

# Adolescents' Social Environment and Depression: Social Networks, Extracurricular Activity, and Family Relationship Influences

Michael J. Mason · Christopher Schmidt ·  
Anisha Abraham · Leslie Walker · Kenneth Tercyak

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**Abstract** The present study examined components of adolescents' social environment (social network, extracurricular activities, and family relationships) in association with depression. A total of 332 adolescents presenting for a routine medical check-up were self-assessed for social network risk (i.e., smoking habits of best male and female friends), extracurricular activity level (i.e., participation in organized sports teams, clubs, etc.), family relationship quality (i.e., cohesion and conflict), and symptoms of depression (i.e., minimal, mild, moderate/severe). Results of a forward linear regression modeling indicate that social environment components were associated with a significant proportion of the variance in adolescent depression (Adjusted  $R^2 = .177$ ,  $p \leq .05$ ). Specifically, adolescent females ( $\beta = .166$ ,  $p < .01$ ) and those having more smokers in their social network ( $\beta = .107$ ,  $p < .05$ ) presented with significantly greater depression symptoms. Conversely, adolescents who engaged in more extracurricular activities ( $\beta = -.118$ ,  $p < .05$ ) and experienced higher quality family relationships ( $\beta = -.368$ ,  $p < .001$ ) presented with significantly lower depressive symptoms. These findings highlight the important role that the social environment plays in adolescent depression, as well as

yields new insights into socially-based intervention targets that may ameliorate adolescent depression. These intervention targets may be gender-specific, include positive social network skills training, increase adolescents' engagement in organized activities, and attend to the quality of their family relationships.

**Keywords** Adolescents · Depression · Social networks · Extracurricular activities · Family relationships

Depression and its associated sequelae continue to be a source of burden for many adolescents in the U.S. (Costello, Erkanli, Federman, & Angold, 1999; Friedman, Katz-Leavy, Manderscheid, & Sondheimer, 1998; Kessler, Avenevoli, & Merikangas, 2001). Estimates of the lifetime prevalence of Major Depressive Disorder (MDD) among adolescents aged 15–18 years are 14% (Kessler et al., 1994). In contrast, prevalence rates for adolescents' self-reported subthreshold levels of depression range from 20 to 50% (Kessler et al., 2001). Clinically meaningful subthreshold depressive symptoms among adolescents are associated with significant role impairment, as well as substantial risk of the onset of MDD in adulthood (Angst, Sellaro, & Merikangas, 2000; Pine, Cohen, Cohen, & Brook, 1999). Unfortunately, only one in five children with a serious emotional disturbance, including depression utilize mental health specialty services, with far more youth in need going untreated and/or treated in other non-specialty care settings (Leaf et al., 1996; U.S. Department of Health and Human Services, 1999). As adolescent depression is one of the most commonly occurring mental health disorders with known interventions that are efficacious for symptom reduction, identifying settings that are compatible for mental health care is critical (Curry, 2001; Hankin, 2006).

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M. J. Mason (✉)  
Villanova University, Villanova, PA, USA  
e-mail: michael.mason@villanova.edu

C. Schmidt  
William & Mary University, Williamsburg, VA, USA

A. Abraham · K. Tercyak  
Georgetown University Medical Center, Washington, DC, USA

L. Walker  
Children's Regional Hospital, Seattle, WA, USA

One way to help meet the mental health care needs of adolescents is to provide services in more locations touching their lives. For example, among youth receiving mental health care, many will receive their care through a school or a primary care setting—underscoring the importance of capitalizing on naturalistic opportunities to intervene with young people (Kellam, Xiang, Merica, Brown, & Ialongo, 1998; Werthamer-Larsson, 1994; Zuckerbrot et al., 2007).

