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Parenting Risk and Protective Factors in the Development of Conduct Problems in Seven Countries

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Abstract

This study advances the understanding of risk and protective factors in trajectories of conduct problems in adolescence in seven countries that differ widely on a number of sociodemographic factors as well as norms related to adolescent behavior. Youth- and parent-report data from 988 adolescents in seven countries (Colombia, Italy, Kenya, Philippines, Sweden, Thailand, and the USA) who were followed longitudinally from ages 10 to 18 (yielding 6872 total data points) were subject to latent class growth analysis. A 4-class model provided the best fit to the data: *Late Starters*, *Alcohol Experimenters*, *Mid-Adolescent Starters*, and *Pervasive Risk Takers*. The probability of membership in each class differed by country in ways that were generally consistent with country-specific norms and expectations regarding adolescent behavior. Positive parenting was associated with a lower likelihood of adolescents' membership in the *Pervasive Risk Takers* class, whereas psychological control, monitoring/behavioral control, and autonomy granting were associated with a higher likelihood of membership in the *Pervasive Risk Takers* class. Associations between parenting and membership in the other classes suggest that some risk taking during adolescence is normative even when parenting is positive.

Keywords Conduct problems · Culture · Development · Parenting · Risky behavior

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Violence, alcohol and drug use, tobacco use, sexually transmitted infections, and early pregnancy are major health risks for adolescents worldwide (World Health Organization, 2023). Countries vary widely in the prevalence of these different behaviors and health outcomes (World Health Organization, 2023), and adolescents within countries also vary widely in engaging in these behaviors (Graham & Kahn, 2019). Parenting can be a risk or protective factor related to adolescents' conduct problems (Pinquart, 2017). Dr. Robert McMahon, former Editor of *Prevention Science*, was pioneering in his proactive approaches to reducing risk for violence among children and adolescents, including by providing evidence-based parenting support (e.g., McMahon & Forehand, 2003). The present study advances the understanding of trajectories of conduct problems in adolescence in seven countries as well as parenting risk and protective factors in the development of conduct problems, building on Dr. McMahon's legacy of rigorous research on risk and protective factors, particularly parenting, associated with the development of conduct problems.

Trajectories of Conduct Problems in Adolescence

It is well established that adolescence is a developmental period characterized by more risky behavior than childhood or adulthood (Steinberg et al., 2018). One classic theoretical framework distinguishes "early starters," who begin engaging in conduct problems in childhood, from "late starters," whose conduct problems do not start until adolescence (Patterson, 1982). Another classic theory distinguishes "adolescence-limited" from "life-course-persistent" conduct problems and attributes adolescence-limited conduct problems to a maturity gap between a growing desire to engage in adult-like behaviors (like smoking, drinking, and sexual activity) and sanctions against those behaviors for adolescents (Moffitt, 1993).

Prior studies of developmental trajectories of conduct problems in adolescence have typically focused on one type of conduct problem at a time, such as substance use (Chen & Jacobson, 2012) or conduct disorder (Bevilacqua et al., 2018). In addition, the large majority of those studies have been conducted in high-income, western countries (e.g., Bevilacqua et al., 2018). A review and meta-analysis of three different trajectories of conduct problems (early onset persistent, adolescent-onset, and childhood-limited) found the most problematic adult outcomes were associated with the early onset persistent trajectory followed by the adolescent-onset trajectory (Bevilacqua et al., 2018). The present study fills a gap by focusing on trajectories of clusters of different types of conduct problems during adolescence in a range of under-studied cultural contexts.

The Role of Culture in Adolescents' Conduct Problems

Despite similarities across cultures in the increasing propensity for adolescents to engage in risky behaviors (Steinberg et al., 2018), cultural groups differ in how risky or unacceptable particular behaviors are deemed to be. For example, sex outside of marriage might present a health risk in all countries but is considered not just risky but also immoral by many in Jordan and the Philippines (e.g., De Jose, 2013). Therefore, risky sexual behavior would be a marker of rejection of mainstream values and a brighter red flag for future developmental problems in these countries than in Sweden, where sex outside of marriage is common and accepted (Borneskog et al., 2021). In the present study, we investigate trajectories of a range of different adolescent behaviors that may or may not be considered normative or problematic in a particular cultural group. We also examine whether membership in different trajectory classes differs by cultural group to advance understanding of culture-common versus culture-specific ways that development unfolds over time.

In examining these questions, we capitalize on longitudinal data from a study of children and their mothers and fathers from seven countries (Colombia, Italy, Kenya, the Philippines, Sweden, Thailand, and the USA). These countries represent cultural contexts that vary widely with respect to norms about the acceptability of different behaviors and opportunities for engaging in risky behaviors. Although more variance in aggression and delinquency is accounted for by within-country than between-country factors, the countries in the present study differ in opportunities and peer support for aggression and delinquency (Lansford et al., 2020). These countries also vary in "looseness" and "tightness" in terms of how much tolerance there is for deviation from cultural norms (Gelfand et al., 2011; e.g., tightness scores = 5.1 and 6.8 in the USA and Italy, respectively). Consistent with the idea that different countries have different norms about the acceptability of particular behaviors during adolescence, we note that, although the larger longitudinal project in which our study is situated included Jordan, the Institutional Review Board at the collaborating university in Jordan did not allow the inclusion of questions about substance use or sexual activity for ethical reasons related to Muslim prohibitions on the use of intoxicants (Haddad et al., 2010) and morality related to premarital sexual activity (Saharso et al., 2023). Thus, Jordan is not included in the present analyses yet highlights the point that cultural differences exist in which behaviors are considered problematic and that cultural differences in trajectories of conduct problems are likely.

Parenting as a Protective or Risk Factor for Adolescents' Conduct Problems

Parenting encompasses many dimensions that can serve as risk or protective factors for adolescents' conduct problems. For example, meta-analyses have established that parental rejection (in contrast to warmth; Khaleque & Ali, 2017), psychological control (Yan et al., 2020), and physical punishment (Gershoff & Grogan-Kaylor, 2016) are risk factors for conduct problems across cultures. In contrast, positive parenting characterized by warmth protects against the development of conduct problems (Pinquart, 2017).

