

International Journal of School Social Work

Volume 3 | Issue 1

Article 3

2018

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Recommended Citation

Guo, Yuqi; Hopson, Laura M.; and Yang, Fan (2018) "Socio-ecological Factors Associated with Adolescents' Psychological Well-being: A multilevel analysis," *International Journal of School Social Work*. Vol. 3: Iss. 1. <https://doi.org/10.4148/2161-4148.1032>

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Socio-ecological Factors Associated with Adolescents' Psychological Well-being: A multilevel analysis

Abstract

Purpose: Supports and stressors across different ecological systems affect adolescents' perceptions of psychological well-being. The purpose of this study is to analyze how social support, school experiences, and socio-economic factors relate to psychological well-being among adolescents. Furthermore, our study explores how family income shapes the relationship between social supports and well-being.

Method: Multilevel linear regression models were applied to a sample of 19,767 middle and high school students, with students serving as Level 1 and schools as Level 2.

Results: Students reporting more support from parents, friends, teachers, and neighbors and better school engagement perceive better psychological well-being. Furthermore, family income moderates the relationship between teacher support and adolescents' psychological well-being. Implications for social work practice are discussed.

Conclusion: Social support plays an important role in promoting adolescents' psychological well-being. Teacher support is associated with better psychological well-being for all students, and this relationship is strongest for students from higher income families.

Keywords

adolescents, psychological well-being, social support, school engagement

Cover Page Footnote

Special appreciation is expressed to Dr. Gary L. Bowen, School of Social Work, The University of North Carolina at Chapel Hill, who constructed the SSP datafile for research use that advances the science of youth development. Responsibility for the ethical use of these data, including their coding, analysis, and reporting, remain with user and do not necessarily reflect the advice, decisions, recommendations or agreement of either Dr. Bowen or other members of his research team at the University of North Carolina at Chapel Hill. Approval for release of these data for secondary analysis was approved by the Behavioral IRB at the University of North Carolina at Chapel Hill on February 10, 2006 (IRB Number: SOCW 2005-054).

Introduction

Adolescence can be a volatile period during which mental health concerns, such as depression and suicidal ideation, present serious threats to well-being (Blum & Qureshi, 2011). One in five adolescents has a mental health problem that will persist into adulthood (Lee et al., 2014). The high risks of psychological problems among adolescents calls for more research attention. Ecological and systemic factors related to the psychological well-being of adolescents include social supports and stressors in their homes, neighborhoods, peer groups, and schools (Graham, Phelps, Maddison, & Fitzgerald, 2011; Hopson, Lee, & Tang, 2014; Stewart & Suldo, 2011). Past studies have examined student-level protective and risk factors across multiple ecological domains associated with adolescent psychological well-being; however, the combined effect of these factors have not been thoroughly examined. This multi-level analysis aims to examine how poverty, race, school experiences, and social supports relate to psychological well-being among middle and high school students. Also, we analyzed the moderating role of family income in the effect of school support on adolescents' psychological well-being.

Literature Review

The Social Ecological Model as a Framework

The Socio-ecological Model (SEM) is a theoretical model of health promotion that offers a multiple systems perspective (Stokols, 1996). Stokols (1996) proposed that personal well-being is a complex issue cannot be adequately understood and addressed by single level analyses. The SEM provides a comprehensive framework that integrates multiple levels of influence on health outcomes and has served as the framework for a number of prior studies on the promotion of well-being (Kef, Hox, & Habekothé, 2000; Ostrom, 2009).

According to the SEM, intra- and interpersonal factors operating within multiple ecological systems influence adolescents' psychological well-being. These factors include those within the individual system (age, gender, etc.), family system (family income, family support etc.), school system (school engagement, school support etc.), and community system (organizations, neighbor support, etc.), as well as the public policy context (Sallis, Owen, & Fisher, 2008). These social ecologies are interconnected in their relationships with psychological well-being. Including variables related to multiple social systems in the same analysis allows for exploring how they may be inter-related. The predictors of adolescents' psychological well-being analyzed in our study include socio-economic factors, school engagement, academic performance, and social supports (family support, peer support, teacher support, and neighborhood support).

Poverty

As described above, adolescents' psychological well-being is associated with multiple social systems, each of which can be compromised by stressors associated with living in poverty (Hopson, Lee, & Tang, 2014). In the United States, approximately 15 million children are living in poverty (Koball & Jiang, 2018). Children living in impoverished neighborhoods are more likely attend underperforming schools and may experience their schools and neighborhoods as less safe than children who attend schools that serve higher income neighborhoods (Engle, & Black, 2008). They may also have less access to peers and adults who have graduated from high school or attended college (Berliner, 2006; Hopson & Lee, 2011). The literature consistently reveals a positive relationship between growing up in impoverished neighborhoods and dissatisfactory health and psychological well-being (Leventhal et al., 2009; Smokowski, Evans, Cotter, & Guo, 2014). For these reasons, it is important to examine how family income may shape a child's social support network and how these social supports relate to children's psychological well-being.

