

The structure and developmental course of Positive Youth Development (PYD) in early adolescence: Implications for theory and practice[☆]

Erin Phelps^a, Stacy Zimmerman^a, A.E.A. Warren^a, Helena Jeličić^b, Alexander von Eye^c, Richard M. Lerner^{a,*}

^a Tufts University, United States

^b University of London, UK

^c Michigan State University, United States

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ABSTRACT

Using data from Grades 5 to 7 of the longitudinal 4-H Study of Positive Youth Development (PYD), this research assessed the structure and development of PYD. Building on Grade 5 findings, that “Five Cs” (Competence, Confidence, Connection, Character, and Caring) could be empirically defined as latent constructs converging on a second-order construct, labeled PYD, we used structural models to assess the fit of this original model for Grades 5, 6, and 7. Results indicated that PYD continued to be a robust construct that can be defined comparably for Grades 6 and 7, as it was in Grade 5. We discuss implications for future research and for applications of the finding that, across the three years of early adolescence that we assessed (about ages 10 to 12), there is continuity in the structure of PYD.

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The positive youth development (PYD) perspective has changed the landscape in science and practice about adolescents (Lerner, Phelps, Forman, & Bowers, 2009; Lerner, 2009). There is burgeoning evidence in support of the key facets of this perspective. All young people have strengths, as demonstrated by their capacity for substantial brain, cognitive, emotional, social, and behavioral changes across the adolescent years (e.g., see Gestsdottir & Lerner, 2007). When these strengths are aligned with resources for healthy growth found in homes, schools, and communities, the positive development of youth will be enhanced (Benson, Scales, Hamilton, & Sesma, 2006). Further, the findings that support the PYD perspective have served to effectively counter, and diminish, the influence of, the “deficit model” of adolescence that dominated theory and research for much of the 20th century.

Given that practitioners and parents are becoming increasingly aware of these findings, there is greater interest in the nature of PYD, its measurement, and its use in settings aimed at enhancing the positive development of young people – homes, schools, and community-based, youth serving programs. Building on past findings from the 4-H Study of PYD (e.g., Lerner et al., 2005), the present research used longitudinal data from the early years of adolescence (Grades 5 to 7, approximately ages 10 to 12) to assess the structure and development of PYD. By clarifying the developmental course of PYD across this portion of early adolescence, we hoped to advance both research about this strength-based approach to youth and, as well, to enhance the empirical base for the construction and use of developmentally-sensitive indices of PYD in applied areas.

The importance of measuring PYD: Research and applied perspectives

As discussed in several recent reviews (J. Lerner et al., 2009; Lerner, 2005, 2009), the roots of the PYD perspective lie in developmental systems theories of human development. These models emphasize that positive, healthy trajectories across life are

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* Corresponding author. Institute for Applied Research in Youth Development, 307 Lincoln-Filene Building, Tufts University, Medford, MA 02155, United States.
E-mail addresses: Erin.Phelps@tufts.edu (E. Phelps), Richard.Lerner@tufts.edu (R.M. Lerner).

the result of mutually beneficial relations between the developing person and aspects of his or her context that support and promote healthy growth (Benson et al., 2006). A key idea associated with the PYD perspective is that these mutually beneficial relations, termed adaptive developmental regulations (e.g., Brandtstädter, 1998, 2006), should lead a young person to make multifaceted contributions – to self, family, community, and civil society, a relation confirmed by Gestsdottir and Lerner (2007) and Zimmerman, Phelps, and Lerner (2007). In short, PYD benefits both individual development and the welfare of the social context that supports the development of all individuals (Lerner, 2004). As such, the importance of measuring PYD is clear for youth development, in the social world of youth, and for applications (e.g., community-based programs) aimed at promoting youth thriving.

However, prior to the launching of the 4-H Study of Positive Youth Development (PYD) (Lerner et al., 2005; Lerner, 2006), there were no measures of PYD. Eccles and Gootman (2002) and Roth and Brooks-Gunn (2003a,b) hypothesized that PYD should be comprised of “Five Cs,” that is, competence, confidence, character, connection, and caring. But, without measures, there was no way to test whether these Cs or PYD covaried across time and in hypothesized directions with youth contributions (a positive relation was expected) and with risk/problem behaviors (an inverse relation was expected) (e.g., Pittman, Irby, & Ferber, 2001; but see Phelps et al., 2007, for a more nuanced view).

Accordingly, to build the foundation for PYD research within the 4-H Study data set, Lerner et al. (2005) used data from the first wave (Grade 5) of the study to provide cross-sectional information about the usefulness of measures of the “Five Cs” as a means to operationalize PYD. Table 1 presents the definitions of the Cs found in Lerner et al. (2005).

In order to assess the usefulness of the theoretical model of PYD, including its relationship with positive and negative outcomes and, as well, the relationships among these outcomes themselves, Jeličić et al. (2007) assessed whether fifth grade scores on PYD covaried across time in theoretically expected ways with these constructs. The authors constructed and tested a structural model to evaluate the relationships simultaneously. They found that the Five Cs created a second order latent PYD construct which was related to three latent constructs for contribution, depression, and risk/problem behaviors in Grade 6, with a correlation between depression and risk/problem behaviors ($CFI = .96$, $RMSEA = .051$ [.045, .057]¹). A two-group model was tested to determine whether there were sex differences in model fit and found not to be a significant improvement. Finally, it should be noted that no relationship was posited between the positive outcome of contribution and the negative outcomes, a demonstration that in this model, decreases in negative outcomes are not a function of increases in positive outcomes, but conceptually and empirically distinct constructs.

Does the structure identified by Lerner et al. (2005) generalize across the early years of adolescent development? To address this question, it is necessary to consider longitudinal evidence about the *course of development* of PYD. As such, more information is needed about the PYD second-order latent construct. Conceptions of developmental change, for instance, the orthogenetic principle (Werner, 1957), would suggest that structures identified at an earlier point in ontogeny should become more differentiated and hierarchically integrated across subsequent portions of development. On the other hand, longitudinal evidence from the study of mental abilities in adolescence (e.g., Fitzgerald, Nesselroade, & Baltes, 1973) suggests that, if orthogenetic change does occur during adolescence, it takes place prior to early on this period (i.e., adult-like structural differentiation of primary mental abilities are in evidence during all of adolescence). Therefore, it remains to be determined whether a structurally stable PYD construct may be found in data across a portion of early adolescence. In addition, it is also possible that, despite the level of continuity in structure that may exist, mean levels of PYD may increase, decrease, or remain constant as participants' age.

As well, of course, the relationship of PYD to other measures of adolescent functioning over time may also vary. The longitudinal data within the 4-H Study permits us to consider the presence of such changes, and in the present research we address two questions about the Five Cs model of PYD. First, is there evidence that the Five Cs model of PYD identified by Lerner et al. (2005) among fifth graders describes the structure of PYD existing in data about sixth and seventh graders? Second, what patterns of constancy and change are associated with the Five Cs model of PYD across the fifth to seventh grade span?

Method

Full details of the methodology of the 4-H Study have been presented in earlier reports (e.g., Lerner et al., 2005). Accordingly, we present here those features of methodology pertinent to the focus of the present article.

