

Contents lists available at [ScienceDirect](#)

Journal of Adolescence

journal homepage: [www.elsevier.com/locate/jado](http://www.elsevier.com/locate/jado)

## Activity-specific pathways among duration of organized activity involvement, social support, and adolescent well-being: Findings from a nationally representative sample



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### ARTICLE INFO

#### Article history:

Received 23 September 2016

Received in revised form 28 April 2017

Accepted 19 July 2017

Available online 28 July 2017

#### Keywords:

Organized activity involvement

Substance use

Self-esteem

Physical activity

Social support

### ABSTRACT

Using data from  $N = 10,148$  American youth ( $M_{\text{age}} = 15.18$ ) who participated in the National Comorbidity Survey Adolescent Supplement, we tested whether duration of involvement in specific organized activities was associated with different sources of social support, and whether these links explained the health-related benefits affiliated with participation. Duration of involvement in certain activities was differentially associated with support from peers, teachers, and other adults, and many of these links partially mediated associations between involvement and well-being. Specifically, greater duration of sports involvement was indirectly associated with higher self-esteem and greater physical activity through greater adult support. Greater duration of club involvement was indirectly associated with greater physical activity through higher adult support and greater duration of music involvement was indirectly associated with lower substance use and greater self-esteem through greater teacher support. Prolonged engagement in specific activities may cultivate certain types of supportive relationships, which may promote adolescent well-being.

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Participation in organized activities such as sports, music, honor society, student council, yearbook, and clubs is an important component of positive youth development (PYD; Mahoney, Larson, & Eccles, 2005). Organized activity involvement provides youth with opportunities to learn new skills and abilities, develop self-confidence, and establish high-quality social relationships. Research supports the promotive effects of organized activity involvement, and has shown that greater participation is associated with multiple indices of health and well-being, including higher self-esteem, lower depression, and lower substance use (Darling, 2005; McHale et al., 2005). The benefits of organized activity participation may be especially pronounced for youth who have been involved for a greater duration of time, which may allow continued exposure to the social and developmental assets affiliated with the activity (Darling, 2005; Fauth, Roth, & Brooks-Gunn, 2007).

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One health-related benefit of prolonged engagement in organized activities is the ability to establish broad networks of social support. Sustained involvement in organized activities may provide youth with the time and opportunity to cultivate supportive peer and adult relationships, which may in turn promote physical and psychological health (Bohnert, Fredricks, & Randall, 2010). Some evidence suggests that supportive relationships with activity leaders may partially explain associations among overall activity involvement and lower engagement in substance use (Viau, Denault, & Poulin, 2015). However, specific types of organized activities provide distinct developmental benefits (Farb & Matjasko, 2012), which may include differential access to social support from peers, teachers, and other non-parental adults. Less is known about whether duration of involvement in specific organized activities offer opportunities to cultivate a diverse network of social support, and whether these associations explain the health and well-being benefits of involvement. Using a large nationally representative sample, we examined whether duration of participation in specific organized activities (sports, music, newspaper/yearbook, student council/honors society, clubs/organizations) was associated with multiple sources of social support (peer, teacher, other adult), and whether these associations partially explain the health and well-being benefits affiliated with activity involvement.

## 1. Organized activity involvement and positive youth development

The majority of research examining organized activity involvement within a PYD framework has been guided by ecological theoretical models. These models posit that development occurs through bidirectional interactions between individuals and multiple elements of their contexts, including families, peers, schools, and communities (Overton, 2013). Organized activities represent one element of youths' micro-ecological context that encompasses several adult-led organizations, including sports, music, honor society, student council, yearbook, and clubs. Participation in these activities is theorized to provide adolescents with several resources that promote positive adjustment (Mahoney et al., 2005), and youth involved in organized activities report lower internalizing and externalizing symptoms, higher academic achievement, and higher levels of civic engagement compared to those uninvolved (Darling, 2005; Ferris, Oosterhoff, & Metzger, 2013; Fredricks & Eccles, 2006).

Researchers have also argued that organized activity involvement is multidimensional, and adolescents may participate in organized activities at varying levels of breadth, intensity, and duration (Bohnert et al., 2010). *Breadth* of organized activity participation refers to the number of specific activities in which youth are involved. *Intensity* typically refers to the average number of hours or weeks spent within each activity, and *duration* references the number of calendar or school years spent in each activity. Greater breadth, intensity, and duration of organized activity involvement are theorized to provide youth with distinct benefits, and each of these dimensions may independently contribute to PYD (Vandell, Larson, Mahoney, & Watts, 2015).