Social Support

The psychological well-being of adolescents is strongly connected to their social support system, including the family system, school system and the community system (Quinn, Briggs, Miller, & Orellana, 2014; Smokowski, Evans, Cotter, & Guo, 2014). Family represents the most critical venue for promoting the psychological well-being of adolescents in the household (Hoagwood et al., 2010). Parental support is, possibly, the strongest predictor of all indicators of mental health (Stewart & Suldo, 2011).

Social support in school is also linked to students' psychological well-being. Multiple prior studies propose that support from parents and teachers promotes students' well-being, including their self-esteem and adjustment (Graham et al., 2011; Stewart & Suldo, 2011; Wit, Karioja, Rye, & Shain, 2011). Support received from adults in their neighborhoods shapes adolescents' psychological well-being (Buchanan & Bowen, 2008; O'Campo, Salmon, & Burke, 2009). Peers are also important, as low peer support compromises psychological well-being among adolescents (Smokowski, Evans, & Cotter, 2014) and, in school settings, emotional support from peers is associated with reduced mental health problems, including anxiety (Wit et al., 2011). Protective supports in one area of a youth's life may amplify the impact of supports in another. For example, one study found that students reporting the best psychological well-being had support from both peers and adults in their neighborhood (Buchanan & Bowen, 2008). Similarly, support from adults across multiple systems (home, school, and neighborhood) may strengthen the protective effects of social support on psychological wellbeing (Capp, Berkowitz, Sullivan, Astor, De Pedro, Gilreath, Benbenishty, & Rice, 2016).

School Engagement and Experience

The relationship between school engagement and students' mental health and well-being has been supported by numerous studies (e.g. Christenson, Reschly, & Wylie, 2012; Green et al., 2013; Renshaw, Long, & Cook, 2015; Tisdale & Pitt-Catsuphes, 2012; Wang & Peck, 2012). In addition, adolescents' psychological well-being is positively correlated with their academic performance (Biddle & Asare, 2011). Adolescents with a low grade point average are more likely to experience mental health problems including substance abuse and depression (Diego, Miguel, Fieff, Tiffany, & Sanders, 2003). We include school engagement and grades in the present study because they tend to be strongly related to well-being, and we would like to determine how social supports and family income relate to well-being in the context of these important variables.

Race and Gender

Variation in psychological well-being by race and gender has been identified in previous studies (Harris, Gordon-Larsen, Chantala, & Udry, 2006; Mustanski, Van Wagenen, Birkett, Eyster, & Corliss, 2014). Black and Hispanic adolescents tend to report more mental health challenges and more depressive symptoms than white youths (Biddle & Asare, 2011; Newacheck, Hung, & Wright, 2002). In addition, some researchers suggest that female adolescents may experience worse psychological well-being than males (Teplin et al., 2002; Smokowski, Evans, Cotter, & Guo, 2014) and are more likely to develop depression (Hyde, Mezulis, & Abramson, 2008; Petersen, Sarigiani, & Kennedy, 1991).

Method

This study explores how social support relates to psychological well-being among middle and high school students and whether family income shapes these relationships. We hypothesize that: 1) Students reporting more support from parents, friends, teachers, and neighbors and students reporting more engagement in school will perceive better psychological well-being. 2) Students from higher income families will perceive better psychological well-being, and the strength of the relationship between social supports and psychological well-being will depend on family income.

The present study is a secondary analysis of the public use data from middle and high school students (N=19767) who completed the School Success Profile (SSP; Bowen, Rose, & Bowen, 2005) between 2001 and 2005. Procedures for the original study were approved by the Institutional Review Board of the University of North Carolina at Chapel Hill. The present study was approved by the Institutional Review Board at the University of Alabama.

Participants

The original dataset includes a population of 37,354 students who took the SSP between September 1, 2001, and July 31, 2005. These data were originally collected for non-research purposes and were later

approved for use as secondary data. The methods used in each school varied based on the school's preferences and capacity. Thus, in some schools, all students were invited to complete the survey while, in others, students in one or two grade levels completed the survey. For purposes of secondary analysis, the dataset excluded students from sites with fewer than 50 students and those that attend special intervention programs (e.g., juvenile detention). The dataset only includes respondents who answered at least 95 percent of the 220 items on the SSP. Only respondents with valid codes for gender, race/ethnicity, and grade level were retained in the dataset. After removing cases based on the above criteria, the data set includes 20,749 middle and high school students across 67 school sites.