A socially informed theoretical model for understanding the impact of adolescents' social environments is Bandura's (1986) Social Cognitive Theory (SCT) that posits human behavior results from the dynamic and ongoing interaction of personal, environmental, and behavioral factors—a phenomena termed 'reciprocal determinism.' While each factor influences and is influenced by the others, the level and direction of those influences varies substantially across situations, individuals, and activities (Wise, 2002). SCT emphasizes the viewpoint that persons play a proactive role in adapting to their environments rather than their environments acting upon their personal vulnerabilities (Bandura, Pastorelli, Barbaranelli, & Caprara, 1999). An individual's perceived self-efficacy—a belief in one's ability to regulate functioning and exercise control over environmental events—has been shown to regulate both functioning and emotional well-being (Bandura, 1997). More specifically, a strong sense of efficacy within social situations has been shown to reduce vulnerability to depression among adolescents (Bandura et al., 1999; Ehrenberg, Cox, & Koopman, 1991; Tonge et al., 2005). Relative to the present study is SCT's specific focus on individuals' pro-social agency, which equips them with the necessary resources to structure their social environments in manners that proactively produce competencies serving as protective against outcomes such as depression.

Social environment components such as social networks (Mason, Chueng, & Walker, 2004; Valente, 2003), extracurricular activities (Fredericks & Eccles, 2006), and family relationships (Reinherz, Paradis, Giaconia, Stashwick, & Fitzmaurice, 2003) comprise the majority of adolescents' social worlds and, therefore, are critically important to consider when examining mental health, especially depression. Within SCT, the nature and choice of social networks and extracurricular activities influence one another in a bidirectional manner (Bandura et al., 1999); hence, adolescents with a more positive (i.e., pro-social and health-promoting) social network quality may also engage in more positive extracurricular activities and vice versa. Family relationship quality is also clearly linked to adolescent mental health, well-being, and depression (Kendler, Garder, & Prescott, 2002) and plays a role in modeling and shaping adolescents' social network selection and maintenance. For example, without strong,

positive, overlapping connections between youth and their nested, interrelated systems, such as family and peers, healthy development is threatened (Bronfenbrenner, 1989).

Social networks may also function as a bridge between extracurricular activities and mental health outcomes through the processes of social development. Social networks can be conceptualized as dynamic, interpersonal mechanisms for adolescent social development that impact health and well-being (Valente, 2003). Among adolescents, social networks may be defined as a relatively small number of other individuals that one associates with on a regular basis (i.e., at least monthly), and shares some type of influence on or experience with (Mason et al., 2004). There is ample evidence to support the association between social networks and health outcomes with specific impact on health status, health behaviors, and health decision-making (Cattell, 2001; Heaney & Israel, 1997; House & Landis, 1998; Valente, 2003). In a recent study among adolescent outpatients receiving substance abuse treatment, those who had even a single daily substance user in their social network were at elevated risk for depression and almost eight times more likely to have clinically significant depression symptoms compared to those adolescents without the influence of daily substance users in their networks. Further, these adolescents were over two times as likely to have anxiety symptoms and were over four times as likely to have problems with memory, concentration, or understanding compared to those adolescents without a daily substance user in their network (Mason, 2009). This finding highlights the important influence of adolescent social network risk behaviors on a broad spectrum of adolescent mental health outcomes, including depression.

A developing body of research suggests that adolescents' participation in extracurricular activities is associated with improved outcomes, such as improved academic adjustment (absence of behavioral problems, expected academic achievement) and mental well-being (Barber, Eccles, & Stone, 2001; Bartko & Eccles, 2003; Bohnert & Garber, 2007; Gibbs, 1986). In general, extracurricular activities promote belongingness and positive future outlooks through structured engagement, which serve as protective factors against mental stress, strain, and depression (Fredericks & Eccles, 2006; Mahoney, Schweder, & Stattin, 2002; Michaelson & Nakamura, 2001). However, there is research demonstrating the inconsistency of the benefits of extracurricular activities on mental health outcomes such as depression (Darling, 2005; Feldman & Matjasko, 2005). Specificity of the types and quality of these activities is also less clear, with recent research highlighting the need to consider the context such as intensity of involvement, successes or failures within activities, norms, and patterns of relationships within activity settings (Guest & McRee, 2009).

