Associations of Social Capital with Mental Disorder Prevalence, Severity, and Comorbidity among U.S. Adolescents

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Abstract

Objective: To examine cross-sectional associations between social capital constructs and 1) adolescent lifetime mental disorders, 2) severity of functional impairment, and 3) psychiatric comorbidity.

Method: Data were from the National Comorbidity Survey Adolescent Supplement, a nationally representative mental health survey of 6,483 U.S. adolescents aged 13–18 years. Information from fully-structured diagnostic interviews, including adolescent and caregiver reports, was used to measure seven social capital constructs and lifetime DSM-IV mental disorders (mood, anxiety, behavior, substance use and eating disorder classes). Disorder severity was divided into severe vs. mild/moderate. Comorbidity was measured as the number of different classes of lifetime mental disorders.

Results: Adjusted for socio-demographics and caregivers' mental health, the most consistent associations with adolescent mental disorder were for supportive friendships (any disorder OR=0.95, 95%CI=0.91–0.99), family cohesion (OR=0.81, 95%CI=0.75–0.86), school bonding (OR=0.76, 95%CI=0.71–0.81), and extracurricular participation (OR=0.90, 95%CI=0.86–0.95), although results differed by disorder class. Caregiver-reported neighborhood trust and reciprocity and caregiver community involvement were less consistently associated with mental disorder. Medium levels of adolescent-reported affiliation with neighbors was associated with lower odds

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of mood (OR=0.81, 95%CI=0.66–0.98) and anxiety (OR=0.78, 95%CI=0.64–0.96) disorder, while high levels were associated with higher odds of behavior disorder (OR=1.47, 95%CI=1.16–1.87). Several associations were stronger for severe vs. mild/moderate disorder and with increasing comorbidity.

Conclusion: Although we cannot infer causality, our findings support the notion that improving actual and/or perceived social capital, especially regarding friendships, family, and school, (e.g., through multimodal interventions) could aid in the prevention and treatment of both individual adolescent mental disorders and psychiatric comorbidity.

Keywords

social capital; adolescent; mental disorders; severity; comorbidity

Introduction

Social capital, although being theoretically pluralistic, generally comprises concepts such as social cohesion, reciprocity, and trust (Putnam, Leonardi, & Nanetti, 1994), as well as social support and social integration, at the individual, family, and community levels (Almedom, 2005). Social capital also can be divided into cognitive and structural social capital. The former refers to the values, attitudes, and beliefs that produce cooperative behavior, while the latter pertains to roles, rules, precedents, behaviors, networks, and institutions (McKenzie, Whitley, & Weich, 2002). Social capital is a key concept in public health, epidemiology, and behavioral sciences (Kawachi & Berkman, 2001); its associations with both physical and mental health outcomes have been examined (Christakis & Fowler, 2007; Silva, McKenzie, Harpham, & Huttly, 2005). Given the multifaceted nature of social capital, its measurement entails querying multiple domains at multiple levels including neighborhood (trust, reciprocity, safety), social networks (family and friends), and community involvement (Baum & Ziersch, 2003). Among youth, measurement also includes the influential domains of family and school (Morgan & Haglund, 2009; Novak, Suzuki, & Kawachi, 2015). Although research on the association between social capital and mental health has largely focused on adults (Fujiwara & Kawachi, 2008; Lofors & Sundquist, 2007), the number of studies conducted among children and adolescents has been increasing (Li, Jiang, & Fang, 2017; McPherson et al., 2014). Focusing on youth is important given the early age of onset of many mental disorders (Kessler et al., 2005; Paus, Keshavan, & Giedd, 2008), and the impact of family and school factors on treatment outcomes (Miklowitz et al., 2013). Overall, findings from these studies indicate that higher social capital is associated with better mental health (e.g. greater wellbeing and fewer internalizing and externalizing problems) (Birndorf, Ryan, Auinger, & Aten, 2005; McPherson et al., 2014; Rotenberg et al., 2004; Van Meter, Paksarian, & Merikangas, 2019).

Social capital at the neighborhood/community level, such as neighborhood collective efficacy, may also impact youth wellbeing (Sampson, Raudenbush, & Earls, 1997; Sampson, Morenoff, & Earls, 1999). Children are reliant on their families for the resources necessary to healthy development and families are, in turn, supported by their neighborhoods and communities (Hoagwood, Atkins, et al., 2018). When families are part of socially-connected and well-resourced communities, their children benefit; conversely, in

communities characterized by poverty, poor housing, and a transitory population, children tend to have worse mental and physical health (Anderson, Leventhal, & Dupéré, 2014; Hoagwood, Rotheram-Borus, et al., 2018). Related, schools are important communities for youth and families, providing not only education, but social support and, in many cases, access to nutritional food, afterschool care, and other resources including mental health and medical services. Measuring the influence of social capital derived from the community, such as school and neighborhood trust and involvement, on youth mental health could inform social policy priorities and the allocation of limited resources.

Few studies have examined the association between social capital and psychiatric disorder in children and adolescents from non-clinical samples. Garrison et al. (1992) and Cuffe et al. (2005) reported inverse cross-sectional associations between perceived family cohesion and affective disorder among adolescents from a school-based sample (Cuffe, McKeown, Addy, & Garrison, 2005; Garrison, Addy, Jackson, McKeown, & Waller, 1992). Meltzer et al. (2007) found that adolescents from a national survey in Great Britain who perceived their neighbors to be less trustworthy had higher odds of emotional and conduct disorders (Meltzer, Vostanis, Goodman, & Ford, 2007). To our knowledge, no population-based studies have assessed associations between several domains of social capital and a wide array of mental disorders among youth. Furthermore, although there is indication that social capital is associated with mental disorder severity and comorbidity among youth, this evidence is limited to clinical samples (Drabick, Gadow, & Sprafkin, 2006; Esposito-Smythers et al., 2006).

