the odds of reporting having gotten into a fight at school in the past year (High AGGR/High PSYCH/Low SC × Gender $OR = 1.39$, 95% CI [1.08, 1.79]). Specifically, the probability of getting into a fight at school in the past year was stronger among male youth in the High AGGR/High PSYCH/Low SC subgroup compared to male youth in the Mid AGGR/Mid PSYC/High SC or Low AGGR/Low PSYC/High SC subgroup. Evidence from this segment of the supplemental analyses corresponds with evidence from a recent study examining the prevalence of delinquent behavior among high school students in Riyadh, Saudi Arabia, where males were 3 times more likely to engage in school fights compared to female students (AlMakadma & Ramisetty-Mikler, 2015). The supplemental results are not presented but are available upon request.

Discussion

Over the past two decades, a growing amount of interest has been focused on understanding the differences in subclass formation for antisocial behavior (Moffitt, 1993). Much of this interest has fueled the emergence of life-course/developmental theoretical perspectives within criminology and the introduction of methodological approaches designed to assess associations between the creation of different latent subclasses for antisocial behavior, conduct disorder, and delinquency at different stages of the life course. Contemporary research has shown that many behavioral risk factors for

delinquency such as aggression, psychopathic personality disorder, and low self-control are associated with different types of offending and different levels of delinquency (Piquero, 2008). While informative, the bulk of this evidence has been drawn from samples of youth growing up in Western industrialized countries such as Canada, England, Germany, and the United States. As a result, much is unknown about the co-occurrence of antisocial behaviors and delinquency among youth from different geographical regions with different cultural norms and ways of life. The present study focused on beginning to address this gap in the criminological literature by analyzing a sample of Saudi Arabian youth. Overall, our analyses revealed three important findings.

First, model fit indices for the LCA suggested that a three-class model fit the data best. The three-class model was characterized by three distinct subgroups. The largest subgroup, which consisted of 53.39% of the sample, was characterized by low levels of aggression, low levels of psychopathy, and high levels of self-control. Despite having the largest group membership, regression analyses indicated that only one nonviolent delinquent offense (taking something without paying for it) was modestly associated with group membership. Although surprising, this finding conforms to evidence from other studies analyzing samples of youth from other countries (Moffitt, 1993; Piquero, 2008). One possible reason for the low level of offending among these group members could be that youth in this group are better able to control their emotional impulses and exercise self-control. This ability may also impact or be closely associated with an individual's ability to control aggressive tendencies and be willing to resolve disputes in a nonaggressive manner. Along these lines, members of this group may conform to what Moffitt (1993) labels as abstainers who rarely engage in deviant behavior even when it is normative during adolescent development. Another reason for the low levels of offending and prosocial behavioral tendencies among this subgroup could also be accounted for by fear of punishment by religious or criminal justice authorities in Saudi Arabia. Criminal justice procedures in Saudi Arabia and cultural expectations for behavior are vastly different compared to Western societies such as the United States. At this time, however, these explanations are only speculative in nature and require additional research to elucidate the reason for these weak associations.

Second, 37.96% of the sample belonged to a subgroup that was characterized by overall middle levels of aggression, middle levels of psychopathy, and high levels of self-control. Members of this subgroup, compared to other subgroups, were more likely to report skipping school, running away from home, damaging other people's property, taking something without paying for it, taking a vehicle without permission, holding or selling stolen goods, and other types of aggressive behaviors. A general trend from these results was that stronger associations were observed between nonviolent delinquent behavior and group membership compared to other group memberships. As such, the results suggested that youth with higher levels of self-control and moderate levels of psychopathy might be more methodical in their delinquent offending. For instance, they may be more willing to deceive others in their delinquency so as to decrease their likelihood of detection (e.g., taking something without paying for it, holding or selling stolen goods). Members of this group may also demonstrate adolescent-limited offending patterns where adolescents engage in minor delinquent acts during adolescence and desist from engaging in this behavior, as they enter into adulthood (Moffitt, 1993). Future research should focus on further examining individual- and environmental-level factors present in Saudi Arabia that may be able to explore this association between youth who display a moderate degree of antisocial behavioral traits and nonviolent delinquency with greater detail.

