

Impacts of Adolescent and Young Adult Civic Engagement on Health and Socioeconomic Status in Adulthood

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The present study examines links between civic engagement (voting, volunteering, and activism) during late adolescence and early adulthood, and socioeconomic status and mental and physical health in adulthood. Using nationally representative data from the National Longitudinal Study of Adolescent to Adult Health, a propensity score matching approach is used to rigorously estimate how civic engagement is associated with outcomes among 9,471 adolescents and young adults (baseline $M_{age} = 15.9$). All forms of civic engagement are positively associated with subsequent income and education level. Volunteering and voting are favorably associated with subsequent mental health and health behaviors, and activism is associated with more health-risk behaviors and not associated with mental health. Civic engagement is not associated with physical health.

Many adolescents and young adults participate in civic life by joining with others to address social issues, caring for others in their communities, and fighting for social change. Voting, volunteering, and activism are forms of civic engagement, which can be defined as “individual and collective actions designed to identify and address issues of public

concern” (American Psychological Association n.d.). Civic engagement, a multidimensional construct that includes attitudes, beliefs, and behaviors, is critical to the positive development of individuals, communities, and democracies (e.g., Youniss & Levine, 2009). However, the impact of civic engagement on positive developmental trajectories across adulthood is not clear. In particular, young people who participate in civic activities may already be on positive developmental trajectories (Hershberg, Johnson, DeSouza, Hunter, & Zaff, 2015), perhaps especially those who participate in “nonconflictual” forms of civic engagement such as voting (e.g., Flavin & Keane, 2012). This makes it difficult to isolate the contribution of civic experiences to positive outcomes. In this article, we examine the longitudinal association between voting, volunteering, and activism (examples of the behavioral dimension of civic engagement) and key developmental outcomes using analytical methods that account for self-selection into civic engagement.

Consistent with current thinking in developmental science, we view adolescence and the transition into adulthood as a time of social changes and developmental opportunity (Dahl, 2004; Flanagan &

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Levine, 2010) with special formative significance across domains such as identity, work, peer and romantic relationships, and health, as well as moral, political, and civic concerns. Below, we review relevant theory and evidence that underscore the importance of understanding how civic engagement during this transitional period affects health and socioeconomic outcomes into adulthood.

Civic Engagement and Health

Many scholars argue that civic engagement plays an important role in healthy development (Ballard & Syme, 2015; Christens & Peterson, 2012; Hershberg et al., 2015; Hope & Spencer, 2017). Given that the empirical and theoretical literature linking civic engagement with health among adolescents and young adults is emergent, we draw on evidence and theory that are relevant for understanding how civic participation relates to health (e.g., physical health, mental health, and health behaviors) as well as well-being (e.g., self-esteem and self-confidence). We define the constructs of health and well-being as operationalized by authors wherever possible.

The most relevant theoretical frameworks for linking civic engagement with positive outcomes come from positive youth development theory, sociopolitical development theory, and empowerment theory (Ballard & Ozer, 2016). From the perspective of positive youth development, civic engagement is often considered to be a marker of healthy development (Hershberg et al., 2015). For instance, positive developmental contexts are said to give young people opportunities to develop competence and connection, allowing youth to thrive and thus to contribute to their communities (Hershberg et al., 2015; Lerner, Johnson, Wang, Ferris, & Hershberg, 2015). In the contexts of oppression and disadvantage, the sociopolitical development framework examines how individuals develop a critical understanding of how society works and become involved in activism and resistance forms of civic engagement (Ginwright & James, 2002; Watts, Diemer, & Voight, 2011). According to this framework, activist forms of civic engagement in the face of systemic disadvantage may have a role in both an individuals' healthy development and positive systems change (Ballard & Ozer, 2016; Hope & Spencer, 2017). Specifically, this might work through empowering young people (Christens, 2012; Zimmerman, 1995). According to empowerment theory, psychological empowerment is the process through which people gain greater control over their lives, take a proactive approach in their communities,

and develop critical understandings of their sociopolitical environments (Zimmerman, 1995); this process is suggested to facilitate well-being (Christens, 2012).

Civic engagement comes in many forms. Developmental psychologists often argue for a broad inclusion of diverse behavioral forms of civic engagement given that young people lack access to many forms of civic engagement available to adults, such as voting (Flanagan, 2009), and that young people, particularly those who are not college bound, face fewer opportunities for civic engagement as they transition from adolescence to young adulthood (Flanagan & Levine, 2010). In addition, there are disparities in the types of civic opportunities available to young people from different sociodemographic backgrounds (Levinson, 2010), making it important to attend to the diverse ways that individuals participate in their communities. However, three key forms of civic engagement (i.e., volunteering, voting, and activism) have different predictors and consequences (Ballard, 2014; Obradović & Masten, 2007; Wray-Lake & Sloper, 2015). For example, volunteering is generally supported by all sectors of society, whereas some forms of political civic engagement, such as activism, are more controversial; volunteering involves private activities directed at helping people or groups, while activism often involves publically voicing controversial opinions; and volunteering is often motivated by wanting to help or "give back," whereas activism is often motivated by a desire to create change and right perceived injustices (Ballard, Malin, Porter, Colby, & Damon, 2015; Ginwright & James, 2002; Walker, 2000; Youniss & Levine, 2009). These very different activities, although each example of civic engagement, likely has different implications for individual development. Therefore, it is important to clarify, theoretically and empirically, the potentially different roles that these forms of civic engagement play in healthy development.

Volunteering and Health

In cross-sectional studies, volunteering is positively linked with many aspects of health and well-being. Volunteering might affect health by allowing people to feel good about themselves, to feel like they matter, to experience social connection and decreased loneliness, and to feel satisfaction from contributing to others (Ballard & Syme, 2015; Konrath, Fuhrel-Forbis, Lou, & Brown, 2012; Poulin, Brown, Dillard, & Smith, 2013). Although there is a robust literature linking volunteerism to positive

outcomes, including health (Pilivian & Siegl, 2014), the vast majority of evidence linking volunteering to health relies on cross-sectional data and older adult samples. In a review of 73 published articles linking volunteerism and health among older adults, Anderson et al. (2014) found that volunteerism is correlated with reduced depressive symptoms, better self-reported health, fewer functional limitations, and lower mortality. One notable recent study used a randomized control trial design to examine the effects of volunteering on physical health among late adolescents. High school students were randomly assigned to volunteer at an after-school program for elementary school children weekly for 2 months in the fall (intervention group) or spring (control group). After 2 months, intervention group participants had lower cardiovascular risk, as measured through inflammatory markers, and lower cholesterol and body mass index compared to the control group (Schreier, Schonert-Reichl, & Chen, 2013). However, given that adolescents and young adults generally experience relatively good health compared to older adults, the effects of volunteerism on health *during* the teenage and young adult years are difficult to document, whereas potential long-term cumulative health effects into adulthood are more straightforward to observe. In a recent longitudinal study drawing on data from the National Study of Adolescent to Young Adult Health, volunteerism in late adolescence predicted fewer depressive symptoms in adulthood among those who participated voluntarily (Kim & Morgül, 2017). Although this study did not account for various factors that predict volunteerism (i.e., selection effects), findings suggest an important role of motivations in links between volunteering and health. Using the same data set, Wray-Lake, Shubert, Lin, and Starr (2017) also found links between community engagement (including volunteer service) and fewer depressive symptoms.

