









EMPIRICAL ARTICLE

Positive youth development from early adolescence to young adulthood in nine countries: Intercepts, trajectories, and associations with parental warmth and behavioral control

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Abstract

This longitudinal study concerns initial levels, trajectories of growth, and associations of positive youth development (PYD) with parental warmth and behavioral control from early adolescence to young adulthood. Participants included 1338 adolescents ($M = 13.25$, $SD = 1.04$, years; 50% girls) from nine countries trichotomized by income level based on World Bank groupings of economies as well as cultural, sociological, and psychological considerations. Composite measures of PYD at ages 13, 15, 16, 18, and 21 were created from adolescent-report EPOCH dimensions of engagement, perseverance, optimism, connectedness, and happiness. Adolescents reported a high average initial level of PYD (3.50 on a 4-point scale) at 13 years of age; however, developmental trajectories of each income-level group differed with little within-group variation across age. Multigroup latent growth curve models examined associations of family-level and parent-specific dimensions of warmth and control with intercepts and trajectories of PYD. Parental warmth was consistently associated with higher PYD intercepts in all three country income levels, whereas control showed varied effects. PYD followed similar trajectory slopes across the three country income levels; parental warmth was consistently associated with growth, whereas parental control showed nuanced associations with parent and country. Warmth appears to act as a common protective correlate of adolescent PYD, whereas control appears to constitute a protective correlate in some cultural contexts but a risk correlate in other cultural contexts.

KEYWORDS

adolescence, international sample, parental control, parental warmth, positive youth development

For affiliations refer to page 14.

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POSITIVE YOUTH DEVELOPMENT

Positive Youth Development (PYD) is a strengths-based framework of developmental processes, strategies, and systems that promote affirmative assets in youth. PYD has “a long past but a short history” (Lerner et al., 2021, p. 1115) as theories of PYD in diverse forms date from Greek philosophy (Muuss, 1975) to contemporary empiricism (Benson, 2008; Lerner et al., 2021). PYD has garnered considerable and continuing interest, marked by a burgeoning literature (Catalano et al., 2019; Lerner et al., 2015), but evidence identifying specific parenting practices that sustain PYD from childhood to adulthood as well as international comparisons of the developmental course of PYD from childhood to adulthood is wanting. Such data are essential to a more complete understanding of PYD, to promote PYD development in natural settings, and to strengthen PYD interventions (Eichas et al., 2019; Qi et al., 2022, 2025).

Mutually influential links between individuals and their contexts—represented as individual↔context relations—constitute fundamental processes in human development (Lerner, 2018), and PYD is theorized to develop from nurturing, positive relations between the strengths of youth and specific resources in the contexts of youth development, notably warm, trusting, and nurturing relationships between youth and caring and competent adults (Rhodes, 2020). In consequence, parental warmth and parental behavioral control have been theorized to play encouraging and discouraging roles, respectively, in the development of PYD (Rohner & Ali, 2025). To date, however, few studies have verified associations between these dimensions of parenting and the longitudinal development of PYD or explored the dynamics of these parenting practices in international contexts. To begin to address these gaps, the present study coordinates three perspectives: measurement of intercepts and trajectories of the growth of PYD from adolescence to young adulthood, associations of PYD with parenting warmth and behavioral control, and international developmental science studies of PYD. Specifically, the current longitudinal study attempts to meet these outstanding needs by examining initial levels (intercepts) and developmental slopes (trajectories) in PYD from early adolescence to young adulthood and by documenting associations of parental warmth and control with PYD intercepts and trajectories in 1338 families based on reports of adolescents, mothers, and fathers in nine countries trichotomized by economy (country income level) as well as cultural, sociological, and psychological considerations.

To measure PYD this study used the EPOCH (Kern et al., 2016). The EPOCH assesses and averages five thriving and well-being psychological characteristics central to PYD. Kern et al. (2016, p. 587) defined each of the five characteristics, and subsequent literature has confirmed the convergent and predictive validities of each. *Engagement* encompasses the capacities to become absorbed in and

focused on what one is doing as well as involvement and interest in life's activities and tasks. Longitudinal data from the 4-H Study of PYD in 1977 adolescents aged 10–13 years identified distinctive developmental trajectories for academic and emotional engagement linked in specific and meaningful ways to grades, depression, delinquency, and substance use (Li & Lerner, 2011; for longitudinal work, see also Chan et al., 2014; Skinner & Belmont, 1993; Symonds et al., 2023). *Perseverance* is the ability to pursue one's goals to completion, even in the face of obstacles. Perseverance accounted for significant variance in educational attainment in two samples of adults ($N_s = 1545$ and 690), grade point average among Ivy League undergraduates ($N = 138$), retention in two classes of cadets at the United States Military Academy at West Point ($N_s = 1218$ and 1308), and ranking in the National Spelling Bee ($N = 175$), net IQ and conscientiousness (Duckworth et al., 2007; for longitudinal work, see also Buenconsejo et al., 2024; Eskreis-Winkler et al., 2014). *Optimism* is hopefulness, confidence about the future, and the tendency to take favorable views in life. Optimism in over 4000 children aged 8–11 years related to enhanced feelings of peer belonging, fewer experiences of peer victimization, and higher levels of adult support in school, above and beyond the effects of sex, age, and SES (Oberle et al., 2018; for longitudinal work, see also Carver et al., 2010; Zou et al., 2022). *Connectedness* is the sense of enjoying satisfying relationships with others, believing that one is cared for, loved, esteemed, and valued, and providing friendship or support to others. In two waves of the National Longitudinal Study of Adolescent to Adult Health (Add Health; a prospective nationally representative cohort of U.S. adolescents), linear and logistic analyses revealed that school connectedness in 14,800 adolescents had independent protective associations into adulthood, reducing emotional distress and odds of suicidal ideation, physical violence victimization and perpetration, multiple sex partners and STI diagnosis, prescription and illicit drug misuse; additionally, family connectedness had protective effects for emotional distress, violence indicators, multiple sex partners and STI diagnosis, and substance use indicators (Steiner et al., 2019; for longitudinal work, see also Oberle et al., 2024; Olsson et al., 2013; Raniti et al., 2022). *Happiness* is a steady state of positive mood and feeling content with one's life. Regression models in a longitudinal cohort of 9003 15-year-olds documented that adolescents with the highest positive affect enjoyed better physical, cognitive, and mental health as well as psychological well-being, social, and civic outcomes 11.4 years or 20.6 years later (Kim et al., 2024; for longitudinal work, see also Hoyt et al., 2012; Matic & Musil, 2023). In consequence of its established convergent and predictive validities, and in service to dimension reduction and following Kern et al. (2016; see also Geldhof et al., 2014; Lerner et al., 2021), this study used the composite EPOCH as a measure of PYD (i.e., all five dimensions were averaged into a total EPOCH score).

PARENTING AND POSITIVE YOUTH DEVELOPMENT

This study evaluated the roles of mothers and fathers individually, and mothers and fathers together as a coparenting team, as they acted in manners that presumably enhanced or diminished adolescent PYD. The majority of adolescents grow up in family systems with more than one significant parenting figure (Bornstein & Sawyer, 2006; Kerig, 2019), yet the research literature has typically focused on mothers, as mothers are acknowledged to be children's principal caregivers (Murray et al., 2019). However, fathers are playing increasingly important roles in child development (Bornstein et al., 2026; Volling & Bornstein, 2025), and nations around the globe have witnessed increases in the amounts of time fathers spend with their children (Volling & Bornstein, 2025). Moreover, in the family systems perspective, mothers' and fathers' coparenting are recognized as vital in child and adolescent development (Bornstein et al., 2026; McHale & Sirotkin, 2019; Rothenberg & Bornstein, 2025; Rothenberg et al., 2024). In consequence, this study focused on mothers' and fathers' individual, and mothers' and fathers' combined, warmth and control associations with both initial levels and developmental slopes of PYD across the entirety of adolescence (more complete justifications for the inclusions of mothers, fathers, and coparenting appear in the [Supplementary Materials](#) [Justification for Focusing on Mothers, Fathers, and Coparenting]).