A constellation of parenting behaviors including knowledge solicitation (asking children for information about their lives), rule setting, autonomy granting, and behavioral control is involved in monitoring children's activities and setting guardrails that are meant to prevent engagement in conduct problems. These monitoring-related behaviors may be most protective for children at highest risk of conduct problems (Yang et al., 2024). However, these aspects of parenting are variable across cultures (Lansford et al., 2021). In addition, associations between these behaviors and children's conduct problems differ across cultures (Ng & Wang, 2019).

The Present Study

We address three research questions in the present study. First, what patterns of conduct problems emerge from early to late adolescence? Consistent with prior research in high-income countries (as reviewed by Bevilacqua et al., 2018), we hypothesized that distinct trajectory classes would emerge in our more diverse sample from low- and middle-income as well as high-income countries. Second, are there country differences in adolescents' membership in trajectory classes of conduct problems? Based on previous research suggesting that particular behaviors are perceived as being more problematic in some countries than others (Borneskog et al., 2021; De Jose, 2013) and that cultural norms affect engagement in particular behaviors (e.g., Gelfand et al., 2011), we hypothesized country differences in trajectory class membership that would reflect norms within each country. Third, does parenting in childhood predict membership in different trajectory classes of conduct problems from early to late adolescence? We hypothesized that positive parenting would protect against membership in trajectory classes characterized by more conduct problems and that negative parenting and psychological control would increase the likelihood of membership in trajectory classes characterized by more conduct problems. We did not have specific directional hypotheses about parental monitoring/behavioral control or autonomy granting, as these aspects of parenting may have protective effects but may also be implemented or withheld when parents are concerned that their children already engage in conduct problems. Although we consider parenting as a predictor of child conduct problems, we acknowledge that all of the parenting behaviors we investigated also could have been in response to prior child conduct problems.

Method

Participants

Participants included 1101 children ($M = 8.29$ years, $SD = 0.66$, range = 7 to 10 years; 51% girls), their mothers ($n = 1041$), and their fathers ($n = 798$) recruited in 2008 through letters sent to multiple schools per country in seven countries as part of the larger Parenting Across Cultures project. Families were drawn from Medellín, Colombia ($n = 108$); Naples, Italy ($n = 102$); Rome, Italy ($n = 111$); Kisumu, Kenya ($n = 100$); Manila, Philippines ($n = 120$); Trollhättan/Vänersborg, Sweden ($n = 129$); Chiang Mai, Thailand ($n = 120$); and Durham, NC, USA ($n = 111$ white, $n = 103$ Black, $n = 97$ Latino). These countries were selected because they vary across a number of important dimensions. For example, the countries rank from 8 to 147 out of 189 countries on the United Nations' Human Development Index, a composite reflecting countries' life expectancy, education, and gross national income per capita.

Most parents (82%) were married, and nonresidential parents were able to provide data. Nearly all were biological parents, with 3% being grandparents, stepparents, or other adult caregivers. To maximize representativeness, sampling focused on including families from the majority ethnic group in each country; the exception was in Kenya where we sampled Luo (3rd largest ethnic group, 13% of population), and in the USA, where we sampled white, Black, and Latino families. Participants were drawn from two cities in Italy that have distinct social class, educational, and occupational characteristics, as well as differences in the prevalence of organized crime. To ensure economic diversity, we included students from private and public schools and from high- to low-income families, sampled in proportions representative of each recruitment area. Child age and gender did not vary across countries.

Data for the present study were drawn from surveys at wave 3 (mean age 10) and waves 5–11 (mean ages 12–18) of the larger study. Given the methods used for this study,

eligibility for inclusion was restricted to families for whom at least one parent or child completed at least one survey item capturing the conduct problems assessed in waves 5–11. Using this eligibility criterion, a total of 988 families were included (90% of the original sample). Participants who provided follow-up data did not differ from the original sample with respect to child gender or parental education, but did differ by country. Attrition rates were somewhat higher in Colombia (18%), the Philippines (16%), and Thailand (16%) than in the other countries. Of the 988 families included in the analyses, 93% of families provided at least some information about parenting at wave 3/age 10.

Procedure and Measures

Measures were administered in Spanish (Colombia and USA), Italian (Italy), Dholuo (Kenya), Filipino (the Philippines), English (the Philippines and USA), Swedish (Sweden), and Thai (Thailand) following forward- and back-translation and methodological validation to ensure the conceptual equivalence of the instruments (Erkut, 2010). The measures used in the present study have established reliability, convergent and discriminant validity, and measurement invariance and have been used successfully with families in all seven participating countries by our own and other research teams (e.g., Lansford et al., 2018; Rohner, 2005). In early waves of data collection, measures were administered in person in families' homes or at other locations chosen by participants. In later waves, measures were increasingly administered online. Parent consent and child assent were obtained prior to data collection at each wave. Participants received modest financial payment or other compensation as approved by ethics boards in each participating country.

Parenting Behaviors at Age 10

At age 10, parents and children report about five domains of parenting: positive parenting, negative parenting (including physical punishment, aggression, rejection, and neglect), psychological control, parental monitoring and behavioral control, and parental autonomy granting. Conceptually, these five domains encompass both the emotional climate of the parent–child relationship and specific parenting behaviors that have been theorized to be important predictors of youth outcomes.

Positive parenting was measured using 4 parent-reported scales (2 scales for each parent). The first captures how often each parent spent time talking with, doing something special with, and praising his/her child (Capaldi & Patterson, 1989) by averaging across four items (mother $\alpha = 0.64$ and father $\alpha = 0.72$, $r = 0.31$). The second captures how often each parent shows their child warmth-affection (e.g., "I let my child know I love, him/her") by averaging eight items (mother $\alpha = 0.81$ and father $\alpha = 0.83$, $r = 0.43$) from the Parental Acceptance-Rejection/Control Questionnaire-Short Form (PARQ/Control-SF; Rohner, 2005). Parents reported the frequency of different parenting behaviors on a 4-point response scale ranging from almost never (1) to every day (4). The *positive parenting* scale was constructed by averaging these standardized scales with high scores indicating greater positive parenting ($\alpha = 0.70$).