Nevertheless, adolescent social development through extracurricular activities appears to be situated within a dynamic interaction among contextual, individual, and social determinants. Recent research identifies linkages to SCT noting that extracurricular activities serve as a pathway for social development by providing opportunities for group collaboration and identification, support from relevant and competent adults, and the development of interpersonal skills (Gilman, Meyers, & Perez, 2004). Extracurricular activities also divert youth away from high-risk behaviors and peer groups, teach positive skills and competencies, and structure social networks with supportive adults and pro-social peers through affiliation and behavior management (Fletcher, Nickerson, & Wright, 2003).

The family context is also known to be influential in protecting adolescents against mental stress, strain, and depression. It has long been known that supportive, cohesive, and less conflictual family relationships enhance adolescent protective factors, and encourage mental health maintenance under challenging situations (Hollahan & Moos, 1982; Jacobson & Addis, 1993; Rice, Harold, Shelton, & Thapar, 2006; Willens & Biederman, 1993). This relationship appears to hold whether the focus of research is parental marital discord, divorce, or separation (Emery, 1982; Sandler, Tein, & West, 1994), parental rejection and parent–child conflict (Patterson, 1982), parental substance abuse (Adger, 1998; Clark, Kirisci, & Moss, 1998), or perceived negative quality of overall family relationships (Williams, Anderson, McGee, & Silva, 1990). The impacts of negative family relationship quality include internalizing behavioral symptoms (Cummings & Davies, 2002; Emery, 1982; Fergusson, Horwood, & Lynskey, 1995; Harold & Conger, 1997) and depressive disorders (Kendler et al., 2002; Reinherz et al., 2003). Conversely, positive family relationship qualities (supportive and cohesive) foster psychological well-being (Aydin & Öztütüncü, 2001) and have been shown to be one of the critical resources that protect against substance use (Fergus & Zimmerman, 2005) and compensates for the effects of emotional distress (Fleming, Kim, Harachi, & Catalano, 2002; Lloyd-Richardson, Papandonatos, Kazura, Stanton, & Niaura, 2002) and delinquent behaviors (Scheier, Botvin, Griffin, & Diaz, 1999). Positive family environments have been shown to reduce the effects of stress and promote adaptive functioning (Garmezy, 1983; Werner & Smith, 1982) due to an adolescent's sense that, despite stressors, his or her emotional needs will continue to be met by important family figures (Davies & Cummings, 1994; Formoso, Gonzales, & Aiken, 2000).

Despite this growing literature and research base, relatively little work has focused on or attempts to empirically integrate key elements of adolescents' social environments

such as their social network risk, extracurricular activities, and family relationships with adolescent depression. Such research would more accurately inform the development of targeted and ecologically appropriate mental health prevention efforts. As part of a larger National Cancer Institute funded study examining correlates of adolescent smoking, the current study sought to address this gap by examining the qualities of adolescents' social environment and the association with depression. Based on SCT and the existing literature, we hypothesized that those adolescents with smokers in their social network would be at risk for higher levels of depression symptomatology, and that greater involvement in positive extracurricular activities and more positive family relationships would be protective and therefore associated with less depression.

## Method

### Participants

The participants were healthy adolescents between 12 and 21 years old, with a mean age of 16 years, who attended a routine medical check-up (well-visit appointment) at an adolescent medicine clinic housed within an academic medical center in Washington, DC. Participating adolescents were 44% African American, 39% White, 9% Hispanic, and 9% were of mixed or other race or ethnicity; the majority (70%) were female, which corresponds with other primary care gender distributions (Mason et al., 2004; Tercyak, Donze, Prahlad, Mosher, & Shad, 2006). Eligibility requirements for the study included age-eligibility (11–21 years, the standard age range of adolescent medicine patients), ability to read and understand English, freedom from impairments potentially compromising an ability to provide valid informed consent/assent (e.g., mental retardation, pervasive developmental delay), and good general health (i.e., absence of major medical illness such as cancer or cardiovascular disease). Primary residential address information was collected as an area-based socioeconomic measure (via conversion of zip code to median household income based on U.S. census data) (Krieger et al., 2003; Tercyak et al., 2006). Sample characteristics are detailed in Table 1.

