

Contrasting ecological models for adolescent mental health, problem behavior, and academic achievement*

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Introduction

The previous presentations in this symposium have focused on different aspects of the social ecology that affect adolescent development---the school, the peer group, and the family. In this final presentation we will attempt to combine these various domains within a single set of analyses to illuminate their differential contributions.

Applying ecological models to adolescence gives perspective on the multiple determinants of behavior during this age period. Studies that have analyzed the effects of separate social systems have either **over** or **under**-emphasized their contribution to various adolescent behaviors. Only studies that can simultaneously contrast the effects of multiple contexts can assess their relative contribution. Moreover, these different contexts may make different contributions to different adolescent behaviors.

Proliferation of Complexity

One of the central features of modern developmental theory has been the increasing complexity of conceptualization as more and more factors have been shown to influence human growth. Emerging from the contextual emphases of the life span approach to development and the organization of these contexts into ecological models, studies of development have increasingly incorporated variables reflecting extra-individual influences on the psychological functioning of children and adolescents. From an exclusive concern with the parent-child relationship research programs are now including family, neighborhood, community, school, and peer factors as additional contexts for consideration.

This perspective is best visualized as a Ven diagram with the child embedded in a multiplicity of contexts.

Figure 1-Ecological Model

The child is influenced by parents who are nested in the family which is nested in the community. As the child moves from infancy to adolescence the contexts of school and peer group exert new influences while the effects of the community, which may have previously been **mediated** by the parents begin to have more direct influences on developmental progress.

Sample

The data to be presented here is from our investigation of about 1500 7th graders through interviews with youth and their primary caregiver. As previously mentioned the sample varied in SES, was about half male and half female, and about two-thirds African-American and one-third White. We assessed the influence of parent, family, peer, school, and neighborhood factors. The

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analyses presented here will be of the cross-sectional relations of these variable during our first wave of data collection, when the adolescents were in the 7th Grade.

Parent variables were mental health and efficacy, family factors were emotional climate and control dimensions, peer factors were association with pro- and antisocial peers, school variables were academic climate and conventional values of classmates, neighborhood variables were census tract data and parent report of community problems.

Ecological Variables

For the purposes of this presentation we have placed our social variables in an ecological model with domains at various levels of proximity to the youth in our study.

Figure 2 –Context Levels

Family Interaction would be the most proximal context because it reflects the here and now style with which parents engage their children. At one remove is a construct we label as **Family Management** which includes the specific behaviors and strategies parents use to assist their children. At a further remove are the **Psychological Characteristics of the Parents** who interact with and manage the child. These psychological characteristics are facilitated or hindered by the **Socioeconomic Circumstances of the Family**, and then by **Interactions with the Community** producing supports and stresses on the family functioning. Two other interactive domains in which the youth is embedded are the **Peer and School Contexts** which are themselves embedded in a **Neighborhood Context**.

For our analyses we will be interested in how these different contexts contribute to adolescent development when considered in the same analysis. The specific variables that went into our analysis can be seen in this overhead.

Figure 3 –Context Variables

Outcome Variables

Where we are focusing our analyses on multiple domains of the social ecology of development to examine their relative contributions, we are also interested in examining multiple outcomes to determine if the patterns of social influence vary or are similar across behavioral domains.

Figure 4-Outcome Variables

For the purposes of this presentation we are using four outcomes: Two are **Psychological Adjustment** as reported by the youths themselves and as reported by the parent. The third is **Problem Behavior** as reported by the youth and the fourth is **Academic Achievement** as reflected in school grades and achievement tests.

Statistical Analysis

For our data analyses we performed hierarchical regression analyses with context factors as independent variables and adolescent mental health, problem behavior, and academic achievement as dependent variables. Race, gender, and youth age were entered first as covariates.