Negative parenting was measured using 8 parent-reported scales (4 scales for each parent). Each parent reported the frequency of physical punishment ranging from never (0) to almost every day (5), the severity of physical punishment ranging from not used (0) to very hard (4), and the average times per week the child was physically punished (Physical Punishment Questionnaire, Rohner, 2005). A physical punishment scale was created by averaging the three standardized responses (mother $\alpha = 0.71$ and father $\alpha = 0.68$, $r = 0.37$). Parental hostility-aggression towards their child was captured by an average of six PARQ/Control-SF items (e.g., "I punish my child severely when I am angry"; mother $\alpha = 0.58$ and father $\alpha = 0.63$, $r = 0.32$). Parental rejection of their child was captured by an average of four PARQ/Control-SF items (e.g., "My child is a nuisance for me"; mother $\alpha = 0.39$ and father $\alpha = 0.55$, $r = 0.40$). Parental neglect-indifference of their child was captured by an average of six PARQ/Control-SF items (e.g., "I pay no attention to my child"; mother $\alpha = 0.56$ and father $\alpha = 0.62$, $r = 0.24$). The *negative parenting* scale was constructed by averaging these standardized scales with high scores indicating greater negative parenting ($\alpha = 0.75$).

Parental psychological control was assessed using child-rated agreement with eight statements describing parental attempts to control the child psychologically such as "my parents tell me their ideas are correct and I should not question them" and "my parents act cold and unfriendly if I do something they don't like." A mean score was created by averaging across the items rated on a 4-point scale ranging from strongly disagree (1) to strongly agree (4) ($\alpha = 0.62$; Barber et al., 1994).

Behavioral control/monitoring was measured using 6 parent-reported scales (3 scales for each parent). Parental knowledge solicitation about the child's experiences outside the home was measured by averaging five parent-reported items on a 3-point response scale ranging from 0 (I don't try) to 2 (I try a lot) including where, with whom, and how the child spends free time (Conger et al., 1994; Steinberg et al., 1992; mother $\alpha = 0.79$ and father $\alpha = 0.81$, $r = 0.24$). Parental rule setting was measured by an average of five parent-reported items capturing the frequency with which the parent sets rules or limits using a 4-point response scale ranging from 0 (never) to 3 (always) including where, with whom, and how the child spends free time (Conger et al., 1994; Steinberg et al., 1992; mother $\alpha = 0.82$ and father

$\alpha = 0.83$, $r = 0.25$). Parent behavioral control was captured by an average across the five control items (e.g., "I want to control whatever my child does") from the PARQ/Control-SF (mother $\alpha = 0.53$ and father $\alpha = 0.56$; $r = 0.23$). The *monitoring and behavioral control* scale was constructed by averaging these standardized scales with high scores indicating more monitoring and behavioral control ($\alpha = 0.65$).

Parent autonomy granting was assessed using child-rated agreement with three statements describing parental support of the child participating in family decisions, thinking independently, and voicing ideas even if others disagree. A mean score was created by averaging across the items rated on a 4-point scale ranging from strongly disagree (1) to strongly agree (4) ($\alpha = 0.53$; Barber et al., 1994).

Adolescent Conduct Problems from Age 12 to 18

The Achenbach System of Empirically Based Assessment provided the items used to capture conduct and oppositional defiance disorder problems. Youth participants completed the 1991 version of the Youth Self-Report (YSR; Achenbach, 1991) at ages 12, 14, and 15 and the 1997 version of the Young Adult Self-Report (YASR; Achenbach, 1997) at ages 17 and 18. Mothers and fathers completed the 1991 version of the Child Behavior Checklist (CBCL; Achenbach, 1991) at ages 12–16 and 18. All measures capture the frequency with which youth experienced internalizing and externalizing symptoms in the last 6 months using a 3-point scale from never (0) to often (2). These instruments are widely used internationally; their convergent and discriminant validity as well as reliability are well-established (Achenbach & Rescorla, 2007). Their measurement invariance across different cultures has also been documented in other studies (Yarnell et al., 2013) as well as for the sample used in this study (Rothenberg et al., 2022, 2023).

A *conduct disorder (CD) problems* score was created for ages 12, 14, 15, 17, and 18 based on the 2013 Achenbach DSM-5-Oriented Scales (Achenbach, 2013) by summing across the nine items available from the YSR and YASR (e.g., damaging property, physically attacking others, having delinquent peers, threating others). The scores ranged from 0 to 18 with higher scores indicating more frequent conduct problems ($\alpha = 0.67$ to 0.75).

For ages 12, 14, 15, 17, and 18, an *oppositional defiance disorder* (ODD) problem score was created based on the 2013 Achenbach DSM-5-Oriented Scales (Achenbach, 2013) by summing across the four items available on the YSR and YASR (argues, disobedience at school, stubbornness, and hot temper) as well as sudden mood changes (Evans et al., 2020). The scores ranged from 0 to 10 with higher scores indicating more frequent ODD problems ($\alpha = 0.65$ to 0.72).

Substance use and sexual activity were captured using four measures over time, including the Achenbach measures. The youth-reported Behavior Frequency Scale (BFS; Farrell et al., 1992) at age 12 captured the frequency of various aggressive and delinquent behaviors, including substance use, in the past 30 days on a 6-point scale ranging from never (0) to 20 or more times (5). The youth-reported Benthin Risk Perception Scale (Benthin et al., 1993) at ages 13 and 16 captured the frequency with which participants engaged in eight inherently risky behaviors in the past 6 months including smoking cigarettes, drinking alcohol, and having unprotected sex. Frequency was measured on a 4-point scale ranging from none (1) to six or more times (4). Finally, youth completed the Risky Behavior Scale (RBS) at ages 17 and 18. This adaptation of the Benthin Risk Perception Scale captured the frequency with which adolescents engaged in nine risky behaviors including drinking beer or wine, drinking hard liquor, using drugs (not for medical reasons), smoking cigarettes, and having sex. Frequency was measured on a 3-point scale from not at all (0) to often (2).

For ages 12–18, an indicator for *any alcohol or drug use* (0 = no, 1 = yes) was created by using all youth and parent reports of alcohol and drug use (for non-medical purposes). At ages 12, 14, and 15, the indicator was based on the youth-reported YSR item and mother- and father-reported CBCL item capturing frequency of alcohol or non-medical drug use in the past 6 months. At ages 13 and 16, the indicator was coded using the youth-reported Benthin item capturing alcohol use as well as the mother- and father-reported CBCL item for alcohol and drug use. At age 17, the indicator for any alcohol or drug use was based on five youth-reported items: three items from the RBS (including drinking beer or wine, drinking liquor, and using drugs for non-medical reasons) and two items from the YASR (drinking too much and using drugs other than alcohol and nicotine for non-medical purposes). At age 18, the indicator for any alcohol or drug use was based on the five youth-reported items used at age 17 plus the mother- and father-reported CBCL item capturing the frequency of alcohol or non-medical drug use in the past 6 months.

