

The Relations Between Cluster Indexes of Risk and Promotion and the Problem Behaviors of 6- and 7-Year-Old Children From Economically Disadvantaged Families

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This study examined the relations between alternative representations of poverty cofactors and promotion processes and teacher reports of the problem behaviors of 6- and 7-year-old children from economically disadvantaged families ($N = 159$). The results showed that single-index representations of risk and promotion variables predicted child aggressive behaviors but not child anxious/depressed behaviors. An additive model of individual risk indicators performed similarly. Smaller indexes representing clusters of parent adjustment variables and family instability variables, however, differentially predicted aggressive and anxious/depressed behaviors, respectively. The results suggest the importance of promotion processes and of representing environmental adversity at varying levels of specificity for children from economically disadvantaged families.

Economic disadvantage is associated with a variety of cofactors that pose risks for children's normative development (Dodge, Pettit, & Bates, 1994; Duncan & Brooks-Gunn, 1997; Elder, Eccles, Ardel, & Lord, 1995). Risk exposure is quite diverse for children, however, because disadvantaged families vary widely in personal, parental, and family resources (Coll et al., 1996). Some families, for example, change residences many times in a young child's life, whereas other families maintain the same residence. Some caregivers experience multiple relationship changes with intimate adult partners, while others maintain a stable marital relationship. Some caregivers maintain a positive and optimistic perspective amidst significant environmental adversity, whereas others experience intense negative emotionality.

In this study, we addressed the relations between poverty cofactors and teacher reports of the problem behaviors of 6- and 7-year-old children from economically disadvantaged families. We focused on first-grade children to describe early aspects of disruptive behavior, fearful behavior, and interpersonal skill deficiencies that may cumulate over time for children from disadvantaged families (Hinshaw, 1992). We explored issues concerning the distinction between economic disadvantage and cofactors, representations of contextual adversity, and family promotion processes.

Poverty Cofactors

Many studies have linked poverty and child problem behaviors without distinguishing between economic disadvantage per se and other associated aspects of environmental adversity (see Brooks-Gunn, Duncan, & Maritato, 1997). One result is that the unique effects of disadvantage and of its cofactors are unclear. In studies with economically heterogeneous samples of families, for example, analyzing for economic resources often obscures the social diversity among disadvantaged families (Coll et al., 1996; McLoyd, 1998). Alternatively, controlling for economic resources assumes that other aspects of environmental adversity function similarly across economic strata. Only recently have researchers examined the independent contributions of economic adversity and its cofactors to the well-being of children from disadvantaged families (cf. Duncan & Brooks-Gunn, 1997). The results of Duncan and Brooks-Gunn (1997) and Miller and Davis (1997) suggest that income poverty contributes to differences in cognitive ability and academic achievement. Cofactors such as years of maternal schooling and family structure may relate more strongly to the social functioning of young children (Hanson, McLanahan, & Thomson, 1997; McLanahan & Sandefur, 1994).

Duncan and Brooks-Gunn (1997) focused primarily on the unique effects associated with economic disadvantage while essentially controlling for the influence of the cofactors. We reversed this focus by examining a larger range of cofactors for a sample of economically disadvantaged families while controlling for family earned income. Our goal was to represent some of the multiple and varied aspects of environmental adversity that children in disadvantaged families may experience over time.

Cofactor Representation

An important issue concerns the representation of environmental adversity associated with economic disadvantage. Representations of individual variables usually lack power in explaining children's problem behaviors (Rutter, 1990a; Sameroff, Seifer,

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Baldwin, & Baldwin, 1993). In contrast, blocks of individual variables in additive-factors models often account for substantial variance in children's problem behaviors (Ackerman, Izard, Schoff, Youngstrom, & Kogos, in press; Deater-Deckard, Dodge, Bates, & Pettit, 1998), and serious problems usually are associated with multiple factors (Fergusson, Horwood, & Lynskey, 1994). These findings suggest the usefulness of representations that aggregate risk factors.

One form of aggregate representation cumulates the risk indicators for each family and represents environmental adversity with a single multiple risk index (Fergusson et al., 1994; Sameroff et al., 1993; Sameroff, Seifer, & Bartko, 1997; Shaw, Winslow, Owens, & Hood, 1998; Thornberry, Smith, & Howard, 1997). This index thus reflects the number of environmental risks that a child may experience. This representation potentially honors the diversity among disadvantaged families and has performed well in explaining child and adolescent maladaptation in economically heterogeneous samples. Sameroff et al. (1993, 1997) found, for example, that a single index representing 10 aspects of family adversity for 4-year-old children explained as much as 25% of the variance in the social functioning of the children at Ages 4 and 13. Similarly, Ackerman et al. (in press) found that a single index of 11 factors predicted the problem behaviors of first-grade children from disadvantaged families.