Participants

In Grade 5, participants in the 4-H Study came from sites located in 13 states that provided regional, rural–urban, and racial/ethnic diversity. Participants were 1722 fifth grade adolescents and 1161 of their parents. At Grade 6, youth were retested and an additional sample of 976 sixth graders was added to maintain power, to appraise retesting effects, and to form a new longitudinal cohort. A total of 1967 sixth graders and 1313 of their parents participated in Grade 6 data collection, sampled from 34 states across the nation. In Grade 7, in addition to retesting Grade 5 and Grade 6 participants, a new group of 778 participants was added to the sample for the same purposes. A total of 1893 youth and 1043 of their parents from 29 states were included. In all three grades, the sample varied in race, ethnicity, socioeconomic status, family structure, rural–urban location, and geographic region. Table 2 shows sample characteristics for each grade.

¹ LISREL provides a 90% confidence interval for the RMSEA, and we follow this practice in this report.

Table 1

Definitions of the 5Cs of Positive Youth Development.

C	Definition
Competence	Positive view of one's actions in domain specific areas including social, academic, cognitive, and vocational. Social competence pertains to interpersonal skills (e.g., conflict resolution). Cognitive competence pertains to cognitive abilities (e.g., decision making). School grades, attendance, and test scores are part of academic competence. Vocational competence involves work habits and career choice explorations.
Confidence	An internal sense of overall positive self-worth and self-efficacy; one's global self-regard, as opposed to domain specific beliefs.
Connection	Positive bonds with people and institutions that are reflected in bidirectional exchanges between the individual and peers, family, school, and community in which both parties contribute to the relationship.
Character	Respect for societal and cultural rules, possession of standards for correct behaviors, a sense of right and wrong (morality), and integrity.
Caring and Compassion	A sense of sympathy and empathy for others.

Note. Derived from Roth & Brooks-Gunn (2003a).

Attrition in the 4-H sample is not randomly distributed across schools. In Grades 6 and 7, some principals withdrew consent for their schools to participate, and, thus, these students “dropped out” without our having had the opportunity to ask them if they wanted to remain in the study. Consent was most commonly withdrawn due to scheduling and/or time commitment issues.² For example, in one state we were unable to collect Grade 6 data, which resulted in the loss of over 250 participants. Overall, we lost 561 participants in Grade 6 because of the absence of principal or superintendent permission to continue. In turn, however, Grade 5 and Grade 6 attrition for students who were allowed to be asked to remain in the study was only 10%. Of 1967 participants tested in Grade 6, 337 participants (17%) dropped out because of school/site attrition in Grade 7, and there was 21% individual attrition.

The two groups of Grade 5 youth (those who continued into Grade 6 and those who did not) and the two groups of Grade 6 youth (those who continued into Grade 7 and those who did not) were compared on several background and outcome variables to determine differences between the “dropouts” and the youth who continued into the next wave (for details, see Zimmerman et al., 2007). The youth who continued in the study were shown to differ by background variables of race/ethnicity, and urban/rural location, but not by family income, or mothers' education. In terms of race/ethnicity, youth who continued in the study from Grade 5 to 6 and from Grade 7 to 8 were significantly less likely to be Latino/a American and significantly more likely to be European American. In terms of location, youth who continued in the study from Grade 5 to 6 were less likely to come from suburban areas and more likely to come from rural areas. When comparing youth who continued from Grade 6 to 7, the trends were in the same direction, but the only significant difference was the increase in rural youth.

Procedure

For Grades 5, 6, and 7, student questionnaires (SQs) were administered primarily during school and, in a few cases, at after school programs. For each wave of data collection, teachers or program staff gave each student an envelope to take home to his or her parent, what contained a letter explaining the study, consent form, a parent questionnaire (PQ), and a self-addressed envelope for returning the parent questionnaire. For those youth who received parent(s)' consent, data were collected by trained study staff or hired assistants in more distant locations. Administration of the survey began with reading the instructions to youth. Participants were instructed that they could skip any questions they did not wish to answer. Data collection took approximately two hours, which included one or two short breaks. Students' who were unable to be surveyed at their school or 4-H site, because they were either absent during the day of testing or the school superintendent did not allow testing to occur in the school the following year, received a survey in the mail.

Measures

The measures used in the present study were pertinent to the assessment of the latent structure and latent growth of the 5 Cs of PYD. The information was collected from the SQs. Information about SES is described at the end of this section and was obtained from the PQs.

The Five Cs are measured using subscales from the following measures: the *Profiles of Student Life-Attitudes and Behaviors Survey* (PSL-AB; Benson, Leffert, Scales, & Blyth, 1998), *Monitoring the Future* (2000), the *Self-Perception Profile for Children* (SPPC; Harter, 1982), the *Peer Support Scale* (Armsden & Greenberger, 1987) from the *Teen Assessment Project Survey Question Bank* (Small & Rodgers, 1995), the *Eisenberg Sympathy Scale* (ESS; Eisenberg et al., 1996), and the Empathic Concern Subscale of the *Interpersonal Reactivity Index* (IRI; Davis, 1980). Detailed information regarding the measurement of each of the Cs is presented below.

Three of the Cs, Competence, Character, and Caring, have been revised since Grade 5, based on our emerging definitions of each C. For Character and Competence, we decided that our original definitions needed to be enhanced by drawing from other scales in the SQ. In this case, we have simply substituted the new versions at all three Grades. For Caring, new items were added in Grade 6 because we believed that the original five items did not capture Caring in fifth graders. After analyzing the Grade 6 data, the original five items were deleted from the Grade 7 questionnaire.

² Reasons given by principals and superintendents included: “The survey takes too much time out of class;” “Because of state-mandated testing, we don't have time;” and “We have too many requests from researchers to do them all.”

Table 2

Sample characteristics for each wave.

	Wave 1	Wave 2	Wave 3
<i>Number of students</i>	1722	1967	1893
Lost/added		731/976	852/778
Age (mean, SD)	10.97 (0.53)	12.09 (0.70)	13.07 (0.68)
Female (n, %)	887 (51.5%)	1122 (57.0%)	1122 (59.3%)
Annual family per capita income (mean, SD)	\$13657 (8348)	\$13656 (8621)	\$16553 (10631)
Mothers' education, in years (mean, SD)	13.66 (2.40)	13.94 (2.51)	14.16 (2.31)
<i>Participant's geographic location (n, %)</i>			
Northeast: CT, DE, MA, MD, NH, NJ, NY, PA, RI	657 (38.2%)	448 (22.8%)	349 (18.4%)
North Central: IL, KS, MI, MN, MO, OH, WI	142 (8.2%)	419 (21.3%)	667 (35.2%)
Southeast: AL, FL, KY, NC, SC, TN, TX, VA	482 (28.0%)	625 (31.8%)	484 (25.6%)
West: AZ, ID, MT, OR, WA	438 (25.4%)	469 (23.8%)	391 (20.7%)
<i>Race/ethnicity (n, %)</i>			
African American	130 (7.5%)	146 (7.4%)	157 (8.3%)
Asian American	68 (3.9%)	51 (2.6%)	51 (2.7%)
American Indian	51 (3.0%)	57 (2.9%)	43 (2.3%)
European American	917 (53.3%)	1,184 (60.2%)	1,271 (67.1%)
Latino/a American	305 (17.7%)	307 (15.6%)	213 (11.3%)
Multiracial	81 (4.7%)	90 (4.6%)	77 (4.1%)
Inconsistently reported	113 (6.6%)	113 (5.7%)	71 (3.8%)
Missing	57 (3.3%)	19 (1.0%)	10 (0.5%)
<i>Parent marital status (n, %)</i>			
Married or cohabiting, currently	872 (76.6%)	1,031 (75.9%)	970 (82.1%)
Single: never married	70 (6.1%)	95 (7.0%)	44 (3.7%)
Single: divorced, separated, widowed	167 (14.7%)	210 (15.5%)	155 (13.1%)
<i>Location (n, %)</i>			
Urban	471 (27.4%)	528 (26.8%)	400 (21.1%)
Suburban	772 (44.8%)	653 (33.2%)	649 (34.3%)
Rural	477 (27.7%)	782 (39.8%)	805 (42.5%)

As with any longitudinal project, researchers' conceptions about constructs and measures may change with experience and their own intellectual development, as well as that of the participants (Phelps & Colby, 2002). We have revised our ideas about how to measure the C of Caring slightly. This change will be described and incorporated into models presented below. Here we describe the measures as used in this report.