## 2. Duration of organized activity involvement and adolescent health and well-being

The majority of research on organized activity involvement has focused on breadth or intensity (Farb & Matjasko, 2012), thus the focus here is on duration. Duration of activity involvement may be particularly relevant for adolescent self-esteem, physical activity habits, and substance use. Developing skills and abilities that promote health and well-being often requires time. Greater duration of organized activity involvement provides youth with longer exposure to the benefits affiliated with participation, which may allow greater time to acquire resources that enhance well-being and practice health-related skills. This may include assimilating with the cultural milieu of certain activities, building self-competence within a given craft, and establishing positive relationships with peers and community members (Bohnert et al., 2010). Additionally, greater duration of activity involvement (as opposed to breadth or intensity) increases the likelihood that the assets affiliated with participation will overlap with developmental differences in youths' motivations for adopting certain skills such as positive physical health habits (Garcia et al., 1995). Empirical evidence supports links between duration of specific organized activity involvement and adolescent health and wellbeing. Whereas greater duration of involvement in clubs (including student government) and arts is associated with lower substance use and higher self-worth, greater duration of involvement in sports is associated with higher levels of substance use but lower depression (Fauth et al., 2007; Fredricks & Eccles, 2006). Prolonged engagement in sports, clubs, and arts may offer youth distinct contexts, features, and structures that differentially promote health and well-being (Farb & Matjasko, 2012).

## 3. Duration of organized activity involvement and social support

One way duration of organized activity involvement may promote health and well-being is by providing opportunities to acquire social support from community adults, teachers, and peers (Simpkins, Eccles, & Becnel, 2008). Some evidence suggests that greater duration of overall activity involvement is associated with greater support from activity leaders and better integration into activity peer groups (Viau et al., 2015). However, it is unknown whether these links extend to a broader range of social support and whether certain activities facilitate the acquisition of social support better than others. Involvement in specific activities may provide youth with opportunities to cultivate social support from several diverse sources. For instance, involvement in sports, music, and student council may offer more frequent opportunities to talk with teachers outside of the classroom (Broh, 2002), which may include conversations about upcoming or past performances or ways the student body can improve the curriculum. In contrast, adolescents' involvement in clubs often provides opportunities for community

outreach (Hansen, Larson, & Dworkin, 2003), which may facilitate greater interactions and ties with non-parental community adults. Further, youth involved in clubs and arts experience fewer negative interactions with their peers compared to youth involved in other activities (Hansen et al., 2003), suggesting that clubs and arts may facilitate positive peer relations. Thus, specific forms of activity involvement may provide access to distinct sources of social support. In turn, this increased social support may promote health and well-being by facilitate positive views of the self (Hoffman, Ushpiz, & Levy-Shiff, 1988), discourage engagement in health-risk behavior (Wills, Resko, Ainette, & Mendoza, 2004), and encourage engagement in health-promoting behaviors (Duncan, Duncan, & Strycker, 2005).

#### 4. Methodological considerations

Examining the intersection between duration of organized activity involvement, social support, and well-being requires certain methodological considerations. Levels of youth organized activity involvement, self-esteem, substance use, and physical activity systematically vary across several demographic characteristics, including age, gender, race, and parents' education (Bachman et al., 2014; Sallis, Prochaska, Taylor, Hill, & Geraci, 1999; Vandell et al., 2015). Additionally, higher achieving youth and those with greater parental warmth may engage in organized activities for a longer duration of time and have a broader network of social support from peers, teachers, and other adults (Sallis et al., 1999). Accounting for variation in academic achievement may be particularly important given that teachers may engage in more supportive behavior with students that earn higher grades in school. Thus, to address these potential confounds, all analyses controlled for demographic characteristics (age, gender, race/ethnicity, parents' education) academic achievement, and parental warmth. Prior research has also demonstrated that the benefits derived from organized activities may vary for adolescent boys and girls and for youth enrolled in middle school versus high school (Farb & Matjasko, 2012). Although little research has examined these potential differences with regards to duration of activity involvement, social support, and adolescent well-being, the current study explored whether associations between these constructs were moderated by adolescent gender or grade.

#### 5. Current study

The central aim of this research was to test whether duration of involvement in specific organized activities is associated with different types of social support, and whether these links partially explain the health and well-being benefits affiliated with activity involvement. Based on prior research (e.g., Fredricks & Eccles, 2006), we hypothesized that greater duration of involvement in music, clubs, and honors society/student council would be associated with lower substance use, greater involvement in sports, clubs, and honors society/student council would be associated with greater self-esteem, and greater involvement in sports would be associated with greater physical activity. Additionally, based on prior research (Broh, 2002), we hypothesized that greater duration of involvement in sports, music, and honors society/student council would be associated with greater teacher support, greater duration of involvement in sports and clubs would be associated with greater adult support, and greater duration of involvement in arts and clubs would be associated with greater peer support. Further, we generally expected that duration of involvement in specific activities would be indirectly associated with indicators of health and well-being through greater peer, teacher, and adult support.

#### 6. Method

##### 6.1. Participants

Data were taken from the National Comorbidity Survey Adolescent Supplement (NCS-A; Kessler, 2013). The NCS-A is a nationally representative epidemiological survey conducted in the United States between 2001 and 2004. The NCS-A surveyed over 10,000 adolescents between 13 and 18 years old to estimate the prevalence of DSM-IV disorders and potential correlates, including indices of personality, developmental contexts, and physical health. Additional details of the NCS-A are available elsewhere (Kessler et al., 2009). This study utilized the total sample of youth included in the NCS-A ( $N = 10,148$ ). Adolescents ( $M_{age} = 15.18$ ,  $SD = 1.51$ ) were 51.1% female and identified as White (55.7%), Black (19.3%), Hispanic (18.9%), and other (6.1%). Parents of adolescents varied in their highest achieved education level; 33.1% of youth had at least one parent earning a college degree, 19.7% had at least one parent complete some college, 30.5% had at least one parent complete high school, and 16.7% had neither parent complete high school.