Parenting warmth relates to affording children love, affection, and acceptance; by contrast, parenting behavioral control relates to monitoring and regulating children's behavior. (This study concerns behavioral control *contra* psychological control, which involves manipulating children's thoughts or emotions as, for example, by withdrawing love or inducing guilt; e.g., Pomerantz & Wang, 2009.) Warmth appears to be a culturally common positive aspect of parenting, whereas behavioral control appears to be more culturally specific and variable (Rothenberg, Lansford, Bacchini, et al., 2020; Rothenberg, Lansford, Bornstein, et al., 2020). Parental warmth is consistently related to fewer adolescent internalizing problems, whereas relations between behavioral control and adolescent internalizing problems are more variable across cultures (Rothenberg, Lansford, Bacchini, et al., 2020). Classic parenting theories feature parents' warmth and behavioral control as cornerstones of caregiving styles (Baumrind, 1967; Maccoby & Martin, 1983), and a substantial literature has identified the significances of warmth and control in child development (Rohner & Ali, 2025). For example, parental warmth predicts subsequent child prosocial behavior (Putnick et al., 2018), better academic achievement (Putnick et al., 2015), and less aggressive behavior (Rothenberg, Lansford, Bornstein, et al., 2020). However, fewer studies have explored associations between these complementary dimensions of parenting and initial levels or developmental slopes of PYD across adolescence or explored their dynamics in international samples. In consequence of gaining greater purchase on cultural moderation

of parenting warmth and control in relation to adolescent PYD, this study analyzed mothers', fathers', and mothers' and fathers' coparenting in relation to the development of PYD from adolescence to young adulthood in nine countries.

INTERNATIONAL DEVELOPMENTAL AND PARENTING SCIENCE

The majority of research in developmental and parenting science still derives from samples recruited in Western, educated, industrialized, rich, and democratic (so-called WEIRD) nations (Henrich, 2020). In response, in this study we recruited a cross-national sample of adolescents, mothers, and fathers from China, Colombia, Italy, Jordan, Kenya, the Philippines, Sweden, Thailand, and the United States. The main goal of recruiting families from these diverse countries was to create an international sample that would vary with respect to a number of demographic and sociodemographic characteristics. The second decade of the 21st century witnessed growing interest in global studies of PYD (e.g., Dimitrova & Wiium, 2021; Lerner et al., 2021; Petersen et al., 2017; Smith et al., 2017), but Koller et al. (2017) and Lerner et al. (2019) alike emphasized that the growing global use of strengths-based models of PYD would be particularly important in low- and middle-income countries (LMICs), given the history of deficit perspectives that has infused research about majority-world youth. The strengths-based orientation is vital to supplanting previous conclusions on deficit models of youth development (Lerner et al., 2025). To move toward a greater global understanding, the study of PYD should involve both majority-world and minority-world youth. Ultimately, this diversity provided an opportunity to examine parenting in a broader sample that is more generalizable to a wider range of the world's population than is typical of most research in this field. Implementing an international developmental design offers many advantages over much more common monocultural approaches (see Bornstein & Esposito, 2020). For example, international research is positioned to encompass a wider spectrum of human variation, which helps overcome limitations in understanding development restricted to the predominantly WEIRD samples. In a nutshell, broadening the study of adolescent-to-adult PYD and parenting to encompass a range of national contexts advances behavioral and social science by evaluating which processes are culture-general and which are culture-specific, and advances those sciences by promoting critical examinations of theories and conclusions drawn from early work dominated by WEIRD samples. An international design can also aid in disentangling parenting practices from the functions they serve in different contexts (Bornstein, 1995).

The nine countries which participated in this study are diverse in terms of several international indicators, including predominant ethnicities, religions, economies, and indices of child well-being. For example, on demographic dimensions participating countries ranked from 5th to

143rd of 193 countries with available data on the Human Development Index, a composite indicator of a country's status with respect to health, education, and income (Human Development Report, 2025); in addition, from 6.3% to 38.6% of the populations of participating countries fell below the international poverty line of less than \$2.15 USD per day (Hasell & Arriagada, 2022). Participating countries also varied widely on sociodemographic indicators and on psychological constructs. For example, they ranked from –177th to 133rd on the Individualism–Collectivism Index (Hofstede, 2001; Minkov & Kaasa, 2022), in the top 5 of 68 countries for looseness (characterized by weak social norms and high tolerance for deviant behavior), and in the top 5 of 68 countries for tightness (characterized by strong social norms and little tolerance for deviant behavior; Gelfand et al., 2011; Uz, 2015). Again, in service to dimension reduction, the nine countries were trichotomized by income-level.

Human development and parenting are each conditioned by macrosystem country-level factors, such as national income (Bronfenbrenner & Morris, 2007). The nine countries in the present study were divided into high-income (HIC: Italy, Sweden, the United States), upper-middle-income (UMIC: China, Colombia, Thailand), and lower-middle-income (LMIC: Jordan, Kenya, the Philippines) groups following the World Bank Group's (2025) international income-level classification. The World Bank income classification is a powerful composite that captures systematic differences in resources, stability, social expectations, and cultural values, all of which are primary drivers of human development and parenting. The income-level trichotomization used here was informed by economic, cultural, sociological, and psychological considerations. With respect to the economic categorization, a country's income level determines the resources and opportunities available to its population. World Bank groupings are based on economics, but the three income levels are also associated with broad and systematic cultural values thought to influence adolescent development and parenting. With exceptions and variations, HICs tend to embrace individualism, emphasizing personal achievement, autonomy, and independence, whereas LMICs lean toward collectivism, emphasizing family honor, interdependence, and group harmony (Hofstede Insights, 2023). PYD and warmth and control are likely manifested differently in these contrasting cultural contexts. Income-level classification as well serves as a proxy for significant sociological factors like social structure, inequality, and the timing of major life transitions. The trajectory of psychological development across adolescence is likely influenced by societal expectations with respect to when adolescents should adopt adult roles. Finally, economic, cultural, and sociological factors converge to create different psychological niches that may directly peg the intercepts and inflect the trajectories of PYD across adolescence. Adolescents and parents alike in LMICs are statistically more likely to experience stressors related to poverty circumstances, political instability, or environmental crises. Chronic adversity may depress the intercept and/or flatten the growth trajectory of PYD. In economically secure HICs,

parents can prioritize autonomy support and psychological control, whereas in more economically constrained LMICs, parents may prioritize behavioral control to ensure offspring safety and even survival. These different orientations could in turn distribute intercepts and determine growth trajectories of PYD. In consequence, this study evaluated adolescent PYD and parental warmth and control in nine countries that contrasted income levels.