First-Last Analyses

In a multivariate analysis it is difficult to determine the true contribution of each variable. Only the unique variance associated with each variable can be easily obtained. The unique contribution is the variance explained by a variable when all other variables have already been entered into the regression as controls. However, there may be, and usually is, variance associated with each variable that overlaps, or is common, with other variables. Thus the unique variance test is usually an **underestimate** of the effect of each variable. But if one enters a variable into the regression without the controls, one obtains a variance estimate that includes both the unique and common variance and is an **overestimate** of a variable's contribution to the outcome.

The thrust of this presentation is to explore the patterning of ecological contributors to our outcomes. So we thought it best to explore both total and unique variances to see if the patterns were similar. We accomplish this by comparing regression analyses where each variable is entered first in the regression analysis, thereby maximizing its effect, and analyses where the variable is entered last, thereby minimizing its effect.

Slide 5---Parent Report of Adjustment

The first outcome is the **Parent Report of Youth Psychological Adjustment** and we see a similar pattern in the R-square associated with each variables whether entered first or last. The major influences are **Parent Mental Health, Family Management, and Family Interaction**.

Slide 6---Youth Report of Adjustment

We see a different pattern for **Youth Report of Adjustment**. Although **Family Interaction** is still a major influence, **Parent Mental Health** and **Family Management** have smaller influences than the **School Climate** and **Peer Climate**.

Slide 7---Problem Behavior

Youth report of **Problem Behavior** shows a similar pattern to youth report of **Psychological Adjustment** but the order of magnitude has shifted. **Peer Climate** moves into first place followed by **Family Interaction** and **School Climate**.

Slide 8---Academic Achievement

And **Academic Achievement** shows a very different pattern. Almost every contextual level makes a contribution to the outcome, with **Family Socioeconomic Status** being the most powerful correlate.

Regression Equations

A summary of these results can be seen in the next overhead where the major two or three influences are listed for each outcome.

Slide 9—Summary of Ecological Contributions

For each outcome there is a different pattern of ecological contributions. **Family Interaction** is among the top contributors to all the mental health related outcomes, **Psychological Adjustment** as reported by the youth and the parent and **Problem Behavior**. **Peers** are influential in both **Youth Reports of Adjustment and Problem Behavior**. **School Climate** enters the picture

for **Academic performance and Problem Behavior**. **Family SES** is influential only for **Academic Achievement**.

These results have indicated the relative influence of different ecological levels to our four outcomes and lead us to conclude that there are different and interesting patterns for each outcome. For a more detailed analysis of contextual influences we can examine the effects of the separate variables that compose each ecological level as shown in the next overhead.

Slide 10--Regression Equations

Results

For this colorful slide we think the best title may be “**What’s wrong with this picture?**” We have selected the 14 variables that are making statistically significant contributions from the set of 24 that composed the 8 ecological domains used in our regression analyses. The **red rows** are variables taken from the parent interview and the **yellow rows** are variables taken from the youth interview. The table lists the **beta weights** from the summary table of the regression analysis for the four outcomes.

First we should note our achievement in explaining large amounts of outcome variance. The range of Total R-squares listed in the last row range from a low of 30% to a high of 41%. Next, however, we must note the problems. The amount of variance explained in the parent report of psychological adjustment is much higher than in the youth report, **but** the main contributors to this higher variance are parent reports of their own behavior. Method variance may play a large role in this relation with parents biasing or being biased by their estimate of youth’s psychological adjustment.

Family Emotional Climate

A clear example of reporter specificity is that parent’s estimate of **Positive Family Climate** is related only to the parent report of adjustment and youth report of **Positive Family Climate** is related only to youth report of adjustment.

The effects of the youth’s report of **Negative Family Climate** are much more robust, showing negative relations to all outcomes, regardless of source of data. Unfortunately, there was not a comparable parent report variable where we asked about negative emotions and harshness of punishment.

Family Management

The effects of family management highlight problems with cross-sectional analyses such as this presentation. The beta weights have the wrong sign. **Proactive Encouragement and Prevention of Problems**, that is, the parents’ time spent and efforts to work with the child on talents and problem areas, are negatively correlated with three of the outcomes. The more management the worse the outcomes.