Therefore, using data from the National Comorbidity Survey Adolescent Supplement (NCS-A), a nationally-representative, population-based survey of adolescents aged 13–17, we aimed to examine 1) cross-sectional associations between several constructs of social capital and adolescent mental disorders, 2) association between social capital and the severity of functional impairment associated with mental disorders, and 3) associations between social capital and psychiatric comorbidity. Based on prior research, we hypothesized that adolescents who perceive lower support and social trust in the family, the school, or the neighborhood (cognitive social capital) and those who have lower structural social capital, are more likely to have lifetime mental disorder. We also hypothesized that higher social capital would be associated with lower disorder severity and fewer comorbid disorder classes.

Methods

Study Design and Participants

The NCS-A is a face-to-face survey conducted in a nationally-representative probability sample of adolescents aged 13–17 years in the United States, designed to assess the burden of DMS-IV disorders and risk factors (Kathleen R. Merikangas, Avenevoli, Costello, Koretz, & Kessler, 2009). Professional interviewers at the Institute for Social Research at the University of Michigan administered computer-assisted personal interviews. The background, sampling and recruitment methods, and weighting procedures have been described elsewhere (Kessler et al., 2009a, 2009b). The NCS-A was carried out in a dual-frame sample that included a household sub-sample and a school sub-sample (Kessler et

al., 2009b). The overall NCS-A adolescent response rate combining the two sub-samples was 82.9%, yielding a total number of 10,123 adolescents. One parent or parent surrogate of each participating adolescent was asked to complete a self-administered questionnaire (PSAQ) that contained informant questions about the adolescent's mental health. The full PSAQ was completed by parents of 6,483 participating adolescents; this sample was used for the current study. The Human Subjects Committees of Harvard Medical School and the University of Michigan approved the NCS-A recruitment and procedures. One parent or guardian of each adolescent provided written informed consent, and adolescents provided written assent to participate.

Measures

Social capital—Participants in the NCS-A were administered the CIDI (Kessler & Ustün, 2004), a fully structured interview to assess the lifetime prevalence of DSM-IV diagnoses. The interview also contained a number of modules designed to measure risk factors and correlates of mental disorder. Information from these modules was used to measure seven social capital constructs based on existing literature: supportive friendships (4 items from the Supportive Interaction and Negative Interaction scale (Schuster, Kessler, & Aseltine, 1990)), family cohesion (9 items from the Family Adaptability and Cohesion Evaluation Scale (FACES) II (Olson, Portner, & Bell, 1982)), school bonding (9 items adapted from the multidimensional school bonding scale (Cernkovich & Giordano, 1992)), affiliation with neighbors (2 items), parent-reported neighborhood trust and reciprocity (2 items), extracurricular participation (5 items), and parent community involvement (3 items). The first five indices captured cognitive social capital, and the latter two indices captured structural social capital. Among the seven indices, the parent-reported neighborhood trust and reciprocity index and the parent civic involvement index were derived from the PSAQ. Parent-reported items were included to capture social capital available at the family (parent-reported community involvement) and neighborhood (trust and reciprocity) levels independent of adolescent perception.

Affiliation with neighbors was measured via two items assessing how many people the adolescent knows in their neighborhood and how often they interact with them. Extracurricular participation was measured via the extent of adolescent participation in five different types of extracurricular activities. Neighborhood trust and reciprocity index was measured via two items assessing the extent to which neighbors help and look out for each other. Parent community involvement was measured via three items assessing whether parents were regularly involved in community activities. For each index, items were summed to create a total score. For four indices (supportive friendships, family cohesion, school bonding, and extracurricular participation), total scores were standardized using the median absolute deviation, an alternative to the standard deviation that does not assume a normal distribution. The remaining three indices (affiliation with neighbors, parent-reported neighborhood trust and reciprocity, and parent community involvement) were unsuitable for standardization and were instead categorized into three levels. Details of the social capital measures are provided in the Supplemental Material.

Mental disorders—Lifetime mental disorders ascertained in the CIDI were grouped into one of five classes for analysis: mood (major depressive disorder/dysthymia and bipolar I/II), anxiety (panic disorder, agoraphobia, social phobia, specific phobia, generalized anxiety disorder, posttraumatic stress disorder, separation anxiety disorder), behavior (attention-deficit/hyperactivity disorder [ADHD], oppositional defiant disorder [ODD], and conduct disorder [CD]), substance use (alcohol abuse/dependence, drug abuse/dependence), and eating (anorexia nervosa, bulimia nervosa, and binge eating disorder). We also considered an aggregate indicator of any class. Mood, anxiety, and substance use disorders were ascertained using adolescents' reports alone. To increase validity, CD and ODD were operationalized using adolescent and parent reports combined using an "or" rule at the symptom level, while ADHD was ascertained using parent reports alone (Cantwell, Lewinsohn, Rohde, & Seeley, 1997; Grills & Ollendick, 2002).

To capture disorder severity, each diagnosis was further divided into severe vs. mild/ moderate. Impairment criteria embedded in DSM-IV required endorsement of some/a lot/ extreme levels of impairment or moderate/severe/very severe levels of symptom severity. To more clearly identify disorders that were clinically significant, our definition of severe lifetime disorders used higher thresholds of impairment that required endorsement of "a lot" or "extreme" impairment in daily activities, or "severe or very severe" distress (Kathleen Ries Merikangas et al., 2010). Severe emotional disorders required both distress and impairment to be present, and severe behavior disorders required endorsement of symptom criteria by both the parent and the adolescent. No severe definition was made for eating disorder or substance use disorder. Comorbidity was measured according to the number of different classes of mental disorder (mood, anxiety, behavior, substance, and eating) for which participants met lifetime criteria. This was categorized as 0, 1, 2, 3, and 4–5.