THIS STUDY

In overview, theoretical and empirical issues motivated this study. First, several strengths-based conceptions of PYD emerged in the 21st century (e.g., Benson et al., 2011; Damon, 2004; Eccles & Gootman, 2002; Larson, 2000; Lerner et al., 2015) derived from a dynamic relational developmental systems metamodel (Lerner, 2026; Lerner et al., 2026). This model asserts that human development involves the interrelated ontogeny of three meaningful instantiations of change across the lifespan: nomothetic changes that characterize variation in all humans, group differential changes that are present in some but not all groups of humans, and idiographic changes that are specific to individuals (Bornstein, 2019a, 2019b; Lerner, 2026). To date, these changes have not been systematically investigated in regard to global PYD, but the present study marshals a comparative data set on which to address this omission in the global PYD literature. Second, the Five Cs model (Lerner et al., 2015) dominates contemporary PYD research in and across counties (Buenconsejo et al., 2025; Chen et al., 2024; Chen & Chen, 2023; Marín-Gutiérrez & Caqueo-Úrizar, 2025; Qi et al., 2022). Lerner et al. (2019) also emphasized that international research should include developmental designs (see also, Bornstein, 1980). The dynamic relational developmental systems model of PYD is lifespan in conception (Lerner et al., 2015, 2026). Therefore, thriving in adolescence likely has important theoretical significance for positive development in adulthood. This study was designed to investigate whether nomothetic, differential, and idiographic knowledge about changes involved in PYD around the world could be usefully extended using a different measurement model from the 5Cs. Third, insofar as dynamic relational developmental systems-based models of human development are lifespan in their theoretical scope, then the study of PYD from adolescence to young adulthood should illuminate cross-life-period linkages and speak to nomothetic, differential, or idiographic changes in and across specific countries. Fourth, fundamental processes of change across ontogeny involve mutually influential coactions between the individual and the individual's intergenerational sociocultural context (Damon, 2004). Mutually beneficial youth⇌parent relationships have individual, lifespan, and generational significance and so are particularly salient (Balaguer et al., 2022; Bebiroglu et al., 2013; Bowers et al., 2011; Boyd et al., 2011; Dotterer & Clark, 2026; Lerner & Hilliard, 2019; Lerner & Konowitz, 2016; Ohannessian et al., 2000; Pillai et al., 2025). This study systematically explores that relation.

This study leveraged a longitudinal international sample to explore initial levels (intercepts) and directions and rates of change (trajectories) of PYD from early adolescence to young adulthood (ages 13 to 21) across three income-level groups of countries (lower-middle, upper-middle, and high). This study also contrasted the roles of two parenting dimensions (warmth and behavioral control) in examining intercepts and trajectories of PYD across the three income-level groups of countries. Specifically, the study pursued three main aims. First, the intercepts and trajectories of adolescent PYD in each of the three income-level groups of countries were investigated using an exploratory approach and without formulating specific hypotheses regarding country income-level group-specific or -general comparisons of intercepts and trajectories.

Second, associations of family-level parenting warmth and control were investigated with respect to both intercepts and trajectories of PYD from ages 13 to 21. To capture overall family-level scores for warmth and control, and to examine aggregate associations of these parenting dimensions with PYD, this analysis combined mothers' and fathers' reports of their warmth and control. On the basis of extant research (Khaleque & Ali, 2017; Lansford et al., 2025; Rothenberg, Lansford, Bacchini, et al., 2020; Rothenberg, Lansford, Bornstein, et al., 2020), higher levels of mother+father combined warmth and lower levels of mother+father combined control were hypothesized to relate to higher intercepts of early adolescent PYD and to positive trajectories of growth in PYD from adolescence to young adulthood.

Third, individual and specific associations of mothers' and fathers' warmth and control (i.e., mothers' warmth, mothers' control, fathers' warmth, fathers' control) with both initial levels and directions and rates of change of PYD across adolescence were evaluated. This parent-specific approach to analysis promised a more fine-grained understanding of whether mothers' or fathers' (or both) warmth or control constituted unique or differential associations with PYD intercepts and trajectories. Mothers' and fathers' warmth were each hypothesized to relate to higher initial intercepts and positive trajectories of growth of PYD, whereas mothers' and fathers' control were each hypothesized to relate to lower initial intercepts and less positive trajectories of growth of PYD.

Given that these dynamics likely vary across country contexts, however, with cultural norms and socioeconomic conditions strongly influencing adolescent development and parenting practices (Amir & Bornstein, 2025; Gorla et al., 2024; Lee et al., 2010), between-country variability was hypothesized for the second and third research aims. Specifically, higher levels of parental warmth were expected to be consistently associated with higher PYD across all country groups, independent of income level, an expectation that accords with previous evidence linking childhood experiences of parental warmth to positive psychological adjustment across different cultural contexts (Khaleque & Ali, 2017; Lansford et al., 2025; Rothenberg, Lansford,

Bacchini, et al., 2020; Rothenberg, Lansford, Bornstein, et al., 2020). Contrariwise, and in accord with previous studies highlighting significant cross-cultural variation in associations of parental control with adolescent development (Brody & Flor, 1998; Chao, 2001; Chua, 2011; Lamborn et al., 1991; Lansford, Godwin, et al., 2018; Rothenberg, Lansford, Bacchini, et al., 2020; Rothenberg, Lansford, Bornstein, et al., 2020), associations between parental control and adolescents' PYD were expected to vary inversely with upper-middle and high country-group income levels but perhaps positively with the lower-middle country-group income level.

METHOD

Participants and procedures

Participants were drawn from the Parenting Across Cultures (PAC) project, a longitudinal study investigating parenting and adolescent development across multiple cultural contexts. The project began in 2008, with participants followed annually. The PAC project initially included 1458 children (50% girls; mainly aged 8 years at the time of recruitment) along with their mothers and fathers in single-parent as well as dual-parent families. This report includes 1338 participants with data collected at 8 time points, when youth were 8, 9, 10, 13, 15, 16, 18, and 21 years of age. When their children were 8 years old, mothers averaged 37.56 years old ($SD=6.62$) and had an average of 12.93 years of education ($SD=4.03$), and fathers averaged 39.64 years old ($SD=6.88$) and had an average of 13.16 years of education ($SD=4.05$), meaning that, on average, parents had slightly more than a high school education but represented the full range of education from less than a high school education to graduate degrees.

Original PAC families were recruited from 13 cultural groups residing in urban areas in nine countries, including Jinan ($n=120$) and Shanghai ($n=123$), China; Medellín, Colombia ($n=108$); Naples ($n=102$) and Rome ($n=111$), Italy; Zarqa, Jordan ($n=114$); Kisumu, Kenya ($n=100$); Manila, Philippines ($n=120$); Trollhättan/Vänern, Sweden ($n=129$); Chiang Mai, Thailand ($n=120$); and Durham, NC, United States ($n=102$ African American, $n=110$ European American, $n=99$ Latin American). For the current study, participants from Jinan were excluded because their PYD data were only available through age 10, and participants from Shanghai reported on PYD only at 3 time points (until age 16; details related to implications for analyses are described below). Attrition rates between 13 and 21 years varied from a high in Sweden (66%) to a low in Italy (16%), but participants who provided PYD data until 21 years did not differ from the original sample in parental education, gender, or warmth and control.

Following the World Bank Group's (2025) income-level classification, participants' countries were grouped into three categories: (1) LMICs ($n=334$, Jordan, Kenya, and

the Philippines); (2) UMICs ($n = 351$, China, Colombia, and Thailand); and (3) HICs ($n = 653$, Italy, Sweden, and the United States). Recruitment of convenience samples in each country was conducted through letters sent home by schools. Parents interested in the study either responded directly to the school, granting permission for researchers to contact the parents, or, depending on the site, schools facilitated direct contact between families and researchers. To ensure economic diversity, the samples included students from both private and public schools as well as families across the socioeconomic spectrum in each country in proportions generally representative of each recruitment area. For example, Colombia has six well-defined socioeconomic strata, so participants were recruited into the Colombian sample in proportion to their representation in each of these six strata in the city of Medellín. All children in the target age range who were students at the participating schools were eligible for inclusion. Parental consent and adolescent assent were obtained from participants younger than 18 years, and informed consent was obtained from participants 18 years or older. Participants were given modest monetary or other compensation. The research was approved by university IRBs in all participating countries.