Family management during adolescence may be more reactive than spontaneous. Children who have problems have families that need to work with them. Children who are well-adjusted and competent may not need and actually reject high levels of parent involvement with their activities. I usually don’t admit this in public but in spite of or because of my many expressions of love and affection, my 13-year old daughter gives me more feelings of rejection than I ever could have imagined.

Parent Efficacy

The implications from cross-sectional analyses are that there are causal links leading from the ecological variables to youth outcomes. However, evidence for direction of effects must await longitudinal analyses using data from multiple time points. But even in single-waves of data we have a rich source for hypotheses. Take the variable **Parent Efficacy** which makes significant contributions to three of the four outcomes. At least the sign of the beta-weights is in the right direction. Bandura has argued that there is no general sense of efficacy, but rather that efficacy is domain specific and must be specifically measured within those domains. Thus, for example, the questions on our parent scale ask whether the parent feels efficacious at influencing the adolescents' academic behavior and problem behavior. Clearly, youth with high or low levels of academic proficiency or problem behavior will have parents who feel corresponding more or less efficacious in those domains. Similarly, the negative family emotional climate that is associated with all four outcomes could just as easily be the result of the good performance of the child as the cause.

Absence of Relations

In our analyses comparing the relations between multiple contextual domains and adolescence behavior we must note the absence of correlations as well as their presence. The variables that did not figure in the final regression equations may be surprising to some. The more distal domains of **Neighborhood Quality** and **Community Interaction** did not make significant contributions in the final equations for any of the outcomes. This included the **Stressful Life Event** variable and the **Social Support** variable. In addition, **Family Socioeconomic Status** only figured in the **Academic Achievement** outcome, and here it was only **Parent Educational Achievement** that was statistically significant.

The implication is that distal effects are mostly mediated through the proximal contexts of the adolescent and it is to these contexts that interventions must be addressed if improvements in competence are to be expected. Although one can propose statistical analyses to detect mediating and moderating influences within this data set, more meaningful conclusions will emerge when we examine the longitudinal relations between successive waves of data among our ecological domains and our youth competencies.

Discussion

To summarize these results, I will focus on answering three questions:

Figure 11---Summary Points

- 1) What can we conclude from these analyses?
- 2) What are the implications for changing the lives of youths with problems?
- 3) What are appropriate directions for future work?

1) Analytic Conclusions

The answer to the first question is that there are strong correlations between many levels of the social context and adolescent competence. Moreover the patterning of these relations differ for different domains of youth behavior. The most powerful relations are with the **Family Emotional Climate**. Competent kids have very good emotional relations with their parents and problem kids don't. The peer group and school also are related to several outcomes. Association with positive peers is related to **Psychological Adjustment** and association with negative peers is related to

Problem Behavior. School Climate related to all four outcomes, but most strongly to **Academic Achievement and Problem Behavior**.

2) Intervention Targets

In answer to our second question, our analyses are important for planning programs to change behavior so that appropriate targets of intervention can be selected for different outcomes. Although **direction-of-effects** are not clear in cross-sectional analyses such as described here, these analyses do identify patterns of association between ecological contexts and important aspects of adolescent life. To the extent that we can identify the health related aspects of community and family life, we will have found targets for intervention efforts that will foster the development of our adolescents.

Although we recognize the transactional interpenetration of youth and context, we believe in the relative power of institutions over individuals. It is more likely that the community will change the individual than that the individual will change the community. In general, we believe that families have more influence over their children than children have over their families. However, as we have noted, individual characteristics of children, beginning with early temperamental variation and extending through their successes and failures at personal, social, and academic achievement into adulthood, may have powerful influences on how their families treat them. But in the main, it is not children that raise families, but families that raise children.

The analyses we have chosen to present challenge our notions that individuals play a major role in their development. In other data sets we have found that youth with equal levels of competence end up quite differently depending on the affluence or adversity of their social context. This will be another major interest in our continuing analyses of these data, which leads us to the answer to our last question.