Covariates—Adolescent sociodemographic characteristics were measured during the CIDI and included age (13–14, 15–16, 17–18), sex, race/ethnicity (non-Hispanic black, non-Hispanic white, Hispanic, and other race/ethnicity), region (Northeast, Midwest, South, West), urbanicity of county of residence (metropolitan, other urban, non-urban), parental highest level of education (less than high school, high school graduate, some college, college graduate or higher), ratio of family income to the federal poverty line (<=1.5, >1.5 to <=3.0, >3.0 to <=6.0, > 6.0), and the number of biological parents living with the adolescent (0, 1, or 2). Parental mental health was assessed in the PSAQ. Parent informants were asked how many years out of the past 10 they had various mental health problems. These included depression, mania, anxiety, panic attacks, impulsive anger/aggression, problems with alcohol and drugs, and suicidal thoughts and behaviors (see Supplemental Material). Parental mental health problems were coded as present if the parent reported having any of these problems in the past 10 years, and absent otherwise.

Analysis

Mean and standard errors of social capital indices were calculated and compared by adolescent characteristics. To evaluate the associations of social capital indices and lifetime DSM-IV disorders, a series of separate binary and multinomial logistic regression analyses were conducted in which social capital indexes were entered as predictors and the class of

lifetime DSM-IV disorders, severity of disorders, and the number of classes of disorders were outcomes. Results are presented as odds ratios (ORs) with 95% confidence intervals (CIs). The nine covariates described above were included, as all were associated with at least one social capital index and at least one mental disorder class at $\alpha<.10$. Rates of missingness were less than 5% for all variables, and missingness was therefore addressed using model-wise deletion. Because the NCS-A data are both clustered and weighted, the Taylor series linearization method implemented in SUDAAN (version 11; Research Triangle Institute) was used to estimate variance and 95% confidence intervals. Significance of predictors were evaluated using Wald $\square^2$ tests based on design-adjusted coefficient variance-covariance matrices. Statistical significance was evaluated using 2-sided tests with $\alpha<.05$; no method of controlling the overall Type 1 error rate was used.

Results

The distribution of the 7 social capital indices, according to adolescent characteristics and parent mental health, are displayed in Table 1. All 5 adolescent-reported indices were associated with adolescent age and sex, while the 2 parent-reported indices were not. All demographic and socioeconomic characteristics were associated with multiple social capital indices, although many group differences were small in magnitude. However, several indicators of social capital were positively associated with social advantage. For example, non-Hispanic white adolescents, as well as those with higher parental education and higher family income, had higher scores on caregiver-reported neighborhood trust and reciprocity and extracurricular participation. Parental mental health problems were associated with lower scores on 4 of the 7 social capital indices (Table 1).

Table 2 shows associations between social capital indices and mental disorder classes, adjusted for sociodemographic characteristics and parental mental health. Three cognitive social capital indices (supportive friendships, family cohesion, and school bonding) were negatively associated with all mental disorder classes, except that supportive friendships index was not associated with substance use disorder and school bonding was associated with anxiety at trend levels. In terms of magnitude, the strongest of these estimates were observed for the associations of school bonding with substance use disorder (OR=0.68, 95%CI=0.61–0.75) and behavior disorder (OR=0.70, 95%CI=0.65–0.76) and the association between family cohesion and substance use disorder (OR=0.69, 95%CI=0.63–0.76). We also found negative associations of extracurricular participation with eating (OR=0.81, 95%CI=0.68–0.96), behavior (OR=0.82, 95%CI=0.75–0.89), and substance use disorders (OR=0.79, 95%CI=0.72–0.87). Note that the preceding ORs correspond to a median absolute deviation increase in the respective social capital indicator. Adolescent-reported affiliation with neighbors, parent-reported neighborhood trust and reciprocity, and parent community involvement were less consistently associated with mental disorders. For example, neighborhood trust and reciprocity was inversely associated only with behavior disorders (medium vs. low: OR=0.83, 95%CI=0.64–1.08; high vs. low: OR=0.49, 95%CI=0.34–0.71), while high levels of parent community engagement were inversely associated only with mood disorders (OR=0.65, 95%CI=0.47–0.91) and substance use disorder (OR=0.62, 95%CI=0.45–0.85). Additionally, the odds of anxiety disorder and mood disorder were lower among adolescents reporting medium (anxiety disorder: OR=0.81,

95%CI=0.66–0.98, mood disorder OR=0.78, 95% CI=0.64–0.96) levels of affiliation with neighbors compared to those reporting low levels, but the odds of these disorders when comparing high and low levels of this social capital index did not reach statistical significance. Finally, the odds of behavior disorder (OR=1.47, 95%CI=1.16–1.87) were higher among adolescents reporting high levels of affiliation with neighbors compared to those reporting low levels. The odds of substance use disorder also differed significantly by levels of affiliation with neighbors, with lower odds among those reporting medium levels and higher odds among those reporting high levels, although the CIs for individual OR estimates contained 1 (Table 2).