### Procedure

Participants completed a comprehensive battery of self-report and other study measures. Measures were administered in private (i.e., in a separate room from parents to protect patient confidentiality and obtain more valid data) and the procedure generally lasted 30 min or less. The medical center's institutional review board approved the

**Table 1** Participant characteristics and study variable descriptive statistics ( $N = 332$ )

Variable/level	$N$ (%)	$M$ ( $SD$ )
Age	332 (100)	16.3 (2.2)
Gender		
Female	233 (70)	
Male	99 (30)	
Race		
African American	146 (44)	
White	129 (39)	
Hispanic	29 (9)	
Other	28 (8)	
Median area household income (in \$)	65k (29k)	
Depression symptoms		13.4 (9.6)
Peer network quality		2.5 (3.1)
Extracurricular network quality		3.2 (2.4)
Family relationship network quality		74.1 (11.7)

research protocol and the study received a federal certificate of confidentiality. Parents of those under 18 were first approached in the clinic waiting area, then participants themselves were approached. Adolescents over 18 were approached directly while they waited for their appointments. Our research included approval to review clinic rosters, which included patient date of birth and this information was verified by a treating provider. Written informed consent was obtained from all parents and/or adolescent participants. Nominal incentives, (\$20.00) were used to acknowledge participants' time and effort and the study's consent rate was 88%.

#### Dependent Variable: Depression

##### *Depression Symptoms*

The Center for Epidemiologic Studies-Depression Scale (CES-D) (Radloff, 1977) was used to measure the presence of adolescent depressive symptoms and is a widely used measure in adolescent health and behavior research (Schimmer, Tsao, & Knapp, 1977). The CES-D contains 20 items rated along a 4-point Likert scale indicating the frequency of each symptom's occurrence over the past week (Rarely or none of the time = 0, Most of the time = 3). The scores range from 0 to 60, with higher scores indicating a greater degree of depressive symptoms; scores of 0–15 are considered minimal; 16–23 are mild, and 24 and higher are moderate/severe (Rushton, Forcier, & Schectman, 2002). In this sample, the CES-D's internal consistency was adequate (Cronbach's coefficient  $\alpha = .90$ ). The dependent variable was treated analytically as a continuous variable.

#### Independent Variables: Social Environment

##### *Social Network Risk*

Social network risk was measured by asking subjects about the smoking habits of their best friends, following similar research methods (Choi, Pierce, Gilpin, & Berry, 1997). Smoking is known to be a marker for associated and future substance use and mental health problems (Chen et al., 2002; Mathers, Toumbourou, Catalano, Williams, & Patton, 2006; Simons-Morton, Haynie, Crump, Eitel, & Saylor, 2001). Items included were: (a) Does your best friend smoke? (b) Do any of your four best male friends smoke? (c) How many of the four smoke? (d) Do any of your other four best female friends smoke? (e) How many of the four smoke? and (f) Does your girlfriend/boyfriend smoke? Total network risk was calculated by scoring items a, b, d, and f as Yes = 1, No = 0 and then summing the total count for items c and e. The sum total of these items could range in score from 0 to 12, with higher scores indicating greater risk (Cronbach's coefficient  $\alpha = .69$ ). These procedures follow those widely used and accepted in the social network field (Burt, 1984; Liebow et al., 1995; Marsden, 1987, 1990).