For ages 12, 13, and 16–18, an indicator for any *cigarette smoking* (0 = no, 1 = yes) was created based on youth reports of the frequency of smoking cigarettes. The item came from the BFS at age 12, the Benthin scale at ages 13 and 16, and the RBS at ages 17 and 18.

For ages 13 and 16–18, an indicator for any *sexual activity* (0 = no, 1 = yes) was created based on youth reports of the frequency of sexual behavior. At ages 13 and 16, the indicator for any sexual activity was coded using the youth-reported Benthin item capturing the frequency of having unprotected sex. At ages 17 and 18, the RBS item measuring the frequency of sex was used.

Analytic Plan

Using latent class growth analysis (LCGA) in M*plus* Version 8.8, patterns of conduct problems (including CD problems, ODD problems, alcohol/drug use, smoking cigarettes, and sexual activity) were estimated across ages 12–18. Trajectories for CD and ODD problems were modeled as fixed quadratic functions; the trajectories for the probability of using alcohol/drugs, smoking cigarettes, and engaging in sex were modeled as fixed linear trajectories due to their dichotomous nature. For all conduct problems, the trajectory intercepts were estimated at age 13. The LCGA models control for country by including six dichotomous indicators for country. The optimal number of classes was determined by comparing fit across models (Nylund et al., 2007). Full information maximum likelihood was employed to account for missing data in these analyses.

To assess the association of early parenting behaviors with class membership, we used a 3-step approach (Asparouhov & Muthén, 2014; R3STEP in M*plus*). After selecting the optimal number of classes, as described above (step 1), those model results were used to assign youth to their most likely class (step 2). The associations with different parenting behaviors were then estimated within a multinomial logit model that adjusted for measurement error associated with assigning class membership (step 3). Multiple imputation was used to adjust for missing data among the predictors. We note that this modeling approach assumes there are distinct classes rather than testing whether there are distinctive classes and will generate reasonably parsimonious categorical representations of data. However, the approach does not test whether qualitatively distinct categories exist. The underlying constructs can be entirely continuous and dimensional, and the modeling will still suggest a categorical representation. The online Supplemental Materials include tests for parent gender differences, LCGA results without controlling for country, means/proportions of conduct problems over time for each country, and parenting behavior means and correlations by country.

Results

After comparing model fit for the 2-, 3-, and 4-class LCGA models (Table 1), we chose the 4-class model. The 5-class model was not included because it did not converge properly. The 4-class model yielded the lowest Bayesian information criterion (BIC), sample-adjusted Bayesian information criterion (aBIC), and Akaike information criterion (AIC). Although the χ^2 value for the Lo-Mendel-Rubin likelihood ratio test indicated that the 3-class model was preferred, a bootstrapped likelihood ratio test indicated that the 4-class model was preferred to the 3-class model. Also, the additional class generated by the 4-class model was substantively different from the classes generated by the 3-class model. Table 2 provides the parameter estimates.

Table 1 LCGA model fit comparisons

	Number of classes[a]		
	2	3	4
AIC	42,615	42,040	41,684
BIC	42,864	42,383	42,120
Adjusted BIC	42,703	42,160	41,837
Lo-Mendel-Rubin likelihood ratio test (*p*-value)	0.000	0.001	0.24
Bootstrapped likelihood ratio test (*p*-value)	0.000	0.000	0.000
Entropy	0.79	0.78	0.81
Proportion of sample in smallest class	0.36	0.21	0.15

[a]The model with five classes did not converge properly

Patterns of Conduct Problems

Figure 1 depicts the model-estimated trajectories for the conduct problems by class. To facilitate a succinct description of the difference in classes across countries and relations between parenting behaviors and class membership, we assigned abbreviated names to each class but provide a detailed description of the estimated trajectories of behaviors in each class here.

The *Late Starters* accounted for 32% of the sample. Members of this class reported low mean levels of CD problems that exhibited a slight, but significant concave trajectory over time reaching a minimum at age 17 before rising slightly. ODD problems for the group were also low and stable over time. Although this class consistently experienced a very low estimated probability of smoking and a low initial probability of alcohol/drug use, they exhibited a late and increasing probability of alcohol/drug use with the estimated probability rising from 0.11 at age 16 to 0.29 at age 18. Engagement in sexual activity was also delayed, but increasing, with the estimated probability rising from 0.20 at age 16 to 0.43 at age 18.

The *Alcohol Experimenters* accounted for 15% of the sample. Members of this class reported low and stable mean levels of CD problems and moderate mean levels of ODD problems that exhibited a convex trajectory over time, reaching a maximum at age 15 and dropping below the age 12 average by age 17. This class was estimated to have a stable and very low probability of smoking and sexual activity. Members of this class, however, exhibited a moderate and increasing estimated probability of alcohol/drug use in mid-adolescence with an estimated 0.24 probability at age 15 quickly rising to 0.97 by age 18.

