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An Ecological Risk/Protective Factor Approach to Understanding Depressive Symptoms in Adolescents

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Abstract: We applied an ecological multiple risk/protective factor model to study factors related to depressive symptoms among adolescents. Participants were 39,740 adolescents who self-reported risk factors, protective factors, and depressive symptoms on a school-based survey. Results indicate that an index of multiple risk was related to increased depressive symptoms. Two hypothesized protective factors moderated the effects of the risk index; four other hypothesized protective factors were directly related to lower levels of depressive symptomatology. These findings suggest that prevention strategies for externalizing behaviors currently used in Extension programs might be able to be extended to address depressive symptoms.

Introduction

Over the past two decades, the ecological risk/protective factor framework has been a popular lens through which to study variables related to externalizing behaviors among children and adolescents. According to this approach, human behavior results from a process of mutual interactions among an individual, his or her immediate environmental settings, and larger social and cultural contexts in which he or she is embedded (Bronfenbrenner, 1979; 1986). Within each of these ecological settings, individuals are exposed to a variety of risk factors that increase the likelihood of negative outcomes and protective factors that buffer against the effects of such risk. A person's response to these factors typically depends on a variety of variables, including the number of factors the person experiences, the type of factors, and the timing of exposure to these factors (Jenson & Fraser, 2006; Small & Memmo, 2004).

Cooperative Extension specialists, agents, and educators within the family life and youth development program areas have used the research grounded in the risk/protective factor framework to guide the

development, implementation, and evaluation of policies and programs designed to reduce common youth problems such as delinquency, drug use, and academic failure (e.g., Astroth & Vogel, 2008; Bogenschneider, 1995; Hill & Parker, 2005; Mincemoyer et al., 2008; Perkins, Mincemoyer, & Lillehoj, 2006). Reviews of outcome evaluations of Cooperative Extension and other community-based prevention strategies indicate that many programs based on this model have had at least some success in reducing the incidence of externalizing outcomes among youth (e.g., Greenberg, 2004; Hawkins, Catalano, & Arthur, 2002; Hawkins et al., 2008; Spoth et al., 2007; Spoth, Randall, & Shin, 2008).

In recent years, there has been some interest in determining how well the risk/protective factor model applies to internalizing outcomes in the hopes of extending currently available prevention strategies to outcomes such as depressive symptoms. Early studies in this area have revealed a variety of risk and protective factors associated with depressive symptomatology among adolescents. Risks such as poor family processes, negative parent-child relationships, and high levels of stress have been found to be associated with increased depressive symptoms in young people, whereas protective factors such as intelligence and self efficacy have been found to buffer the effects of some risk factors (e.g., Gilbert, 1997; Jenson & Fraser, 2006; Kandel & Davies, 1982; Sadler, 1991; Stewart, McKenry, Rudd, & Gavazzi, 1994).

While the above-mentioned studies provided insights into how individual predictors relate to depressive symptoms, later studies have been based on a more ecological model. Indeed, recent studies have focused on the complex interrelationships among depressive symptoms and multiple risk and protective factors from a variety of ecological contexts (Bond, Toumbourou, Lyndal, Catalano, & Patton, 2005; Costello, Swendsen, Rose, & Dierker, 2008; Denny, Clark, Fleming, & Wall, 2004). The results of such investigations provide preliminary evidence that the risk/protective factor model underlying many popular prevention programs can indeed be applied to internalizing outcomes such as depressive symptomatology.

More specifically, they suggest that individual risk factors within a variety of contexts are related to increased levels of depressive symptoms and that depressive symptoms become increasingly likely as the number of risk factors increases. They also provide preliminary evidence that depressive symptoms are less likely when protective factor levels are high. Given the similarities in predictors of internalizing and externalizing outcomes, these findings provide preliminary evidence that current prevention programs based on this model may have positive effects on program participants' mental health in addition to their behavioral health.

In light of this evidence, one purpose of the study described in this article was to further examine the degree to which the risk/protective factor model commonly used to understand externalizing outcomes among adolescents can be applied to understand predictors of depressive symptoms as well. Specifically, we sought to determine if we could replicate the above-mentioned findings of previous researchers who have found that an accumulation of risk factors increases the likelihood of depressive symptoms, whereas the presence of specific protective factors decreases the likelihood of such outcomes.