Third, 8.64% of the sample were characterized as demonstrating high levels of aggression, high levels of psychopathy, and low levels of self-control, which constituted their own subclass of antisocial behavior. Members of this group were significantly more likely to report engaging in almost every type of delinquent behavior compared to the other two subgroups. Importantly, the strongest observed associations were between violent or physical forms of delinquent behavior and

group membership. Indeed, this makes conceptual sense, given that all group members reported higher levels of aggression, expressing of a lack of remorse for the welfare of others, and having low levels of self-control. Interestingly, this finding and group structure aligns with many other findings from research using LCA to assess group structure of antisocial behavioral development in the United States (Larson et al., 2015; Vaughn et al., 2011). Perhaps more importantly, the size of the group and the nature of offending among members align with arguments from Moffitt's developmental taxonomic theory (1993) which suggests that around 5–10% of the youth population commit serious delinquent acts during adolescence and violent crime during adulthood. Taken together, evidence from the current study suggests that Moffitt's developmental theory may be used to partially explain the underlying group structure in antisocial behavior among youth growing up in Saudi Arabia. Future research, however, using larger and more representative samples from Saudi Arabia will be better equipped to evaluate this possibility.

Limitations to the current study must be mentioned. First, while the results offer important insight and some of the first results on latent classes structure of antisocial behavior and the links between latent class membership and delinquency among youth from the Middle East, the data were only collected at one time which means that causal order could not be established. Second, findings from the current study are based on a relatively small convenience sample of Saudi Arabian youth from Jeddah, Saudi Arabia. Thus, findings from the current study may not be generalizable to the larger youth population currently living in Saudi Arabia, and additional subclasses of antisocial behavior may have been detected if the sample was a nationally representative sample of Saudi Arabian youth. Future research should aim to survey a nationally representative sample of youth, so more comprehensive comparative analyses can be conducted comparing results from Western industrialized populations and Middle Eastern populations. In a similar vein, future research should also develop psychometric measures that take into account the cultural and societal context of Saudi Arabia. The development of culturally sensitive measures will enable researchers to better evaluate whether or not there are significant differences in the factor structure of aggression, psychopathy, and low self-control among youth from different regions of the world. Third, many youth in the analytic sample came from different families which precluded any possibility of collecting useful genetic relatedness information from participants. As a result, the present study was not able to take into account unobservable confounders such as genetic influences. Given that previous research has found that aggression (DiLalla, 2002), psychopathy (Viding & Larsson, 2010), and self-control (Connolly & Beaver, 2014) are partially heritable, future research should focus on conducting genetically informed LCA to further understand the etiological origins of antisocial latent class membership among Saudi Arabian youth.

Conclusions

In conclusion, the present study provides some of the first empirical evidence on the structure of latent classes for antisocial behavior among youth growing up in a major city in Saudi Arabia. Evidence from the current study also provides important insight into the associations between latent class membership and violent and nonviolent delinquency. Moreover, model fit statistics from the current study indicated that a three-class model of antisocial behavior explained patterns of antisocial behavior the best, thus offering support for previous life-course/developmental perspectives which posit a similar number of antisocial subgroups. Taken together, the present study addresses an important gap in the literature and highlights the need for more comparative criminological research to assess the generalizability of theoretical perspectives focused on (1) explaining the development and number of subclasses for antisocial behavior and (2) assessing the cross-sectional and longitudinal associations between subclass membership and delinquency. Results from this future line of

research will help shed new light on universal patterns of behavior and offending among youth from diverse societal and cultural contexts.

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Note

1. Lanza, Tan, and Bray (2013) recently proposed a flexible model-based approach which suggests that including the distal outcome under examination as a covariate will provide less biased estimates between class membership, and the outcome since both class membership and effects of latent class variables on the distal outcome are simultaneously estimated. Supplemental LCA models were therefore estimated for each outcome in Mplus 7.11 using Lanza et al.'s (2013) flexible model-based approach. Results from these models were not substantively different from the results presented in Table 6. We would like to thank an anonymous reviewer for bringing this to our attention.

References

AlMakadma, A. S., & Ramisetty-Mikler, S. (2015). Student, school, parent connectedness, and school risk behaviors of adolescents in Saudi Arabia. *International Journal of Pediatrics and Adolescent Medicine*, *2*, 128–135.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric.

Arneklev, B. J., Grasmick, H. G., & Bursik, R. J. Jr. (1999). Evaluating the dimensionality and invariance of "low self-control." *Journal of Quantitative Criminology*, *15*, 307–331.