Activism and Health

The hypothesized association between activism and health is less clear because very few studies have tested links directly. On the one hand, activism might positively affect health and well-being, similar to other forms of civic engagement. Participating in activism can present young people with opportunities for coping with stress, generating empowerment, developing a positive sense of purpose and identity, forming connections and building social capital, and effecting systemic change

(Ballard & Ozer, 2016; Christens, 2012). On the other hand, activism exposes young people to difficult social problems and barriers to social change. Thus, activism might undermine health because it can be stressful, can make people vulnerable, and can place undue burden on individuals to address systemic problems (Ballard & Ozer, 2016; Kahne & Westheimer, 2006).

One longitudinal study found that among Germans who were concerned about one particular social issue—nuclear threat—activism predicted better mental health across the life course (Boehnke & Wong, 2011). In contrast, a study of Israeli activists found self-reported well-being was significantly higher among *less* experienced community activists in Israel compared to more experienced activists, perhaps pointing to a developed sense of disillusionment among longtime activists (Itzhaky & York, 2003). In Wray-Lake et al.'s (2017) study, high-cost political behaviors, such as attending a protest, predicted more depressive symptoms over time. Although there is limited direct evidence linking activism and health, indirect evidence supports both positive and negative theorized pathways from youth activism to well-being. For example, activism has been linked with self-esteem, empowerment, and self-confidence (Ginwright & James, 2002; Itzhaky & York, 2003), which are important predictors of mental health (Christens & Peterson, 2012). In contrast, activism often arises in response to feeling marginalized or discriminated against (Ballard, 2014), experiences that are linked to poor health.

Voting and Health

From a theoretical standpoint, voting presents an opportunity to exert voice, perhaps establishing a path to health through empowerment. However, there is little evidence of links between voting and health. Poor health is related to lower voting behavior at the state level (Blakely, Kennedy, & Kawachi, 2001), and at the individual level, some evidence from England suggests that less healthy people are less likely to vote (Denny & Doyle, 2007). Wray-Lake et al. (2017) found that young adults with depressive symptoms were less likely to vote, and that voting predicted less depression over time. There is also evidence that voting leads to physiological changes in the short term, such as elevated levels of cortisol (Waismel-Manor, Ifergane, & Cohen, 2011), perhaps especially for those who vote for the losing candidate (Stanton, LaBar, Saini, Kuhn, & Beehner, 2010). These studies provide

some indication of a connection between voting and biological functioning, which can be considered indicators or precursors of health. However, very little is known about the impact, if any, of casting a vote on subsequent health over the long term.

Civic Engagement and Socioeconomic Status

Participation in civic activities in adolescence and young adulthood might also affect social well-being later in life. Although links between various types of civic participation and socioeconomic status (SES) are established, the role that civic activities play in social mobility across different developmental stages is not known. Civic engagement is often stratified by SES background. Individuals from high-SES backgrounds are typically more involved in traditional forms of civic engagement (e.g., voting, campaigning, and volunteering; Levinson, 2010) compared to those from low-SES backgrounds. Some research has found comparable or higher levels of issue-based participation in activism and local community organizing among immigrants and people of color, who tend to be from lower SES backgrounds (Ballard et al., 2015; Jensen, 2010). However, even if individuals from lower SES backgrounds participate (at equal or higher levels) in some forms of civic engagement, the clear inequality in access to civic *power* by SES is problematic for American democracy, which is predicated on citizen participation and equal rights under the law (American Political Science Association, 2004; Bartels, 2010).

Cross-sectional disparities in civic engagement by SES are clear, but less is known about longitudinal links between civic engagement in late adolescence and adult social class. In Kim and Morgül's (2017) study, volunteerism in late adolescence predicted educational attainment and personal earnings in adulthood. Importantly, this was true regardless of whether the volunteerism was mandated or not, which suggests that selection effects do not fully explain positive links between volunteerism and SES. Participating in civic life might place youth on positive socioeconomic trajectories for a variety of reasons. First, all three forms of civic engagement can serve an instrumental function by connecting young people to social networks. Exposure to nonfamilial adults might provide professional models and opportunities for youth (Jarrett, Sullivan, & Watkins, 2005; Zeldin, Larson, Camino, & O'Connor, 2005). Second, all three forms of civic activities might serve a social function by putting young people in contact with adult mentors

and like-minded peers who can provide psychological support and shape expectations, aspirations, and goals (Diemer, 2009; Malin, Ballard, & Damon, 2015; Zeldin et al., 2005). Third, meaningful engagement in civic life might engage young people in their education. At a time when some young people are at risk for disengaging from school, civic opportunities can provide a context for them to derive purpose and find meaning in their lives (Malin et al., 2015), increase their future orientation and a tendency to plan for the future (Robbins & Bryan, 2004), and redirect effort toward attaining goals, all of which might lead to more academic engagement and better academic performance. However, it could also be the case that certain forms of civic engagement might funnel people toward career paths in helping or advocacy professions, which may result in lower SES in adulthood.

The Present Study

The present study adds to existing work linking civic engagement and developmental outcomes in three important ways. First, we provide empirical evidence for links between civic engagement and subsequent health and SES using statistical methods that improve estimation of causality. Second, we examine the potential differential impact of civic engagement on multiple, developmentally relevant aspects of health (i.e., depressive symptoms, risky health behaviors, metabolic markers) and SES (i.e., educational attainment, personal earnings, and household income). Finally, we examine the potential differential effects of three distinct forms of civic engagement: voting, volunteering, and activism. Thus, the research questions in the present study are: (a) Given similar health and SES backgrounds, does civic engagement during late adolescence and early adulthood predict health and SES outcomes later in adulthood? (b) Do the effects of civic engagement differ across three types of health outcomes (mental health, metabolic risk, and health behaviors) and two types of SES outcomes (income and education)? (c) Do associations differ depending on the form of civic engagement (voting, volunteering, and activism)?