The Competence construct has been revised since Grade 5 based on our emerging definitions. In Grade 5, Competence was defined as Academic Competence, Social Competence, and School Engagement. In Grade 6, the competence measure was revised following an intensive evaluation of the measures in order to more accurately capture the latent construct of Competence during the developmental period under study. The revised version differs from the original in two important ways: 1) the deletion of the School Engagement subscale, and 2) the addition of a Physical Competence subscale. First, it was decided that the construct of School Engagement was not a measure of Competence. Second, in order to have a more comprehensive measure of Competence, that would assess multiple domains, we added a subscale of Physical Competence.

Six items from the Self-Perception Profile for Children (SPPC; Harter, 1982) form the academic competence scale, six of the items form the social competence scale, and six items form the physical competence scale. As mentioned above, the SPPC uses a structured alternative response format. An example of an item from the academic competence scale is "Some kids feel like they are just as smart as other kids their age BUT Other kids aren't so sure and wonder if they are as smart." Alphas for Grades 5, 6, and 7 were .70, .78, and .80, respectively. An example of an item from the social competence scale is "Some kids have a lot of friends BUT Other kids don't have very many friends." Alphas for Grades 5, 6, and 7 were .62, .74, and .71, respectively. An example of an item from the Physical Competence scale is "Some kids do very well at all kinds of sports BUT Others don't feel that they are very good when it comes to sports." Alphas for Grades 5, 6, and 7 were .66, .74, and .75, respectively.

Confidence is defined by two scales, positive identity and self-worth. Six items measure positive identity (Theokas et al., 2005) and come from the Search Institute's Profile of Student Life-Attitudes and Behaviors Survey (PSL-AB; Benson et al., 1998). The response format for these six items ranged from 1 = strongly agree to 5 = strongly disagree. An example of an item used to measure positive identity is "On the whole I like myself." Alphas for Grades 5, 6, and 7 were .70, .80, and .80, respectively.

Six items form the self-worth scale from the Self-Perception Profile for Children (SPCC; Harter, 1982). Harter (1982) developed a structured alternative response format to assess perceived competence in a domain. Participants are asked to choose between two types of people. Once they have selected which person they are most like, they are asked to decide if it is "really true for me" or "sort of true for me." The items are counterbalanced so that half begin with a positive sentence, reflecting high competence, while half begin with a negative sentence, reflecting low competence. Each item is scored from 1–4, with 4 reflecting higher perceived

competence. An example of an item used to assess self worth is “Some kids don't like the way they are leading their lives BUT Other kids do like they way they are leading their lives.”

To index Connection, 22 of the items from the student questionnaire were used to measure the subscales of connection to family (six items), school (seven items), and community (five items). All of the items measuring connection to family, connection to school, and connection to community come from the PSL-AB (Benson et al., 1998).

Five of the items measuring connection to family, six of the items used to measure connection to school, and all of the items used to measure connection to community use the forced choice response format ranging from 1 = *strongly agree* to 5 = *strongly disagree*. An example of an item measuring connection to family is “My parents give me help and support when I need it.” An example of an item measuring connection to school is “I get a lot of encouragement at my school.” An example of an item measuring connection to community is “Adults in my city or town make me feel important.”

The sixth item measuring connection to family, “If you had an important concern about drugs, alcohol, or sex, or some other serious issue, would you talk to your parent(s) about it?,” uses a forced choice response format ranging from 1 = *yes* to 5 = *no*. The seventh item measuring connection to school, “How often do you feel bored at school?” uses a forced choice response format ranging from 1 = *usually* to 3 = *never*. These responses were rescaled to a 1 – 5 point scale. Alphas for connection to family in Grades 5, 6, and 7 were .79, .84, .86, respectively; alphas for connection to school in Grades 5, 6, and 7 were .78, .82, .75, respectively; and alphas for connection to the community in Grades 5, 6, and 7 were .87, .85, .89, respectively.

The four items used to measure connection to peers come from the *Teen Assessment Project Survey Question Bank* (TAP; Small & Rodgers, 1995). These items, in which participants must decide how true a statement is for them, measure Peer Support (Armsden & Greenberger, 1987) and use a forced choice response format that ranges from 1 = *always true* to 5 = *almost never true or never true*. An example of an item is “My friends care about me.” Alphas for Grades 5, 6, and 7 were .89, .89, .89, respectively.

Eighteen items from the Search Institute's *Profile of Student Life-Attitudes and Behaviors Survey* were originally used to measure Character for Grade 5 (PSL-AB; Benson et al., 1998). These items index the subscales of Interpersonal Skills, Valuing of Diversity, Personal Values, and Social Conscience. In Grade 6, the Character construct was revised, again following an intensive evaluation of the measures used for Grade 5, with the goal of increasing the validity of this measure. This revision involved the deletion of the Interpersonal Skills items and the addition of a Behavioral Conduct measure. It was determined that the construct of Interpersonal Skills has a closer theoretical association with the overarching construct of Competence (in the social domain) than with Character. As such, it was concluded that the omission of Interpersonal Skills would increase the validity of Character, while also affording a more parsimonious measure.

For the five items that measure Personal Values and the six items that measure Social Conscience participants are asked to rate how important each item is in their lives. Response formats range from 1 = *not important* to 5 = *extremely important*. An example of an item measuring Personal Values is “Telling the truth, even when it's not easy,” while an example of an item measuring Social Conscience is “Helping other people.” Alphas for Grades 5, 6, and 7 were .88, .91, .84, respectively for Personal Values, and .92, .93, .88, respectively for Social Conscience.

One of the items used to measure Valuing of Diversity, “getting to know people who are of different race than I,” uses the same response format as above for measuring importance. The remaining three items used to measure Valuing of Diversity and the three items used to measure Interpersonal Skills ask participants to think about the people who know them well and how they think they would rate them on each of the items. The response format ranges from 1 = *strongly agree* to 4 = *strongly disagree*. An example of an item used to measure Valuing Diversity is “Enjoying being with people who are a different race than I am.” Alphas for Grades 5, 6, and 7 were .68, .81, .89, respectively.

Behavioral Conduct was measured by six items from the Self-Perception Profile for Children (Harter, 1982). An example of an item from the Behavioral Conduct scale is “Some kids *usually* do the right thing BUT Other kids often *don't* do the right thing.” Alphas for Grades 5, 6, and 7 were .67, .76, .77, respectively.