Measures

Three main sets of measures, completed by self-report, were administered orally or in writing during 1.5- to 2-h interviews in participant-chosen locations. Measures were administered in participants' preferred language and have been validated and used previously in the countries included in the current study (e.g., Buchanan et al., 2023; Deater-Deckard et al., 2011; Lansford, Godwin, et al., 2018; Lansford, Rothenberg, et al., 2018; Rothenberg et al., 2021).

Positive youth development

When adolescents were 13, 15, 16, 18, and 21 years of age, they completed the EPOCH measure of adolescent well-being (Kern et al., 2016). This 20-item multidimensional instrument measures five different positive youth characteristics promoting high levels of adolescent well-being and thriving. These characteristics are Engagement (e.g., "I get completely absorbed in what I am doing."), Perseverance (e.g., "I finish whatever I begin."), Optimism (e.g., "I think good things are going to happen to me."), Connectedness (e.g., "I have friends that I really care about."), and Happiness (e.g., "I feel happy."), each assessed using 4 items on 5-point scales (1 = not at all like me; 5 = very much like me). All items indicate PYD and correspond closely to measures used in various models of and approaches to PYD (as discussed by Lerner et al., 2021). The EPOCH

demonstrated appropriate factor structure and strong internal and test-retest reliability, as well as convergent, discriminant, and predictive validity (Kern et al., 2016). An overall PYD composite score was calculated by taking the mean of the five subscales ($\omega = .90$; Kern et al., 2016). When estimating trajectories, PYD scores were rescaled from 1–5 to 0–4 to ensure that 0 values were interpretable in inferential models. This rescaling did not change the meaning of EPOCH scores in any way. Higher scores indicate higher PYD. This measure (used for a different purpose) showed reliability, validity, and measurement invariance in the current cross-national sample (see Buchanan et al., 2023). [Table S1](#) reports the internal consistency for each subscale and each year of data collection.

Parental warmth and behavioral control

When youth were 8, 9, and 10 years of age, mothers, fathers, and children themselves completed the Parental Acceptance–Rejection/Control Questionnaire–Short Form (PA-R/CQ; Rohner, 2005). Specifically, 8 items captured parental warmth (e.g., "I make it easy for my child to confide in me.", "My mother makes it easy for me to confide in her.", "My father makes it easy for me to confide in him.") and 5 items measured parental behavioral control (e.g., "I always tell my child how (s)he should behave.", "My mother always tells me how I should behave.", "My father always tells me how I should behave.") on modified 4-point scales (1 = almost never to 4 = every day). Higher scores indicate greater warmth and control. To address this study's aims, family, mothers', and fathers' means were created. Composite of family parenting dimensions were also created by averaging mothers', fathers', and youth ratings. Composite measures of both parents' warmth ($\omega = .86$) and parents' control ($\omega = .83$) scores were calculated. A composite of mothers' means was created by averaging mother and youth ratings of mothers' warmth ($\omega = .79$) and control ($\omega = .74$), and a composite of fathers' means by averaging father and youth ratings of fathers' warmth ($\omega = .78$) and control ($\omega = .70$). The PA-R/CQ has been used in over 60 cultures with excellent reliability, convergent and discriminant validity, and measurement invariance (Lansford, Godwin, et al., 2018; Lansford, Rothenberg, et al., 2018). [Table S1](#) reports the internal consistency for each composite and year of data collection.

Covariates

Adolescent gender (0 = girl, 1 = boy) and parent education (years of education obtained by mothers and fathers) were included as covariates and their associations with PYD intercepts and trajectories analyzed (see the [Supplementary Materials](#) [Justification of Covariates]).

Analytic plan

All analyses were performed using R software (version 4.2.2, R Core Team, 2020) and the lavaan package (Rosseel, 2012). Data were missing for 39% of PYD at age 21, 35% of PYD at age 18, 27% of PYD at age 16, 25% of PYD at age 15, 19% of PYD at age 13, 6% of fathers' warmth and control, 2% of mothers' warmth and control, and 2% of family means of warmth and control. Little's (1988) Missing Completely at Random (MCAR) test was used to compare participants with and without missing data. The MCAR test was significant, $\chi^2(466) = 688.609$, $p < .001$. However, the normed χ^2/df of 1.47 suggested that data were missing at random, supporting the inclusion of participants with missing values in the analyses and using full information maximum likelihood (FIML) to handle missing data (Bollen, 1989). Skewness and kurtosis for all study variables fell in acceptable ranges (i.e., -2 for skewness, -7 for kurtosis) that indicate no substantial deviation from normality (West et al., 1995). To examine changes in PYD over time across income-level groups of countries, as well as the effects of covariates, we used Latent Growth Curve Analysis (LGCA). LGCA estimates both the initial levels (i.e., intercepts) and rates of change (e.g., trajectories) of statistical variables and allows examination of group differences in developmental trajectories and the inclusion of covariates to predict variation in both intercepts and trajectories (Burant, 2016; Byrne & Crombie, 2003; Muthén, 2002; Preacher, 2018).

To investigate the first aim, assessing initial levels of PYD at age 13 and trajectories of PYD from ages 13 to 21 in each of the three income-level groups of countries, unconditional multigroup latent growth curve models with no predictors were estimated. Four different functional growth forms were compared: (1) a nongrowth, intercept-only model where PYD was allowed to vary in the first year but not over time (not including slope); (2) a linear growth model assuming a linear change in PYD over time (including intercept and linear slope); (3) a quadratic growth model estimating the acceleration or deceleration in PYD over time (including intercept, linear, and quadratic slope); and (4) a cubic growth model capturing potential changes in acceleration or deceleration (including intercept, linear, quadratic, and cubic slope). Following convention (e.g., Curran & Bauer, 2011), models using chi-square likelihood ratio tests were compared, retaining the more complex model in case of a significant chi-square difference. Given the limited number of time points (i.e., 5) available for PYD, the cubic term led to estimation issues, and the quadratic model was selected as the best-fitting (see in the Table S2).

Once the best-fitting model was selected, predictors were added and a series of multigroup latent growth curve models (i.e., conditional models) investigated the second and third aims, examining associations of parental warmth and control with initial levels of PYD at age 13 and with trajectories of PYD from ages 13 to 21 at the family level and for the distinct contributions of mothers and fathers. Because between-family and mothers' and fathers'

means were disaggregated, parent-combined warmth and control were investigated first followed by mothers' and fathers' separate warmth and control. Every model used a FIML estimator and included adolescents' gender and parental education as control variables. Final model fit was evaluated using multiple SEM indices, including the Comparative Fit Index (CFI), the goodness of fit (GFI), the root-mean-squared error of approximation (RMSEA), and the standardized root-mean-squared residual (SRMR). Consistent with guidelines, acceptable model fit was indicated by a CFI greater than .90, a GFI greater than .95, an RMSEA less than .08, and an SRMR less than .08 (Kline, 2023). This study was not preregistered. Analysis code is presented in the Final Model Specification subsection of the [Supplementary Materials](#); other materials are available from corresponding author.

RESULTS

Positive youth development: Differences by income-level groups of countries

To test whether PYD trajectories and parent associations with these trajectories differed by income-level groups of countries, multigroup model comparisons were conducted using the chi-square likelihood ratio test. This analysis was performed for both family-level and parent-level models. First, intercepts, trajectories, and regression paths were constrained to be equal across the three income groups (i.e., LMICs, UMICs, and HICs). Then, each path was sequentially freed to vary across groups and the resulting change in model fit compared by using a 1-degree-of-freedom chi-square test. If the chi-square test revealed that freeing paths to vary improved the model fit, the path was left unconstrained. Otherwise, the path remained equal across groups. Through this stepwise procedure, exactly which trajectory and regression paths differed across income-level groups of countries were identified. The [Tables S3](#) and [S4](#) report the results of this comparison and show that, for both family- and parent-level models, intercepts, trajectories, and regression paths were free to vary among all income-level groups of countries. This all-free-to-vary model structure indicated that the grouping division accounted for heterogeneities in PYD intercepts, trajectories, and associations between parenting warmth and control and PYD across different income-level groups of countries. Accordingly, the results reported in the following sections are based on this fully free-to-vary model specification.