3) Future Directions

Although longitudinal analyses will be necessary to determine **which** ecological factors are associated with **which** changes in youth performance, we may still be stuck with unanswered questions about the major contributors to those relations. For example, we have found that family emotional climates is highly correlated with all outcome domains. It may be that these correlations have been primarily established during prior phases of development in early childhood or, perhaps, even during infancy. Despite these high intercorrelations, it may be that interventions in these interactions during adolescence may be a poor second or third strategy compared to interventions during these earlier periods.

Much is made about risk and protective factors as sources of information about targets for improving adolescent life. We are struck that the positive and negative psychological factors in children's lives are the same in most contexts, whether rich and poor. Parents who love their kids have kids who are doing well kids who feel loved are doing well. However, it is highly likely that in certain contexts it is more or less difficult for parents to feel or find time to express that love. We hope in our future longitudinal analyses of this data set to be able to identify the conditions that foster those feelings in both parent and youth.

Ecological Contexts

Proximal

Family Interaction

Family Management

Parent Mental Health

Family Socioeconomics (SES)

Community Interaction

Peer Climate

School Climate

Neighborhood Quality

Distal

Ecological Contexts – Family

Family Interaction

Positive Emotional Climate (P & Y)

Negative Emotional Climate (P & Y)

Discipline and Monitoring (P & Y)

Family Management

Encouragement of Youth

Prevention of Problems

Spending Time with Youth

Attitude Toward School Involvement

Parent Mental Health

Efficacy and Resilience

Mental Health

Marital Adjustment

Family Socioeconomics

Education

Occupation

Income

Family Size

Ecological Contexts – Community

Community Interaction

Social Support

Stressful Life Events

Peer Climate

Association with Positive Peers

Association with Negative Peers

Need for Peer Social Support

School Climate

Positive School Climate (Youth Report)

Positive School Climate (Parent Report)

Differential Ethnic & Gender Treatment

Neighborhood Quality

Census Tract SES

Neighborhood Quality (Parent Report)

7th Grade Adolescent Outcomes

Youth Psychological Adjustment

(Parent Report -- $\alpha = .86$)

Depression
Anger
Distractedness
Resiliency
Problem Solving

Youth Problem Behavior

(Youth Report -- $\alpha = .73$)

Delinquency
Substance Use
Early Sexuality
Violence

Youth Psychological Adjustment

(Youth Report -- $\alpha = .79$)