At Grade 5, the *Eisenberg Sympathy Scale* (ESS; Eisenberg et al., 1996) was used to measure Caring. The items measure the degree to which participants feel sorry for the distress of others. The response format for these items ranged from 1 = *really like you* through 3 = *not like you*. High scores indicate low levels of sympathy. An example of an item from ESS is “I feel sorry for people who don't have the things I have.” Alphas for Grades 5 and 6 were .87 and .90, respectively. This will be referred to as the Sympathy construct.

As with any longitudinal project, researchers' conceptions about constructs and measures may change with experience and their own intellectual development, as well as that of the participants (Phelps & Colby, 2002). We have revised our ideas about how to measure the C of Caring slightly. This change will be described and incorporated into models presented below.

At Grade 6, the Eisenberg Sympathy items were modified and four experimental items were added, resulting in a nine-item caring measure. The four new items were adapted from the Empathic Concern Subscale of the *Interpersonal Reactivity Index* (IRI; Davis, 1980). Example items include “It makes me sad to see a person who doesn't have friends” and have the same response format. Davis (1980) reports adequate reliability and validity for this scale. In Grade 7, the original five items were dropped from the questionnaire. Alphas for Grades 6 and 7 were .86 and .85, respectively. This will be referred to as the Caring construct.

For the structural equation models to be discussed, individual items were combined to form packets in order to enhance reliability. For the five Sympathy items, the average of the first three items form the first packet and the average of the fourth and fifth item form the second packet. For the nine Caring items, the average of three sets of three items form packets 1, 2, and 3.

Finally, two measures of family socioeconomic status (SES) were used: Mother's education and annual family per capita income. Highest level of mother's education reported is used in the event that it changes during the Grade 5 to 7 period. Because the autocorrelation for family per capita income between the three waves was highly and significantly correlated ($r = .81, .87, .89$,

$p < .001$), average family per capita income was computed for each participant, based on available data (1, 2, or 3 waves). The mean (SD) of this composite variable was \$14,407 (\$9150). For analysis, per capita family income was transformed with a square root transformation to render the distribution more normal, and divided by 10 to constrain its range to be similar to other measures.

Missing data

Ideally every participant would answer every question every year and we would have complete data. Since this is not the case in our large, multi-site sample for our over 350-item, Grade 5, 6, and 7 SQs, we have developed strategies for estimating missing data, based on current statistical thinking (Allison, 2002; Graham, Cumsille, & Elek-Fisk, 2003; Jeličić, Phelps, & Lerner, *in press*) and assumptions we make about the responses. This approach is considered clearly preferable to deleting cases with missing data, which can yield a biased sample. Our estimation of missing data is done at two levels in this report: 1. Item non-response in measures, missing measures or variables; and 2. Participant non-response for a wave due to attrition or absence.

Item non-response refers to the situation where some of the items for a measure were not completed. In general we assume that the items used to measure a given construct or subscale are sampled from a universe of possible items related to this construct. Second, we assume that the responses to any one of the items are related to the construct in the same way that responses to any of the other items are. Based on these assumptions, we believe that the items and the responses both reflect only a subset of possible items and responses that are all functionally equivalent, and we typically assign scale scores to participants who have complete data on at least 50% of the items that compose a given scale. This decision was based on the above-noted assumptions, on high alphas for the measures (.70 to .93), and one additional decision rule – that, whenever possible, we should base an individual participant's values on the data they provided to us, rather than on imputing values from other variables or data from other participants.

Missing data ranged from 6% to 64% across variables. This range includes missing data due to non-participation in a wave. Missing data for each participant were imputed whether the data were missing because of wave non-response or item non-response. To maximize statistical power, replacement values for missing data were estimated using the Expectation-Maximization (EM) algorithm as implemented in SYSTAT 12.0 (www.systat.com). Auxiliary variables from each wave were used for imputation of missing subscale data at each wave, and included measures of intentional self-regulation and depression that are not included in the present set of analyses (Collins, Schafer, & Kam, 2001). All measurement models were computed using a complete data file with 2,888 participants across three grades; that is, data for participants who were added at later waves or who were absent from earlier waves were imputed.

Results

The current report addressed two questions about the Five Cs model of PYD: 1. Is there evidence that the Five Cs model of PYD identified by Lerner et al. (2005) among fifth graders describes sixth and seventh graders as well? 2. What patterns of constancy and change are associated with the Five Cs model of PYD across the fifth to seventh grade span? Table 3 presents descriptive statistics for the subscales to be used in the following analyses, for both original data and imputed data. It should be noted that in earlier work, random effects regression analyses showed that the effect of clustering students within schools was minimal and thus is not controlled for here. For example, Jeličić et al. (2007) conducted random effects regression analyses with Grade 6 data; the intra-class correlation coefficients were all under .05 (ns).

The original Lerner et al. (2005) model

Lerner et al. (2005) demonstrated the empirical validity of the Five Cs and the construct of PYD with fifth graders in order to provide a foundation for using these measures in longitudinal research on youth thriving. Here we sought to extend this work to six and seventh graders by determining whether there is evidence of a latent construct of PYD as youth develop and whether it can be operationalized by lower-order latent constructs representing the Five Cs. Specification of the measurement model of the Five Cs proceeded through multiple steps in the first wave and is described in detail in Lerner et al. (2005). To summarize their approach and findings, confirmatory factor analysis (CFA) was conducted to assess the adequacy of the *a priori* model; subsequent analyses were used to assess model improvement following theoretically based modifications. LISREL 8.54 (Jöreskog & Sörbom, 1996), using maximum likelihood estimation on the covariance matrix from a PRELIS 2.0 file (Jöreskog & Sörbom, 1996), was used for all CFA analyses. The initial model contained 19 manifest indicators (subscales); five first order latent factors, one for each of the Five Cs; and one second-order latent factor, representing the PYD construct. All hypothesized pathways were significant, and the model had a reasonably good fit, $\chi^2 = 1933$, $df = 147$, $p < .01$; root mean square error of approximation (RMSEA) = 0.085 [.081, .088]; and the comparative fit index (CFI) = 0.94. The Five Cs of PYD model was therefore retained and subjected to model-improving modifications. In the final model, correlations among the residual errors for some indicators were permitted, specifically for subscales from the Harter SPPC scale (Harter, 1998), since they share method variance not accounted for by the model. In addition, selected residual errors were allowed to correlate between indicators within factors. Taken together, these modifications also improved model fit, $\chi^2 = 552$, $df = 134$, $p < .01$; RMSEA = 0.043 [.039, .047]; CFI = 0.99.

Table 3
Descriptive statistics for subscales.