Following scoring instructions from the survey developers (Bowen, Woolley, Richman, & Bowen, 2001), cases missing responses to more than 50% of items within a scale were coded as missing for the present study. For the other cases, scores for each scale were calculated using the sum of the valid responses divided by the number of valid responses. In the present analysis, 4.7% of cases were excluded due to missing data. There were no significant differences in well-being between participants who were included in the analysis and those excluded due to missing values. The resulting sample for this study included 19,767 students from 67 middle and high schools from seven southeastern states.

Measures

The analysis includes composite scales created from SSP items, as well as single items measuring demographic characteristics. The SSP is particularly appropriate for this study, as it includes subscales measuring risk and protective factors in students' neighborhoods, schools, peer groups, and families, along with measures of students' psychological well-being (Bowen, Rose, & Ware, 2006). The SSP scales have demonstrated strong reliability and validity across multiple studies (Bowen et al., 2006; Powers, Bowen, & Rose, 2005). Measures are described briefly below. Table 1 provides the number of items, range, and internal consistency (Cronbach's alpha) for each scale.

Dependent Variable

The study includes one dependent variable measured with composite scales of psychological well-being. *Perceived psychological well-being* is a scale that was created from two composite scales: self-confidence and adjustment. These scales include items that assess how students perceived themselves. Items from the adjustment scale assess how often during the past seven days students felt successful, lonely, pleased with self, sad, confident, or felt like crying (response categories: 0=never; 1=sometimes; 2=often). Items from the self-confidence scale asked students to describe themselves in the following ways: I feel positive about myself; I am satisfied with myself; I am able to do things as well as most other people; I have a number of good qualities (response

categories: 0=not like me; 1=a little like me; 2=like me). These scales captured slightly different dimensions of well-being but were correlated strongly with each other. They were combined into one scale to avoid problems with multicollinearity. A factor analysis confirmed that items from the two scales loaded well together. A few items from the self-confidence scale had stronger loadings with a second factor, but they also had strong loadings with the first factor that were higher than .40. The scale was coded so that higher scores indicated better well-being (i.e. more often self-confident; less often sad).

Independent Variables: Demographic Characteristics

Independent variables include measures of student age, gender, ethnicity, and family income. Dummy-coded variables indicate whether students identified their race/ethnicity as: African American Race/Ethnicity (1=African American; 0=all others), Hispanic Race/Ethnicity (1=Hispanic; 0=all others), or Other Non-white Ethnicity (1=other non-white ethnicity; 0=all others). White ethnicity was the reference group. Family Income is measured by student-reported participation in the free or reduced price lunch program (0=does not receive free/reduced lunch; 1=receives free/reduced price lunch). The eligibility for a free or reduced price lunch is commonly used as a measure of a student's socioeconomic status in school-based quantitative research (Harwell & LeBeau, 2010). The analysis also includes variables for students' Gender (0=female; 1=male), whether students are in middle school or high school (0=middle; 1=high) and their age (range: 0= age 9 or younger to 12= age 20). This variable was assessed for possible collinearity with age but was found to have an acceptable tolerance value above .10.

Social Support

The analysis includes measures relating to social support from parents, teachers, friends, and neighbors. The *Neighborhood Support* scale assesses the extent to which adults in students' neighborhood are trustworthy, supervise children, help each other, and encourage education. Higher scores indicate greater support. *Parental Support* is a composite scale constructed from students' reports of receiving love and appreciation from adults at home. Higher scores indicate more emotional support. *Peer Support* is a composite scale constructed from students' reports of the social support they receive from friends. This scale is reverse coded so that higher scores indicate more social support from friends. *Teacher Support* is a composite scale constructed of items related to students' perceptions of support from teachers. Higher scores indicate greater support.

School Engagement and Grades

School Engagement is a composite scale created from three variables asking students to indicate the extent to which they feel that they identify with the following sentiments: School is fun; I learn new things at school; I look forward to school (0= not like me, 1= a little like me; 2= a lot like me). *Grades* is a single variable asking students to report the grades on their most recent report card (0=Mostly D's and F's; 1=Mostly C's and D's; 2=Mostly C's; 3=Mostly B's and C's; 4=Mostly A's and B's).