##### 6.2. Measures

###### 6.2.1. Duration of organized activity involvement

Duration of organized activity involvement was assessed through youths' free-response report of the number of school years they were involved in five separate activities: *sports teams*, *band/orchestra/chorus*, *student newspaper/yearbook*, *student council/honor society*, and *other clubs/teams/organizations*. Higher values indicated greater duration of involvement within each specific activity<sup>1</sup>.

### 6.2.2. Peer support

Peer support was assessed with 2 items taken from a larger battery included in the NCS-A to assess general social networks. Youth answered questions stating: (1) “How much can you rely on friends when you have a serious problem?” and (2) “How much can you open up to friends and talk about worries?”. Responses were given on a 4-point scale from 1 (*not at all*) to 4 (*a lot*). Given the few number of items, correlation coefficients were used to evaluate internal consistency, with acceptable values of  $r > 0.30$  (Nunnally & Bernstein, 1994). Correlations between the two items were  $r = 0.34$ , indicating acceptable internal consistency. Higher values indicated greater peer support.

### 6.2.3. Teacher support

Teacher support was measured with 3 items ( $\alpha = 0.66$ ) taken from a pool of 9 items designed to assesses school bonding. These items were consistent with measurement recommendations of teacher support outlined by Libbey (2004) and assessed youths' agreement with a series of statements (e.g., “Most of my teachers treat me fairly”). Responses were given on a 4-point scale from 1 (*not at all*) to 4 (*very*). Higher values indicated greater teacher support.

### 6.2.4. Adult support

Adult support was measured using 2 free-response items included in the NCS-A to assess general social networks. Participants provided estimates of (1) the number of adults they felt comfortable talking to about personal problems and (2) the number of adults that cared about them and would help them if they were in trouble. Internal consistency was acceptable ( $r = 0.46$ ; Nunnally & Bernstein, 1994). Higher values indicated greater adult support.

### 6.2.5. Self-esteem

Self-esteem was measured with 5 items ( $\alpha = 0.73$ ) adapted from the Rosenberg Self-Esteem Scale (Gray-Little, Williams, & Hancock, 1997) in which youth rated their agreement with a variety of statements (e.g., I am a person of worth, at least equal with others) on a 4-point scale from 1 (*not at all true*) to 4 (*very true*). Higher scores indicated greater self-esteem.

### 6.2.6. Substance use

The NCS-A protocol measured youths' substance use in the context of structured interviews meant to determine the presence of alcohol, tobacco, and substance use disorders. From these interviews, 3 items ( $\alpha = 0.72$ ) were selected to capture adolescents' alcohol, marijuana, and tobacco use in the past year. Youth reported the frequency that they (1) had at least 1 drink in the past 12 months (2) and used marijuana/hash in the past 12 months on a 6-point scale from 1 (*never*) to 6 (*nearly every day*). Participants also provided a free-response report of the number of days that they smoked at least 1 cigarette, cigar, or pipe in the last 12 months. Responses for tobacco use were rescaled to range from 1 to 6. Higher values for each item indicated greater substance use.

### 6.2.7. Physical activity

Physical activity was measured with 2 items included in the NCS-A to measure frequency of vigorous physical exercise. Youth rated how often they engaged in vigorous physical activity that lasted for 15 minutes or longer and increased their heart rate during the summer and winter. Responses were given on 5-point scale from 1 (*never*) to 5 (*several times a week or more*). Internal constancy was acceptable ( $r = 0.57$ ; Nunnally & Bernstein, 1994). Higher values indicated greater physical activity.

### 6.2.8. Academic achievement

Academic achievement was assessed with a single-item self-report question in which youth rated whether their grades were 1 (*currently below average*), 2 (*average*), or 3 (*currently above average*). Higher ratings indicated greater academic achievement.

### 6.2.9. Parental warmth

Parental warmth was assessed with 8 items ( $\alpha = 0.79$ ) adapted from the care dimension of the Parental Bonding Instrument (Parker, Tupling, & Brown, 1979) in which participants rated their agreement with 4 statements about their mother figure (e.g., “How much love and affection did your mother figure show you”) and 4 identical statements about their father figure. Responses were given on a 4-point scale from 1 (*not at all*) to 4 (*a lot*). Mean scores were calculated with higher values indicating greater overall parental warmth.

### 6.2.10. Demographics

Participants reported their age, gender, and race/ethnicity. Reports of parents' education level were also provided in terms of number of school years completed.