Positive youth development: Descriptive statistics, intercepts, and trajectories

Descriptive statistics and correlations for all study measures are shown in [Tables 1](#) and [2](#). [Tables 3](#) and [4](#) report the unconditional and conditional model results, respectively.

TABLE 1 Descriptive statistics for positive youth development, parental warmth, and parental behavioral control in nine countries.

	Positive youth development (PYD)					Parental warmth			Parental behavioral control		
	Age 13	Age 15	Age 16	Age 18	Age 21	Parents	Mothers	Fathers	Parents	Mothers	Fathers
China (<i>n</i> = 123)	3.08 (.76)	2.89 (.59)	2.42 (.59)	n/a	n/a	2.23 (.27)	2.30 (.28)	2.17 (.37)	1.55 (.21)	1.55 (.23)	1.55 (.26)
Colombia (<i>n</i> = 108)	2.75 (.53)	2.73 (.71)	2.79 (.52)	2.90 (.54)	3.07 (.51)	2.76 (.20)	2.77 (.25)	2.75 (.25)	2.29 (.25)	2.33 (.26)	2.24 (.33)
Italy (<i>n</i> = 213)	2.73 (.59)	2.61 (.58)	2.53 (.63)	2.49 (.63)	2.23 (.73)	2.59 (.27)	2.68 (.23)	2.49 (.43)	2.11 (.31)	2.22 (.34)	2.80 (.38)
Jordan (<i>n</i> = 114)	2.79 (.59)	2.79 (.60)	2.40 (.75)	2.3 (.76)	2.19 (.69)	2.53 (.27)	2.59 (.27)	2.46 (.33)	1.77 (.27)	1.82 (.28)	1.72 (.31)
Kenya (<i>n</i> = 100)	3.22 (.68)	3.41 (.43)	2.89 (.61)	3.18 (.56)	2.52 (.75)	2.18 (.30)	2.19 (.33)	2.18 (.32)	2.03 (.19)	2.06 (.23)	1.99 (.24)
Philippines (<i>n</i> = 120)	3.12 (.49)	3.06 (.53)	2.75 (.65)	2.82 (.57)	2.39 (.69)	2.63 (.27)	2.68 (.25)	2.58 (.31)	1.95 (.23)	1.96 (.27)	1.96 (.27)
Sweden (<i>n</i> = 129)	3.09 (.43)	2.83 (.57)	2.5 (.63)	2.62 (.54)	2.4 (.64)	2.73 (.22)	2.78 (.19)	2.69 (.33)	1.65 (.34)	1.66 (.34)	1.64 (.43)
Thailand (<i>n</i> = 120)	2.61 (.62)	2.74 (.54)	2.53 (.59)	2.75 (.63)	2.22 (.77)	2.37 (.33)	2.41 (.35)	2.32 (.39)	1.69 (.24)	1.75 (.26)	1.64 (.31)
United States (<i>n</i> = 311)	3.09 (.55)	2.94 (.57)	2.61 (.69)	2.64 (.73)	2.42 (.75)	2.76 (.22)	2.79 (.19)	2.72 (.33)	2.03 (.35)	2.08 (.35)	1.96 (.45)

Note: *M* (*SD*). n/a means not available.

To investigate the first aim, we explored how PYD is distributed at its intercepts and trajectory changes over time across the three income-level groups of countries (Figure 1). Linear and quadratic trajectories best captured patterns of change in PYD in these groups. Overall, the model fit was acceptable, $\chi^2(12) = 123.02$, $p < .001$, CFI = .919, GFI = .997, SRMR = .060, with the exception of RMSEA = .154. Across all income-level groups of countries, the significant mean of the intercepts indicated that adolescents reported a positive average starting point different from zero at 13 years of age. However, differences emerged when examining the trajectories of each income-level group. As for LMICs, at age 13 adolescents scored an average of 3.50 on the 0–4 point PYD scale. The negative linear slope indicates that PYD declined by an average of .26 points per year from ages 13 to 21. However, the positive quadratic slope suggests that this decline slowed over time at a rate of .02 per year, indicating a decelerating pattern of change in PYD. Overall, therefore, adolescents from LMICs exhibited a trend characterized by a general decline that decelerated in PYD. As for UMICs, at age 13 adolescents scored an average of 2.62 on the PYD scale. However, neither their linear nor quadratic slopes were significant, suggesting that, on average, their PYD did not exhibit a consistent change over time. As for HICs, at age 13 adolescents scored an average of 2.96, which decreased over time at a constant rate of .10 per year. However, this group exhibited no evidence of acceleration or deceleration in the rate of decline of PYD over time because the quadratic slope was not significant.

Combined mother and father warmth and control associations with positive youth development: Family-level analyses

To investigate the second aim, associations of mother and father parental warmth combined, and mother and father parental control combined, at a family level were examined with intercepts and trajectories of PYD over time in the three income-level groups of countries. Overall, the model showed an acceptable fit, $\chi^2(35) = 160.05$, $p < .001$, CFI = .908, GFI = .996, RMSEA = .09, SRMR = .050.

Parental warmth was consistently associated with higher PYD at age 13 in all income-level groups of countries. Specifically, higher levels of parental warmth experienced during childhood were associated with higher PYD scores at age 13 for youth living in LMICs ($\beta = .17$, $p = .047$), UMICs ($\beta = .18$, $p = .041$), and HICs ($\beta = .42$, $p < .001$). However, parental warmth was not associated with changes in PYD over time in any income-level country group. Parental control demonstrated more nuanced effects. In LMICs, higher levels of control were associated with a higher PYD score at age 13 ($\beta = .15$, $p = .050$) as well as a linear increase over time ($\beta = .42$, $p = .024$). In UMICs, higher levels of control were related to a lower PYD score at age 13 ($\beta = -.22$, $p = .015$). In HICs, no significant

TABLE 2 Correlations among positive youth development (PYD), parental warmth, and parental behavioral control in nine countries.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) PYD Age 13	–										
(2) PYD Age 15	.56***	–									
(3) PYD Age 16	.39***	.57***	–								
(4) PYD Age 18	.37***	.55***	.54***	–							
(5) PYD Age 21	.28***	.34***	.37***	.48***	–						
(6) Warmth (parents combined)	.18***	.10***	.14***	.09*	.15***	–					
(7) Warmth (mothers)	.15***	.05	.09***	.01	.10***	.88***	–				
(8) Warmth (fathers)	.19***	.12***	.15***	.14***	.17***	.92***	.62***	–			
(9) Control (parents combined)	.01	.01	.13***	.10***	.13***	.27***	.23***	.27***	–		
(10) Control (mothers)	–.04	–.05	.09***	.05	.10***	.22***	.23***	.18***	.89**	–	
(11) Control (fathers)	.03	.06	.13***	.12***	.13***	.28***	.18***	.31***	.91***	.62***	–

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

associations between control and PYD intercept or trajectory were found. Youth gender was significantly associated with the PYD intercept ($\beta = -.19$, $p = .017$) but not with the PYD trajectory in LMICs, and no association between parental education and PYD was found in LMICs. No effects for youth gender or parent education in UMICs or HICs emerged for intercepts or trajectories.

Individual mother and father warmth and control associations with positive youth development: Parent-level analyses

To investigate the third aim, associations of warmth and control at a parent level (i.e., for mothers and fathers separately) were examined with respect to youth intercepts of PYD at age 13 and trajectories of PYD over time across three income-level groups of countries. Overall, the model showed a good fit, $\chi^2(48) = 177.17$, $p < .001$, CFI = .904, GFI = .995, RMSEA = .08, SRMR = .045. Distinct associations emerged for mothers' and fathers' warmth and control with adolescents' initial levels and slopes of PYD across income-level groups of countries.