Table 2 Estimated effects (*SE*) for 4-class LCGA model results

	Latent classes			
	Pervasive Risk Takers	Mid-Adolescent Starters[a]	Alcohol Experimenters	Late Starters
Means				
Conduct problems				
Intercept	2.85 (0.22)***	1.46 (0.09)***	1.66 (0.16)***	1.47 (0.10)***
Slope	0.13 (0.09)	0.07 (0.05)	−0.10 (0.08)	−0.18 (0.06)**
Quadratic	−0.04 (0.02)*	−0.03 (0.01)*	0.02 (0.02)	0.02 (0.01)*
OD problems				
Intercept	4.88 (0.17)***	3.49 (0.13)***	3.74 (0.22)***	2.50 (0.22)***
Slope	0.31 (0.07)***	0.22 (0.06)***	0.12 (0.08)	−0.01 (0.06)
Quadratic	−0.08 (0.02)***	−0.08 (0.01)***	−0.05 (0.02)*	−0.01 (0.02)
Alcohol/drug use				
Intercept	2.62 (0.53)***	0.00 (0.00)	−0.4 (1.24)	0.00 (0.62)
Slope	0.99 (0.08)***	1.53 (0.20)***	1.57 (0.56)**	0.59 (0.08)***
Smoking				
Intercept	2.34 (0.22)***	0.00 (0.00)	−0.66 (0.46)	−0.43 (0.37)
Slope	0.76 (0.09)***	0.32 (0.05)***	0.14 (0.08)	−0.09 (0.08)
Sexual activity				
Intercept	2.45 (1.13)*	0.00 (0.00)	−2.27 (3.09)	1.50 (1.14)
Slope	0.89 (0.08)***	1.56 (0.27)***	0.99 (0.63)	0.55 (0.09)***
Variances/covariances				
Conduct problems				
Intercept	1.77 (0.20)***	1.77 (0.20)***	1.77 (0.20)***	1.77 (0.20)***
Slope	0.08 (0.01)***	0.08 (0.01)***	0.08 (0.01)***	0.08 (0.01)***
Intercept with slope	−0.16 (0.04)***	−0.16 (0.04)***	−0.16 (0.04)***	−0.16 (0.04)***
OD problems				
Intercept	2.47 (0.19)***	2.47 (0.19)***	2.47 (0.19)***	2.47 (0.19)***
Slope	0.06 (0.01)***	0.06 (0.01)***	0.06 (0.01)***	0.06 (0.01)***
Intercept with slope	−0.14 (0.03)***	−0.14 (0.03)***	−0.14 (0.03)***	−0.14 (0.03)***
Covariances across behaviors				
Conduct intercept with OD intercept	1.40 (0.14)***	1.4 (0.14)***	1.4 (0.14)***	1.4 (0.14)***
Conduct intercept with OD slope	−0.16 (0.03)***	−0.16 (0.03)***	−0.16 (0.03)***	−0.16 (0.03)***
Conduct slope with OD intercept	−0.13 (0.03)***	−0.13 (0.03)***	−0.13 (0.03)***	−0.13 (0.03)***
Conduct slope with OD slope	0.07 (0.01)***	0.07 (0.01)***	0.07 (0.01)***	0.07 (0.01)***

These are raw coefficient estimate

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

[a]Model identification requires that the intercepts for dichotomous outcomes in the LCGA be set to 0 for one class

The *Mid-Adolescent Starters* accounted for 35% of the sample. Similar to members of the *Alcohol Experimenters*, this class reported low but slightly convex mean levels of CD problems over time (reaching a maximum at age 14 and dropping below the age 12 average by age 17). Likewise, they reported moderate mean levels of ODD problems that also exhibited a convex trajectory over time (reaching a maximum at age 15 and dropping below the age 12 average by age 17). In addition, they exhibited a moderate and increasing probability of alcohol/drug use in mid-adolescence with an estimated 0.31 probability at age 15 quickly rising to 0.98 by age 18. Unlike the *Alcohol Experimenters*, in mid-adolescence, this class experienced a small but rising estimated probability of smoking and a steeply increasing estimated probability of sexual activity (consistent with the *Pervasive Risk Takers*).

The *Pervasive Risk Takers* accounted for 18% of the sample. Members of this class, relative to all other classes, reported significantly higher mean levels of CD and ODD problems at age 12. Over time, those trajectories followed a convex pattern with both reaching a maximum at age 15 and dropping below the age 12 average by age 17 and 18 for conduct and ODD problems, respectively. Compared to all other classes, the *Pervasive Risk Takers* had higher expected

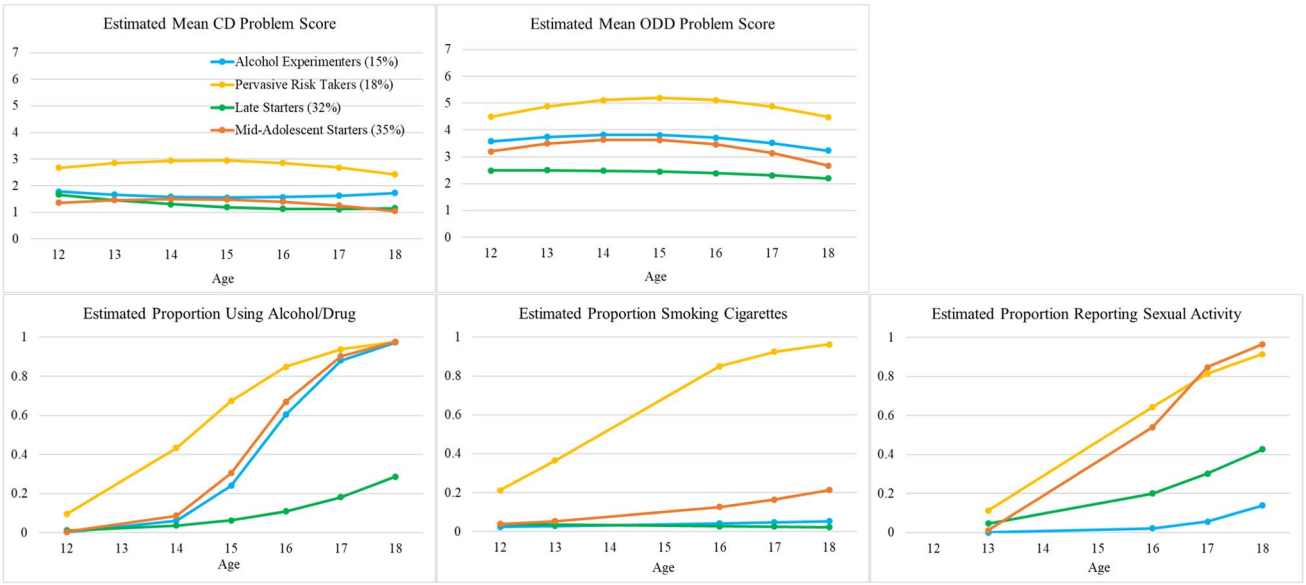

Fig. 1 Estimated trajectories for 4-class LCGA model

probabilities of using alcohol/drugs at age 12, smoking at age 12, and engaging in sex at age 13 (although only significant at the 10% level compared to the *Late Starters*). The expected probabilities of all behaviors increased sharply through adolescence.