Barnes, J. C., Boutwell, B. B., Morris, R. G., & Armstrong, T. A. (2012). Explaining differential patterns of self-reported delinquency evidence from a latent class analysis of sibling pairs. *Journal of Contemporary Criminal Justice*, *28*, 254–272.

Barry, C. T., Frick, P. J., DeShazo, T. M., McCoy, M., Ellis, M., & Loney, B. R. (2000). The importance of callous–unemotional traits for extending the concept of psychopathy to children. *Journal of Abnormal Psychology*, *109*, 335–340.

Beaver, K. M., Al-Ghamdi, M. S., Kobeisy, A. N., Alqurashi, F. H., Connolly, E. J., & Schwartz, J. A. (2015a). The association between psychopathic personality traits and victimization and exposure to violence in a sample of Saudi Arabian youth. *Psychiatric Quarterly*, 1–12. doi:10.1007/s11126-015-9383-1

Beaver, K. M., Al-Ghamdi, M. S., Kobeisy, A. N., Alqurashi, F. H., Schwartz, J. A., Connolly, E. J., & Gajos, J. M. (2015b). The effects of low self-control and delinquent peers on alcohol, tobacco, and drug use in a sample of Saudi Arabian youth. *International Journal of Offender Therapy and Comparative Criminology*. doi:0306624X15583670

Brame, B., Nagin, D. S., & Tremblay, R. E. (2001). Developmental trajectories of physical aggression from school entry to late adolescence. *Journal of Child Psychology and Psychiatry*, *42*, 503–512.

Brinkley, C. A., Schmitt, W. A., Smith, S. S., & Newman, J. P. (2001). Construct validation of a self-report psychopathy scale: does Levenson's self-report psychopathy scale measure the same constructs as Hare's Psychopathy Checklist-Revised? *Personality and Individual Differences*, *31*, 1021–1038.

Broidy, L. M., Nagin, D. S., Tremblay, R. E., Bates, J. E., Brame, B., Dodge, K. A., . . . Vitaro, F. (2003). Developmental trajectories of childhood disruptive behaviors and adolescent delinquency: A six-site, cross-national study. *Developmental Psychology*, *39*, 222–245.

Bryant, F. B., & Smith, B. D. (2001). Refining the architecture of aggression: A measurement model for the Buss–Perry Aggression Questionnaire. *Journal of Research in Personality*, *35*, 138–167.

Buss, A. H. (1961). *The psychology of aggression*. Hoboken, NJ: John Wiley.

Buss, A. H., & Perry, M. (1992). The aggression questionnaire. *Journal of Personality and Social Psychology*, *63*, 452–459.

Buss, A. H., & Warren, W. L. (2000). *Aggression questionnaire:(AQ). Manual*. Torrance, CA: Western Psychological Services.

Celeux, G., & Soromenho, G. (1996). An entropy criterion for assessing the number of clusters in a mixture model. *Journal of Classification*, *13*, 195–212.

Chui, W. H., & Chan, H. C. O. (2013). Association between self-control and school bullying behaviors among Macanese adolescents. *Child Abuse & Neglect*, *37*, 237–242.

Connell, C. M., Cook, E. C., Aklin, W. M., Vanderploeg, J. J., & Brex, R. A. (2011). Risk and protective factors associated with patterns of antisocial behavior among nonmetropolitan adolescents. *Aggressive Behavior*, *37*, 98–106.

Connolly, E. J., & Beaver, K. M. (2014). Examining the genetic and environmental influences on self-control and delinquency results from a genetically informative analysis of sibling pairs. *Journal of Interpersonal Violence*, *29*, 707–735.

Côté, S., Tremblay, R. E., Nagin, D. S., Zoccolillo, M., & Vitaro, F. (2002). Childhood behavioral profiles leading to adolescent conduct disorder: Risk trajectories for boys and girls. *Journal of the American Academy of Child & Adolescent Psychiatry*, *41*, 1086–1094.

DeLisi, M. (2009). Psychopathy is the unified theory of crime. *Youth Violence and Juvenile Justice*, *7*, 256–273.

DeLisi, M., & Vaughn, M. G. (2012). Still psychopathic after all these years. *Violent offenders: Theory, research, policy, and practice*, 95–108.