Actual samples	Grade 5		Grade 6		Grade 7		Possible range
	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	
<i>Confidence</i>							
Positive identity (6 items)	1073	8.54 (2.27)	1361	8.76 (2.31)	1763	8.87 (2.23)	0–12
Self-worth (6 items)	1328	9.73 (2.00)	1352	9.68 (1.76)	1496	9.70 (1.75)	0–12
<i>Competence</i>							
Academic (6 items)	1340	9.45 (2.16)	1345	9.66 (1.83)	1501	9.66 (1.78)	0–12
Grades (1 item)	1263	3.34 (0.68)	1428	3.32 (0.69)	1620	3.30 (0.76)	0.50–4.00
Social (6 items)	1339	9.35 (2.07)	1341	9.58 (1.91)	1502	9.58 (1.84)	0–12
Physical (6 items)	1338	9.47 (1.82)	1338	9.46 (1.82)	1498	9.41 (1.93)	0–12
<i>Character</i>							
Personal values (5 items)	1017	9.17 (2.68)	1320	8.78 (2.71)	1763	9.15 (2.37)	0–12
Social conscience (6 items)	1038	9.01 (2.82)	1329	8.61 (2.77)	1777	9.14 (2.38)	0–12
Values diversity (4 items)	1290	8.20 (2.75)	1257	8.35 (2.53)	1746	8.28 (2.49)	0–12
Conduct behavior (6 items)	1330	9.54 (2.04)	1339	9.72 (1.73)	1497	9.65 (1.73)	0–12
<i>Connection</i>							
Family (6 items)	1404	10.09 (1.95)	1502	9.94 (2.08)	1692	9.19 (2.37)	0–12
Community (5 items)	1191	7.67 (2.70)	1396	7.37 (2.58)	1576	6.83 (2.63)	0–12
Peer (4 items)	1481	9.81 (2.61)	1551	9.71 (2.57)	1476	9.48 (2.5)	0–12
School (7 items)	1220	8.61 (2.07)	1411	8.18 (2.18)	1599	8.25 (1.79)	0–12
<i>Caring</i>							
Sympathy (5 items)	1417	2.60 (0.51)	1432	2.54 (0.55)			1–3
Caring (9 items)			1254	3.83 (0.85)	1745	3.92 (0.778)	1–5
<i>Imputed samples (n = 2888)</i>							
	Grade 5		Grade 6		Grade 7		Possible range
	Mean (SD)		Mean (SD)		Mean (SD)		
<i>Confidence</i>							
Positive identity	8.55 (1.64)		8.74 (1.80)		8.86 (1.83)		0–12
Self-worth	9.73 (1.46)		9.63 (1.30)		9.65 (1.31)		0–12
<i>Competence</i>							
Academic competence	9.45 (1.59)		9.60 (1.37)		9.57 (1.39)		0–12
Grades (1 item)	3.33 (0.54)		3.28 (0.58)		3.25 (0.65)		0.50–4.00
Social competence	9.33 (1.51)		9.51 (1.41)		9.51 (1.42)		0–12
Physical competence	9.34 (1.44)		9.42 (1.31)		9.37 (1.44)		0–12
<i>Character</i>							
Personal values	9.18 (1.81)		8.81 (2.01)		9.10 (1.93)		0–12
Social conscience	9.04 (1.93)		8.63 (2.06)		9.10 (1.95)		0–12
Values diversity	8.17 (1.97)		8.32 (1.85)		8.23 (2.01)		0–12
Conduct behavior	9.55 (1.48)		9.68 (1.29)		9.59 (1.32)		0–12
<i>Connection</i>							
Family	10.10 (1.54)		9.94 (1.71)		9.18 (1.99)		0–12
Community	8.00 (1.95)		7.40 (1.99)		3.00 (2.13)		0–12
Peer	9.83 (1.94)		9.69 (2.00)		9.42 (1.94)		0–12
School	8.64 (1.52)		8.19 (1.74)		7.87 (1.56)		0–12
<i>Caring</i>							
Sympathy packet 1 (3 items)	2.58 (0.39)		2.54 (0.42)				1–3
Sympathy packet 2 (2 items)	2.63 (0.41)		2.53 (0.44)				1–3
Caring packet 1 (3 items)			3.83 (0.63)		4.00 (0.66)		1–5
Caring packet 2 (3 items)			3.75 (0.66)		3.80 (0.68)		1–5
Caring packet 3 (3 items)			3.88 (0.77)		3.93 (0.83)		1–5

Fit of the five Cs model in Grades 5, 6, and 7

For the current analyses, LISREL 8.8 was used to re-estimate the Grade 5 model with the modified definitions of the latent constructs and to estimate, as well, models for Grades 6 and 7 (Jöreskog & Sörbom, 2003). For each latent variable the parameter for the indicator variable with the smallest variance was fixed to 1. The maximum likelihood method was used to analyze the covariance matrix from a PRELIS file that consisted of 2,888 cases and three waves of data. Model fit was evaluated through the following fit indices: Minimum Fit Function Chi-Square, RMSEA, and CFI (Hu & Bentler, 1999; Jackson, Gillaspay, & Pure-

Table 4
Model fit statistics for cross-sectional models.

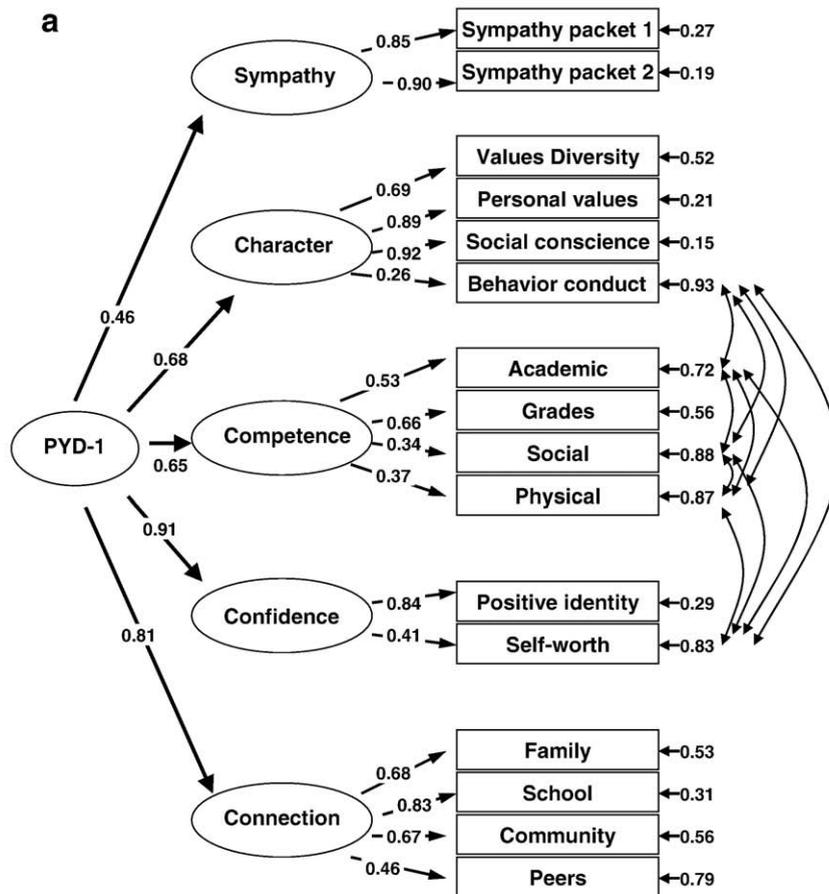
	Grade 5		Grade 6		Grade 7	
	M1	M2	M1	M2	M1	M2
χ^2	2611.22	1185.7	5330.11	1867.34	2879.09	2234.86
df	99	89	147	136	114	107
Change in χ^2		1425.52		3462.77		644.23
RMSEA	0.094	0.065	0.111	0.066	0.098	0.083
Confidence interval	(.091, .097)	(.062, .069)	(.108, .113)	(.064, .069)	(.095, .101)	(.080, .086)
CFI	0.930	0.967	0.907	0.971	0.932	0.950

Note. M1 (model 1): no correlated residuals. M2 (model 2): correlated residuals for Harter subscales.