Depression
Anger
Satisfaction with Self & Relationships
Resiliency
Self-Esteem

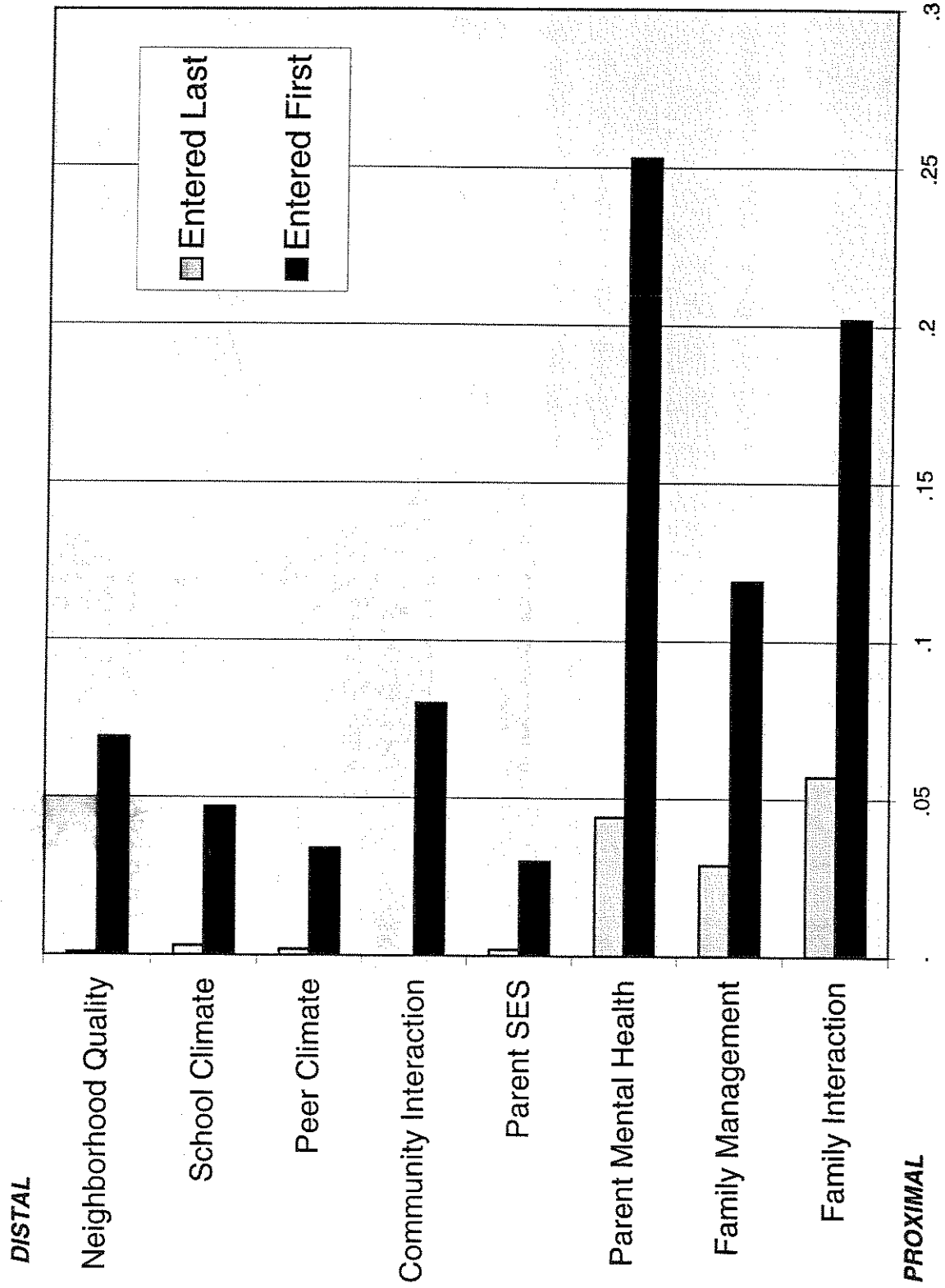
Academic Achievement

(School Report -- $\alpha = .87$)