Warmth

No associations between mothers' warmth and youth PYD at age 13 or over time emerged in LMICs. Higher levels of mothers' warmth were associated with higher youth PYD at age 13 in UMICs ($\beta = .27$, $p = .006$), with no association with PYD trajectory. Higher levels of mothers' warmth were also associated with higher youth PYD at age 13 in HICs ($\beta = .16$, $p = .002$), where higher levels of mothers' warmth were related to a constant linear decrease over time ($\beta = -.15$, $p = .046$) as well as to a deceleration in the rate of the decline ($\beta = .19$, $p = .035$). By contrast, higher levels of fathers' warmth were only related to higher PYD

at age 13 for adolescents in LMICs ($\beta = .23$, $p = .049$) and in HICs ($\beta = .33$, $p < .001$).

Control

In LMICs, mothers' control was not associated with adolescents' PYD intercept or growth trajectory. In UMICs, higher levels of maternal control were related to lower levels of PYD at age 13 ($\beta = -.37$, $p = .001$), and a steady increase over time ($\beta = .57$, $p < .001$), but also a deceleration in that increase ($\beta = -.73$, $p = .001$). In HICs, mothers' control was unrelated to adolescents' intercept or trajectory of PYD. By contrast, in LMICs higher levels of fathers' control were linked to higher PYD at age 13 ($\beta = .19$, $p = .037$), but also to a decline in the PYD growth over time ($\beta = -.36$, $p = .033$). In UMICs, fathers' control was not associated with the intercept of youth PYD but showed an association with the quadratic slope of PYD ($\beta = .38$, $p = .042$). In HICs, fathers' behavioral control was not associated with adolescents' intercept or trajectory of PYD.

Again, youth gender (but not parental education) was associated with PYD at age 13 ($\beta = -.19$, $p = .016$) for adolescents in LMICs (but gender was not associated with PYD trajectory). No associations of youth gender or parental education with PYD emerged for UMICs and HICs.

DISCUSSION

This longitudinal study explored initial-level intercepts and directions and rates of change in slope trajectories of PYD from early adolescence to young adulthood (age 13 to 21 years) in nine countries divided into three income-level groups, as well as associations of mothers' and fathers' parenting warmth and control with intercepts and trajectories of their adolescents' PYD. The study has several moving

TABLE 3 Unconditional latent growth curve models.

	Lower-middle-income countries		Upper-middle-income countries		High-income countries	
	B (SE)	<i>p</i>	B (SE)	<i>p</i>	B (SE)	<i>p</i>
Intercept	3.5 (.08)	<.001	2.62 (.09)	<.001	2.96 (.06)	<.001
Linear slope	-.26 (.04)	<.001	.05 (.05)	.246	-.10 (.03)	<.001
Quadratic slope	.02 (.01)	.001	-.01 (.01)	.277	.01 (.00)	.208
Fit indices						
$\chi^2(df)$	123.023 (12)					
CFI	.919					
GFI	.997					
RMSEA	.154*					
SMRM	.060					

Note: Values represent unstandardized regression coefficients (B) with standard errors (SE) in parentheses.

**p* < .05.

TABLE 4 Conditional latent growth curve models.

	Family level				Parent level							
	Warmth (parents)		Control (parents)		Warmth (mothers)		Warmth (fathers)		Control (mothers)		Control (fathers)	
	β (SE)	<i>p</i>	β (SE)	<i>p</i>	β (SE)	<i>p</i>	β (SE)	<i>p</i>	β (SE)	<i>p</i>	β (SE)	<i>p</i>
Lower-Middle-Income Countries (LMICs)												
Intercept	.17 (.12)	.047	.15 (.14)	.050*	-.04 (.15)	.727	.23 (.15)	.049	-.04 (.16)	.686	.19 (.14)	.037
Linear slope	-.22 (.05)	.281	.42 (.06)	.024	-.00 (.07)	.997	-.27 (.07)	.354	.10 (.07)	.678	.42 (.06)	.078
Quadratic slope	.14 (.01)	.369	-.27 (.01)	.051[†]	-.07 (.01)	.774	.24 (.01)	.266	.03 (.01)	.865	-.36 (.01)	.033
Upper-Middle-Income Countries (UMICs)												
Intercept	.18 (.18)	.041	-.22 (.21)	.015	.27 (.18)	.006	-.05 (.16)	.649	-.37 (.22)	.001	.09 (.18)	.380
Linear slope	.04 (.10)	.743	.24 (.12)	.051[†]	-.08 (.10)	.572	-.21 (.09)	.103	.57 (.12)	< .001	.10 (.09)	.496
Quadratic slope	-.06 (.01)	.776	-.19 (.02)	.293	.02 (.01)	.913	-.05 (.01)	.826	-.73 (.02)	.001	.38 (.01)	.042
High-Income Countries (HICs)												
Intercept	.42 (.10)	< .001	-.07 (.07)	.171	.16 (.13)	.002	.33 (.08)	< .001	-.01 (.08)	.849	-.06 (.07)	.325
Linear slope	-.11 (.05)	.092	.08 (.01)	.31	-.15 (.07)	.046	-.01 (.04)	.929	.08 (.04)	.331	.03 (.04)	.297
Quadratic slope	.10 (.04)	.141	-.97 (.00)	.201	.19 (.01)	.035	-.06 (.01)	.543	-.13 (.01)	.204	.00 (.01)	.987

Note: Values represent standardized regression coefficients (β) with standard errors (SE). Bold values refer to *p* ≤ .05. Bold values with † refer to *p* = .051.

parts: intercepts of PYD at the beginning of adolescence, slopes of trajectory change in PYD across adolescence into young adulthood, maternal and paternal combined and separate parenting warmth and control associations with PYD, and three levels of national income in nine countries around the globe. In addition, the study included assessments of adolescent gender. Here we unpack these results, discussing PYD intercepts and trajectories across income groups

and combined and separate maternal and paternal warmth and control associations with PYD. The results are compatible with the Specificity Principle, viz. that conditions of specific individuals at specific times residing in specific places moderate specific facets of development in specific ways (Bornstein, 2017, 2019a, 2019b). Here, we focus on significant results for our three aims, including PYD intercept and trajectory, parents' combined and individual parent

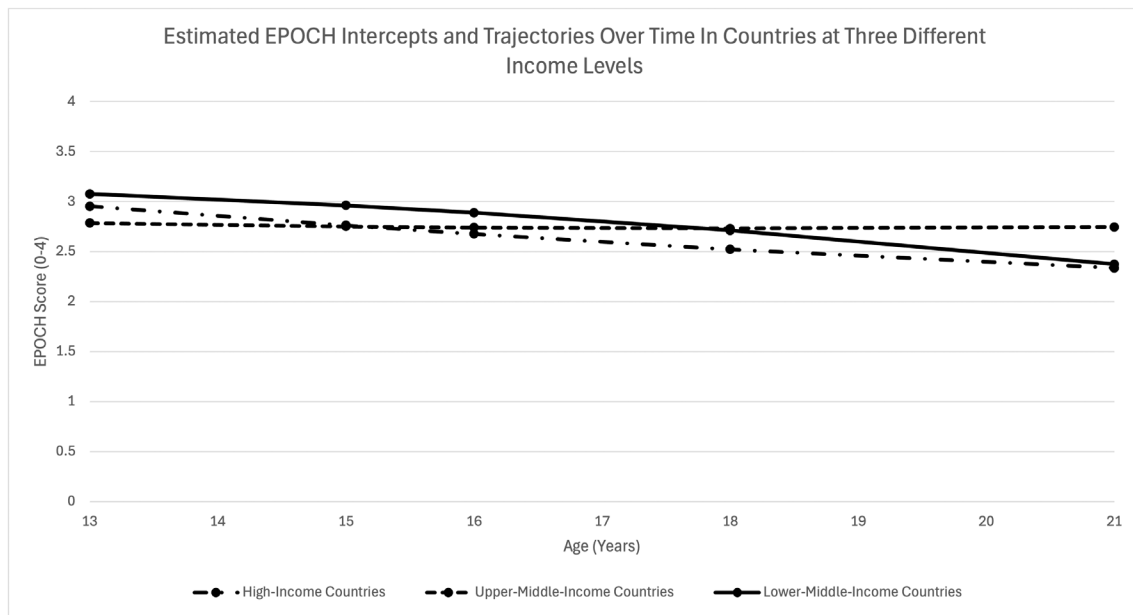


FIGURE 1 Positive youth development intercepts and trajectories for three income-level groups of countries.

associations, the antecedents of warmth and control, and the income level of the country.