Table 3 reports adjusted associations between social capital and severity of mood, anxiety, and behavior disorder classes. Supportive friendships, family cohesion, and school bonding, all displayed at least one association in the hypothesized direction. For example, higher supportive friendships scores were associated with lower odds of severe behavior disorder (OR=0.81 95%CI=0.71–0.92) but not associated with mild-moderate behavior disorder (OR=0.97, 95%CI=0.91–1.03), a difference that was statistically significant (not shown). Similarly, we found significant inverse associations between family cohesion and severe (but not mild/moderate) anxiety disorders and between school bonding and severe (but not mild/moderate) mood and behavior disorders (Table 3). Associations of extracurricular participation with anxiety and behavior disorder appeared to be in the hypothesized direction, but ORs were not significantly different from one another (Table 3). As in Table 2, these ORs correspond to a median absolute deviation increase in the respective social capital indicator. Associations of other social capital indices with mental disorder severity were less consistent. For example, both medium (OR=1.86, 95%CI=1.24–2.80) and high (OR=1.73, 95%CI=1.09–2.75) levels of parent-reported neighborhood trust and reciprocity were associated with higher odds of severe anxiety disorder but were not associated with mild-moderate anxiety disorder. Results for adolescent-reported affiliation with neighbors and parent community involvement also did not show a clear pattern of association with disorder severity (Table 3).

Table 4 shows associations of social capital indices with the number of lifetime DSM-IV disorder classes. Overall, greater adolescent-reported cognitive social capital (supportive friendships, family cohesion, and school bonding) was associated with fewer comorbid mental disorders; the relationship between school bonding and the number of disorder classes appeared especially graded. A similar pattern was observed in the extracurricular participation index and for medium levels of adolescent-reported affiliation with neighbors. As in Table 2 and Table 3, however, associations for parent-reported neighborhood trust and reciprocity and parent community involvement were less consistent.

Discussion

In the present study, we examined associations of multifaceted social capital indices with mental disorders as well as disorder severity and psychiatric comorbidities in a nationally representative population sample of adolescents. To our knowledge, this is the first study to consider several aspects of social capital in relation to the full domain of DSM-defined mental disorders among adolescents from a population-based sample. Our results are

broadly consistent with prior literature demonstrating a positive association between social capital and mental health, but also highlight the complexity and nuance inherent in these relationships.

We found the most consistent relationships for adolescent-reported indices of social capital, especially cognitive social capital. Our findings are broadly consistent with prior studies in that better friendship quality (Rotenberg et al., 2004; Windle, 1994), greater family cohesion (Cuffe et al., 2005), and greater school bonding (Bond et al., 2007) were associated with better mental health. We did not find an association between supportive friendships and substance use disorder, which seems to conflict with prior studies (Awgu, Magura, & Coryn, 2016; Dishion & Owen, 2002). This could be due to the potential dual role of friendships: close peer networks can lead to better social control over deviant behaviors (Bolin, Lindgren, Lindström, & Nystedt, 2003), but may also increase the risk for deviant behavior through peer pressure (Villalonga-Olives & Kawachi, 2017), and associations with deviant peers (Patterson, DeBaryshe, & Ramsey, 1989). Related, participants who reported higher levels of school bonding and extracurricular participation were less likely to meet the criteria for substance use disorder.

The domains of friendship, family, and school were more consistently inversely associated with mental disorder than other domains, in line with the known importance of these domains in child and adolescent development (Buhrmester, 1990). Supportive friendships, in particular, were associated with lower odds of anxiety, mood, and behavior disorders, and with fewer overall psychiatric diagnoses. This is consistent with research demonstrating that youth with positive peer affiliations are less likely to develop internalizing or externalizing disorders (Newman, Lohman, & Newman, 2007). Additionally, youth who have mental disorders often struggle socially and may be less likely to develop supportive friendships than their typically developing peers (Finsaas et al., 2018).

Although adolescence is a period of identity formation and differentiation from one's family of origin, during which peer relationships take on new importance, familial relationships still hold significant influence on adolescent outcomes (Steinberg, 2001). Youth who grow up in families characterized by conflict or over-control are more likely to develop mental health disorders (Hale et al., 2016) – and these negative family characteristics can increase the severity and duration of symptoms over time, as reflected in the higher rates of comorbidity we found in youth with poor family cohesion. Interestingly, the one mental disorder class with which family cohesion was not associated was anxiety; other work has shown that anxiety is transmitted within families both through modeling of anxious behaviors and biological pathways (Norton & Paulus, 2017). Families may be perceived by youth as cohesive and supportive while still instilling high expectations or other messages that contribute to anxiety. Related, we found that school bonding, although associated with lower odds for some other mental health disorders, was not associated with lower risk for anxiety. This may also reflect that involved, high achieving adolescents can be vulnerable to anxiety (Daniels et al., 2008). In general, the associations we found between school bonding and lower odds of mood, behavior and substance use disorders are consistent with the literature on the important role schools play in helping students develop confidence, a sense of efficacy, and a positive sense of community (Aldridge & McChesney, 2018).

These factors are protective against mood disorders, particularly depression, and substance use disorders, as described above. Although we cannot make inferences about causality with these data, like the reciprocal nature of the association between mental disorders and relationship factors described above, it is likely that youth who start out with better mental health participate more and are able to benefit from strong school ties, whereas those who struggle may have less opportunity to experience the positive influences of the school community.