Differences in Class Membership by Country

Figure 2 displays the predicted probabilities of class membership by country based on the LCGA model. Comparing across countries, youth from Italy have the highest predicted probability of exhibiting behaviors consistent with the *Pervasive Risk Takers* (50%) which is statistically significantly higher than the predicted 21% and 20% among youth in Colombia and Thailand, respectively, as well as those probabilities in all other countries. The predicted probability of *Pervasive Risk Takers* membership in Colombia and Thailand is not significantly different from the probabilities in other countries. Youth in Colombia (58%), Sweden (63%), and the USA (44%) have the highest predicted probabilities of membership in the *Mid-Adolescent Starters* class. These probabilities are not significantly different from each other, but they are significantly higher than the predicted probability of membership in the *Mid-Adolescent Starters* class in Kenya, the Philippines, and Thailand. Youth from the Philippines have the highest predicted probability of exhibiting behaviors consistent with the *Alcohol Experimenters* (70%), which is statistically significantly higher than youth in all other countries except Thailand. The predicted probabilities of being in the *Alcohol Experimenters* group do not differ among the other countries. Youth from Kenya have the highest predicted probability of exhibiting behaviors consistent with the *Late Starters* (96%), which is significantly higher than that in all other countries. The predicted probability is 42% in the USA, which is statistically significantly higher than the probabilities in Colombia, Italy, the Philippines, and Sweden.

Associations of Early Parenting with Patterns of Conduct Problems

The first three columns of Table 3 display the results from the multinomial logit model predicting the effects of age 10 parenting behaviors on membership in the *Pervasive Risk Takers* class relative to each of the other classes. As seen in column 1, a 1 standard deviation (*SD*) increase in positive parenting at age 10 was associated with a 56% decrease in the odds of being in the *Pervasive Risk Takers* class relative to the *Mid-Adolescent Starters* class (OR = 0.44). A 1 *SD* increase in child-reported parental psychological control was associated with a 34% increase in the odds of being in the *Pervasive Risk Takers* class relative to the *Mid-Adolescent Starters* class (OR = 1.34). As seen in column 2, a 1 *SD* increase in positive parenting was also associated with a 58% decrease in the odds of being in the *Pervasive Risk Takers* class relative to the *Alcohol Experimenters* class (OR = 0.42). In addition, a 1 *SD* increase in negative parenting was associated with a 50% decrease in the odds of being in the *Pervasive Risk Takers* class relative to the *Alcohol Experimenters* class (OR = 0.50). However, a 1 *SD* increase in monitoring/behavioral control at age 10 was associated with a 137% increase in the odds of being in the *Pervasive Risk Takers* class relative to the *Alcohol Experimenters* class (OR = 2.37). As seen in column 3, a 1 *SD* increase

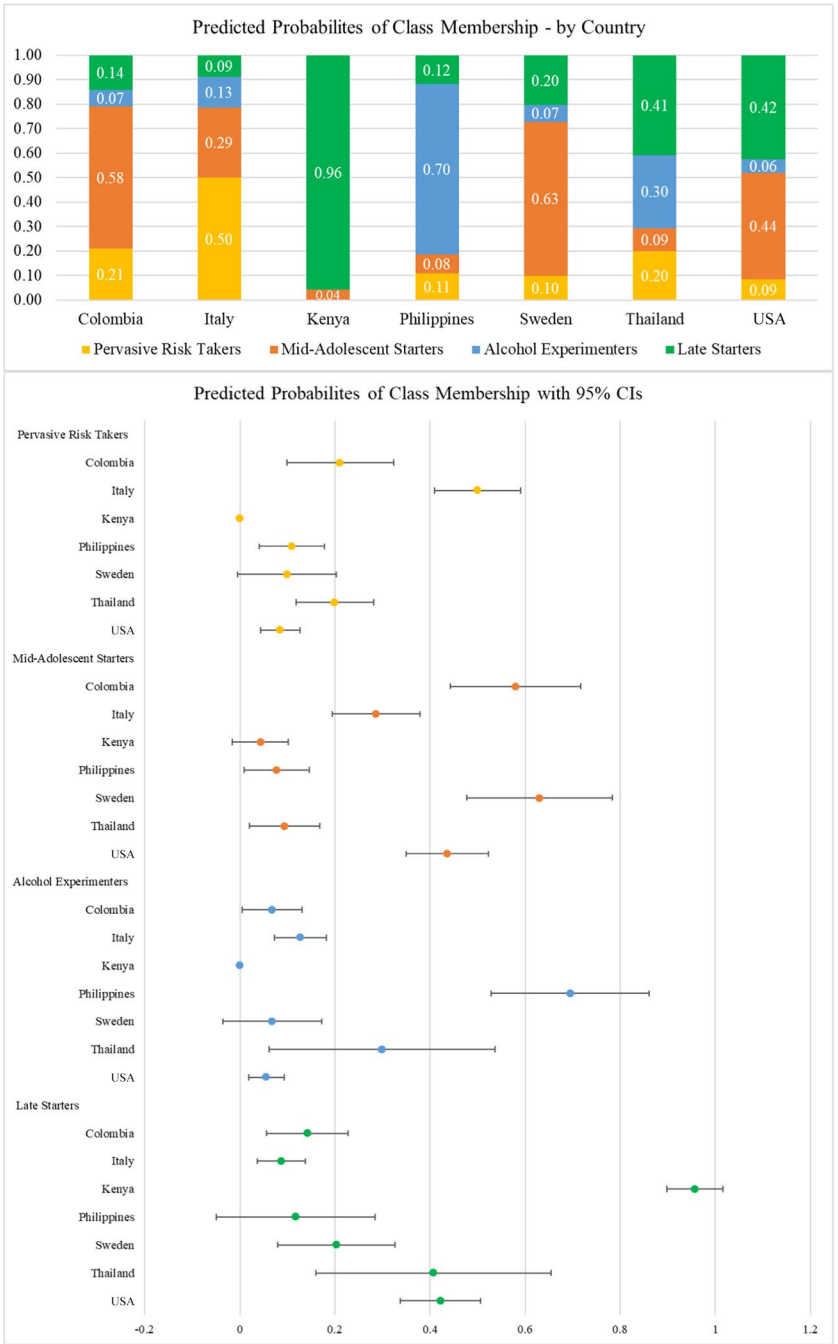

Fig. 2 Predicted probabilities of class membership by country

in monitoring/behavioral control at age 10 was also associated with a 62% increase in the odds of being in the *Pervasive Risk Takers* class relative to the *Late Starters* class (OR = 1.62). In contrast, a 1 *SD* increase in child-reported autonomy granting at age 10 was also associated with a 32% increase in the odds of being in the *Pervasive Risk Takers* class relative to the *Late Starters* class (OR = 1.32).