Final Grades
Math Achievement

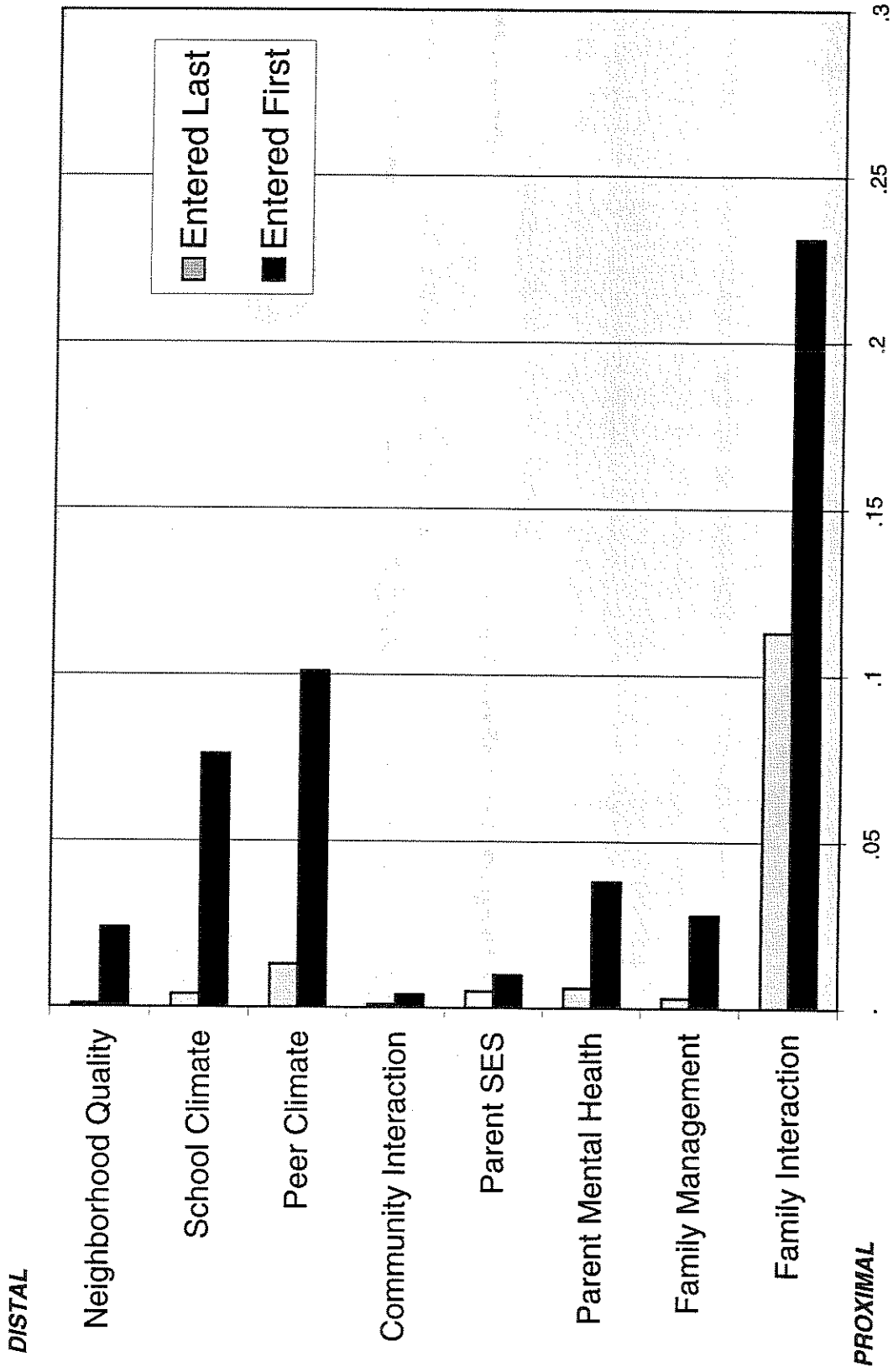
Youth Psychological Adjustment -- Parent Report