Method

The data were drawn from Waves 1, 3, and 4 of the National Longitudinal Study of Adolescent to Adult Health (Add Health), a nationally representative sample of students in Grades 7 through 12 in the

United States in 1994–1995. The study used a school-based design to select a stratified sample of 80 high schools and feeder middle schools with selection probability proportional to the size of the school. The survey design has been described extensively elsewhere (Harris et al., 2009). Wave 1 (1994–1995) included 20,745 adolescents (aged 11–20). All of the original Wave 1 participants were eligible to participate in Wave 3 ($n = 15,197$, aged 18–27) and Wave 4 ($n = 14,800$; aged 24–32). Data from Wave 2 were omitted because it comprised only a subset of the original Wave 1 population. In the current study, we used survey weights designed by Add Health to account for sampling design and to ensure that the estimates were nationally representative. Analyses for this study were performed using STATA version 14 (StataCorp LLC; College Station, TX) between June 2016 and July 2017.

Participants

The final analytic sample for the present study included 13,014 respondents. Detailed descriptive statistics are reported in Table 1 for the subsample of participants ($N = 9,471$) who contained no missing data on Wave 1 covariates, contained data for at least one of the Wave 3 civic variables, and contained data for at least one of the Wave 4 outcome variables. The final sample size for each analytical model varies due to missing data on the outcome variables or civic variables in a given model. At baseline (Wave 1), participants identified as 49.4% female, and had a mean age of 15.71 ($SD = 1.78$) years. Participants identified as 68.9% White, 15.7% Black, 3.2% Asian, 10.6% Hispanic, and 2.4% reported another race.

Measures

All questions in Add Health were constructed for the goals of the Add Health study and were not drawn from any existing measures (Harris et al., 2009). For the scales that follow, we provide indices of internal reliability where applicable and details about scale construction in the case of new measures.

Civic Engagement

The key predictors in our analyses were three distinct forms of civic engagement measured at Wave 3: vote, volunteer, and activism. Each variable was dichotomously measured as 0 (nonparticipation) or 1 (participation). Although previous

research has operationalized civic engagement using different ways of combining civic behaviors, for example, through a composite score of 20 civic activities measured by Add Health surveys (e.g., Duke, Skay, Pettingell, & Borowsky, 2009), the present study separates three forms of civic behaviors to specify unique links between civic behaviors and health and SES outcomes. *Vote* was measured by the question: If eligible, did you vote in the most recent presidential election? There were 47 people in our analytic sample who were not eligible to vote at Wave 3, so they were not included in analyses. *Volunteer* was measured by the question: During the last 12 months did you perform any unpaid volunteer or community service work? *Activism* was measured by the question: “Which of the following things have you done during the last 12 months (check all that apply): attended a political rally or march?”

SES and Health Outcomes in Young Adulthood

All outcomes were measured at Wave 4 (see Table 2 for descriptive statistics) and standardized ($M = 0$, $SD = 1$) for final analyses.

Education. To assess educational attainment at Wave 4, we used participants’ responses to the question: “What is the highest level of education that you have achieved to date?” Answer options ranged from “eighth grade or less” to “graduate school.” In order to make this a continuous outcome, we estimated total years of education, which ranged from 6 (*eighth grade or less*) to 20 (*graduate school*; $M = 14.412$, $SD = 2.18$), and 5% of data were missing on this variable.

Household income. Household income at Wave 4 was measured by one question:

Thinking about your income and the income of everyone who lives in your household and contributes to the household budget, what was the total household income before taxes and deductions in (2006/2007/2008)? Include all sources of income, including nonlegal sources.

The options for household yearly income ranged from < \$5,000 to \$150,000 or more ($M = \$63,794$, $SD = \$38,041$) and 6.4% of data were missing on this variable.

Personal earnings. Personal earnings at Wave 4 was measured by one question: “What is your best guess of your personal earnings before taxes?” The options for personal yearly income ranged from < \$5,000 to \$150,000 or more ($M = \$36,2623$, $SD =$

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Table 1
Survey-Weighted Descriptive Statistics for Treatment and Control Sample Wave 1 Covariates

	Voting				Volunteering				Activism			
	Treatment		Control		Treatment		Control		Treatment		Control	
	N = 4,154		N = 4,880		N = 2,798		N = 6,271		N = 334		N = 8,751	
	M (SD)/%		M (SD)/%		M (SD)/%		M (SD)/%		M (SD)/%		M (SD)/%	
Demographics												
Male	0.51		0.51		0.49		0.51		0.54		0.50	
Age	15.90	1.77	15.58	1.77	15.54	1.75	15.79	1.78	15.53	1.70	15.72	1.78
Age ²	255.91	56.40	245.95	55.84	244.47	55.28	252.45	56.76	244.05	53.37	250.24	56.51
White	0.71		0.67		0.74		0.67		0.73		0.69	
Black	0.19		0.13		0.12		0.17		0.14		0.16	
Hispanic	0.07		0.13		0.09		0.12		0.07		0.11	
Asian	0.02		0.04		0.04		0.03		0.02		0.03	
Native	0.01		0.01		0.00		0.01		0.02		0.01	
Other	0.01		0.01		0.01		0.01		0.02		0.01	
Foreign born	0.02	0.15	0.07	0.25	0.04	0.20	0.05	0.22	0.03	0.18	0.05	0.22
Parental education	13.65	2.54	12.57	2.57	13.87	2.57	12.68	2.55	14.74	2.32	12.98	2.60
Region (West)	0.15	0.35	0.16	0.37	0.15	0.36	0.15	0.36	0.12	0.33	0.15	0.36
Region (Midwest)	0.31	0.46	0.31	0.47	0.32	0.47	0.31	0.46	0.34	0.48	0.31	0.46
Region (Northeast)	0.13	0.34	0.14	0.35	0.15	0.36	0.13	0.34	0.14	0.35	0.14	0.35
College aspirations	4.44	0.96	4.06	1.12	4.49	0.92	4.11	1.15	4.67	0.72	4.21	1.11
Health												
General health	1.99	0.87	2.15	0.91	1.93	0.83	2.15	0.92	1.89	0.84	2.09	0.90
Symptoms	6.94	5.97	7.28	6.57	6.91	5.80	7.21	6.51	7.57	6.23	7.11	6.30
Physical limitations	0.02	0.15	0.02	0.16	0.03	0.16	0.02	0.15	0.05	0.23	0.02	0.15
Depression	0.55	0.44	0.64	0.46	0.53	0.41	0.63	0.46	0.52	0.42	0.60	0.45
Body mass index	22.34	4.42	22.36	4.58	22.12	4.38	22.45	4.58	22.08	4.31	22.36	4.53
Physical activity	3.87	2.12	3.88	2.16	4.22	2.13	3.72	2.13	4.33	2.15	3.86	2.14
Screen time	2.35	0.88	2.38	0.86	2.34	0.89	2.38	0.86	2.26	0.94	2.37	0.87
Marijuana use	1.08	5.33	1.32	6.16	0.57	3.69	1.49	6.49	1.06	5.07	1.22	5.81
Binge drinking	0.53	1.15	0.64	1.32	0.44	1.06	0.66	1.32	0.43	1.06	0.60	1.25
Smoking regularly	0.15	0.35	0.22	0.42	0.12	0.32	0.22	0.41	0.12	0.33	0.19	0.39
Social connections												
Neighbors look out	0.24	0.43	0.28	0.45	0.22	0.42	0.28	0.45	0.21	0.41	0.27	0.44
Neighborhood not safe	0.08	0.27	0.11	0.01	0.07	0.01	0.11	0.01	0.08	0.02	0.10	0.01
Feel safe in school	3.88	0.99	3.77	1.04	3.93	0.95	3.77	1.04	3.90	1.02	3.82	1.01
Teachers care	3.64	0.94	3.48	1.01	3.74	0.90	3.47	1.01	3.66	0.85	3.55	0.98
Parents care	4.84	0.46	4.80	0.53	4.86	0.41	4.80	0.53	4.87	0.41	4.82	0.50
Friends care	4.31	0.74	4.23	0.79	4.36	0.68	4.23	0.80	4.35	0.69	4.27	0.77
Family understands	3.64	0.98	3.58	1.01	3.69	0.94	3.57	1.02	3.69	0.94	3.61	1.00
Religiosity	0.17	0.85	0.03	0.91	0.24	0.81	0.03	0.91	0.18	0.87	0.05	0.89
School performance												
Civic extracurricular	0.38	0.49	0.37	0.49	0.39	0.49	0.36	0.48	0.40	0.49	0.37	0.49
Grade in English	2.03	0.90	1.77	0.98	2.16	0.86	1.76	0.96	2.25	0.84	1.87	0.95
Grade in math	1.84	1.01	1.63	1.06	1.95	0.99	1.62	1.05	1.96	1.02	1.71	1.04
Grade in social studies	2.11	0.92	1.80	1.02	2.23	0.88	1.81	1.01	2.37	0.84	1.92	0.99