##### *Extracurricular Activities*

The extent of adolescents' involvement in extracurricular activities was measured by asking: (a) how many organized sports teams they were involved in, (b) how many recreational clubs (e.g., theater/drama, debate, foreign language, computing, musical instrument/band) they were involved in, and (c) how many other activities they were involved in (e.g., student or local government, newspaper or other writing, yearbook, homecoming, church group) (McCaul, Glasgow, O'Neill, Freeborn, & Rump, 1982). These items were adapted from the Centers for Disease Control and Prevention, Youth Risk Behavior Surveillance Survey (2008). Each item had a forced choice response option of 0, 1, 2, 3, and 4 or more activities. The sum of these items served as the total extracurricular activities variable, with a score range of 0 to 12 (higher scores indicated greater activity level). All three items correlated at least .5 with at least one other item, suggesting reasonable consistency. The Bartlett's test of sphericity used to test the strength of the relationship among variables was significant ( $\chi^2(3) = 65.246, p < .001$ ).

##### *Family Relationship*

The Family Environment Scale (FES) was used to assess the quality of the family environment and is a commonly used scale for measuring this construct (Moos & Moos, 1994). As part of the FES, the Family Relationship Index

(FRI) provides an overall index of the quality of the family environment; it is the sum of the Cohesion, Expressiveness, and Conflict (reversed) subscales. Internal consistency reliability estimates (Cronbach's coefficient  $\alpha$ 's) for the subscales range from .61 to .78. Test–retest reliabilities for the subscales at 2, 3, and 12 month intervals range from .52 to .91—suggesting reasonable stability across time. In this sample, the FRIs internal consistency was adequate (Cronbach's coefficient  $\alpha = .82$ ). The FRI is scored on a Likert-type scale with response options ranging from 1 = not at all true to 4 = very true; this produces a potential range of scores from 27 to 108, with higher scores indicating better quality of family relationships (e.g., more cohesive and expressive and less conflictual).

### Statistical Analysis

Independent variables were examined for their univariate properties and then in a bivariate fashion to determine associations with the dependent variable (CES-D depression score). Initial bivariate correlation analyses were conducted to determine relationships among theoretically derived independent variables with the CES-D scores, and included demographic variables of age, race, and gender. Independent variables with significant ( $p < .05$ ) associations were then retained in a forward multivariate linear regression model. The order of the predictor variables was predicated on our hypotheses regarding the risk and protective quality of social environmental components utilized in the study. The analyses consisted of 4 steps (1) using gender as a covariate, (2) conceptualizing risk as smoking peers, (3) conceptualizing protection as both positive family relations, and (4) extracurricular activities. The primary outcome of the original study on which this secondary data analysis is based was adequately powered to detect difference in a binary smoking outcome variable and its relationship to key predictor variables. With a sample size of  $N = 300$ , power was adequate (80%) to detect a bivariate relationship as low as  $r = .16$  with a two-tailed  $p$ -value  $< .05$ , thus increasing our confidence in the results.

### Results

Frequencies, means, and standard deviations of the independent and dependent variables are presented in Table 1 and bivariate correlation analysis is presented in Table 2. Correlations revealed that social network risk ( $r = .167$ ,  $p < .05$ ), extracurricular activity level ( $r = -.126$ ,  $p < .05$ ), family relationship ( $r = -.377$ ,  $p < .01$ ), and gender ( $r = .131$ ,  $p < .05$ ) were significantly correlated to depression symptoms. Among the three independent variables, only family relationship and social network risk were

**Table 2** Pearson correlations of study variables ( $N = 332$ )

Variable	1	2	3	4	5
1. Female gender	1.00				
2. Social network risk	.054	1.00			
3. Extracurricular activity level	.077	-.086	1.00		
4. Family relationship quality	.091	-.167**	.029	1.00	
5. Depression symptoms	.131*	.167**	-.126*	-.377**	1.00

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

correlated ( $r = -.167$ ,  $p < .05$ ). A dichotomous race variable with (African American = 1 and Other = 0) was created and tested for main and interactive effects with gender on depression symptoms with no significant effects found [ $F(1, 329) = 3.233$ ,  $p > .05$ ].