R-Squares for Ecological Contexts Entered First and Last



Youth Psychological Adjustment -- Youth Report

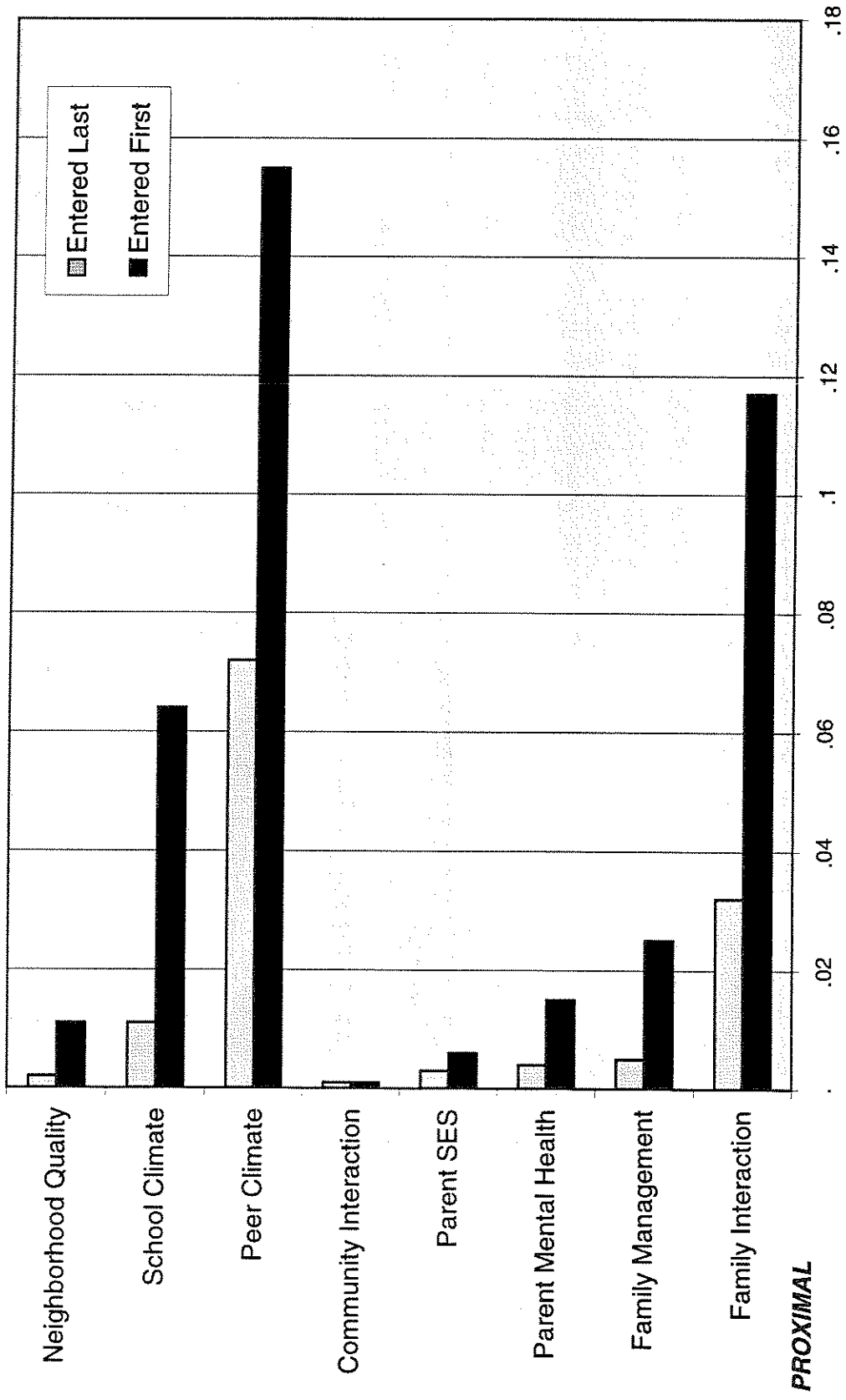
R-Squares for Ecological Contexts Entered First and Last