A second purpose of the study was to overcome a discrepancy in the way in which protective factors typically have been analyzed across internalizing and externalizing outcomes. Although there are many similarities in studies that have focused on predictors of both types of outcomes, there is at least one difference in the way in which protective factors have been examined. When studying externalizing outcomes, scholars generally examine the degree to which hypothesized protective factors moderate the relation between a risk factor and an outcome (Jenson & Fraser, 2006; Small & Memmo, 2004). As such, protective effects often are examined using linear regression techniques in which the investigators interpret interactions between risk factors and protective factors (Aiken & West, 1991; Cohen & Cohen, 1983). Significant interactions provide evidence that the protective factors moderate (or buffer) the effects of risks. Despite the widespread use of this technique when examining externalizing outcomes, few researchers have

examined interaction effects when looking at internalizing outcomes.

In light of this discrepancy in methods, we specifically examined ways in which protective factors from multiple ecological contexts statistically moderate the effects of an index of multiple risks. If the mechanism by which protective factors work is similar across both externalizing and internalizing outcomes, we believe that it may be possible for Cooperative Extension professionals to use programs based on such a model to address both internalizing and externalizing outcomes. Specifically, they may be able to use existing programs that are designed to decrease the accumulation of common risk factors, and also to increase the presence of protective factors that buffer against the effects of such risks.

Method

Participants

Participants in the study were 39,740 adolescents who were in grades 6 through 12 and were living in Pennsylvania at the time of the survey. The ethnic background of most participants was White (89.6%), with African American and Hispanic racial/ethnic groups being represented at the next highest levels (about 4% each). There was a slightly higher percentage of females (52.3%) than males (47.7%). These participants were drawn from a larger data set that was representative of all adolescents living in Pennsylvania during 2005. The adolescents included in the analytic sample completed the Pennsylvania Youth Survey (PAYS), which is a version of the Communities That Care Youth Survey (CTCYS). The survey is administered to middle and high school students throughout Pennsylvania every 2 years. There were two versions of the survey—one with items related to family relations and one without. For the analyses in this article, we used only participants with family data, which is about half of the total sample.

Measures

The PAYS instrument included a variety of questions related to demographics. Depressive symptoms and risk and protective factors were measured with indices developed specifically for the survey. All items have been found to be valid and reliable indicators in past studies (Arthur et al., 2002). In the study reported here, Cronbach's alpha for the depressive symptoms index was 0.874, and alphas for the protective factors ranged from 0.714 to 0.870. A list of hypothesized protective factors is included in Table 1.

Table 1
Protective Factors

Community Rewards for Prosocial Behavior
Family Attachment
Family Opportunities for Prosocial Behavior
Family Rewards for Prosocial Behavior
Religiosity
School Rewards for Prosocial Behavior

The multiple risk factor index was computed by aggregating the scores of 19 risk factors that are part of the Communities That Care prevention system and are commonly addressed in a wide variety of current prevention programs (Channing Bete, 2004). Before computing the index, we dichotomized each risk variable by coding the upper third of the distribution for each variable as "at risk." This procedure is consistent with what has been used by other researchers in the risk and resiliency field (Bond et al., 2005). Next, we summed up the number of variables for which each participant was "at risk" to obtain a composite index indicating number of risk factors experienced. Cronbach's alpha for this index was 0.870. A list of individual risk factors that comprise this index is included in Table 2.

Table 2.
Individual Risk Factors Included in Composite Cumulative Risk Index

Sensation Seeking	Family History of Antisocial Behavior
Rebelliousness	Perceived availability of drugs
Early initiation of problem behavior	Poor academic performance
Low perceived risk of drug use	Low school commitment
Favorable attitudes towards drugs	Community disorganization
Favorable attitudes towards antisocial behaviors	Low neighborhood attachment
Poor family supervision	Personal transitions and mobility
Poor family discipline	Laws and norms favorable to drug use
Family conflict	Parental attitudes favorable toward drug use
Parental attitudes favorable toward antisocial behavior	

Data Cleaning

Several procedures were employed to assess the accuracy of adolescents' self reports and to remove individuals who provided implausible responses. First, students who reported using a fictitious drug called "derbisol" were removed from the sample. Second, students were removed if they reported antisocial behaviors or alcohol, tobacco, or other drug use that would be considered unrealistically high. Finally, students who provided more than one instance of inconsistent answers across questions (such as reporting 30-day use of a drug but no lifetime use) were removed.

Analytic Design

All variables were entered into a single Ordinary Least Squares (OLS) regression equation. The depressive symptoms measure was entered as the outcome variable. Sex and age were entered as covariates on the first block of the equation. The multiple risk factor index and the protective factor indices were entered on the

second block. Interaction effects, which were computed by multiplying the multiple risk factor index by each protective factor index, were entered on the final block. Given the large size of our dataset, we used a relatively conservative cutoff of $p < .01$ as our significance level for all analyses.