The fourth and fifth columns of Table 3 display the effects of age 10 parenting behaviors on membership in the *Mid-Adolescent Starters* class relative to the *Alcohol Experimenters* and *Late Starters*, respectively. As seen in column 4, a 1 *SD* increase in negative parenting was associated with a 62% decrease in the odds of being in the *Mid-Adolescent Starters* class relative to the *Alcohol Experimenters* class (OR = 0.38). Similarly, a 1 *SD* increase in child-reported psychological control was associated with a 24% decrease in the odds of being in the *Mid-Adolescent Starters* class relative to the *Alcohol Experimenters* class (OR = 0.76). As seen in column 5, a 1 *SD* increase in negative parenting was also associated with a 50% decrease in the odds of being in the *Mid-Adolescent Starters* class relative to the *Late Starters* class (OR = 0.50). However, 1 *SD* increase in positive

Table 3 Multinomial logit results predicting the probability of relative class membership (OR with 95% CI)

	Probability of Being in:					
	Pervasive Risk Takers relative to Mid-Adolescent Starters (1)	Pervasive Risk Takers relative to Alcohol Experimenters (2)	Pervasive Risk Takers relative to Late Starters (3)	Mid-Adolescent Starters relative to Alcohol Experimenters (4)	Mid-Adolescent Starters relative to Late Starters (5)	Alcohol Experimenters relative to Late Starters (6)
Positive parenting, parent-reported	0.44 (0.27, 0.70)*	0.42 (0.25, 0.70)*	0.78 (0.54, 1.12)	0.96 (0.55, 1.68)	1.78 (1.13, 2.8)*	1.85 (1.14, 3.01)*
Negative parenting, parent-reported	1.31 (0.77, 2.24)	0.50 (0.29, 0.88)*	0.65 (0.42, 1.01)	0.38 (0.22, 0.67)*	0.50 (0.31, 0.80)*	1.29 (0.77, 2.17)
Parental psychological control, child-reported	1.34 (1.04, 1.71)*	1.01 (0.77, 1.32)	1.10 (0.87, 1.39)	0.76 (0.58, 0.98)*	0.82 (0.65, 1.04)	1.09 (0.84, 1.41)
Behavioral control/monitoring, parent-reported	1.52 (0.98, 2.37)	2.37 (1.49, 3.76)*	1.62 (1.06, 2.48)*	1.55 (1.00, 2.43)	1.06 (0.68, 1.66)	0.68 (0.44, 1.06)
Parental autonomy granting, child-reported	1.09 (0.87, 1.37)	1.20 (0.92, 1.55)	1.32 (1.07, 1.64)*	1.10 (0.85, 1.42)	1.21 (0.97, 1.51)	1.10 (0.85, 1.43)
Indicator for male child	0.97 (0.62, 1.50)	1.37 (0.84, 2.26)	1.14 (0.75, 1.71)	1.42 (0.89, 2.28)	1.18 (0.78, 1.78)	0.83 (0.51, 1.33)
Maximum years of parental education	1.00 (0.76, 1.33)	0.91 (0.69, 1.20)	1.10 (0.87, 1.39)	0.90 (0.71, 1.16)	1.10 (0.88, 1.36)	1.21 (0.98, 1.50)

Country was controlled for in the first step model—the LCGA model described in Table 2 and Figs. 1 and 2

*$p < .05$

parenting was associated with a 78% increase in the odds of being in the *Mid-Adolescent Starters* class relative to the *Late Starters* class (OR = 1.78).

The final column of Table 3 displays the associations of age 10 parenting behaviors with membership in the *Alcohol Experimenters* class relative to the *Late Starters*. A 1 *SD* increase in positive parenting was associated with an 85% increase in the odds of being in the *Alcohol Experimenters* class relative to the *Late Starters* class (OR = 1.85).

Discussion

This study advanced the understanding of trajectories of conduct problems in adolescence as well as parenting risk and protective factors in the development of conduct problems in seven countries. Overall, we found country differences in trajectory class membership. In addition, we found that positive parenting was associated with a lower likelihood of adolescents' membership in the *Pervasive Risk Takers* class, whereas psychological control, monitoring/behavioral control, and autonomy granting were associated with a higher likelihood of membership in the *Pervasive Risk Takers* class. Associations between parenting and membership in the other classes suggest that some risk taking during adolescence is normative even when parenting is positive.

Our first research question was what patterns of conduct problems emerge from early to late adolescence. Consistent with our hypothesis, we found that four distinct trajectory classes characterized conduct problems from age 12 to 18 in our diverse sample of adolescents from seven countries. The identified classes of *Late Starters*, *Alcohol Experimenters*, *Mid-Adolescent Starters*, and *Pervasive Risk Takers* share similarities with previous theoretical and empirical work and extend this work to include a range of conduct problems considered simultaneously and to include adolescents from low- and middle-income countries. Like prior seminal work (Moffitt, 1993; Patterson, 1982), our findings also revealed early and late starting paths. Our additional examination of multiple conduct problems suggests differentiation among adolescents in terms of which conduct problems they start earlier versus later. Between-adolescent differences in engagement in conduct problems are also consistent with prior research (Graham & Kahn, 2019).