Youth Problem Behavior

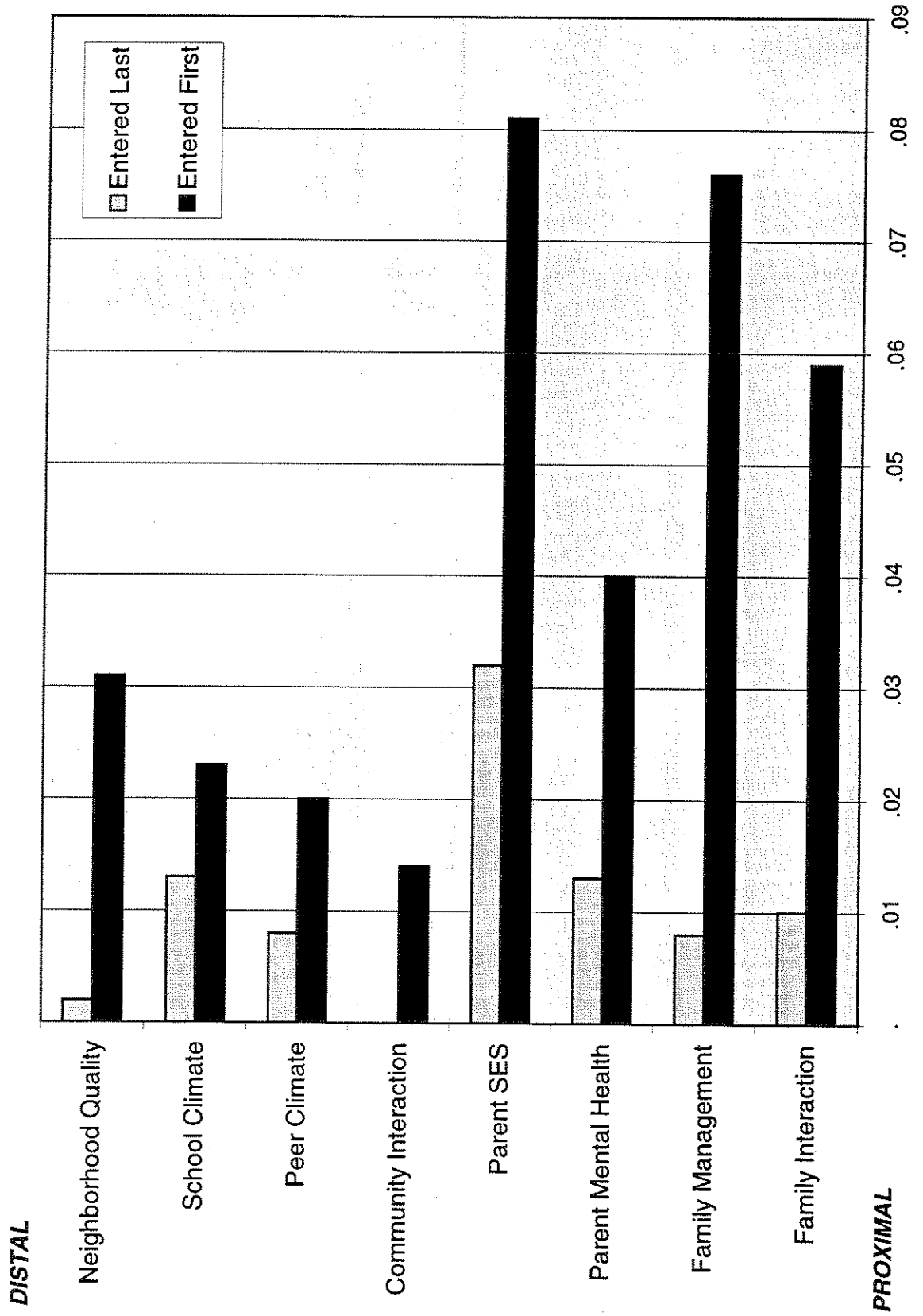
R-Squares for Ecological Contexts Entered First and Last

DISTAL



Youth Academic Achievement

R-Squares for Ecological Contexts Entered First and Last



Ecological Model Summaries

(Standardized Regression Beta Coefficients)

	Psych. Adjust. (P)	Psych. Adjust. (Y)	Prob. Behav. (Y)	Acad. Ach. (Sch)
Family Interaction				
Positive Emotional		.18		
Negative Emotional Climate	-	-	.17	-
Discipline & Monitoring (Y)			-	
Positive Emotional				
Discipline & Monitoring (P)	.08			-
Family Management				
Proactive Encouragement	-			
Proactive Prevention of	-		.10	-
Parent Mental Health				
Parent Efficacy and	.17	.10		.17
Parent Mental Health (P)	.17			
Family SES				
Highest Educ Parent (P)				.19
Family Income (P)				.08
Peer Climate				
Negative Peer Climate (Y)			.28	
Positive Peer Climate (Y)		.06		
Need for Peer Social			.09	
School Climate				
Positive School Climate (Y)	.06	.09	-	.12
Total R-Squared =	.41	.30	.31	.38

Summary of Ecological Contributions

<i>Psychological Adjustment (Parent Report)</i>	<i>Psychological Adjustment (Youth Report)</i>	<i>Problem Behavior (Youth Report)</i>	<i>Academic Achievement (School Records)</i>
Family Interaction	Family Interaction	Peer Climate	Parent SES
Parent Mental Health	Peer Climate	Family Interaction	Parent Mental Health
Family Management		School Climate	School Climate