Contrary to our hypotheses, the structural social capital factors were not consistently associated with mental health disorders. For instance, caregiver reports of neighborhood trust and reciprocity were associated only with behavior disorders and community involvement only with mood and substance use disorders. In addition, associations between adolescent-reported neighborhood affiliation and mental disorder were not straightforward. Medium levels of neighborhood affiliation were associated with lower odds of anxiety and mood disorder, in line with previous reports (Meltzer et al., 2007). However, high levels of neighborhood affiliation did not exhibit any "protective" associations and were associated with higher odds of behavior disorder. Although we lacked community-level measures in this study, prior studies of adults have discussed potential mixed health effects of tight-knit communities, where high levels of social regulation and cohesiveness can lead to both protective and damaging effects on health (Ferlander et al., 2016; Murayama et al., 2015). Of specific relevance to our results, in some cases, high neighborhood affiliation is associated with deviant behavior in youth. This is more likely to occur in low income neighborhoods and in situations where the child may rely on neighbors to fill roles typically filled by family members (Chung & Steinberg, 2006). Extracurricular participation, another index of structural social capital was not associated with mood or anxiety disorder. However, this was inversely associated with behavior and substance use disorders in the present study, corroborating prior work (Fredricks & Eccles, 2006). The association of extracurricular activities with substance use may be explained by the role of extracurricular activities in providing rewarding, substance-free environments (Meshesha, Dennhardt, & Murphy, 2015). In addition, one prior NCS-A study found a higher likelihood of substance use disorder among participants who were not involved in extracurricular activities (Rudolph et al., 2019).

Participation in school activities, trust in the neighborhood, and other individual-level indices of social capital may reflect access to, or engagement with, forms of community-level social capital such as collective efficacy (Sampson, Raudenbush, & Earls, 1997). Community social capital may benefit youth well-being through multiple pathways (e.g., greater self-efficacy, positive peer relationships, sense of safety) that arise through positive effects on the families and neighborhoods in which children are embedded (Hoagwood, Rotheram-Borus, et al., 2018). Although this study is cross-sectional and presents associations rather than causal effects, our results speak to the importance of social factors in child mental health (Braveman, Egerter, & Williams, 2011) and highlight the potential for social policies to benefit children's mental health (Hoagwood, Atkins, et al., 2018).

This is the first study to examine the association of social capital with mental disorder severity and comorbidity in a population-based sample of adolescents. We found evidence

to support the hypothesis that social capital is inversely associated with mental disorder severity and comorbidity, although results varied somewhat by social capital index and class of mental disorder. Our findings corroborate the work of prior studies in clinical samples (Esposito-Smythers et al., 2006; Langley, Lewin, Bergman, Lee, & Piacentini, 2010). For example, one study investigated the association between family cohesion and comorbid psychiatric disorders in adolescents with bipolar disorder and found that comorbidity was associated with worse family functioning (Esposito-Smythers et al., 2006). Our results are also generally consistent with studies reporting positive associations between social capital and dimensional measures of mental health, such as levels of internalizing and externalizing problems.

Strengths and limitations

As mentioned, this is the first study to present associations among multiple domains of social capital and a wide array of mental disorders in a nationally representative sample of U.S. adolescents. The large sample size is an advantage over prior studies based on clinical samples and affords greater statistical power to examine associations of social capital and mental disorders. In the NCS-A, mental disorders were ascertained through a validated, fully-structured diagnostic interview. The interview collected extensive information on a range of disorders and disorder severity was strictly determined, requiring endorsement of functional impairment or severe distress. In addition, we included both adolescent- and parent-reported measures of social capital. Finally, we had information on a number of potential confounders, including the mental health of parent informants.

The present study has several limitations. First, the cross-sectional design makes it impossible to infer the direction of causality between social capital and mental disorders, disease severity, and comorbidity. As mentioned above, it is possible that associations were due to perceptions of social capital among youth with mental health problems. Second, some associations are vulnerable to same-source bias (i.e., when social capital and mental disorder measurement relied on the same respondent). The inclusion of different informants for both social capital and mental disorders may slightly mitigate these two threats. Related to this, the lack of community-level indicators (e.g. school quality, residential stability in neighborhoods) prohibited us from estimating the effects of collective efficacy on adolescent's mental health. Collective efficacy plays a pivotal role in child mental health (Hoagwood, Rotheram-Borus, et al., 2018), and thus future research should measure both individual-level and community-level social capital indicators. Third, although the magnitude of ORs is interpreted with respect to the scale of the corresponding variable, our results generally indicated small to medium effect sizes for the social capital factors (Chen, Cohen, & Chen, 2010). Such effect sizes are common in epidemiologic studies of psychosocial risk factors. The cumulative impact of both psychosocial and biological (e.g., genetic liability) factors must be considered when quantifying mental disorder risk. It is also possible that the lower magnitude of association for some social capital indices was due to greater measurement error, as validated scales were not available for all constructs. Fourth, although the population-based sample is a strength of this study, the NCS-A excluded non-English speakers and adolescents not residing in households; very severe cases of mental disorder are therefore likely not included. Fifth, lifetime psychiatric diagnoses were based

on retrospective recall, which may be vulnerable to measurement error. Sixth, although we considered several social capital indices, not all sources of social capital were included in the current study. Seventh, some of our indices of social capital, such as family cohesion, represent discrete constructs that may operate through mechanisms other than social capital per se. For example, our measure of extracurricular participation captures both adolescent engagement and the availability of activities. Finally, parent reports on social capital and mental health may be susceptible to residual confounding and were obtained from only one parent/caregiver.