Our second research question was whether there are country differences in classes of conduct problem trajectories. Consistent with our hypothesis and with research suggesting that particular behaviors are perceived as being more problematic in some countries than others (e.g., De Jose, 2013) and that cultural norms affect engagement in particular behaviors (Gelfand et al., 2011), we found country differences in trajectory class membership. These

country differences are generally consistent with norms about engagement in particular behaviors during adolescence. For example, compared with adolescents in the other countries, adolescents in Kenya had the highest probability of being in the *Late Starters* class, perhaps because of the emphasis on strict compliance and obedience in Kenya relative to some other cultural groups, including in Thailand and the USA (Weisz et al., 1993). Compared with adolescents in the other countries, adolescents in the Philippines had the highest probability of being in the *Alcohol Experimenters* class, which demonstrated an increase in alcohol use but not sexual activity or oppositional defiant behavior, which could be explained by norms in the Philippines that devalue premarital sexual activity (De Jose, 2013) and prioritize adolescents' respect for their parents (Darling et al., 2005). Adolescents in Colombia, Sweden, and the USA did not differ from one another but had a higher probability than adolescents in other countries of being in the *Mid-Adolescent Starter* class, which could reflect the relative normativeness in many cultural contexts of an increase in risky behavior during adolescence (Steinberg et al., 2018). Compared with adolescents in the other countries, adolescents in Italy had the highest probability of being in the *Pervasive Risk Takers* class, which may in part reflect Italy's relatively accepting norms related to adolescent alcohol use (where it is generally not perceived as being problematic and is often consumed during family gatherings; Aresi et al., 2020) and sexual behavior, which has become more accepted outside of marriage in recent years (Minello et al., 2020). Our finding regarding Italian adolescents being over-represented in the *Pervasive Risk Takers* class is also consistent with a global study of the prevalence of conduct disorder that found the greatest burden in Western Europe, compared to other geographic regions (Wu et al., 2022).

Our third research question was whether parenting in childhood predicts membership in different trajectory classes of conduct problems from early to late adolescence. We found that parenting was most strongly related to the probability of being in the *Pervasive Risk Takers* class relative to other classes. We found partial support for our hypothesis that positive parenting would protect against membership in trajectory classes characterized by more conduct problems and that negative parenting and psychological control would increase the likelihood of membership in trajectory classes characterized by more conduct problems. Associations between parenting and membership in the classes primarily differentiated the *Pervasive Risk Takers* from the other classes. Across the cultural groups in our sample, positive parenting appears particularly helpful in keeping adolescents out of the *Pervasive Risk Takers* class (although, unexpectedly, negative parenting was associated with lower likelihoods of being in the *Pervasive Risk Takers* class than in the *Alcohol Experimenters*). One interpretation of this finding is that adolescents in many different cultural groups experiment with risky behaviors no matter how well parents parent, but parenting matters most in preventing adolescents from engaging in high stakes, pervasive risk taking.

It is also notable that parental monitoring/behavioral control and autonomy granting differed between the *Pervasive Risk Takers* and the *Alcohol Experimenters* and *Late Starters*. Autonomy granting at a young age may provide adolescents with more opportunities to explore things on their own, which leads them to engage in riskier behaviors. The association of more monitoring/behavioral control with a greater likelihood of being in the *Pervasive Risk Taking* class may reflect a child evocative effect whereby children with more conduct problems elicit more attempts from their parents to control and monitor behaviors that parents regard as problematic. These findings in the parental control domain suggest both that autonomy granting may provide more opportunities for risky behaviors but also that monitoring and behavioral control may either be perceived as intrusive by adolescents (and thereby related to more problem behaviors) or that parents may respond to more problem behaviors with more attempts to control and monitor those behaviors.

Limitations, Future Directions, and Implications for Prevention Science

This study has several strengths, including the use of longitudinal data from ages 10 to 18; the multi-informant design with reports from adolescents, mothers, and fathers; and the availability of data from seven countries. The study also has several limitations. First, sexual activity at ages 13 and 16 is under-reported because the survey only asked about unprotected sex, whereas the item at ages 17 and 18 inquired about sexual activity regardless of whether contraception was used. Second, our three-step modeling procedure controls for country when assigning class membership in step one and then assesses the relation between early parenting behaviors and class membership. Consequently, we cannot explore whether these relations vary by country. Third, the samples were not nationally representative, so care should be taken not to generalize findings to entire countries or beyond the countries that participated in this study. Fourth, some of the subscales had internal reliabilities that were relatively low, which may have contributed to the associations we found and did not find between parenting and class membership. Fifth, although we examined parenting as a predictor of child conduct problems, child conduct problems also have evocative effects on parenting. For example, children with more conduct problems elicit less warmth and more rejection from their parents. These limitations suggest directions for future research, particularly in recruiting nationally representative samples and in employing different methods and measures to determine whether the findings from this study replicate. Two additional

important questions to address in future research will be testing whether the parenting predictors of class membership differ across cultures and testing whether the classes themselves differ across cultures in terms of characteristic behaviors. In addition, to provide a more comprehensive understanding of adolescent behavior across cultures, future research should explore additional factors, such as peer relationships, school environments, and community factors, that may influence trajectories of conduct problems.

Our findings also have important implications for prevention science. Because some level of adolescent risky behavior is normative across cultures and because parenting was generally related mostly to keeping adolescents away from more pervasive risk taking but not to preventing risk taking altogether, risk management and harm reduction approaches to adolescent behaviors are warranted. These approaches can be tailored to specific cultural contexts. For example, in cultural contexts where experimentation with alcohol is normative during adolescence, public health messages can emphasize the importance of designated drivers and not drinking and driving. In cultural contexts that are tolerant of adolescents' engagement in sexual activity, free condoms can be provided in schools and other places easily accessible to adolescents to reduce the risks of sexually transmitted infections and unintended pregnancies. Policies such as graduated driver licensing can also be enacted to prevent some of the riskiest driving situations for adolescents.

Conclusions

Trajectories of conduct problems in adolescence are characterized by differences in starting points as well as which specific behaviors cluster together in trajectory classes. In seven countries that differ widely on a number of sociodemographic factors as well as norms related to adolescent behavior, we found that adolescents in different countries vary in their likelihood of engaging in particular behaviors in ways that largely reflect cultural differences in norms and expectations related to adolescents' behaviors. Positive parenting was important for keeping adolescents out of a class characterized by pervasive risk taking, but parenting did not widely distinguish other behavior classes, suggesting that some level of risky behavior is normative regardless of parenting in many different cultural groups.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s11121-024-01743-1.

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Declarations

Ethics Approval The study was approved by the appropriate institutional review boards at universities in each of the participating countries. The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments.

Consent to Participate All adult participants provided written informed consent for their participation; children provided assent.

Conflict of Interest The authors declare no competing interests.

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