The sample predominantly reported subthreshold levels of depression symptoms ( $M = 13.4$ ,  $SD = 9.6$ , range = 0–44), with females reporting greater symptomatology than males (female  $M = 14.2$ ,  $SD = 9.9$ ; male  $M = 11.4$ ,  $SD = 8.4$ ;  $t = -2.4$ ,  $df = 330$ ,  $p < .05$ ), even taking into account gender-based cut-points (i.e., males = 22 and females = 24) for the CES-D (Radloff, 1977). Approximately 15% of the sample had CES-D scores that fell within the severe depression symptomatology cut-point range ( $>24$ ), closely aligning this sample's likely depression profile with national estimates of 14% and matching the findings that indicate females experience greater depression than males (Kessler et al., 2001). No other significant gender differences were found among the other independent variables.

In general, the sample reported fairly healthy social behaviors. Almost half of the sample reported no social network risk by not associating closely with smokers (48%). With respect to extracurricular activity, most adolescents reported engaging in structured activities (85%), with an average of 3 activities per adolescent. Family relationship quality was evenly distributed, representing an average (50th percentile) overall quality of relations ( $M = 74.1$ ,  $SD = 11.7$ , range = 43–96).

Next, a forward linear regression model was constructed to test the association of the independent risk and protective social environment variables (social network, extracurricular activity, and family relationship qualities) on the dependent variable (depression). Gender was also entered into the model and was found to be associated with increased depression symptoms ( $\beta = .166$ ,  $p < .05$ ). The model was checked with collinearity diagnostics (to examine tolerance [ $>0$ ], variance inflation factor [ $<2$ ], and condition index [ $<15$ ] and revealed no concerns with multicollinearity. As shown in Table 3, each of the

**Table 3** Forward regression analysis of adolescent depression symptoms from gender covariate and social environment components ( $N = 332$ )

Variable	<i>B</i>	<i>SE B</i>	$\beta$	Adjusted $R^2$
Step 1				
Gender	2.515	1.188	.119*	.011
Step 2				
Gender	2.347	1.175	.111*	
Social network risk	.515	.174	.165**	.035
Step 3				
Gender	3.322	1.101	.158**	
Social network risk	.369	.163	.118*	
Family relations	-.316	.045	-.368***	.166
Step 4				
Gender	3.500	1.097	.166**	
Social network risk	.366	.163	.107*	
Family relations	-.316	.045	-.368***	
Extracurricular activities	-.463	.204	-.118*	.177

\*  $p < .05$ ; \*\*  $p < .005$ ; \*\*\*  $p < .001$ 

predictor variables has a statistically significant association with adolescent depression in the anticipated direction. Gender and social network quality were positively associated with depression (and considered risk factors). Family relationship quality and extracurricular activity levels were negatively associated with depression (and considered protective factors). We computed the products of all predictor variables and entered these into our model to test for interactive effects on depression symptoms. We found no significant effects [ $F(15, 188) = 1.047, p > .05$ ]. The models increased in strength throughout all 4 steps, with  $R^2$ 's increasing as well. The overall results of the modeling (step 4) indicate that social environment risk and protective variables are associated with a significant proportion of the variance in adolescent depression (adjusted  $R^2 = .177, p \leq .05$ ).

## Discussion

The present study examined adolescents' social environmental components consisting of social networks, extracurricular activities, and family relationships associated with symptoms of depression. Unique to this study was the simultaneous testing of these social variables with adolescent depression symptoms. In general, findings supported the modeling indicating that social environment variables are associated with a significant proportion of the variance in adolescent depression symptomatology in this sample. Specifically, adolescent females and those having more smokers in their social networks presented with significantly greater depression symptoms. Conversely, adolescents who

engaged in more extracurricular activities and experienced higher quality family relationships presented with significantly lower depressive symptoms. These findings highlight the role that the social environment plays in adolescent mental health, and yield new insights into socially-based intervention targets that may ameliorate adolescent depressive symptomatology. These intervention targets may be gender-specific, include positive social network skills training, increase adolescents' engagement in organized activities, and attend to the quality of their family relationships.