Results

Results indicate that gender ($p < .001$) and age ($p < .001$) were significantly related to depressive symptoms in adolescents, with females and older adolescents reporting higher scores on the depressive symptom index than males and younger adolescents. Beyond the effects of the covariates, the multiple risk factor index was significantly related to self-reported depressive symptom level ($p < .001$). Four of the six hypothesized protective factors were negatively related to depressive symptoms ($p < .001$), and there was a significant interaction between the multiple risk index and each of the remaining two factors. Specifically, both religiosity ($p = .001$) and community rewards for prosocial behavior ($p < .001$) moderated the effects of multiple risk. Coefficients for the full regression models are included in Table 3.

Table 3.

Summary of Hierarchical Regression Analysis for Variables Predicting Depressive Symptoms

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>		<i>B</i>	<i>SE B</i>		<i>B</i>	<i>SE B</i>	
Demographics:									
Sex ^a	-.273*	.008	-.167*	-.304*	.007	-.186*	-.304*	.007	-.186*
Age	.034*	.002	.090*	-.054*	.002	-.142*	-.055*	.002	-.144*
Risk/Protective Factors:									
Cumulative Risk				.061*	.001	.370*	.055*	.003	.331*
Community Rewards for Prosocial Behavior				.007	.005	.008	-.014	.008	-.015
Family Attachment				-.032*	.008	-.030*	-.055*	.015	-.051*
Family Opportunities for Prosocial Behavior				-.139*	.008	-.131*	-.149*	.015	-.139*
Family Rewards for Prosocial Behavior				-.074*	.009	-.066*	-.050*	.017	-.045*
Religiosity				.002	.003	.002	-.013	-.005	-.018

than those without these protective mechanisms. Such findings are very consistent with the literature on externalizing outcomes and suggest that Cooperative Extension programs that target risk and protective factors as a way of preventing delinquency and substance use may also be effective in preventing depressive symptoms among adolescents.

Another rather interesting finding in the study is that the hypothesized protective factors that did not moderate the effects of risk did have a direct relation with the outcome. Specifically, increased levels of the four family- and school-level "protective" factors were related to lower levels of depressive symptoms among adolescents. As such, these variables cannot be considered "protective" because they do not buffer against risk. Several scholars who have focused on externalizing outcomes have referred to such variables as "promotive" factors because they directly promote positive development (e.g., Gutman, Sameroff, & Eccles, 2002). In the study reported here, these factors promote better mental health outcomes among study participants.

As with any empirical investigation, there are several notable limitations associated with the study. First, the sample is not representative of all adolescents in the United States. Study participants were drawn from rural and suburban school districts in the state of Pennsylvania. As a result, the sample included primarily White adolescents, and the current findings cannot be readily generalized to adolescents from urban areas or to adolescents from non-White racial/ethnic backgrounds. In addition, the study relied exclusively on self-reports of behaviors. Although such survey methodologies are common in the behavioral sciences, it is always possible that responses are influenced by forgetfulness, lying, exaggeration, or inaccurate interpretations of questions. As mentioned earlier, in the hopes of limiting the effects of such biases, we did employ several methods to clean suspect data from the analyses.

Despite the above-mentioned limitations, these findings have several general implications for Cooperative Extension practice that fall largely along the same lines as implications drawn from risk and resiliency research on behavioral outcomes. Specifically, these findings suggest that Extension specialists, agents, and educators interested in reducing the incidence of depressive symptoms among adolescents should focus on enhancing promotive factors, reducing known risk factors, and promoting protective factors to buffer against risk.

The results of the study, along with the findings of past research on this topic, indicate that prevention strategies currently employed to address externalizing outcomes might be able to be extended to depressive symptoms. Extension faculty interested in using prevention strategies to address depressive symptoms should examine the degree to which strategies that they are either currently implementing or considering implementing address the multiple risk and protective factors listed in Tables 1 and 2 of this article. Given the direct and moderating effects of these factors, it is very possible that initiatives that target these variables will be effective in addressing not only externalizing outcomes, but depressive symptoms as well. Such a possibility is exciting in that it would not require Extension professionals to "reinvent the wheel" and develop new programs when extending their programmatic focus to include internalizing problems.

A logical next step for Extension professionals and other prevention science scholars would be to conduct evaluations of current prevention initiatives to see if current prevention strategies that address the factors in Tables 1 and 2 do indeed decrease the incidence of depressive symptoms. It would be very gratifying if we learn that we can efficiently use our limited resources by relying on a relatively small number of programs to target multiple types of outcomes. This is particularly true in light of recent cuts to Extension budgets across the country. By wisely choosing strategies that address predictors of both externalizing and internalizing outcomes, we may increase our success in supporting and improving the lives of the adolescents with whom we work within our communities.

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