## 6.3. Analytic technique

Latent variable structural equation models were used to test associations among duration of organized activity involvement, social support, and well-being. We first estimated a measurement model by specifying item-level latent variables encapsulating self-esteem, substance use, physical activity, peer support, teacher support, and adult support. Multi-group

**Table 1**  
Descriptive statistics and bivariate correlations among study variables.

	Range	M	SD	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
1. Gender	—	—	—	0.00	0.00	0.00	0.09**	-0.07**	-0.06**	0.17**	0.10**	0.12**	0.13**	0.15**	-0.02*	0.10**	-0.12**	-0.05**	-0.20**		
2. Race/Ethnicity	—	—	—		0.05**	0.29**	0.16**	0.05**	0.22**	0.17**	-0.01	0.06**	0.10**	0.11**	0.16**	0.06**	0.05**	0.08**	0.21**		
3. Age	13–18	15.18	1.51			0.00	0.01	-0.13**	0.12**	0.05**	0.03*	0.05**	0.16**	0.07**	0.00	-0.03*	0.03*	0.32**	-0.03**		
4. Parents' Education	0–20	13.81	2.89				0.26**	0.06**	0.21**	0.22**	0.05**	0.16**	0.17**	0.05**	0.15**	0.05**	0.10**	-0.04**	0.19**		
5. Academic Achievement	1–3	2.29	0.57					0.07**	0.16**	0.16**	0.09**	0.29**	0.19**	0.05**	0.12**	0.21**	0.16**	-0.12**	0.14**		
6. Parental Warmth	1–4	3.54	0.46						0.07**	0.02	0.00	0.04**	0.01	0.11**	0.16**	0.24**	0.23**	-0.19**	0.09**		
7. Sports	0–12	2.47	2.69							0.17**	0.10**	0.22**	0.23**	0.11**	0.14**	0.08**	0.13**	-0.01	0.29**		
8. Music	0–12	1.52	2.04								0.08**	0.18**	0.20**	0.07**	0.10**	0.10**	0.02*	-0.07**	0.08**		
9. Newspaper/Yearbook	0–12	0.29	0.78									0.21**	0.17**	0.03*	0.06**	0.06**	0.03**	-0.02	0.03**		
10. Honors Society/Council	0–11	0.69	1.32										0.31**	0.06**	0.12**	0.12**	0.10**	-0.07**	0.11**		
11. Clubs/Organizations	0–12	1.09	1.68											0.08**	0.14**	0.10**	0.08**	-0.05**	0.10**		
12. Peer Support	1–4	3.20	0.72												0.12**	0.11**	0.11**	0.03**	0.06**		
13. Adult Support	0–78	5.31	5.05													0.14**	0.13**	-0.04**	0.14**		
14. Teacher Support	1–4	3.27	0.60														0.15**	-0.20**	0.05**		
15. Self-Esteem	1–4	3.48	0.55															-0.11**	0.14**		
16. Substance Use	1–6	1.36	0.83																	-0.02	
17. Physical Activity	1–6	4.86	1.41																		1.00

Notes: \*\* $p < 0.01$ , \* $p < 0.05$ . For the purposes of space, latent variable indices for social support and health variables were collapsed into a single scale. Gender is coded 1 = male, 2 = female. Race/Ethnicity is coded 0 = non-white, 1 = white.

**Table 2**  
Factor loadings for social support and health and well-being indicators from the measurement model.

Items	Factor Loadings			
	$\beta$	B	SE	R <sup>2</sup>
<b>Peer Support</b>				
1. How much can you rely on friends when you have a serious problem?	0.44	0.38	0.03	0.19
2. How much can you open up to friends and talk about worries?	0.77	0.66	0.05	0.60
<b>Teacher Support</b>				
1. Most of my teachers treat me fairly	0.59	0.34	0.01	0.34
2. I like my teachers	0.60	0.51	0.02	0.36
3. I care a lot about what my teachers think of me	0.70	0.44	0.02	0.49
<b>Adult Support</b>				
1. How many adults have you ever had in your life who you felt comfortable talking to about personal problems?	0.70	2.95	0.20	0.49
2. How many adults have you ever had who cared a lot about how you turned out and who would help you if you got into trouble?	0.66	5.00	0.31	0.44
<b>Substance Use</b>				
1. Past year at least one drink of alcohol	0.70	0.69	0.03	0.49
2. Past year smoke at least one cigarette, cigar, or pipe	0.65	0.75	0.04	0.42
3. Past year use marijuana or hashish	0.66	0.59	0.03	0.43
<b>Self-Esteem</b>				
1. Overall, I am satisfied with myself	0.58	0.38	0.02	0.34
2. At times I think I am no good at all (R)	0.71	0.57	0.02	0.51
3. I wish I could have more respect for myself (R)	0.65	0.65	0.01	0.42
4. All in all, I generally feel that I am a failure (R)	0.71	0.42	0.02	0.50
5. I feel I am a person of worth, at least equal with others	0.48	0.36	0.01	0.23
<b>Physical Activity</b>				
1. How often do you do vigorous physical exercise that lasts for 15 min or longer - Summer	0.70	1.01	0.05	0.50
2. How often do you do vigorous physical exercise that lasts for 15 min or longer - Winter	0.82	1.37	0.07	0.67

Notes: Full item wording for all variables available in the supplemental material. All factor loadings were significant at  $p < 0.001$ . Variables with an (R) were recoded prior to model estimation.

analyses were then used to test for metric and scalar measurement invariance across gender and grade (middle school grades 6<sup>th</sup>-8<sup>th</sup> versus high school grades 9<sup>th</sup>-12<sup>th</sup>). Given recommendations that chi-square differences tests may be too liberal when evaluating measurement invariance in large samples, we primarily relied on  $\Delta CFI < 0.01$  as an indicator of invariance (Cheung & Rensvold, 2002).