\$27,224), and 2.0% of data were missing on this variable.

Depressive symptoms. A depressive symptoms scale was created by taking the mean of 10 items from the Center for Epidemiological Studies Depression Scale (Radloff, 1977). Participants

answered "How often was the following true during the past 7 days?" from 0 (*never or rarely*) to 3 (*most of the time or all of the time*): felt blue, bothered by things that do not usually bother you, felt depressed, had trouble keeping mind on things, did not enjoy life, did not feel happy, did not feel just

Table 2
Descriptive Statistics for Wave 4 Outcome Variables

	M	SD	Min	Max
Health				
Depressive symptoms	0.57	0.44	0.00	3.00
Risky health behaviors	0.23	0.21	0.00	1.00
No. of cigarettes/month	3.58	8.17	0	100
Alcoholic beverages/ month	16.48	36.14	0	504
Marijuana use/past 30 days	0.64	1.63	0	6
Fast food/last week	2.31	3.73	0	99
Physical activity/last week	3.73	3.07	0	21
Hours screen time/ last week	22.03	20.58	0	270
Metabolic risk				
Waist circumference/cm	97.96	17.11	50	195
Systolic blood pressure	124.85	13.52	77	215
Diastolic blood pressure	79.31	10.23	30	147
Hemoglobin A1c	5.57	0.81	3.8	23.1
Socioeconomic status				
Education	14.41	2.18	6.00	20.00
Household income	63.79	38.04	2.50	150.00
Personal income	36.262	27.224	0	150

as good as other people, felt disliked by people, felt sad, and felt too tired to do things (never/rarely, sometimes, a lot of the time, most/all of the time; $\alpha = .84$). Scores on the depressive symptom scale ranged from 0 to 3 ($M = 0.57$, $SD = 0.44$) and 0.01% of data were missing on this variable.

Risky health behavior index. To measure health-compromising behaviors, we created a risky health behavior index using young adults' responses to six categories. Responses in the lowest quartile for physical activity (one or fewer activities per week) and the highest quartiles for screen time (29 hr or more per week of TV/video/screen games), fast food consumption (four or more meals per week), cigarette smoking (more than 20 days per month), binge drinking (more than once a month), and one or more uses of marijuana in the past 30 days (22% of sample) each counted as a score of one toward this risky health behavior index. The final risky health behavior index ranged from 0 (*low risk*) to 6 (*high risk*; $M = 0.23$, $SD = 0.21$), and 0.2% of data were missing on this variable. Multiple measures of these subcomponents have been analyzed in detail elsewhere (Hoyt, Chase-Lansdale, McDade, & Adam, 2012).

Metabolic risk index. Wave 4 metabolic risk included four components: waist circumference, systolic and diastolic blood pressure, and hemoglobin

A1c. Each metabolic risk marker was standardized within the sample, with the exception of waist circumference, which was standardized within gender due to gender differences in body composition. Participants were categorized into quartiles for each marker, and participants in the top quartile were considered to be at high risk (Ehrlich, Hoyt, Sumner, McDade, & Adam, 2015). Then, we summed across markers to create a metabolic risk composite. Scores ranged from 0 (*not high risk on any marker*) to 4 (*high risk on all four markers*; $M = 0.95$, $SD = 1.11$), and 6.7% of data were missing on this variable.

Covariates

There is an extensive list of possible covariates available in Add Health. Following recommendations for propensity score matching (PSM) approaches, we included a rich set of covariates in analyses that are theoretically important predictors of health and SES, and civic engagement (Caliendo & Kopeinig, 2008; Starks & Garrido, 2014). We included 37 Wave 1 variables that index: demographic characteristics, health variables, social connections, and school performance and extracurricular activities (see Table 1 for the list of variables and Appendix S1 for detailed description of covariates).

There was minimal missing data on the baseline (Wave 1) covariates: 71.14% of participants were not missing any baseline variables and only 4.75% of the sample were missing data on three or more covariates. There is not a broad agreement about how to handle missing data with PSM, but mean replacement is suggested (Harding, 2015). In this approach, a missing data dummy is created for each variable, and the propensity score is estimated using the imputed mean values. Missing data on the treatment and outcome variables were not imputed (Harding, 2015).

Analytic Strategy

A key concern when testing the relations between civic engagement and future health and SES is addressing a number of selection issues that may bias the results. Propensity score approaches are an increasingly popular approach to mitigate sources of selection bias by matching participants based on observable characteristics and ensuring balance on these observed potential confounders (Caliendo & Kopeinig, 2008). Importantly, using this approach, we compare two extremely similar groups of youth (i.e., matched on demographic

characteristics, health characteristics, social connections, and grades in school). The difference is that the “treatment group” participated in the civic activity (e.g., voted in last presidential election) and the “comparison group” did not (e.g., did not vote in the last presidential election).