Stephenson, 2009; MacCallum & Austin, 2000). Factor loadings were assessed for statistical significance at the $p < .01$ level. Model fit indices are summarized in Table 4.

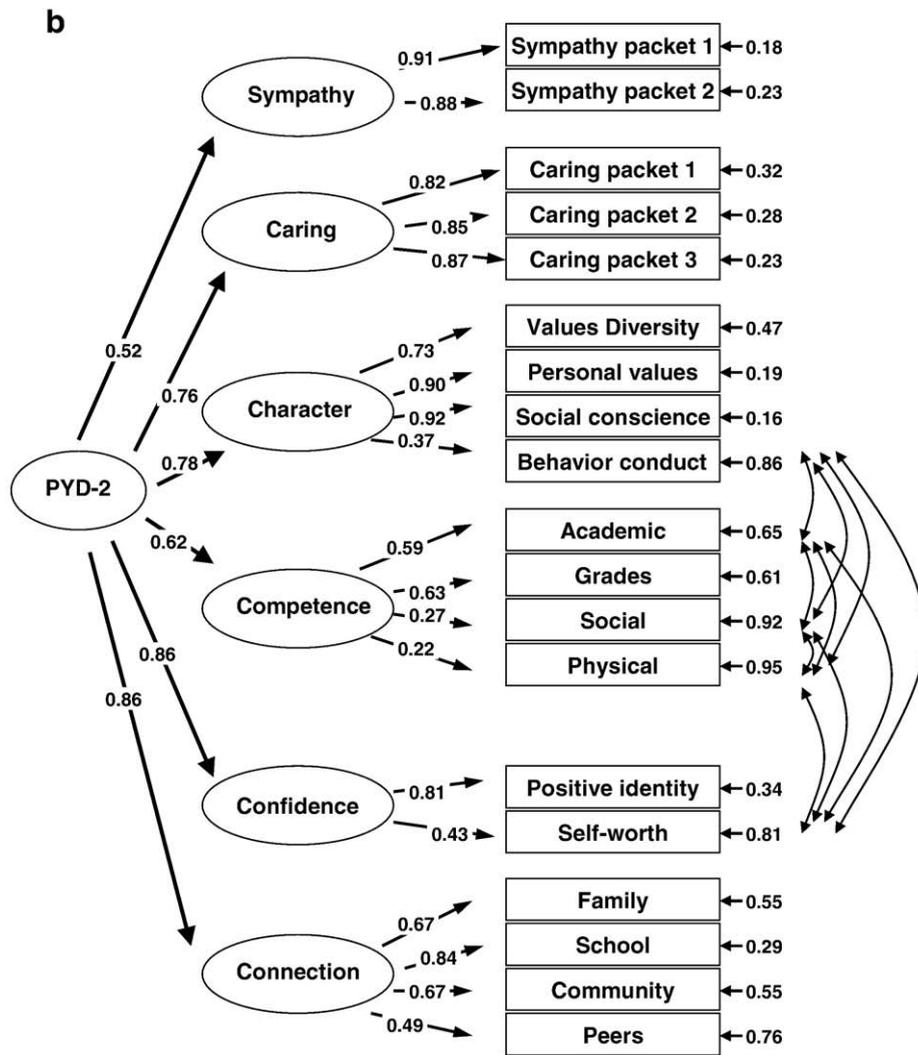
Two main models were tested for each of Grades 5, 6, and 7, using the revised versions of the Cs. In the first set of models, the theoretically specified relationships between indicator (subscale) and latent variables are included. For Grade 6, both Sympathy and Caring indicators were used to estimate the latent variable of Caring. In the second set of models, all Harter subscale residuals were allowed to correlate. Improvement in fit between Models 1 and 2 for each Grade was tested and found to be significant.

The final models for Grades 5, 6, and 7 are shown in Fig. 1. Although the model χ^2 indicates model – discrepancies at all three waves, it is sensitive to sample size. With large sample sizes, the χ^2 statistic can become unreasonably powerful at detecting discrepancies between the model and the data and, under realistic conditions, perfect model fit is not to be expected (Bollen,



$\chi^2 = 1185.70$, $df = 89$, $p < .001$; $RMSEA = .065$ [0.0620 ; 0.0687] ; $CFI = 0.967$

Fig. 1. a. Grade 5 PYD measurement model with standardized parameter estimates. b. Grade 6 PYD measurement model with standardized parameter estimates. c. Grade 7 PYD measurement model with standardized parameter estimates.



$\chi^2 = 1926.85$, $df = 136$, $p < .001$; RMSEA = .068 [0.0649 ; 0.0702] ; CFI = 0.971

Fig. 1 (continued).

1989). Following prior recommendations, we evaluated fit using the RMSEA (Steiger & Lind, 1980), a measure of fit per degree of freedom and sensitive to model misspecification (Hu & Bentler, 1995), with a 90% confidence interval. A value of .08 or less indicates a close fit (Browne & Cudeck, 1993). In addition, we used the CFI with the recommended cutoff value of 0.95 (Hu & Bentler, 1999).

As shown in Table 5, for Grade 5, standardized factor loadings for the subscales ranged from .26 through .92, indicating that the Five Cs factors accounted for 7% through 83% of the indicators' variance. This explained variance ranged from 21% for Sympathy to 85% for Confidence. For Grade 6, standardized factor loadings for the subscales ranged from .29 through .92, and the Five Cs factors accounted for 8% through 83% of the indicators' variance. This explained variance ranged from 36% for Competence to 78% for Confidence. For Grade 7, standardized factor loadings for the subscales ranged from .20 through .86, and the Five Cs factors accounted for 4% through 90% of the indicators' variance. This explained variance ranged from 36% for Competence to 90% for Connection.

Longitudinal model of PYD in Grades 5, 6, and 7

In order to evaluate the factor structures identified in each of the three waves of data longitudinally, a model of PYD across the three Grades was tested. To assess the developmental course of PYD across Grades 5, 6, and 7, CFA was conducted to assess the degree to which the longitudinal covariance model of the Five Cs and PYD model fit the data at Grades 5, 6, and 7. For these models, we used the models described above for Grades 5, 6, and 7 with correlated residuals for the Harter scales, and we estimated a structural model with PYD correlated across Grades 5, 6, and 7. In addition, correlated residuals across time for each of the 5 Cs