Next, a structural model tested whether duration of organized activity involvement was associated with greater well-being through greater social support. Mean scores for duration of involvement in specific organized activities were specified as observed exogenous variables; latent variables encapsulating self-esteem, substance use, and physical activity were specified as endogenous variables; and latent variables encapsulating peer, teacher, and adult support were specified as mediators. Demographic characteristics (age, gender, race/ethnicity, and parents' education), academic achievement, and parental warmth, were entered as covariates. Multi-group models were then estimated to determine if the structural paths varied across gender or grade. Due to the large number of estimated indirect effects in the full structural model (49 total), False Discovery Rate (FDR) adjustments were used to correct for multiple testing (Benjamini & Hochberg, 1995). All analyses were performed in *Mplus* version 7, utilized maximum likelihood estimation with robust standard errors, and incorporated sampling weights, clustering, and stratification.

### 6.3.1. Missing data

Some youth were missing data on organized activity participation (<1%) or covariates (<8%). Full-information maximum likelihood (FIML) estimation was used to address this missing data.

## 7. Results

Table 1 displays the descriptive statistics and bivariate correlations among all study variables. Adolescent girls endorsed greater peer support, lower adult support, greater teacher support, lower self-esteem, lower substance use, and lower physical activity compared to boys. White youth reported greater peer support, greater adult support, greater teacher support, higher self-esteem, greater substance use, and greater physical activity, than non-White youth. Older adolescents endorsed greater peer support, lower teacher support, higher self-esteem, greater substance use, and lower physical activity compared to younger adolescents. Greater parental education was correlated with greater peer support, greater adult support, greater teacher support, higher self-esteem, greater physical activity, and lower substance use. In general, greater academic achievement, parental warmth, and duration of organized activity involvement were correlated with greater peer support, teacher support, and other adult support, higher self-esteem and physical activity, and lower substance use. Greater peer,

**Table 3**  
Model fit indices for measurement and structural multi-group models.

Model	MLR $\chi^2$ (df)	CFI	TLI	RMSEA [90% CI]	SRMR	S-B $\Delta\chi^2$ (df)	$\Delta$ CFI
<b>Measurement Models</b>							
Gender Configural	713.46 (208)	0.954	0.940	0.022 [0.020,.024]	0.028		
Gender Metric	722.35 (219)	0.954	0.943	0.021 [0.020,.023]	0.032	21.08 (11)*	0.000
Gender Scalar	801.23 (230)	0.948	0.939	0.022 [0.020,.024]	0.034	85.08 (22)***	0.006
Grade Configural	675.01 (208)	0.950	0.935	0.022 [0.020,.023]	0.029		
Grade Metric	626.38 (219)	0.957	0.946	0.020 [0.018,.021]	0.031	9.71 (11)	0.007
Grade Scalar	685.45 (230)	0.952	0.943	0.020 [0.019,.022]	0.033	42.71 (22)**	0.002
<b>Structural Models</b>							
Gender Unconstrained	1738.85 (571)	0.922	0.916	0.020 [0.019,.021]	0.049		
Gender Constrained	1545.23 (502)	0.930	0.915	0.020 [0.019,.021]	0.039	192.81 (69)***	0.008
Grade Unconstrained	1767.84 (534)	0.909	0.889	0.022 [0.021,.023]	0.045		
Grade Constrained	1950.88 (609)	0.901	0.895	0.021 [0.020,.022]	0.056	170.46 (75)***	0.008

Notes: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . Grade is grouped as 1 = 6<sup>th</sup>–8<sup>th</sup> grade, 2 = 9<sup>th</sup> – 12<sup>th</sup> grade. All MLR  $\chi^2$  values were significant at  $p < 0.001$ .

teacher, and other adult support were also generally correlated with higher self-esteem, greater physical activity, and lower substance use.

### 7.1. Measurement models

A measurement model was estimated which specified item-level latent variables encapsulating peer support, teacher support, adult support, self-esteem, substance use, and physical activity. Covariances were specified among all latent variables. The model provided a good fit to the data,  $\chi^2(104) = 573.16$ , CFI = 0.957, TLI = 0.943, RMSEA = 0.021 [90% CI: 0.019, 0.023], SRMR = 0.026. Factor loadings for this model are displayed in Table 2. All standardized estimates ranged from 0.44 to 0.82 and  $R^2$  ranged from 0.19 to 0.67, with the majority over 0.34. Invariance tests were used to examine whether the measurement model varied by gender and grade. To test metric invariance by gender, the configural model with all parameters free to vary across boys and girls was compared to a model with factor loading constrained to be equal. Model fit indices for these invariance tests are displayed in Table 3. The  $\Delta$ CFI was <0.001, which supports metric invariance and suggests that factor loadings did not differ by gender. Tests for scalar invariance were also non-significant ( $\Delta$ CFI = 0.006), suggesting that intercepts were similar across groups. To test metric invariance by grade, we performed similar model comparisons across students in middle school versus high school (Table 3). The  $\Delta$ CFI was non-significant for both the metric (0.007) and scalar (0.002) models, supporting invariance by grade.