Conclusions

This study indicates that multi-dimensional cognitive and structural social capital were related to the presence of mental disorders in a nationally representative sample of adolescents. Additionally, higher levels of peer network, family and school cohesion, and school involvement were associated with lower disease severity and less comorbidity. Although we cannot determine causality in this study, results imply a possible role for the improvement of actual and/or perceived social capital at individual, family, school, and neighborhood levels in the prevention and treatment of mental disorders. Longitudinal research is needed in the future to elucidate the temporal and causal relationships between social capital and adolescent mental disorder.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements

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Table 1:

Means and standard errors of social capital indices by adolescent characteristics and parental mental health problems in a population-based sample of U.S. adolescents (NCS-A; n=6,483)

	N	Supportive Friendships Mean (SE)	Family Cohesion Mean (SE)	School Bonding Mean (SE)	Affiliation with Neighbors Mean (SE)	Neighborhood Trust & Reciprocity Mean (SE)	Extracurricular Participation Mean (SE)	Parent Community Involvement Mean (SE)
Total	6,483	12.6 (0.1)	24.1 (0.1)	29.4 (0.1)	6.7 (0.0)	6.9 (0.0)	6.0 (0.2)	0.9 (0.0)
Age								
13–14	2,611	12.5 (0.1)	24.6 (0.2)	30.0 (0.1)	7.0 (0.1)	6.9 (0.0)	5.0 (0.2)	0.9 (0.0)
15–16	2,528	12.7 (0.1)	24.0 (0.2)	29.3 (0.1)	6.7 (0.0)	6.9 (0.1)	6.3 (0.2)	0.9 (0.0)
17–18	1,344	12.6 (0.1)	23.6 (0.2)	28.6 (0.2)	6.3 (0.1)	6.9 (0.1)	7.0 (0.3)	0.9 (0.0)
	6,483	12.6 (0.1)	24.1 (0.1)	29.4 (0.1)	6.7 (0.0)	6.9 (0.0)	6.0 (0.2)	0.9 (0.0)
P-value		*.057*	*<.001*	*<.001*	*<.001*	*.757*	*<.001*	*.347*
Sex								
Female	3,333	12.8 (0.1)	23.9 (0.1)	29.9 (0.1)	6.6 (0.0)	6.8 (0.1)	6.7 (0.2)	0.9 (0.0)
Male	3,150	12.4 (0.1)	24.4 (0.2)	28.9 (0.1)	6.8 (0.1)	6.9 (0.0)	5.4 (0.2)	0.9 (0.0)
P-value		*<.001*	*.008*	*<.001*	*.009*	*.159*	*<.001*	*.357*
Race/ethnicity								
Hispanic	758	12.5 (0.1)	24.0 (0.4)	29.1 (0.3)	6.6 (0.2)	6.5 (0.1)	4.4 (0.2)	0.7 (0.1)
Non-Hispanic black	1,097	12.7 (0.1)	24.1 (0.3)	30.5 (0.2)	6.9 (0.1)	6.3 (0.1)	5.1 (0.3)	1.1 (0.0)
Other race/ethnicity	371	12.4 (0.3)	23.8 (0.6)	30.0 (0.4)	6.6 (0.2)	6.5 (0.1)	4.6 (0.4)	0.7 (0.1)
Non-Hispanic white	4,257	12.6 (0.0)	24.2 (0.1)	29.2 (0.1)	6.7 (0.0)	7.1 (0.0)	6.7 (0.2)	0.9 (0.0)
P-value		*.581*	*.892*	*<.001*	*.185*	*.001*	*.001*	*<.001*
Parental Education								
Less than high school	746	12.6 (0.1)	23.5 (0.4)	29.3 (0.3)	6.7 (0.1)	6.5 (0.1)	4.0 (0.2)	0.7 (0.1)
High school graduate	1,852	12.7 (0.1)	23.6 (0.2)	29.3 (0.2)	6.8 (0.1)	6.8 (0.1)	5.1 (0.2)	0.7 (0.0)
Some college	1,364	12.5 (0.1)	24.1 (0.2)	29.4 (0.3)	6.9 (0.1)	6.8 (0.1)	6.0 (0.2)	0.9 (0.1)
College graduate	2,521	12.6 (0.1)	24.7 (0.1)	29.5 (0.1)	6.6 (0.1)	7.1 (0.0)	7.4 (0.2)	1.2 (0.0)
P-value		*.379*	*<.001*	*.870*	*.149*	*<.001*	*<.001*	*<.001*
Family Income-to-Poverty Ratio								
<= 1.5	925	12.7 (0.1)	23.8 (0.2)	29.7 (0.3)	6.8 (0.1)	6.4 (0.1)	4.2 (0.3)	0.7 (0.1)
<= 3.0	1,218	12.5 (0.1)	23.9 (0.2)	29.5 (0.2)	6.7 (0.1)	6.7 (0.1)	5.3 (0.2)	0.7 (0.0)