Three aims redux

Aim 1: How PYD is distributed at its intercepts and how trajectories of PYD change across adolescence and across three income-level groups of countries. The EPOCH measure of PYD at 13 years differed across the three income groups of countries in a nonmonotonic fashion, with 13-year-olds in LMICs scoring on average around 3.50 (on a 4-point scale), those from UMICs scoring on average 2.62 nearer to midscale, and those from HICs scoring 2.96 midway between the two. Likewise, PYD trajectories differed across the three income-level country groups, with adolescents in LMICs initially declining but later rising in PYD, adolescents in UMICs remaining consistent in PYD along a flat trajectory across age, and adolescents from HICs monotonically declining. Considering specificity, both intercept and trajectory proved sensitive to national income level. As to why adolescents from LMICs start out highest, first decline, and later rise in PYD, why adolescents from UMICs start out lowest and remain there, and why adolescents from HICs start out between the two and then decline in PYD are all challenging findings to explain that should occupy the attention of investigators in the future.

Aim 2: How mother and father parental warmth combined, and mother and father parental control combined, at a family level are associated with intercepts and trajectories of adolescent PYD over time and in the three income-level groups of countries. Higher levels of combined parental warmth and lower levels of combined parental control were hypothesized to relate to higher initial levels of adolescent

PYD and to more positive slopes of growth in PYD across adolescence into young adulthood. In partial support of this hypothesis (and in consonance with the extant literature), mothers' and fathers' combined warmth related positively to adolescent PYD at 13 years but was not associated with PYD slope, adding evidence that caregiving warmth may promote many positive developmental outcomes in children (Rothenberg et al., 2021). In this study, mothers' and fathers' expressions of warmth correlated highly (.62), and so it is likely that coparenting agreement in acting in a warm manner toward their adolescent constitutes a pervasive protective effect on PYD. Once warmth has exercised its positive effect, however, that effect appears to persist unchanged across a substantial portion of the adolescent lifespan leading to adulthood.

Parents' combined control, which was also highly correlated in mothers and fathers (.62), exercised different effects from warmth dependent on intercept, trajectory, and country income level. Hypothetical expectations with respect to control were partially supported as well. Control in LMICs was positively associated with initial levels of adolescent PYD and with a linear increase in PYD across adolescence. Control is exercised more often and may have positive consequences for child development in lower socioeconomic status settings where dangers of various kinds might be more prominent, and so parental control can be adaptive in ensuring positive developmental outcomes in children (e.g., Brody & Flor, 1998; Chao, 2001; Chua, 2011; Lamborn et al., 1991). The fact that parents' combined control would be positively associated with initial levels of adolescent PYD and with a linear increase in PYD across adolescence in LMICs accords with that expectation. Parents' combined control in UMICs was, as hypothesized, associated with lower initial levels of PYD.

Together, these findings indicate that parents' warmth and control are largely independent in their actions (the two shared only 7% common variance) and exercise different consequences for adolescent PYD intercept or trajectory (warmth as a broadly protective factor versus control as a selectively protective, risk, or nonsignificant factor in PYD as conditioned by country income level). This pattern of moderated findings also accords with the Specificity Principle.

Aim 3: How mother and father parental warmth and mother and father parental control each is associated with youth intercepts of PYD at age 13 and trajectories of PYD over time and across three income-level groups of countries. The third aim disaggregated the effects of mothers' and fathers' warmth and control, respectively, on PYD intercepts at the start of adolescence and trajectories across adolescence into young adulthood. Mothers' and fathers' individual levels of warmth were hypothesized to relate to higher initial levels and positive trajectories of growth in adolescent PYD over time across all income-level groups of countries, whereas mothers' and fathers' individual levels of control were hypothesized to relate to adolescent PYD intercepts and slopes in ways that varied across country income level. These hypotheses were also partly supported, and again the results accorded with the Specificity Principle. Among mothers, warmth was unassociated with the adolescent PYD intercept or trajectory in LMICs; warmth was positively related to the PYD intercept but unrelated to the trajectory in UMICs; and warmth was positively related to the PYD intercept and associated with a decrease in the PYD trajectory in HICs. Similarly, maternal control was unassociated with PYD intercept or trajectory in LMICs; negatively associated with PYD intercept, but positively associated with an increase in PYD trajectory in UMICs; and unassociated with PYD intercept or trajectory in HICs. Among fathers, warmth was associated with a higher PYD intercept in UMICs and HICs. Father control was associated with a higher PYD intercept, but a decrease in slope for adolescents in LMICs; there was no association with intercept in UMICs but a quadratic slope; and, finally, no associations for fathers' control with adolescent intercept or slope in HICs.

Mother-adolescent interactions are known to be characterized by higher levels of warmth and conflict compared with those between fathers and adolescents (Fagan, 2022; Timmons & Margolin, 2015). This parenting difference may be attributable to the fact that mothers typically spend more time with their adolescents (Gryczkowski et al., 2010) and assume more responsibility for adolescents' daily care and discipline (Phares et al., 2009), which provides more opportunities for mothers to express parental warmth and control. These findings suggest that mothers' behavioral control functioned as both a protective and risk factor for adolescents in UMICs, being associated with lower PYD at age 13, followed by an increase, and then a subsequent decrease over time. In contrast, fathers' behavioral control (as father and mother combined behavioral control) served as a protective

factor for PYD only among adolescents in LMICs. Notably, among adolescents in HICs, neither parent's behavioral control was related to PYD across adolescence.

Adolescent gender and parental education

Few, if any, consistent effects of adolescent gender or parental education on adolescent PYD intercept or adolescent-to-adult PYD trajectory emerged. At the beginning of adolescence and across adolescence, PYD appears to behave similarly in girls and boys and appears equally associated with parental warmth and control. Similarly, in this sample, adolescent PYD was not associated with parental education. This finding was unexpected considering the extensive (mostly WEIRD) literature emphasizing the relevance of parental education in the developmental assets framework (Benson et al., 2011; Kiadarbandsari et al., 2016). Future re-examination of this result in nonWEIRD contexts is warranted.