### 7.2. Structural models

A latent variable mediation model was estimated to test whether duration of involvement in specific activities was associated with self-esteem, substance use, and physical activity through peer, teacher, and adult support. Demographic characteristics were allowed to covary with organized activities and organized activities were allowed to covary with one another. Covariances were also specified among the social support residual variances and additional covariances were specified among the health and well-being residual variances. The model provided a good fit to the data,  $\chi^2(225) = 1102.49$ , CFI = 0.942, TLI = 0.917, RMSEA = 0.020 [90% CI: 0.018, 0.021], SRMR = 0.023. Table 4 displays standardized estimates, unstandardized estimates, and standard errors for all structural paths. After controlling for age, gender, race/ethnicity, parents' education, academic achievement, and parental warmth, greater duration of involvement in sports and other clubs/organizations was associated with greater self-esteem. Greater duration of involvement in music and other clubs/organizations was associated with lower substance use, and greater duration of involvement in sports, honors society/student council, and other clubs/organizations was associated with greater physical activity.

Concerning social support, greater duration of involvement in sports, music, honor society/student council, and other clubs/organizations was associated with greater peer support. Greater duration of involvement in music and newspaper/yearbook was associated with greater teacher support. Greater duration of involvement in sports, music, and other clubs/organizations was associated with greater adult support. Additionally, greater peer, teacher and adult support was associated with greater self-esteem. Greater peer and adult support was associated with higher levels of physical activity. Greater teacher support was associated with lower substance use, and greater peer support was associated with higher levels of substance use.

After adjusting for multiple testing via FDR, greater duration of sports involvement was indirectly associated with higher self-esteem through greater adult support ( $\beta = 0.01$ ,  $B = 0.003$ ,  $SE = 0.001$ ,  $p < 0.001$ ). Greater duration of involvement in sports and other club/organizations was indirectly associated with greater physical activity through greater adult support (sports:  $\beta = 0.01$ ,  $B = 0.004$ ,  $SE = 0.001$ ,  $p < 0.001$ ; other clubs/organizations:  $\beta = 0.01$ ,  $B = 0.005$ ,  $SE = 0.001$ ,  $p < 0.001$ ). Greater duration of music involvement was indirectly associated with lower substance use ( $\beta = 0.01$ ,  $B = 0.004$ ,  $SE = 0.001$ ,  $p < 0.001$ ) and greater self-esteem ( $\beta = 0.01$ ,  $B = 0.003$ ,  $SE = 0.001$ ,  $p = 0.008$ ) through greater teacher support.

**Table 4**

Standardized estimates, unstandardized estimates, and standard errors, for structural model testing indirect effects of organized activity involvement on adolescent health and well-being through social support.

	Social Support (mediators)									Health and Well-Being (outcomes)									
	Peer Support			Teacher Support			Adult Support			Self-Esteem			Substance Use			Physical Activity			
	$\beta$	B	SE	$\beta$	B	SE	$\beta$	B	SE	$\beta$	B	SE	$\beta$	B	SE	$\beta$	B	SE	
<b>Covariates</b>																			
Age	0.08**	0.06	0.01	0.01	0.01	0.01	-0.03	-0.02	0.01	0.05*	0.03	0.01	0.35**	0.28	0.02	-0.10**	-0.08	0.02	
Gender	0.23**	0.48	0.03	0.09**	0.19	0.05	-0.04*	-0.09	0.04	-0.17**	-0.37	0.03	-0.02	-0.05	0.04	-0.24**	-0.53	0.05	
Parents' Education	0.02	0.01	0.01	-0.07**	-0.03	0.01	0.07**	0.03	0.01	0.02	0.01	0.01	-0.02	-0.01	0.01	0.10**	0.04	0.01	
Race/Ethnicity	0.07**	0.16	0.04	0.03	0.06	0.04	0.12**	0.27	0.03	-0.03*	-0.08	0.04	0.13**	0.32	0.04	0.11**	0.26	0.05	
Academic Achievement	0.00	0.00	0.01	0.25**	0.20	0.01	0.05	0.04	0.02	0.15**	0.12	0.02	-0.11**	-0.09	0.02	0.06*	0.05	0.02	
Parental Warmth	0.12**	0.27	0.04	0.27**	0.65	0.05	0.21**	0.48	0.05	0.17**	0.40	0.05	-0.16**	-0.39	0.05	0.04	0.09	0.05	
<b>Organized Activities</b>																			
Sports	0.04**	0.02	0.01	0.02	0.01	0.01	0.08**	0.04	0.01	0.05**	0.02	0.01	-0.01	0.00	0.01	0.23**	0.11	0.01	
Music	0.03*	0.02	0.01	0.04**	0.03	0.01	0.06*	0.03	0.02	-0.03	-0.02	0.01	-0.08**	-0.05	0.01	-0.02	-0.01	0.01	
Newspaper/Yearbook	0.01	0.02	0.03	0.05*	0.08	0.03	0.01	0.01	0.03	-0.01	-0.01	0.02	0.02	0.04	0.03	0.02	0.04	0.02	
Honors Society/Council	0.03*	0.03	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.00	0.00	0.02	0.05**	0.04	0.02	
Clubs/Organizations	0.04**	0.03	0.01	0.03	0.02	0.02	0.10**	0.07	0.02	0.03**	0.02	0.01	-0.09**	-0.06	0.02	0.04*	0.03	0.01	
<b>Social Support</b>																			
Peer Support										0.05*	0.05	0.02	0.09**	0.09	0.02	0.05*	0.06	0.02	
Teacher Support										0.15**	0.15	0.03	-0.20**	-0.21	0.03	-0.03	-0.03	0.03	
Adult Support										0.08**	0.08	0.02	0.01	0.02	0.02	0.19**	0.10	0.02	
R <sup>2</sup>	0.09			0.18			0.13			0.17			0.27			0.22			