DeLisi, M., Vaughn, M., Beaver, K. M., Wexler, J., Barth, A. E., & Fletcher, J. M. (2010). Fledgling psychopathy in the classroom: ADHD subtypes, psychopathy, and reading comprehension in a community sample of adolescents. *Youth Violence and Juvenile Justice*, *9*, 43–58.

DeWall, C. N., Finkel, E. J., & Denson, T. F. (2011). Self-control inhibits aggression. *Social and Personality Psychology Compass*, *5*, 458–472.

DiLalla, L. F. (2002). Behavior genetics of aggression in children: Review and future directions. *Developmental Review*, *22*, 593–622.

Duckworth, A. L., Gendler, T. S., & Gross, J. J. (2014). Self-control in school-age children. *Educational Psychologist*, *49*, 199–217.

Farrington, D. P. (2003). Developmental and life-course criminology: Key theoretical and empirical issues-the 2002 Sutherland award address. *Criminology*, *41*, 221–256.

Farrington, D. P. (2005). The importance of child and adolescent psychopathy. *Journal of Abnormal Child Psychology*, *33*, 489–497.

Fergusson, D. M., Horwood, L. J., & Lynskey, M. T. (1994). The comorbidities of adolescent problem behaviors: A latent class model. *Journal of Abnormal Child Psychology*, *22*, 339–354.

Frick, P. J., Cornell, A. H., Barry, C. T., Bodin, S. D., & Dane, H. E. (2003). Callous-unemotional traits and conduct problems in the prediction of conduct problem severity, aggression, and self-report of delinquency. *Journal of Abnormal Child Psychology*, *31*, 457–470.

Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.

Grasmick, H. G., Tittle, C. R., Bursik, R. J., & Arneklev, B. J. (1993). Testing the core empirical implications of Gottfredson and Hirschi's general theory of crime. *Journal of Research in Crime and Delinquency*, *30*, 5–29.

Gretton, H. M., Hare, R. D., & Catchpole, R. E. (2004). Psychopathy and offending from adolescence to adulthood: A 10-year follow-up. *Journal of Consulting and Clinical Psychology*, *72*, 636–645.

Hasking, P. A., Scheier, L. M., & Abdallah, A. B. (2011). The three latent classes of adolescent delinquency and the risk factors for membership in each class. *Aggressive Behavior*, *37*, 19–35.

Huizinga, D., Esbensen, F. A., & Weiher, A. W. (1991). Are there multiple paths to delinquency? *Journal of Criminal Law and Criminology*, *82*, 83–118.

Hyde, L. W., Burt, S. A., Shaw, D. S., Donnellan, M. B., & Forbes, E. E. (2015). Early starting, aggressive, and/or callous–unemotional? Examining the overlap and predictive utility of antisocial behavior subtypes. *Journal of Abnormal Psychology*, *124*, 329–342.

Jennings, W. G., & Reingle, J. M. (2012). On the number and shape of developmental/life-course violence, aggression, and delinquency trajectories: A state-of-the-art review. *Journal of Criminal Justice*, *40*, 472–489.

Lacourse, E., Baillargeon, R., Dupéré, V., Vitaro, F., Romano, E., & Tremblay, R. (2010). Two-year predictive validity of conduct disorder subtypes in early adolescence: A latent class analysis of a Canadian longitudinal sample. *Journal of Child Psychology and Psychiatry*, *51*, 1386–1394.

Lanza, S. T., Tan, X., & Bray, B. C. (2013). Latent class analysis with distal outcomes: A flexible model-based approach. *Structural Equation Modeling*, *20*, 1–26.

Larson, M., Vaughn, M. G., Salas-Wright, C. P., & Delisi, M. (2015). Narcissism, low self-control, and violence among a nationally representative sample. *Criminal Justice and Behavior*, *42*, 644–661.

Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology*, *68*, 151–158.

Li, J. J., & Lee, S. S. (2010). Latent class analysis of antisocial behavior: Interaction of serotonin transporter genotype and maltreatment. *Journal of Abnormal Child Psychology*, *38*, 789–801.

Lo, Y., Mendell, N. R., & Rubin, D. B. (2001). Testing the number of components in a normal mixture. *Biometrika*, *88*, 767–778.

Maughan, B., Pickles, A., Rowe, R., Costello, E. J., & Angold, A. (2000). Developmental trajectories of aggressive and non-aggressive conduct problems. *Journal of Quantitative Criminology*, *16*, 199–221.