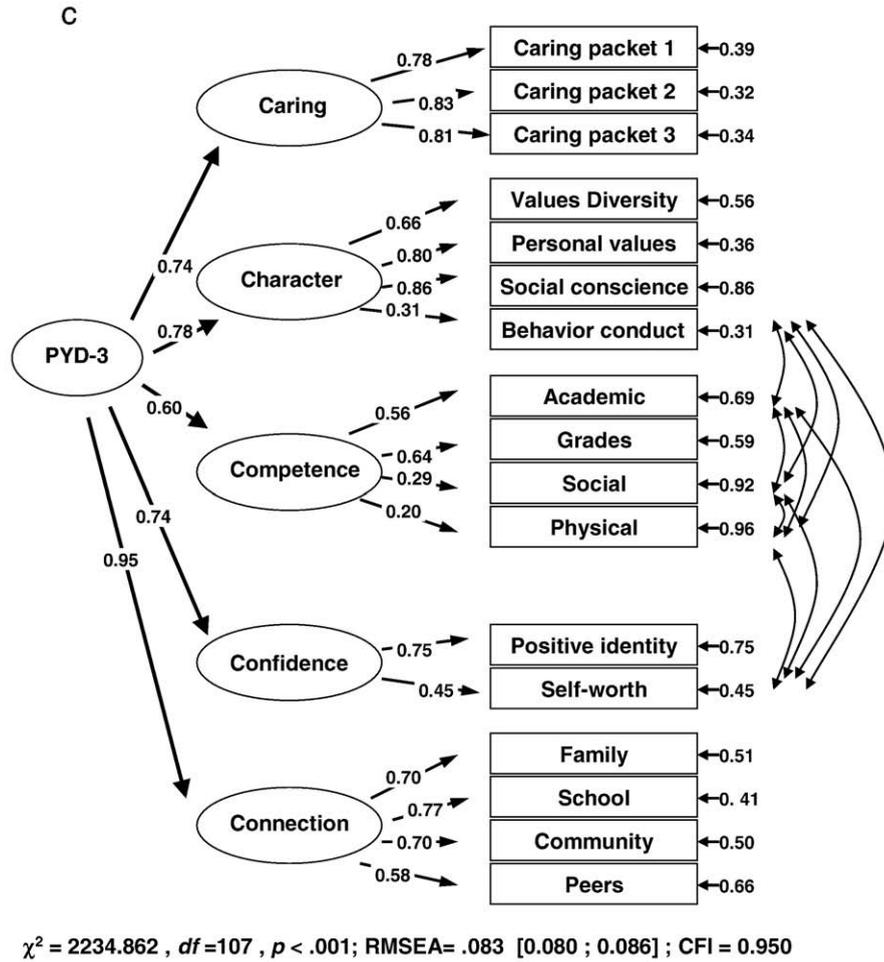


Fig. 1 (continued).

were added for Grade 5 to Grade 6 and Grade 6 to Grade 7. This model resulted in a good fit ($\chi^2 = 17741.13$, $df = 1192$, $p < .01$; RMSEA = 0.069 [0.068, 0.070]; CFI = 0.954). The correlations across PYD at the three grades were 0.88 and 0.89 for Grades 5 to 6 and Grades 6 to 7, respectively; the correlation between PYD from Grade 5 to Grade 7 was 0.79. The structural part of the longitudinal model is displayed in Fig. 2 (cF. Gestsdóttir, Lewin-Bizan, von Eye, Lerner, & Lerner, 2009-this issue).

Change in PYD across Grades 5, 6, and 7

Given the structural model of PYD, the variables for the Five Cs were computed as the average of each component for each Grade. Then PYD was computed for each grade as the mean of the Five Cs, and scaled to range from 0 to 10. Descriptive statistics are shown in Table 6. The Sympathy Scale for Grade 6 had a lower mean than the Caring Scale for Grade 6; thus, the Sympathy Scale was standardized to have the same mean and standard deviation as the Caring Scale, to make the constructs comparable over time.

A multilevel model was created to evaluate change in PYD across Grades 5, 6, and 7, and as well, to look at sex and SES differences in change (per capita income and mother's education). With PYD centered at Grade 6, there was a small, but significant decline in PYD over time [$F(2888) = 57.30$, $p < .001$]. There were significant sex differences such that girls had higher PYD than boys [$F(2888) = 160.02$, $p < .001$], and significant positive relations between PYD and both income [$F(2888) = 40.79$, $p < .001$] and mother's education [$F(2888) = 40.53$, $p < .001$]. Change in PYD did not differ for girls and boys, nor did change differ by income or mother's education. Two- and three-way interactions were tested and found to be non-significant in all analyses.

Discussion

Prior to the launching of the 4-H Study of PYD (Lerner et al., 2005), the idea that the Five Cs could be used to depict the positive outcomes of community-based, youth development programs (Eccles & Gootman, 2002; Roth & Brooks-Gunn, 2003a,b) remained

Table 5

Measurement models for Grades 5, 6, and 7 PYD (standardized estimate, residual errors).

	Grade 5	Grade 6	Grade 7
<i>Confidence</i>			
Positive identity	0.84	0.82	0.75
Self-worth	0.41 (.032)	0.43 (.027)	0.45 (.035)
<i>Competence</i>			
Academic competence	0.53	0.62 (.046)	0.56 (.048)
Grades	0.66 (.021)	0.6	0.64
Social competence	0.34 (.037)	0.29 (.039)	0.29 (.040)
Physical competence	0.37 (.036)	0.24 (.035)	0.20 (.039)
<i>Character</i>			
Personal values	0.89 (.037)	0.90 (.038)	0.80 (.043)
Social conscience	0.92 (.041)	0.92	0.86 (.045)
Values diversity	0.69	0.73	0.66
Behavioral conduct	0.26 (.028)	0.37 (.024)	0.31 (.026)
<i>Caring</i>			
Sympathy, packet 1	0.85	0.44	
Sympathy, packet 2	0.90 (.013)	0.44 (.005)	
Caring, packet 1		0.82 (.022)	0.78
Caring, packet 2		0.85 (.023)	0.83 (.013)
Caring, packet 3		0.87 (.028)	0.81 (.016)
<i>Connection</i>			
Family	0.68	0.67	0.70 (.050)
School	0.83 (.036)	0.84 (.040)	0.77 (.041)
Community	0.67 (.043)	0.67 (.043)	0.70 (.053)
Peers	0.46 (.041)	0.49 (.042)	0.58
<i>PYD</i>			
Confidence	.907 (.022)	0.885 (.021)	0.74 (.025)
Competence	.651 (.036)	0.632 (.031)	0.60 (.030)
Character	.675 (.024)	0.761 (.023)	0.78 (.026)
Caring	.455 (.024)	0.742 (.035)	0.74 (.022)
Connection	.813 (.027)	0.873 (.026)	0.95 (.032)

a conceptual, and not an empirical, tool. However, researchers sought to empirically assess a still-emerging strength-based, positive view about the capacities for positive development among all adolescents. As well, practitioners and parents sought ways to speak about and measure characteristics of a thriving young person. Both groups began to show increasing interest in using the Five Cs to depict the characteristics of a healthy young person.

Using Wave 1 (fifth grade) data from the 4-H Study of PYD, Lerner et al. (2005) assessed the Five Cs through a set of 77 self-reported responses to a questionnaire. The original findings from fifth graders demonstrated that the measures of the Five Cs could be combined into a second order latent variable, PYD, and that PYD was positively related to youth Contribution. While an important contribution to both ongoing PYD research and to practitioners seeking a useful means to appraise the status of thriving among young people, and/or to index the influences of their programs on youth development, there remained no assessment of whether the structure of PYD identified among fifth graders was present as well in subsequent years within, at least, the early portion of adolescence. There was no information about the structural development of PYD.