In the first step of analysis, we ran three separate probit regressions to predict the probability of voting, volunteering, and activism based on the full set of covariates. A single propensity score was then created using the predicted values (pscore) for each civic variable (voting, volunteering, activism), given a set of measured characteristics. Following guidelines (Starks & Garrido, 2014), we next tested balance on the propensity score across treatment and control blocks and then on covariates across treatment and control groups within blocks of the propensity scores (for sample code, see Appendix S2, Step 1).

Next, we chose our analytical approach for comparing groups. As recommended (e.g., Starks & Garrido, 2014), we tried three approaches: nearest neighbor matching, radius matching, and inverse propensity score weighting (IPSW). We selected IPSW for two important reasons: (a) We achieved the best balance using IPSW, and (b) IPSW allowed us to integrate survey weights, which is best practice for generalizing conclusions about the target population and obtaining unbiased estimates of population parameters and standard errors (Tourangeau & Shin, 1999). The IPSW approach uses the inverse of the propensity score as the weight for each participant in the treatment group, and the inverse of one minus the propensity score as the weight for each participant in the control group. IPSW is increasingly recognized as a preferred matching technique (Murnane & Willett, 2010). Past work has demonstrated that using parametric estimates of the propensity score, rather than the true propensity score, is more efficient in adjusting for differences in observable covariates (Hirano, Imbens, & Ridder, 2003).

We ran our main models to examine the relations between the three forms of adolescent civic engagement and the six health and SES indicators in young adulthood. One major advantage of matching approaches over ordinary least squares (OLS) regression is comparing observably similar individuals and eliminating observations without an appropriate comparison. Therefore, we restricted the sample to the region of “common support,” which allowed us to eliminate observations for whom no appropriate matched control observation exists by trimming models at 5% for each of the three types of civic engagement (see Bassok, 2010 for more detail). Finally, we examined the balance

of our sample after IPSW to ensure that covariate balance was optimized.

Results

Preliminary Analyses

All survey-weighted descriptive statistics for covariates for the treatment and control matched samples on voting, volunteering, and activism are shown in Table 1. Descriptive statistics for Wave 4 outcomes are shown in Table 2. In terms of frequency of participating in the civic activities, 45.21% of eligible participants reported voting, 30.03% reported volunteering, and 3.62% reported attending a rally or march. Civic activity variables were weakly correlated ($r = .133$ for activism and vote, $r = .148$ for activism and volunteer, and $r = .173$ for vote and volunteer).

Weighting

A propensity score for each participant for each type of civic engagement was estimated from the full set of covariates (see Table 1) using probit models. These analyses indicated that 17 of the 37 covariates predicted likelihood of voting ($p < .05$), 18 predicted likelihood of volunteering, and 11 variables predicted likelihood of activism. Empirically based methods were used to establish the optimal number of blocks needed so that mean propensity scores were not different for treatment and controls.

Establishing Balance

As an initial step for assessing balance, we tested for balance on all covariates across treatment and control groups within each block of the propensity scores (Starks & Garrido, 2014). We conducted this analysis for each of the three civic engagement variables. Although some covariate imbalance can be expected (Starks & Garrido, 2014), we saw a small amount of imbalance. Only 12 covariates were not balanced.

As the final balance check, it was necessary to ensure balance on covariates across treatment and control groups in the weighted sample (Starks & Garrido, 2014; see Appendix S2, Step 2). Significant imbalance existed on several variables for each of the three forms of civic participation before weighting. After weighting by propensity scores, all standardized mean differences (the difference in means in units of the pooled standard deviation; Austin, 2011) were $< 10\%$ for voting and volunteering and

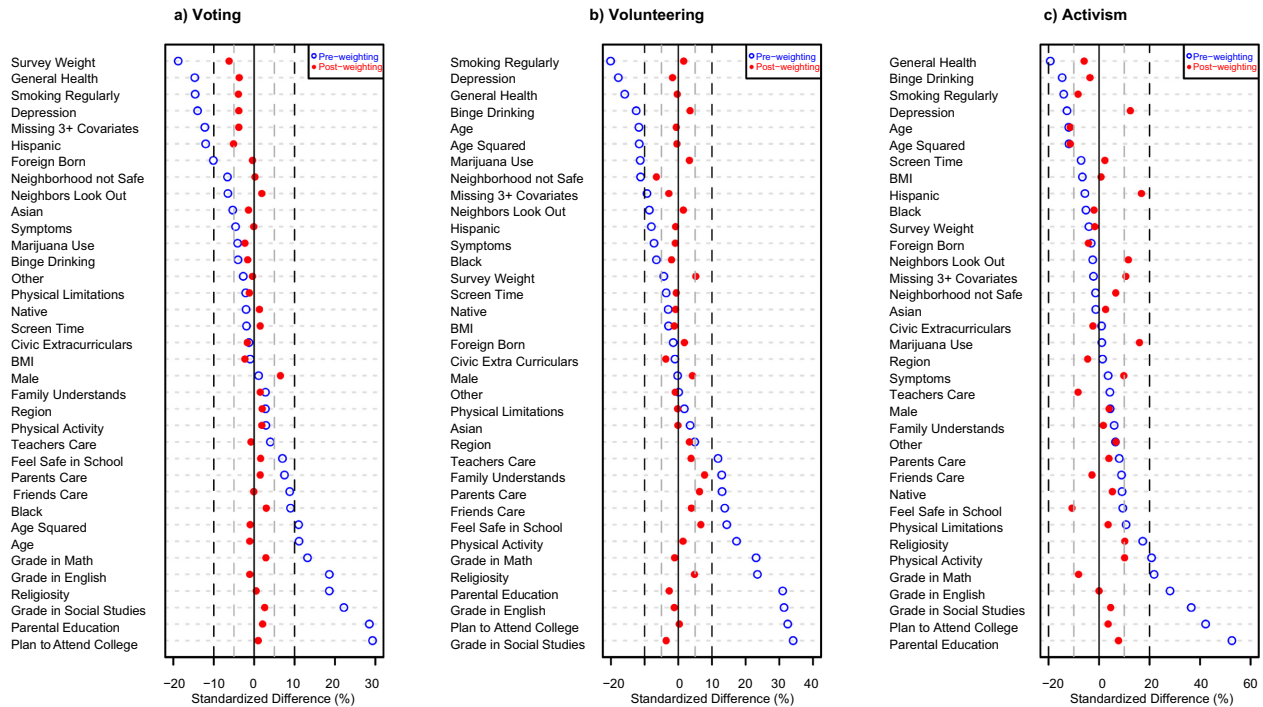


Figure 1. Standardized differences scores on all covariates before and after weighting for (a) voting, (b) volunteering, and (c) activism (see Appendix S2, Step 4 for code to generate Figure 1).