Strengths and limitations

The present investigation of adolescent PYD and the roles of mothers', fathers', and adolescents' reports of parenting warmth and control can lay claim to some strengths but also needs admit of some weaknesses. In terms of strengths, the study employs a longitudinal design, with PYD and parenting dimensions measured at multiple time points during adolescence, allowing explorations of associations between parenting and PYD over an extended temporal span. The study also asked about these constructs in the same way across nine countries, and doing so obviates the problem of having to compare and contrast different behavioral forms of the same parenting constructs. The longitudinal design enabled the identification of best-fitting trajectories for each reported parenting domain within the examined timeframe. The study also recruited a large and culturally diverse multinational sample. Because there have been repeated calls for more global research about PYD (e.g., Banati, 2021; Dimitrova & Wium, 2021; Lerner et al., 2019), the inclusion of nine countries in the current sample represents an effort to view PYD research through a more nationally diverse and globally inclusive lens, taking into consideration several countries that are underrepresented in the literature. The study adopts a holistic approach by considering both risk and protective factors that may foster or hinder PYD, focusing on two well-established parenting dimensions known to play key roles in adolescent development, warmth and control. Finally, the study was multi-informant: Mothers, fathers, and adolescents all reported on the two parenting domains at each age. The majority of children throughout the world grow up in family systems with more than a single significant parenting figure, yet the research literature in parenting usually focuses just on mothers.

By the same token, this study has limitations that prompt directions for future research. Participating samples were locally representative of the sites from which they were drawn but are not nationally representative. Therefore, the findings should not be generalized to entire countries beyond (perhaps) the cities included in the study. Moreover, study participants normally came from one city in a given country, and sample sizes were relatively small. This study plumbed mothers', fathers', and adolescents' reported perceptions of parents' warmth and control rather than observed warm and control behaviors. Subjective perceptions might (or might not) align with what parents actually do. Relatedly, a given form of parenting can function in different ways in different cultural contexts (Bornstein, 1995). For example, a parent can show an adolescent warmth physically (e.g., hugging or kissing), verbally (e.g., praising or saying, "I love you."), or symbolically (e.g., through a cultural ritual or preparing a favorite food).

PYD data were collected at multiple time points in this study, but more complex forms of change (i.e., cubic slope) led to some estimation issues. Examining PYD trajectories in the first unconditional model, the relatively high RMSEA suggested that the model's fit could be improved. Reflecting the complexity of modeling growth processes across diverse groups may be partially related to the fact that participants from China reported on PYD at only three time points. Because the Chinese data were later combined with those of other countries with complete longitudinal data to form the UMIC group, the combined group retained sufficient temporal information to estimate the quadratic growth trajectory. However, this decision might have contributed to the RMSEA's low value. Combining countries into three groups based on their economic levels was justified from a statistical perspective but might obscure differences between and within specific countries that will be important to investigate in future research. Despite these limitations, the model's parameters aligned with aims and theoretical hypotheses, supporting its interpretive utility.

Finally, although combining components into a single PYD composite is a widely used approach (Geldhof et al., 2014; Lerner et al., 2021), this strategy may obscure distinct associations between individual PYD dimensions and parenting factors. Our choice was also supported by a strong internal consistency of the overall PYD score, as well as by our primary interest in exploring PYD trajectories and their association with parental warmth and behavioral control across different income-level groups of countries, but future studies might examine how specific dimensions of PYD change over time and how they are associated with specific parenting dimensions.

With respect to follow-up, data collection in this study traced trajectories over time but concluded at age 21 and so did not investigate how such patterns relate to eventual adult adjustment, thereby requiring future studies on PYD and its antecedents into adulthood. Adolescent gender and age were taken into account in the analyses of intercepts and

trajectories, but the analyses did not control for all potentially important variables, such as adolescents' temperament, which may shape their parents' cognitions and practices. Adolescents' reactions to parental practices render the parent-child relationship bidirectional, but these analyses did not consider bidirectional or transactional associations between parents and adolescents. Finally, the study combined mother, father, and adolescent reports of parenting practices to understand how the family as a whole viewed parenting (in accord with the Family Systems Theory tenet that families are greater than the sum of their parts; Bornstein & Sawyer, 2006; Kerig, 2019; Lerner et al., 2019). However, future studies are needed to separate individual reporter perceptions of parenting domains and evaluate whether and how they may be differentially associated with adolescent functioning (Jager et al., 2012, 2016).

Implications for practice and intervention

This study sought to illuminate nomothetic, differential, and idiographic facets of within- and between-country (or between-country grouping) findings in general, then to use such variation in regard to meaningful change across the age span from adolescence to young adulthood, and, finally, to plumb the nature of parenting-PYD relations. These "domains of variation" hold important implications that reflect issues raised by the Specificity Principle (Bornstein, 2017, 2019a, b) about practice and interventions (Geldhof et al., 2014; Lerner et al., 2021). That is, practitioners and the designers of intervention programs seeking to promote PYD must recognize that "one size does not fit all" for youth within or between nations, that not all youth within or between nations follow an identical path from thriving in adolescence to healthy and positive development into the adult years, or—even if mutually beneficial youth-parent relationships are always important—the ways that those relationships are manifested or can be promoted reveal both meaningful group differential and idiographic variation within and across countries and country groupings. Therefore, in designing, enacting, or evaluating the effectiveness of PYD programs or in efforts dedicated to scaling or sustaining a program (Bornstein et al., 2022; Lansford et al., 2022), a set of questions associated with the Specificity Principle must be addressed having to do with what *specific* actions, of which *specific* youth, in what *specific* places (contexts), of what *specific* durations, at what *specific* times in ontogeny, and at what *specific* times in history will result in what *specific* features of PYD? Building answers to these questions into the design and implementation of practices and programs will admittedly make program application more complex. However, if the goal of developmental science is to promote thriving for all youth, then the Specificity Principle-based approach to PYD promises a productive route to enhancing the lives of all young people in the wholeness of their individuality.

CONCLUSIONS

This study highlights country income-level variation in PYD at the start and across the ontogeny of adolescence, as well as relations of maternal and paternal warmth and control with PYD from early adolescence to young adulthood. Specificities of parent, parenting warmth and control, and country income level all appear to condition the start as well as the ontogeny of PYD across adolescence.

AUTHOR CONTRIBUTIONS

Marc H. Bornstein: Conceptualization; writing – original draft; funding acquisition; methodology; validation; visualization; writing – review and editing; supervision. **Laura Gorla:** Conceptualization; formal analysis; writing – original draft; data curation. **W. Andrew Rothenberg:** Conceptualization; formal analysis; writing – review and editing; writing – original draft; visualization; data curation. **Jennifer E. Lansford:** Conceptualization; writing – review and editing; funding acquisition; project administration; data curation. **Dario Bacchini:** Conceptualization; writing – review and editing. **Lei Chang:** Conceptualization; writing – review and editing. **Kirby Deater-Deckard:** Conceptualization; writing – review and editing. **Giovanna Fonseca:** Conceptualization; writing – review and editing. **Laura Di Giunta:** Conceptualization; writing – review and editing. **Kenneth A. Dodge:** Conceptualization; writing – review and editing. **Sevtap Gurdal:** Conceptualization; writing – review and editing. **Daranee Junla:** Conceptualization; writing – review and editing. **Paul Oburu:** Conceptualization; writing – review and editing. **Concetta Pastorelli:** Conceptualization; writing – review and editing. **Ann T. Skinner:** Conceptualization; writing – review and editing. **Emma Sorbring:** Conceptualization; writing – review and editing. **Laurence Steinberg:** Conceptualization; writing – review and editing. **Liliana Maria Uribe Tirado:** Conceptualization; writing – review and editing. **Saengduean Yotanyamaneewong:** Conceptualization; writing – review and editing. **Liane P. Alampay:** Conceptualization; writing – review and editing. **Suha M. Al-Hassan:** Conceptualization; writing – review and editing. **Richard M. Lerner:** Conceptualization; writing – original draft; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors declare they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

All procedures performed in studies involving human participants accorded with ethical standards of the institutional research committee at the Universities involved and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Duke University IRB approved the project 5–5-25 (protocol number 2017–1191), and ethics committees in each other participating site also provided approval.

PATIENT CONSENT STATEMENT

Informed consent was obtained from all individual adult participants included in the study; assent was obtained from children.

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