The present research addressed these issues by using longitudinal data from Grades 5 to 7 of the 4-H Study. Employing a version of the Cs that was revised slightly from the one used initially with fifth graders, confirmatory factor analyses of PYD were conducted with data from sixth and seventh graders, and a structural model was used to combine the models of PYD to examine longitudinally the structure of PYD across fifth to seventh grades. Results indicated that PYD continued to be a robust construct that can be defined comparably for Grades 6 and 7. In addition, across the three years of early adolescence that we assessed in the present study (i.e., Grades 5 to 7 corresponding to about ages 10 to 12 years), there is continuity in the structure of PYD.

These findings afford the developmental appraisal of PYD as a robust index that can be defined for Grades 5, 6, and 7. In regard to mean level changes over time we found that, as youth enter middle school, moving from Grade 5 to Grades 6 and 7, their levels of PYD decrease slightly, a trend we will follow carefully through the rest of middle school and across high school. In addition, levels of PYD are higher for girls than for boys and are positively related to SES.

Accordingly, we believe that there are at least two benefits of the present research. First, researchers have a valid means to assess PYD in early adolescence. Because such an index precludes problems of interpretation introduced by uncertainty about the underlying constructs, the findings of the present study provide researchers the opportunity to delineate patterns of covariation between the PYD construct and positive and negative “outcomes” of such development. They may follow theoretically predicted

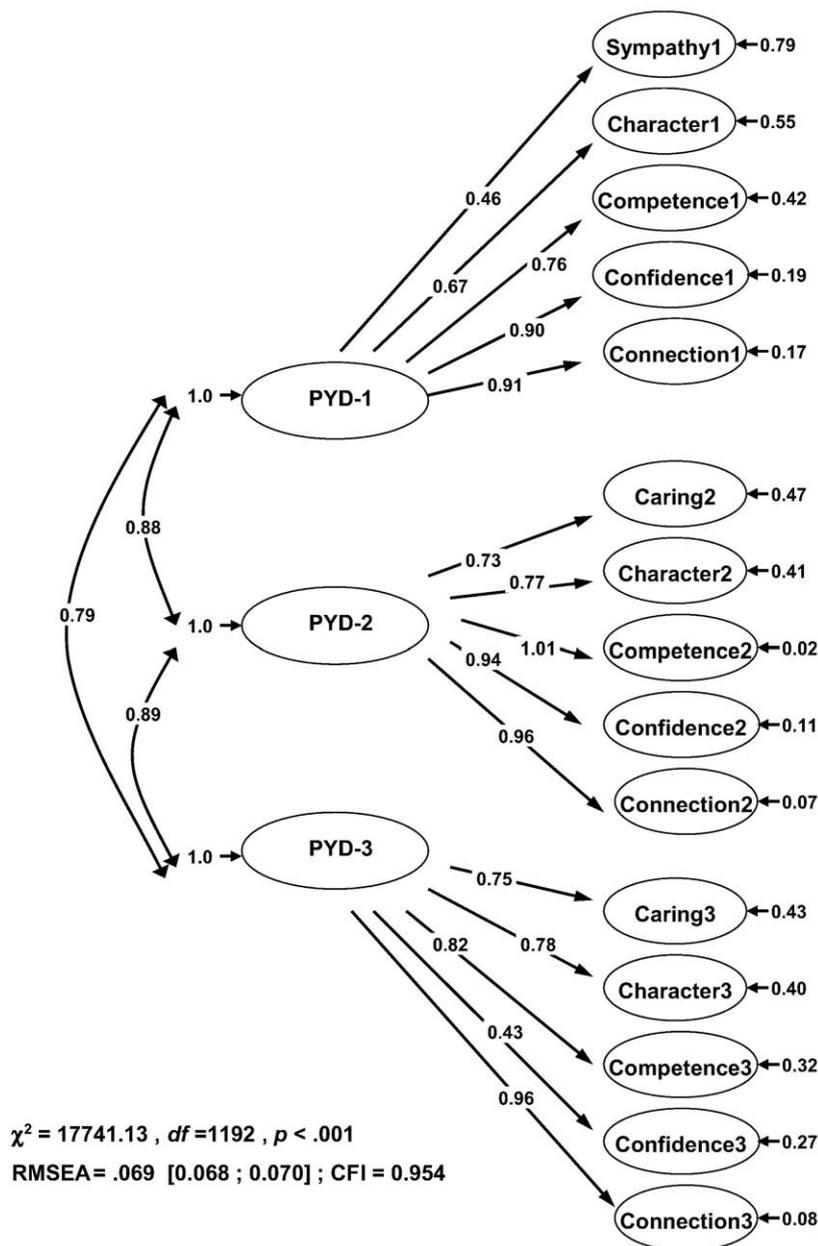


Fig. 2. Structural part of longitudinal PYD measurement model for Grades 5, 6, and 7, with standardized parameter estimates.

courses of change (e.g., see Benson et al., 2006; Lerner et al., 2009; Lerner & Steinberg, 2009) or more nuanced links among trajectories of positive and problematic outcomes (e.g., see Phelps et al., 2007). Second, the indices of the Five Cs and of the overall concept of PYD deriving from the present research provide parent, teachers, and youth development program leaders with a means to use a common vocabulary to discuss, and a tool to measure, PYD among young adolescents.

There are of course limitations of this research. The 4-H Study participants are not a randomly selected, nationally representative sample; thus, the nature of the 4-H Study sample, along with the attrition in the study affects the generalizability of the results. As with most longitudinal studies, the composition of the sample changes over time. In this study, the sample became more “white” and less urban as participants moved from Grades 5 to 6 and Grades 6 to 7. However, the samples did not vary by SES. We believe, nevertheless, that the robustness of our findings among what is a large and diverse sample of youth supports the application of a concept of PYD, with of course cautions that, as with any measure of psychosocial functioning, it too must be used in a manner sensitive to the specific characteristics of diversity of a given group.

Another potential limitation might be considered to be our revision of three of the Cs, Competence, Character, and Caring, based on our emerging definitions of each C. However, this reflects the dynamic nature of longitudinal research in several important

Table 6Descriptive statistics for PYD scores ($n = 2888$).

	Girls		Boys		Total	
	Mean	SD	Mean	SD	Mean	SD
PYD (ranges 0–10)						
PYD, grade 5	7.74	0.80	7.40	0.91	7.59	0.87
PYD, grade 6	7.70	0.86	7.32	0.90	7.53	0.90
PYD, grade 7	7.62	0.88	7.29	0.85	7.47	0.89
	7.69	0.85	7.33	0.89	7.53	0.88
Correlations with average PYD						
Mother's education	0.184					
Per capita family income	0.182					

ways (Phelps & Colby, 2002). Over time, researchers gain experience about the phenomenon under study and theoretical understanding may shift as well. Participants develop naturally within their environments and measures may need to be updated in order to preserve their meanings as youth get older. In fact, in our view, this evolution of our measures is a strength of our work, in that we have the opportunity to improve our understanding of development and how we study it.

Finally, given that we can successfully model PYD with multiple indicators and over time, and consider some individual and family characteristics that may affect the course of the development of thriving, future work will be able to address constructs not addressed in this paper, such as adaptive developmental regulation and the role of individual and contextual developmental assets in promoting PYD. These components are crucial to consider with the developmental systems approach to PYD (Lerner, 2004; Lerner et al., 2009) and, in particular, to our future efforts to identify the individual and ecological bases of healthy, positive development among diverse adolescents.

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