< 15% for activism (Figure 1) with the majority reduced to < 5% (Austin, 2011; Caliendo & Kopeinig, 2008; Rudolph et al., 2014). Thus, covariate balance between the voters and nonvoters, volunteers and nonvolunteers, and activists and nonactivists was achieved in the final weighted sample.

Main Analyses

Next, we ran our main analyses to test the effects of adolescent civic engagement on SES and health in adulthood (see Appendix S2, Step 3). We ran 18 models total testing the “treated” and “control” groups on three civic activities (voting, volunteering, and activism) on six outcomes: household income, personal earnings, education, depressive symptoms, risky health behaviors, and metabolic risk in adulthood. Final propensity score models included the full set of covariates. These conservative, “doubly robust” estimators are the gold standard in PSM (Ho et al., 2007; Rudolph et al., 2014). Final models also controlled for the other two civic activities in order to isolate the links between each type of civic activity and the outcomes. Below, we report the average treatment effect as effect size (ES), standard error, and p value. See Table 3 for full results with confidence intervals and sample size

for each model. The results for our main analyses are organized below by the form of civic engagement.

Voting

Voting was associated with higher SES in adulthood. Voting was associated with more years of education ($ES = 0.22$, $SE = .016$, $p < .001$), higher household income ($ES = .13$, $SE = .019$, $p = .000$), and higher personal earnings ($ES = .14$, $SE = .019$, $p < .001$) in adulthood. In terms of health, voting was associated with decreased risky health behaviors ($ES = -.12$, $SE = .018$, $p < .001$) and fewer depressive symptoms ($ES = -.056$, $SE = .018$, $p = .003$). There was no association between voting and metabolic risk in adulthood.

Volunteering

Volunteering was associated more years of education ($ES = .28$, $SE = .019$, $p < .001$), household income ($ES = .092$, $SE = .022$, $p < .001$), and higher personal earnings ($ES = .095$, $SE = .021$, $p < .001$) in adulthood. In terms of adult health, volunteering was associated with decreased risky health behaviors ($ES = -.19$, $SE = .021$, $p < .001$) and decreased depressive symptoms ($ES = -.115$, $SE = .021$, $p < .001$).

Table 3

Relations Between Adolescent and Young Adult Civic Engagement and Socioeconomic Status and Health in Adulthood

	Depressive symptoms β (SE) [95% CI]	Risky health behaviors β (SE) [95% CI]	Metabolic risk β (SE) [95% CI]	Education β (SE) [95% CI]	Household income β (SE) [95% CI]	Personal income β (SE) [95% CI]
Voting	-.056 (.018)** [-.092, -.019] N = 10,835	-.121 (.018)*** [-.158, -.084] N = 10,818	.002 (.018) [-.037, .038] N = 10,737	.220 (.016)*** [.189, .250] N = 10,832	.131 (.019)*** [.092, .169] N = 10,145	.138 (.019)*** [.101, .174] N = 10,628
Volunteering	-.115 (.021)*** [-.157, -.072] N = 10,878	-.186 (.021)*** [-.228, -.145] N = 10,862	.021 (.021) [-.063, .021] N = 10,776	.282 (.019)*** [.245, .319] N = 10,876	.092 (.022)*** [.049, .035] N = 10,194	.095 (.021)*** [.054, .136] N = 10,663
Activism	-.061 (.051) [-.162, .040] N = 10,714	.132 (.060)* [.015, .250] N = 10,697	.077 (.068) [-.056, .211] N = 10,615	.316 (.059)*** [.201, .431] N = 10,712	.046 (.059) [-.069, .162] N = 10,046	.125 (.056)* [.016, .235] N = 10,512

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

.001). There was no association between volunteering and metabolic risk.

Activism

Activism was associated with significantly more years of education ($ES = .32$, $SE = .059$, $p < .001$) and higher personal earnings ($ES = .13$, $SE = .056$, $p = .025$) but not household income in adulthood. In terms of adult health, activism was associated with an increase in risky health behaviors ($ES = .13$, $SE = .060$, $p = .027$). There were no associations between activism and depressive symptoms or metabolic risk.

Robustness Checks

We ran two sets of additional analyses to check the robustness of our findings. In the first set, we ran models including the relevant W3 variable in each model (i.e., controlling for W3 education level in model predicting W4 education). We ran these models for each of the outcomes except for metabolic syndrome because it was not collected at W3. Including the W3 controls is the most conservative estimate of W3 civic engagement on change in outcomes between W3 and W4. However, because the civic engagement variables measure activities in the past 12 months, these models might be overly conservative. This is because W3 civic engagement might plausibly affect W3 outcomes; controlling for the W3 outcome can mask this through the variance accounted for in the link between the W3 and W4 outcome.

Nonetheless, with one exception, we find consistent findings with those reported in our main analyses. As expected, most of the effects are weaker in

this set of analyses. Voting was associated with more years of education ($ES = .12$, $SE = .013$, $p < .001$), higher household income ($ES = .087$, $SE = .045$, $p = .050$), and higher personal earnings ($ES = .14$, $SE = .021$, $p < .001$) in adulthood. In terms of health, voting was associated with decreased risky health behaviors ($ES = -.070$, $SE = .018$, $p < .001$). The one difference in this set of sensitivity analyses was that the association between voting and depressive symptoms drops to nonsignificance ($ES = -.023$, $SE = .018$, $p = .186$). Volunteering was associated with more years of education ($ES = .28$, $SE = .019$, $p < .001$), household income ($ES = .099$, $SE = .022$, $p < .001$), and higher personal earnings ($ES = .097$, $SE = .023$, $p < .001$) in adulthood. In terms of adult health, volunteering was associated with decreased risky health behaviors ($ES = -.11$, $SE = .020$, $p < .001$) and decreased depressive symptoms ($ES = -.11$, $SE = .020$, $p < .001$). Activism during adolescence was associated with significantly more years of education ($ES = .27$, $SE = .059$, $p < .000$) and higher personal earnings ($ES = .13$, $SE = .056$, $p = .016$) but not household income in adulthood. Activism was associated with increased risky health behaviors ($ES = .14$, $SE = .059$, $p = .019$).