McLachlan, G. J., & Peel, D. (2000). *Finite mixture models*. New York: Wiley.

Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, *100*, 674–701.

Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., … Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences*, *108*, 2693–2698.

Mokros, A., Hare, R. D., Neumann, C. S., Santtila, P., Habermeyer, E., & Nitschke, J. (2015). Variants of psychopathy in adult male offenders: A latent profile analysis. *Journal of Abnormal Psychology*, *124*, 372–386.

Muthén, L. K., & Muthén, B. O. (1998–2012). *Mplus user's guide*. Los Angeles, CA: Author.

Nagin, D. S., Farrington, D. P., & Moffitt, T. E. (1995). Life-course trajectories of different types of offenders. *Criminology*, *33*, 111–140.

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, *14*, 535–569.

Piquero, A. R. (2008). Taking stock of developmental trajectories of criminal activity over the life course. In A. M. Liberman (Ed.), *The long view of crime: A synthesis of longitudinal research* (pp. 23–78). New York: Springer New York.

Pratt, T. C., & Cullen, F. T. (2000). Empirical status of Gottfredson and Hirschi's general theory of crime: A meta-analysis. *Criminology*, *38*, 931–964.

Ray, J. V., Thornton, L. C., Frick, P. J., Steinberg, L., & Cauffman, E. (2015). Impulse control and callous-unemotional traits distinguish patterns of delinquency and substance use in justice involved adolescents: Examining the moderating role of neighborhood context. *Journal of Abnormal Child Psychology*, 1–13. doi:10.1007/s10802-015-0057-0

Rebellon, C. J., Straus, M. A., & Medeiros, R. (2008). Self-control in global perspective an empirical assessment of Gottfredson and Hirschi's general theory within and across 32 national settings. *European Journal of Criminology*, *5*, 331–361.

Sacarellos, C. D., Wright, J. P., Almosaed, N. F., Maghrabi, S. S., Bashatah, F. S., & Morgan, M. A. (2015). Crime in the kingdom: The effects of low self-control in a Saudi Arabian Sample of Youth. *Youth Violence and Juvenile Justice*. doi:10.1177/1541204015616663

Sampson, R. J., & Laub, J. H. (1995). *Crime in the making: Pathways and turning points through life*. Cambridge, MA: Harvard University Press.

Sellbom, M. (2011). Elaborating on the construct validity of the Levenson Self-Report Psychopathy Scale in incarcerated and non-incarcerated samples. *Law and Human Behavior*, *35*, 440–451.

Shah, S. J. (2010). Re-thinking educational leadership: Exploring the impact of cultural and belief systems. *International Journal of Leadership in Education*, *13*, 27–44.

Shaw, D. S., Lacourse, E., & Nagin, D. S. (2005). Developmental trajectories of conduct problems and hyperactivity from ages 2 to 10. *Journal of Child Psychology and Psychiatry*, *46*, 931–942.

Souryal, S. S. (1987). The religionization of a society: The continuing application of Shariah law in Saudi Arabia. *Journal for the Scientific Study of Religion*, *26*, 429–449.

Souryal, S. S. (1988). The role of Shariah law in deterring criminality in Saudi-Arabia. *International Journal of Comparative and Applied Criminal Justice*, *12*, 1–25.

Tremblay, R. E. (2000). The development of aggressive behaviour during childhood: What have we learned in the past century? *International Journal of Behavioral Development*, *24*, 129–141.

Wiesner, M., & Silbereisen, R. K. (2003). Trajectories of delinquent behaviour in adolescence and their covariates: Relations with initial and time-averaged factors. *Journal of Adolescence*, *26*, 753–771.

Vaughn, M. G., & DeLisi, M. (2008). Were Wolfgang's chronic offenders psychopaths? On the convergent validity between psychopathy and career criminality. *Journal of Criminal Justice*, *36*, 33–42.

Vaughn, M. G., DeLisi, M., Gunter, T., Fu, Q., Beaver, K. M., Perron, B. E., & Howard, M. O. (2011). The severe 5%: A latent class analysis of the externalizing behavior spectrum in the United States. *Journal of Criminal Justice*, *39*, 75–80.

Viding, E., & Larsson, H. (2010). Genetics of child and adolescent psychopathy. *Handbook of Child and Adolescent Psychopathy*, *1*, 113–134.

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