Analysis

Models were estimated with multilevel linear regression models, with students serving as Level 1 and schools as Level 2. The between-school variation in well-being was small, as indicated by the Interclass correlation coefficient of .015. Although preliminary analyses indicated that most of the variation occurs within, rather than between, schools, we used multilevel modeling to account for the clustering of students within schools and to provide more accurate standard error estimates.

Our analysis included three main steps. We first examined an unconditional model that included no predictors. In the second model, we incorporated the student-level variables. We assessed for interactions between social supports and family income. We also assessed for cross-level interaction effects, but these were not significant.

All independent variables are centered around their respective grand means. Preliminary exploration of the data indicated that none of the level 1 coefficients (i.e., slopes) for key predictor variables varied significantly between schools. Thus, all predictors were included with fixed slopes. An analysis of collinearity statistics indicated that all variables were found to have acceptable tolerance values above .10.

Results

Table 1 provides descriptive data on the sample, in addition to the number of items, range, and internal consistency (Cronbach's alpha) for each scale included in the analysis. As indicated in Table 1, the sample is evenly divided by gender (48.6% male), and approximately 67% of students were in middle school. The sample includes many students who would be considered at-risk for academic failure, as the majority of students (55%) report receiving free or reduced price lunches, a proxy for family income. In terms of race and ethnicity, the sample is mostly African American (44%) and White (39%), with a small number of students reporting their ethnicity as Hispanic (10%) or Other Race/Ethnicity (7%). The mean proportion of students within each school that are African American is .44, indicating that the student body is, on average, 44% African American. The mean for perceived well-being is 1.51.

Table 1
Summary Statistics of Study Variables (n=19,767)

Student-Level Variables	M	SD	%	Items	Range	Alpha
Psychological Well-being	1.51	0.41		10	0 – 2	0.84
Age	13.62	1.85		1	9 – 20	
Neighborhood Support	0.66	0.23		12	0 – 1	0.80
Parental Support	1.48	0.57		6	0 – 2	0.91
Peer Support	1.54	0.52		5	0 – 2	0.84
Teacher Support	0.76	0.27		11	0 – 1	0.86
Grades	3.08	1.15		1	0 – 4	
School Engagement	1.11	0.62		3	0 – 3	0.80
Receives Free/Reduced Lunch			55.4			
Gender (Male)			48.6			
High School			33.3			
Race and Ethnicity						
Non-Hispanic Whites			39.2			
African American			43.6			
Hispanic			9.9			
Other Race/Ethnicity			7.3			

Psychological Well-being

The analysis revealed significant differences in well-being by gender and race/ethnicity. Based on the analysis, males are predicted to have better well-being than females ($B = .15$; $p < .001$). African American students were the only group predicted to report better well-being than White students in this analysis ($B = .13$; $p < .001$). Older age predicted better well-being, as well ($B = .01$; $p < .05$). Eligibility to receive free or reduced price lunches predicted worse well-being ($B = -.02$; $p < .001$). More support from parents ($B = .23$; $p < .001$), teachers ($B = .08$; $p < .001$), friends ($B = .10$; $p < .001$), and neighbors ($B = .14$; $p < .001$) predicted better well-being. Better school engagement ($B = .05$; $p < .001$) and higher grades ($B = .04$; $p < .001$) also predicted better well-being (see table 2).

Interactions among Social Supports and Income

We assessed for interactions between family income and support from parents, peers, and neighbors, but these were not significantly related to psychological well-being. There was a significant interaction effect between income and teacher support as they related to perceived well-being. Receiving more teacher support predicted better psychological well-being. This relationship was stronger for students from higher income families. Among those students who reported more teacher support, students from higher income families reported better well-being than those from lower income families.

Table 2
Regression Examining Relationships with Psychological Well-being (n=19,767)

	Psychological Well-being			
	B	SE	t	
constant	1.51	0.01	292.96	***
Gender	0.15	0.01	29.79	***
African American	0.13	0.01	20.31	***
Hispanic	0.02	0.01	1.65	
Other Ethnicity	0.02	0.01	1.57	
Age	0.01	0.00	2.22	*
Free Lunch	-0.02	0.01	-3.64	***
Grades	0.04	0.00	15.91	***
Parent Support	0.23	0.01	32.58	***
Friend Support	0.10	0.01	19.41	***
Neigh Support	0.14	0.01	10.54	***
Teacher Support	0.08	0.01	6.14	***
Engagement	0.05	0.01	11.34	***
High School	0.01	0.01	1.21	
Income X Teacher Support	-0.10	0.02	-5.07	***

Note: Reference categories are non-eligible for free or reduced price lunch, female gender, white race/ethnicity.