We ran another set of models using a civic composite variable. These models compared participants who had done *any* of the three civic activities compared to those who had not done any civic activity. After achieving balance, we then ran models looking at main effects of "any civic versus no civic activity" on the six outcomes. Those who had done *no* civic activity (compared to those who had participated in any of the three civic activities) had higher depression ($ES = .11$, $SE = .019$, $p < .001$), higher risky health behaviors ($ES = .181$, $SE = .019$,

$p < .001$), less education ($ES = -.34$, $SE = .016$, $p < .001$), and lower household income ($ES = -.16$, $SE = .019$, $p < .001$) and personal earnings ($ES = -.16$, $SE = .019$, $p < .001$). The composite “no civic activity” variable was not linked with metabolic risk.

Discussion

In this study, we examined links between three forms of civic engagement during the transition to adulthood and SES and mental and physical health in adulthood. Our PSM approach accounted for differential selection into civic engagement to more rigorously estimate effects of civic engagement on developmental outcomes. Civic engagement can take multiple forms, and developmental theory led us to predict slightly different roles of each civic activity on later outcomes. Overall, we found evidence for strong positive associations between all three forms of civic engagement during the transition to adulthood and adult SES. In terms of health outcomes in adulthood, volunteering and voting were robust predictors of better mental health and fewer risky health behaviors, and activism predicted more risky health behaviors.

Civic Engagement and Adult SES

All three forms of civic engagement in late adolescence and early adulthood were associated with higher educational attainment and income in adulthood. The ESs for these links were strong and suggest that civic engagement may have an important function in social mobility. Our findings add to previous literature documenting associations, although often weak, between various forms of prosocial adolescent activity, including volunteering, and subsequent SES (Barber, Eccles, & Stone, 2001; Kim & Morgül, 2017), which may be accounted for by selection effects (Pilivian & Siegl, 2014). These findings are among the first to assess the function of voting and activism on social mobility. Thus, the present study advances our knowledge considerably, given that results were found after accounting for selection effects of key cofounders like parental education levels and academic performance that predict civic engagement.

Civic engagement might operate on SES in several ways. Civic engagement might serve an instrumental or social function by helping young people develop greater social capital, professional skills that support academic and job performance,

connecting them to social networks, and helping them develop occupational expectations (Diemer, 2009; Jarrett et al., 2005; La Due Lake & Huckfeldt, 1998; Malin et al., 2015). Civic activities can also allow young people to connect with important “real life” issues, especially through active school-based civic programs (e.g., Ballard, Cohen, & Littenberg-Tobias, 2016; Levinson, 2010), perhaps reinvigorating a sense of their own potential or inspiring them to put more effort into school and career development. In sum, civic participation in its various forms might affect SES in adulthood by altering education and professional trajectories.

It is noteworthy that the links between activism and education level and personal earnings are among the strongest (albeit, the least common) of the three forms of civic engagement. Although relatively little is known about the role activism plays in development, it is theorized to facilitate positive development especially among marginalized youth (Hope & Spencer, 2017; Watts et al., 2011), and some evidence finds links between activist attitudes and participation and higher SES among marginalized youth (Diemer, 2009) as measured by occupation and income. Activism is a unique and powerful context for youth, especially from low-income backgrounds, to join with like-minded peers and mentors to focus a critical eye on real-world problems. Studies of young people involved in one specific form of activism, youth organizing, report that these youth develop important skills and identities (Conner, 2011) and show higher academic attainment (Rogers & Terriquez, 2016). Thus, our findings lead us to believe that becoming involved in activism during the transition to adulthood, an uncommon civic activity that often involves deep commitment to a cause, might offer an especially powerful civic experience that can influence educational and personal earnings trajectories.

However, although activism predicted higher personal SES (higher education level and personal earnings), it did not predict household income in adulthood but volunteering and voting did. Activism might affect SES through individual-level pathways, for example, helping people build skills and get jobs that can affect educational attainment and higher personal earnings, whereas volunteering and voting might additionally affect SES through social pathways such as plugging people into to new, perhaps high achieving or higher SES social networks, which can influence mate selection and thus higher household income. Indeed, Kim and Morgül’s (2017) finding that volunteerism predicted higher educational attainment and personal

earnings whether it was mandated or not supports the idea that volunteerism might operate via helping youth build social skills and social ties. It will be interesting for future work to understand mechanisms involved in each form of civic engagement and social mobility attending to how activism might differentially predict SES indicators such as income and education.

It is well-known that high SES is linked with positive functioning and that there are widespread disparities in life trajectories by SES (Adler & Ostrove, 1999). Therefore, the possibility that civic engagement might be a formative experience with a role in shaping educational attainment and income provides a promising avenue for interventions meant to promote SES and reduce disparities. The current study provides solid grounding for future work, which should aim to understand how exactly each form of civic engagement shapes SES. Our study focused on civic engagement at the transition to adulthood, but given the formative potential of civic engagement to development across adolescence, we believe it is fruitful to expand civic opportunities earlier in adolescence. For example, we propose that schools and other youth organizations might serve youth well by facilitating activism opportunities at rates comparable to opportunities for volunteerism. In terms of policy, many schools currently require community service hours (Farkas & Duffett, 2010) with the goals of both contributing to youth development as well as to community projects. It may be beneficial to students if activism also counts toward such requirements. This aligns with both current calls to broaden the definition and opportunities for civic participation to include youth from diverse backgrounds (Jensen, 2010) as well as goals of community service requirements.

Civic Engagement and Adult Health

Voting and volunteering at the transition to adulthood were associated with fewer risky health behaviors in adulthood, while activism predicted more risky health behaviors. We interpret the positive findings regarding voting and volunteering in light of psychological and social resources potentially provided by these activities that might decrease health risk-taking behavior. These resources include positive future orientation (Robbins & Bryan, 2004), positive affect, optimism, perceived social support (Hoyt et al., 2012), stronger sense of community membership (Zeldin, 2004), and sense of perceived control about one's own life outcomes (McDade et al., 2011; Wills, 1994); each is

associated with fewer health-risk behaviors among adolescents. Embeddedness in social networks may also reinforce positive behavioral trajectories, for example, through mechanisms of social comparison and social norms (Pachucki & Goodman, 2015; Thoits, 2011). In the case of volunteering, it is also possible that spending time in volunteer activities diverts away from spending time on riskier activities (Pilivian & Seigl, 2014).