	N	Supportive Friendships Mean (SE)	Family Cohesion Mean (SE)	School Bonding Mean (SE)	Affiliation with Neighbors Mean (SE)	Neighborhood Trust & Reciprocity Mean (SE)	Extracurricular Participation Mean (SE)	Parent Community Involvement Mean (SE)
<=6.0	2,139	12.6 (0.1)	23.9 (0.2)	29.3 (0.2)	6.8 (0.1)	7.0 (0.1)	6.2 (0.2)	0.9 (0.0)
> 6.0	2,201	12.7 (0.1)	24.6 (0.2)	29.4 (0.1)	6.6 (0.1)	7.1 (0.1)	7.0 (0.2)	1.1 (0.0)
P-value		*.693*	*.005*	*.600*	*.201*	*<.001*	*<.001*	*<.001*
Urbanicity								
Metropolitan	2,645	12.5 (0.1)	24.1 (0.2)	29.1 (0.2)	6.8 (0.1)	6.8 (0.1)	5.8 (0.2)	0.9 (0.0)
Other Urban	2,242	12.7 (0.0)	24.1 (0.2)	29.5 (0.2)	6.6 (0.1)	6.9 (0.0)	6.1 (0.3)	0.9 (0.0)
Non-Urban	1,596	12.8 (0.0)	24.0 (0.1)	30.0 (0.1)	7.0 (0.1)	7.2 (0.1)	6.5 (0.2)	1.0 (0.0)
P-value		*.090*	*.888*	*<.001*	*<.001*	*.002*	*.075*	*.092*
Region								
Northeast	127	12.6 (0.2)	24.5 (0.2)	29.2 (0.2)	7.1 (0.1)	6.9 (0.1)	6.4 (0.4)	0.9 (0.1)
Midwest	2,081	12.6 (0.1)	23.7 (0.2)	29.2 (0.1)	6.8 (0.1)	7.1 (0.0)	7.1 (0.3)	1.0 (0.1)
South	2,100	12.7 (0.1)	24.2 (0.2)	29.9 (0.1)	6.6 (0.1)	6.8 (0.1)	5.7 (0.3)	1.0 (0.0)
West	1,029	12.6 (0.1)	24.0 (0.3)	28.9 (0.2)	6.6 (0.1)	6.7 (0.1)	5.0 (0.3)	0.7 (0.0)
P-value		*.457*	*.038*	*<.001*	*<.001*	*<.001*	*<.001*	*<.001*
N of Parents in Home								
None	528	12.2 (0.2)	23.0 (0.4)	28.8 (0.4)	6.7 (0.2)	6.8 (0.1)	5.0 (0.4)	0.9 (0.1)
One	2,284	12.7 (0.1)	23.4 (0.2)	29.1 (0.1)	6.8 (0.1)	6.6 (0.1)	5.4 (0.2)	0.7 (0.0)
Two	2,671	12.6 (0.1)	24.8 (0.1)	29.7 (0.1)	6.7 (0.0)	7.1 (0.0)	6.6 (0.2)	1.0 (0.0)
P-value		*.016*	*<.001*	*<.001*	*.410*	*<.001*	*<.001*	*<.001*
Parent Mental Health Problems								
Yes	2,248	12.6 (0.1)	23.6 (0.2)	29.0 (0.2)	6.7 (0.1)	6.8 (0.1)	5.8 (0.2)	0.8 (0.0)
No	4,235	12.6 (0.0)	24.4 (0.1)	29.6 (0.1)	6.7 (0.0)	6.9 (0.0)	6.1 (0.2)	1.0 (0.0)
P-value		*.336*	*<.001*	*.003*	*.500*	*.010*	*.065*	*.010*

Note: Neighborhood trust & reciprocity and parent community involvement were reported by parents/caregivers; other social capital indices were reported by adolescents. SE = standard error. P-values are from Wald χ^2 tests.

Table 2:

Odds ratios and 95% confidence intervals for associations between social capital indices and lifetime mental disorder classes in a population-based sample of U.S adolescents (NCS-A; n=6,483)

	Anxiety	Mood	Eating	Behavior	Substance	Any Disorder
Supportive Friendships	0.95 (0.91–0.99)	0.89 (0.83–0.95)	0.89 (0.78–1.00)	0.92 (0.86–0.97)	0.94 (0.85–1.04)	0.95 (0.91–0.99)
Family Cohesion	0.92 (0.84–1.00)	0.83 (0.74–0.92)	0.85 (0.74–0.97)	0.78 (0.72–0.85)	0.69 (0.63–0.76)	0.81 (0.75–0.86)
School Bonding	0.94 (0.88–1.00)	0.78 (0.72–0.84)	0.85 (0.72–1.00)	0.70 (0.65–0.76)	0.68 (0.61–0.75)	0.76 (0.71–0.81)
Extracurricular Participation	0.95 (0.89–1.01)	0.97 (0.88–1.05)	0.81 (0.68–0.96)	0.82 (0.75–0.89)	0.79 (0.72–0.87)	0.90 (0.86–0.95)
Affiliation with Neighbors						
Medium vs. Low	0.81 (0.66–0.98)	0.78 (0.64–0.96)	0.67 (0.40–1.12)	1.06 (0.86–1.31)	0.81 (0.60–1.09)	0.89 (0.73–1.09)
High vs. Low	0.96 (0.71–1.29)	0.82 (0.56–1.19)	1.33 (0.79–2.26)	1.47 (1.16–1.87)	1.33 (0.93–1.90)	1.10 (0.79–1.54)
Neighborhood Trust & Reciprocity						
Medium vs. Low	1.06 (0.74–1.53)	1.14 (0.80–1.64)	1.10 (0.47–2.58)	0.83 (0.64–1.08)	0.95 (0.51–1.79)	0.95 (0.76–1.18)
High vs. Low	1.09 (0.86–1.39)	1.21 (0.74–1.97)	1.47 (0.62–3.46)	0.49 (0.34–0.71)	0.70 (0.39–1.28)	0.79 (0.67–0.94)
Parent Community Involvement						
Medium vs. Low	0.96 (0.78–1.20)	0.89 (0.63–1.25)	1.76 (0.88–3.50)	0.88 (0.70–1.10)	1.06 (0.75–1.50)	0.87 (0.71–1.06)
High vs. Low	0.96 (0.67–1.39)	0.65 (0.47–0.91)	0.97 (0.58–1.62)	0.92 (0.68–1.23)	0.62 (0.45–0.85)	0.87 (0.69–1.09)

Note: Adjusted for age, sex, race/ethnicity, urbanicity, region, parental education, family income, number of biological parents, and parental mental health problems. Neighborhood trust & reciprocity and parent community involvement were reported by parents/caregivers; other social capital indices were reported by adolescents. Units for supportive friendships, family cohesion, school bonding, and extracurricular participation are median absolute deviations from the median, an alternative to the standard deviation that does not assume a normal distribution.