Notes: Results displayed are from a single mediation analysis with covariates and organized activities specified as observed exogenous variables, indicators of social support specified as latent mediators, and indicators of health and well-being specified as latent endogenous variables. Columns represent dependent variables and rows represent independent variables. \*\* $p < 0.01$ , \* $p < 0.05$ . Gender is coded 1 = male, 2 = female. Race/Ethnicity is coded 0 = non-white, 1 = white.

### 7.2.1. Multi-group models

Two multi-group models were tested to examine whether structural paths in the model varied by gender or grade. The  $\Delta$ CFI test for both multi-group models were 0.008 (Table 3), suggesting that the structural paths in the model did not significantly differ for boys and girls and youth in middle school compared to high school.

## 8. Discussion

Using a large, nationally representative dataset, this study aimed to elucidate how duration of involvement in specific types of organized activities is linked with distinct indicators of adolescent health and well-being and multiple sources of social support. Consistent with hypotheses, findings indicated that duration of organized activity involvement was related to multiple facets of health and well-being among youth, including greater self-esteem, lower substance use, and greater physical activity. Duration of activity involvement was also associated with specific sources of relational social support, including that from peers, teachers, and other adults. Further, associations among specific types of activity involvement and well-being were partially explained by more supportive relationships with teachers and adults. Importantly, these findings were significant even when accounting for several demographic characteristics and theoretically-relevant covariates, including academic achievement and parental warmth, and were consistent across adolescent gender or grade. Results from this study support and contribute to theory on PYD and have important implications for social policy.

### 8.1. Duration of organized activity involvement and adolescent health and well-being

Greater duration of involvement in specific organized activities was linked with distinct health-related benefits among youth. Consistent with hypotheses and similar to prior research (Denault & Poulin, 2009), duration of involvement in music and other clubs/organizations was independently associated with lower substance use. Qualitative evidence suggests that for some youth, the dedication and time demands required to master a musical instrument may prevent engagement in drug use (Campbell, Connell, & Beegle, 2007). Youth who have been involved in music for a longer duration may spend more time practicing and mastering their instruments compared to those involved for a shorter duration, which may subsequently reduce the likelihood of engaging in substance use. Although we accounted for academic achievement in our model, it is also possible that youth who have been involved music for a greater number of years feel more connected with their school, which may also deter engagement in substance use (Bond et al., 2007). Involvement in clubs and other organizations was also associated with lower substance use. Involvement in clubs often entails community engagement (Larson, Hansen, & Moneta, 2006), which over time may facilitate a stronger sense of social trust and subsequently lower engagement in substance use (Wray-Lake et al., 2012).

Also consistent with hypotheses and prior research (Farb & Matjasko, 2012), greater duration of involvement in sports and other clubs/organizations was associated with greater self-esteem and greater duration of involvement in sports, honors



society/student government, and other clubs/organizations was associated with greater physical activity. Prolonged involvement in sports and clubs may promote feelings of self-competence (McGee, Williams, Howden-Chapman, Martin, & Kawachi, 2006; Trew, Scully, Kremer, & Ogle, 1999), and prompt greater self-esteem. Further, whereas sports may directly encompass physical activity, extended involvement in honors society/student council and clubs may emphasize the importance of personal and school-level health, and offer opportunities for physical activity within the community (e.g., volunteering). These results provide robust evidence that duration of involvement in specific organized activities is linked with greater adolescent health and well-being.

## 8.2. Duration of organized activity involvement and social support

Results also indicate that greater duration of involvement in organized activities is associated with multiple sources of social support, including that from peers, teachers, and other adults. Consistent with prior research (Broh, 2002), greater duration of involvement in music and newspaper/yearbook was associated with greater support from teachers. Music and yearbook activities may facilitate more frequent interactions with teachers (Campbell et al., 2007), including discussions of recent performances or the content to include within the schools yearbook. Specific teachers (as opposed to other adults) may also be more likely to assume leadership roles within music and yearbook activities, which may provide youth with greater support. Greater duration of involvement in sports, music, and other clubs/organizations was associated with a broader network of non-parental adult support. Sporting events, music recitals, and clubs may allow youth opportunities to interact with other adult members within their community (Vandell et al., 2015), and more frequent positive interactions with community members may increase youths' supportive adult networks. Duration of involvement in sports, music, honors society/student council, and other clubs/organizations was also associated with greater peer support. Prolonged participation in these activities may provide youth with frequent positive interactions with peers, and opportunities to build relationships with others that share similar interests. These interactions may be less frequent in newspaper/yearbook activities, which may entail more individually-focused tasks (e.g., writing an article).