It was notable that activism (measured as involvement in a march/rally) was associated with an increase in risky health behaviors and was unrelated to the other forms of health in adulthood. Activism differs from voting and volunteering in a few key ways that might explain the divergent findings. Volunteerism is primarily about helping others and alleviating suffering (Walker, 2000) and voting is about exercising voice, whereas activism is most often aimed at social change (Ginwright & James, 2002). Perhaps it is easier to feel satisfied that one "made a difference" given the more straightforward goals of voting and volunteerism compared to activism. Thus, feelings of accomplishment or goal achievement might accompany voting and volunteerism, whereas activism might be accompanied by frustration with a slow pace of social change. This frustration might lead to risky health behaviors sometimes used to cope with negative feelings, such as drinking or smoking. The *experiences* of voting, volunteering, and activism are also different. Although voting and volunteerism are noncontroversial activities that exist within formal structures, activism often involves publically voicing opinions that are controversial (Ballard & Ozer, 2016) and includes a more oppositional set of activities that often exist outside of formal structures, perhaps connecting individuals into social networks where risk-taking behaviors are the norm. Given that activism predicted more risky health behaviors, but positively predicted SES, it is well worth future research exploring potential mechanisms by which activism affects development as well as potential moderators to clarify whether there are specific groups of youth for whom activism might impact health in negative and positive ways.

Voting and volunteering were associated with fewer depressive symptoms in adulthood. This extends evidence, mostly from adult samples (Thoits, 2011), and suggests that engaging in community as a volunteer or a voter can boost mental health among younger samples (Wray-Lake et al., 2017). In addition to potentially operating on the same psychological resources reviewed above, in

the adult literature, it is specifically proposed that helping others can boost healthy functioning through the psychological benefits of giving support to others and “mattering.” The experience of volunteering and voting may be more likely to lead to positive emotions like making people feel good about themselves, perhaps providing the boost to mental health, whereas experiences in activism are likely more emotionally complicated, perhaps explaining why activism was not associated with change in depressive symptoms. Others suggest biological mechanisms based on hormones like oxytocin (Poulin & Holman, 2013), buffering stress (Poulin et al., 2013), and improving immune functioning (Schreier et al., 2013). Voting might be indicative of a general sense of connectedness with society, empowerment to be civically involved, or a belief in civic responsiveness. Each of these might serve promotive functions for mental health.

Given considerable evidence that chronic stress predicts poor mental health and risky health behaviors in adolescence and young adulthood (Adam et al., 2011; Romer, 2010), it is exciting to consider voting and volunteering as a potential disruption to these processes. Offering youth a chance to exert voice and exercise control (Zimmerman, 1995), and providing the opportunity for role fulfillment and an emotional outlet might lead youth to fewer health-risk behaviors and better mental health. It is important for future work to closely examine a potentially risky role of activism for health behaviors, and to understand how best to scaffold activism to promote healthy behaviors.

None of the three forms of civic engagement in the present study were associated with metabolic risk in adulthood. Future work should focus on the time course by which civic engagement might affect biological processes. Biological and physiological effects show up closer in time to civic engagement, especially in the form of helping as with volunteering (Poulin & Holman, 2013; Schreier et al., 2013), but long-term cumulative physical effects are not yet understood among adolescents and young adults.

It is important to note that in our models comparing *any* civic engagement to *no* civic engagement, we found main effects of civic engagement on five of the six outcomes in this study. This underscores the need for research to differentiate between forms of civic engagement in predicting developmental outcomes; combining the forms of civic engagement may obscure the unique role each form plays in development (Obradović & Masten,

2007; Wray-Lake & Sloper, 2015; Wray-Lake et al., 2017).

Limitations and Future Work

Despite the methodological and theoretical contributions of the present study, some limitations must be noted. First, our analytic approach reduced selection bias but does not establish causality. Using propensity scores to move toward causal inference adds considerably to past work investigating the effects of civic engagement on developmental outcomes that typically relies on traditional linear regression techniques. However, the utility of this approach depends on thoroughly accounting for the earlier variables that affect selection into civic engagement and potentially affect the outcomes of interest. In the present analyses, endogenous unobservable characteristics could still account for the results (e.g., Foster, 2010). For example, due to data limitations, in the present study we used parental education to account for family SES, and we were not able to capture family political socialization processes, which affect selection into civic engagement and potentially affect outcomes such as education level.

Second, the civic engagement measures used here were not able to capture the vast differences in the quality of civic experiences young people have. Experiences in volunteerism and activism can be categorized on many descriptive spectra. More finely grained measures of types of civic engagement as well as the quality of engagement (Ozer, Rittnerman, & Wanis, 2010) would add considerably to understanding how civic engagement might promote or undermine health. Not only are the qualities and quantity of civic engagement likely to affect health trajectories, but the nature of civic experiences likely moderates the links between civic engagement and health. As an example, reflection is a critical component of civic engagement that moderates links between community service participation and civic outcomes (van Goethem, Hoof, Orobio de Castro, van Aken, & Hart, 2014); the same might be true for effects of each type of civic engagement on health and SES outcomes.

Additionally, we faced limitations common to using longitudinal, nationally representative data sets like Add Health, including missing data, one item measures of key variables (i.e., civic engagement), and large temporal gaps between survey waves. To address potential bias from attrition, we

used sampling weights that were created by Add Health, which adjust for participant nonresponse. Data were self-reported, so estimation results are sensitive to mismeasurement or misreporting. Finally, biomarker outcomes were not added to the study protocol until Wave 4, so we were only able to control for self-report health measures in our analyses.

In the present study, we were primarily concerned with testing main effects of civic engagement on health and SES outcomes accounting for selection effects. It will be exciting for future work to understand *mechanisms* explaining links between civic engagement and health and SES in adulthood. For example, activism might promote health for marginalized youth when it involves the development of certain attitudes like critical consciousness (Christens, 2012; Diemer & Li, 2011), and volunteerism might operate through beneficial effects of helping others (Brown & Okun, 2013). Future work should also attend to demographic and contextual factors that might moderate links between civic engagement and health and SES. For example, civic engagement during adolescence and young adulthood might operate in different ways for boys and girls because of differences in civic socialization and participation across gender (e.g., Jenkins, 2005) and a historic legacy of excluding women from voting practices and elected office. Furthermore, the positive effects of civic engagement might be amplified when the social networks youth become embedded in have qualities such as being large and tightly knit as opposed to sparse, or diverse rather than homogenous (La Due Lake & Huckfeldt, 1998). In addition, future work can expand our understanding of the nonbehavioral (e.g., cognitive and emotional) aspects of civic engagement on health and SES.

Conclusion

This study documents how engaging in civic life at the transition into adulthood affects developmental trajectories. All forms of civic engagement have robust positive associations with SES in adulthood over and above family SES and known background characteristics predicting selection into civic engagement. Volunteering and voting predict improved mental health and health behaviors, but not physical health, whereas activism predicted more risky health behaviors. Overall, civic engagement seems

to be a powerful experience in adolescence and young adulthood with long-term implications for development.

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(see Appendix S3 for further relevant references)

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Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

Appendix S1. Detailed Description of Covariates (See Table 1 for Descriptive Statistics)

Appendix S2. Sample Code

Appendix S3. References (Continued): Further Readings Relevant to Civic Engagement and Health and Propensity Score Matching Methodology