***p<.001; **p<.01; *p<.05

Discussion

This study examined how gender, race, poverty, social support, and school engagement relate to adolescents' psychological well-being. Several findings emerged from our study. The results partly support our hypotheses. Greater family income and social support predicted better psychological well-being. Our findings suggest that family income was positively associated with adolescents' psychological well-being, which is consistent with findings in prior studies (Fazel et al., 2012). For example, a community-based cohort study suggested that adolescents from low-income families experience significantly more psychological problems compared to their counterparts from higher-income families (Leve, Kim, & Pears, 2005).

Disparities based on gender and race were demonstrated in our study. Male students reported better psychological well-being than female students. In our study, African American students reported significantly better psychological well-being than White students. Yet, African American youths often report worse well-being than White youths in prior studies (Dobalian & Rivers, 2008; Wells, Klap, Koike, & Sherbourne, 2001). Based on the SEM theory, it is important to study an individual in the context of multiple systems (Stokols, 1996). Our study is conducted in schools with a large percentage of racial and ethnic minority students, and African American students comprise 44% of the overall student population. Therefore, African American students may experience positive perceptions of well-being in the context of schools in which they have a large number of African American peers.

The importance of the social system in the school is also demonstrated by the result that better school engagement is associated with better psychological well-being. Students are likely to have better well-being in the context of strong school engagement. In contrast, poor school engagement will generate disequilibrium and conflicting emotions, thus negatively impact the students' psychological well-being (Wang & Peck, 2013).

Social supports from all socio-ecological systems relate positively to adolescents' psychological well-being. In finding that more support from parents, neighbors, friends and teachers predicted better psychological well-being, our study adds additional evidence to support the important effects of social support on adolescents' psychological well-being. Furthermore, we found that family income shapes how teacher support relates to students' psychological well-being. The relationship between income and well-being was stronger among students with high levels of teacher support. Students from higher income families may receive a greater benefit from high levels of teacher than other students. This finding lends support to the idea from the resilience literature that the addition of one protective factors may amplify the impact of others. (Rutter, 2006). For this reason, high levels of teacher support may improve outcomes more for students who have other supports and resources in their lives. Although support from teachers appears to be important for all students, disparities between students based on family income remain. This suggests the need for interventions that develop support and resources for students across multiple systems if we are to reduce these disparities.

Limitations

The results of this study must be understood in the context of its limitations. First, our study did not analyze the effects of macro level factors in the SEM, such as welfare policies and social culture, on adolescents' psychological well-being. Public health policies, mass media, and healthcare culture also, undoubtedly, impact adolescents'

psychological well-being, in addition to micro-level factors (e.g., age, gender, race, family income, social support; McLeroy, Bibeau, Steckler, & Glanz, 1988). Further studies may consider exploring the influence of macro-level factors on adolescents' psychological well-being. In addition, our analysis relies entirely on student self-report, which may be vulnerable to error and bias. The cross-sectional nature of the data prevents us from drawing conclusions about whether social support affects student well-being. We can only assert that they are related. Despite these considerations, the present study provides an important contribution to understanding adolescents' psychological well-being in school settings.

Conclusion and Implications

Social supports and stressors related to adolescents' well-being were examined across different ecological systems in this study. The interactive effects of economic status and social supports on adolescents' psychological well-being were also analyzed. The stressors associated with living in poverty present many potential barriers to success in school and psychological well-being (Berliner, 2006). This analysis not only further emphasizes the advantages associated with higher family income but also demonstrates how its effects may be amplified by the presence of protective factors in the student's social environment.

This study highlights the significant role of social support in promoting adolescents' psychological well-being. School social workers and other helping professionals should pay close attention to social environmental factors and intervene across multiple social systems to promote adolescents' psychological well-being. Working to strengthen students' social support from parents, community neighbors, peers, and teachers will be important in promoting students' well-being. This work calls for engaging families and community stakeholders in promoting students' well-being. This work calls for interventions, that go beyond intervening with the school system to promoting healthy community and parent involvement. Effective family-school partnerships and involving parents in decision-making at the school is an important step (Blum et al., 2002).

Acknowledgements:

Special appreciation is expressed to Dr. Gary L. Bowen, School of Social Work, The University of North Carolina at Chapel Hill, who constructed the SSP datafile for research use that advances the science of youth development. Responsibility for the ethical use of these data, including their coding, analysis, and reporting, remain with user and do not necessarily reflect the advice, decisions, recommendations or agreement of either Dr. Bowen or other members of his research team at the University of North Carolina at Chapel Hill. Approval for release of these data for secondary analysis was approved by the Behavioral IRB at the

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