Findings from this study suggest that associations among duration of involvement in specific types of organized activities and indices of health and well-being may be partially explained by increased social support. Specifically, duration of sports and club involvement was indirectly associated with greater physical activity and self-esteem through greater adult support. The more frequent and supportive interactions with community adults that potentially accompany involvement in sports and clubs may promote positive views of the self and encourage health-promotive behaviors such as physical activity. Additionally, greater duration of music involvement was indirectly associated with lower substance use and higher self-esteem through greater teacher support. Music involvement may facilitate more positive connections with teachers and deter youth from engaging in health-risk behaviors that can interfere with their academic performance, such as substance use. Further, teachers are often in a position to provide youth with consistent adult mentoring, and the increased support from teachers that potentially accompanies prolonged music involvement may be an important source of self-esteem and self-confidence (Reddy, Rhodes, & Mulhall, 2003).

Contrary to hypotheses, peer support was associated with *higher* levels substance use. Prior research that has tested associations among peer support and substance use has found mixed results (Wills et al., 2004). The benefits affiliated with peer support likely vary based on peer characteristics (Bender & Lösel, 1997), and adolescents with less parent and teacher support may be more likely to turn to deviant peers (Brody et al., 2001).

## 9. Limitations and implications

Although this study has several strengths, including the use of a large, nationally-representative dataset and latent variables to model measurement error, findings should be interpreted in light of certain limitations. Duration of organized activity involvement was measured using single-item retrospective reports, which may not have captured the full breadth of the organized activity categories and may be subject to recall bias. Future research is needed that assesses involvement in a larger breadth of organized activities and that utilizes longitudinal designs. Although our measurement model provided a good fit to the data, the variance accounted for by certain indicators for peer support and self-esteem was relatively low. Future research is needed to replicate these findings using more extensive measures for peer support and self-esteem. Data were cross-sectional and causal inferences are cautioned. While our model proposed directionality of effects that is consistent with theory, it is possible that greater well-being and social support allows youth continued involvement in certain activities. Longitudinal research is needed to determine the directionality of effects, and randomized control trials are needed to address causality.

Additionally, although the focus of this study was on duration of organized activity involvement, breadth and intensity of participation were not assessed. Organized activity theorists have proposed that duration of involvement may be especially relevant for social support, health, and well-being, given that enhancing these outcomes likely requires prolonged exposure to the benefits affiliated with participation (Bohnert et al., 2010). This is consistent with recent evidence that suggests duration (but not breadth or intensity) of overall activity involvement is longitudinally associated with greater social support, lower substance use, and greater civic engagement among youth (Viau et al., 2015). Nonetheless, it is possible that youth who have been involved in specific activities for a longer duration of time are also involved at a greater intensity and engage in a

wider breadth of activities at any given time. Future research is needed to replicate our results while also accounting for intensity and breadth of involvement.

Despite these limitations, findings have important implications for developmental theory. Developmental scientists have called for further empirical attention to the processes that explain the benefits affiliated with organized activity participation (Simpkins, 2015). This study helps respond to this call by explicitly demonstrating that involvement in organized activities may be one way youth cultivate positive relationships with others, and access to this social capital may partially explain why teens involved in organized activities appear to receive health and well-being-related benefits. Further, our findings extend prior research that has found links between duration of overall activity involvement and social support from activity leaders and participating peers (Viau et al., 2015), and suggests that certain forms of participation may be more conducive of forming supportive social relationships than others. Interestingly, our findings suggest that while specific activities may be associated with distinct sources of social support, positive connections with adults and teachers (but not peers) seem to be the most important for health and well-being. These findings support theory proposing that the developmental benefits affiliated with social support may vary based on the source (Layne et al., 2009), and that distinct qualities and experiences within organized activities differentially enhance health and well-being (Mahoney et al., 2005).

Findings also have implications for social policy. Improving adolescent health and well-being requires integrated efforts from practitioners, public health officials, and social scientists. A growing body of empirical evidence indicates that increasing youths' social capital may promote adolescent health (Viner et al., 2012). Findings from our study suggest that one potential avenue for youth to access and cultivate social capital is through involvement in specific organized activities. Supporting public policies that both allow youth continued access to organized activities and improve the quality of participation may be one fruitful avenue to promote adolescent health and well-being. Although our findings consistently support the link between activity involvement and health benefits, the effect sizes from this study were relatively small. Even in the presence of small effects, the ubiquity of organized activity involvement and intrinsic motivation among youth to become involved in these activities (Vandell et al., 2015) makes participation an important point of intervention that has the potential to affect a large number of adolescents nationwide.

Promoting health and wellbeing among youth is a challenging yet worthwhile task. Identifying contexts that enhance adolescent wellbeing and elucidating the mechanisms that are responsible for these effects can advance developmental theory and inform social policy. Such efforts may ultimately increase positive youth development, and subsequently enrich the lives of adolescents and members of their communities.

## Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.adolescence.2017.07.012>.

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