Table 3:

Odds ratios and 95% confidence intervals for associations between social capital indices and severity of lifetime mental disorder classes in a population-based sample of U.S. adolescents (NCS-A; n=6,483)

	Anxiety Disorder		Mood Disorder		Behavior Disorder	
	Severe	Mild/Moderate	Severe	Mild/Moderate	Severe	Mild/Moderate
Supportive Friendships	0.97 (0.89–1.05)	0.94 (0.89–1.00)	0.89 (0.80–1.00)	0.89 (0.83–0.95)	0.81 (0.71–0.92)*	0.97 (0.91–1.03)
Family Cohesion	0.82 (0.72–0.94)*	0.96 (0.89–1.03)	0.86 (0.71–1.03)	0.81 (0.73–0.89)	0.79 (0.69–0.90)	0.78 (0.71–0.85)
School Bonding	0.88 (0.78–1.00)	0.96 (0.89–1.04)	0.66 (0.58–0.75)*	0.84 (0.76–0.93)	0.62 (0.55–0.70)*	0.74 (0.68–0.80)
Extracurricular Participation	0.89 (0.82–0.97)	0.97 (0.91–1.04)	0.93 (0.80–1.07)	0.98 (0.89–1.09)	0.78 (0.67–0.90)	0.83 (0.76–0.92)
Affiliation with Neighbors						
Medium vs. Low	0.94 (0.61–1.44)	0.77 (0.62–0.95)	0.86 (0.58–1.29)	0.75 (0.60–0.94)	1.26 (0.81–1.97)	0.99 (0.79–1.25)
High vs. Low	1.21 (0.83–1.75)	0.88 (0.61–1.26)	1.22 (0.76–1.96)*	0.67 (0.45–1.00)	2.25 (1.36–3.75)*	1.23 (0.96–1.57)
Neighborhood Trust & Reciprocity						
Medium vs. Low	1.86 (1.24–2.80)*	0.87 (0.55–1.36)	1.21 (0.70–2.11)	1.10 (0.70–1.74)	1.16 (0.79–1.72)	0.73 (0.52–1.03)
High vs. Low	1.73 (1.09–2.75)*	0.93 (0.67–1.28)	1.65 (0.79–3.44)	1.04 (0.62–1.75)	1.03 (0.56–1.91)*	0.36 (0.25–0.53)
Parent Community Involvement						
Medium vs. Low	0.71 (0.49–1.04)	1.09 (0.85–1.40)	0.79 (0.45–1.41)	0.94 (0.64–1.38)	0.71 (0.45–1.12)	0.97 (0.77–1.22)
High vs. Low	0.87 (0.57–1.33)	1.01 (0.65–1.58)	0.55 (0.30–1.00)	0.70 (0.51–0.97)	0.56 (0.34–0.93)*	1.09 (0.77–1.54)

Note: Adjusted for age, sex, race/ethnicity, urbanicity, region, parental education, family income, number of biological parents, and parental mental health problems. Neighborhood trust & reciprocity and parent community involvement were reported by parents/caregivers; other social capital indices were reported by adolescents. The reference outcome for each class is no lifetime disorder. Asterisks indicate that the OR for severe disorder is significantly different from the OR for mild/moderate disorder. Units for supportive friendships, family cohesion, school bonding, and extracurricular participation are median absolute deviations from the median, an alternative to the standard deviation that does not assume a normal distribution.

Table 4:

Odds ratios and 95% confidence intervals for associations between social capital and number of comorbid lifetime mental disorder classes in a population-based sample of U.S. adolescents (NCS-A; n=6,483)

	1 Class	2 Classes	3 Classes	4–5 Classes
Supportive Friendships	1.00 (0.95–1.05)	0.88 (0.83–0.94)	0.87 (0.78–0.96)	0.85 (0.73–1.00)
Family Cohesion	0.87 (0.81–0.93)	0.74 (0.67–0.83)	0.65 (0.55–0.76)	0.74 (0.56–0.97)
School Bonding	0.83 (0.77–0.88)	0.70 (0.63–0.78)	0.60 (0.51–0.70)	0.55 (0.44–0.67)
Extracurricular Participation	0.93 (0.88–0.98)	0.89 (0.82–0.96)	0.79 (0.71–0.89)	0.66 (0.53–0.81)
Affiliation with Neighbors				
Medium vs. Low	0.92 (0.73–1.15)	0.81 (0.62–1.07)	0.79 (0.49–1.26)	0.49 (0.23–1.03)
High vs. Low	1.14 (0.79–1.63)	0.87 (0.57–1.35)	1.17 (0.69–1.97)	1.48 (0.61–3.58)
Neighborhood Trust & Reciprocity				
Medium vs. Low	0.97 (0.75–1.25)	0.87 (0.60–1.25)	1.51 (0.83–2.74)	0.64 (0.22–1.92)
High vs. Low	0.86 (0.69–1.08)	0.67 (0.47–0.97)	1.03 (0.56–1.89)	0.47 (0.14–1.56)
Parent Community Involvement				
Medium vs. Low	0.89 (0.70–1.13)	0.97 (0.71–1.31)	0.70 (0.42–1.16)	1.27 (0.64–2.53)
High vs. Low	0.93 (0.71–1.21)	0.95 (0.68–1.32)	0.42 (0.24–0.72)	0.72 (0.28–1.86)

Note: Adjusted for age, sex, race/ethnicity, urbanicity, region, parental education, family income, number of biological parents, and parental mental health problems. Neighborhood trust & reciprocity and parent community involvement were reported by parents/caregivers; other social capital indices were reported by adolescents. Reference outcome is no lifetime mental disorder. Units for supportive friendships, family cohesion, school bonding, and extracurricular participation are median absolute deviations from the median, an alternative to the standard deviation that does not assume a normal distribution.