An important finding from this study is the further detailing of social environment-based understanding of depression with an adolescent sample that reveals implications for future prevention research. Further, this model was tested using a diverse, majority female (70%) sample. The sample consisted of 61% non-White adolescents and thus represents a contribution to the empirical and theoretical literature that is typically limited in its representation of ethnic minority female adolescents. In examining broad, yet theoretically convergent variables such as social network risk, extracurricular activity level, and family relationship quality, this study extends the literature concerning the impacts of risk and protective factors on adolescent depression. These findings may provide guidance for developmentally sensitive interventions that simultaneously target interrelated domains and (*processes*) such as peers (*social network risk behaviors*), school/community (*extracurricular activities*), and family (*family relationships*). The causal and mediated effects of these settings and processes could be further tested with an experimental design to examine the effects of a preventive intervention with a diverse sample of female adolescents. For example, a family relationship-based intervention that targets extracurricular activity level and related social network risks with ethnic minority females may be justified from these data, at the very least, these findings warrant further research.

The results that show female adolescents are vulnerable to mental health problems as a function of social environmental risk is an important finding. A growing body of research has demonstrated that relational disturbances places girls at greater risk compared to boys for developing depression and substance use disorders. This line of research maintains that as girls are more likely to derive psychologically relevant information about themselves and others through interpersonal relationships, they are more vulnerable when they encounter interpersonal distress and therefore often experience increased disturbance when their relational ties are threatened, particularly with friends (Crick & Zahn-Waxler, 2003; Cross & Madson, 1997; Geary, 1998; Leadbeater, Blatt, & Quinlan, 1995; Maccoby, 1990). Our findings underscore the need to further investigate the explicit social processes of mental health for adolescent girls.

There are several limitations of the present study. First, the sampling plan consisted of a convenience sample of 332 adolescents. While the size of the sample is adequate, the study results are limited due to lack of random selection of individuals and subsequent external validity. It would seem reasonable based on the findings that were consistent with other studies (Mason et al., 2004) that in general, this sample does not differ dramatically from the entire patient population or with other adolescent patients. Second, due to the busy nature of the clinic, variables of interest lacked more in-depth assessment of more complicated processes. For example, mental health measurement beyond depression would contribute to the fuller understanding of the role of the social environment. Having access to parental mental health history would strengthen the present study. Specifically measuring and testing self-efficacy would be a clear and promising next step in advancing the understanding the theoretical linkages to SCT. Also, the peer social network index only targeted smoking habits of best friends, and was missing other substance use, frequency of use, perceived influences toward health or risk, social support, deviant behavior, all processes that contribute to a deeper level of understanding social networks influence on mental health. Given the limitations of our study, we speculate that the lack of interactive effects was at least in part a function of lack of more specific and in-depth measures to capture the interaction among the social environmental variables. Finally, causality among the variables cannot be fully confirmed from our model due to the cross-sectional nature of the study design.

Despite these limitations, the results suggest that targeting the interrelated social environmental variables of social networks, extracurricular activities, and family relationships can produce theoretically supported models that have clear preventive implications for diverse, majority female samples. Moreover, targeting future intervention research on depression with these social variables could begin to address the unmet mental health needs of adolescents. (Wells, Kataoka, & Asarnow, 2001). Preventing adolescent depression symptomology remains a vital aspect of social and behavioral research and locating and specifying risk and protective factors enables better informed and more intentional responses from prevention researchers. As the need for adolescent mental health services continues to grow, rigorously testing developmentally sensitive initiatives to meet these unmet needs should become a research priority.

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