A single-index representation of risk factors for disadvantaged families, however, has several limitations. One is that the index aggregates sets of variables that may relate to child functioning in very different ways. Such indexes forfeit the possibility of identifying specific (i.e., qualitative) relations between risk indicators and particular kinds of problem behaviors and hence of targeting specific factors for intervention. A second limitation is that multiple risk indicators often include variables that function differently for advantaged and disadvantaged families. For example, the relation between negative aspects of parenting and child problem behaviors may be limited to advantaged families (Deater-Deckard & Dodge, 1997; Deater-Deckard et al., 1998), and single-adult family status may be normative for disadvantaged families in some communities (McLanahan, 1997; Thomas, Farrell, & Barnes, 1996). Including such variables in a multiple risk index may affect the power of the index in predicting problem behaviors and may mislead developmental investigators about poverty cofactors that are risky for children. Finally, a multiple risk index that weights all factors equally does not distinguish between persistent and transitory variables. A consequence may be the inadvertent privileging of transitory variables, because chronic adversity tends to relate more strongly to child problem behaviors (Ackerman, Kogos, Youngstrom, Schoff, & Izard, 1999; Bolger, Patterson, Thompson, & Kupersmidt, 1995; Duncan & Brooks-Gunn, 1997; McLoyd, 1998). For example, current unemployment and single parenthood might not be risky for disadvantaged families to the extent that they are temporary.

We propose a third solution to the representation problem that involves indexes for particular clusters of risk indicators. This solution may retain the advantages of cumulating indicators; it may be useful in exploring specificity in risk–outcome relations and the variation in these relations with poverty status; and it may aid in grouping variables that are more or less persistent. Thus, a cluster index may represent both quantitative and more qualitative aspects of environmental adversity for children from disadvan-

tagged families. Ackerman et al. (1999), for example, found that a family instability aggregate of three continuous variables (e.g., number of residence changes and number of adult relationship changes in a child's lifetime and other negative life events) predicted first-grade teacher reports of child internalizing behavior. These variables reflect chronic disruption of family life and may relate specifically to children's anxious and depressed behaviors through environmental uncertainty and frequent loss of close relationships (friends, father figures, etc.). Other research suggests that a cluster of parent adjustment variables (e.g., alcohol abuse, antisocial behavior, psychiatric episodes, school dropout status, low verbal ability) relates more to disruptive and externalizing behavior by children (Dishion, French, & Patterson, 1995). These variables may reflect enduring parent characteristics (i.e., traitlike attributes) and may relate specifically to children's aggressive and impulsive behavior through socialization practices (Patterson & Yoerger, 1997) and biological mechanisms (Moffitt, 1993). Aspects of family structure (e.g., number of children, single parenthood, adult unemployment) that are normative for disadvantaged families, in contrast, may relate weakly to child functioning. These variables often are transitory and time limited. These aspects could moderate the relations between the other clusters and child problem behaviors, however, in that the impact of stressful life events may be greatest for the families with the least emotional and economic resources. Thus, cluster indexes facilitate examination of moderator relations among variable groupings.

Most multiple risk indexes are constructed from domains of risk indicators, so the idea of discrete groupings of indicators is not new. In recent studies, for example, Shaw et al. (1998) constructed a cumulative stressor index from domains of variables describing maternal adjustment, family environment, criminal or aggressive behavior in the home, and sociodemographic disadvantage, and Deater-Deckard et al. (1998) grouped indicators into child, socio-cultural, parenting, and peer-related domains. Three aspects of our approach are novel, however. First, our clusters involved only contextual aspects of environmental adversity for disadvantaged families (i.e., the sociocultural domain), and not parenting processes or child variables. The narrow focus aided consideration of a wider range of contextual variables than were considered by Shaw et al. or Deater-Deckard et al. The narrow focus also allowed discrimination among privileged indicators within a particular domain and avoided the conflation of proximal and distal variables that may relate differently to child behavior. Second, we examined the independent and interactive relations among the clusters and aggressive behaviors and anxious/depressed behaviors. Deater-Deckard et al. also explored the independent relations among groups of risk variables and children's externalizing behaviors, though not internalizing behaviors. Third, we examined the relative strengths of the clusters in predicting clinical levels of child problem behaviors.

Family Promotion Processes

Our final issue concerned family processes that promote adaptive behavior for children from disadvantaged families and that may moderate the relation between contextual adversity and problem behaviors for such children. Most risk frameworks identify negative parenting processes as a prominent source of environmental adversity. Studies by Dodge et al. (1994), Harnish, Dodge,

and Valente (1995), and others (McLoyd, 1998; McLoyd, Jayaratne, Ceballo, & Borquez, 1994), for example, have shown that family variables such as marital conflict, caregiver negative emotionality, and harsh discipline are associated with both economic disadvantage and child problem behaviors. These negative family processes also are poverty cofactors, and variability in these processes contributes to the diversity of outcomes for children from disadvantaged families.

In contrast, only a few researchers have examined positive family processes that may contribute to the diversity by promoting child adaptation. This issue has particular importance for a disadvantaged sample because a positive family climate may protect children from environmental adversity by reducing the risk impact (Gottman, Katz, & Hooven, 1996). Thus the factors may promote competent behavior by children in highly stressful situations (Cohen et al., 1997; Masten, Morison, Pellegrini, & Tellegen, 1990; Rutter, 1990b). Baldwin et al. (1993), for instance, found that caregiver positive emotionality related significantly to outcomes for children from the Rochester Longitudinal Study, and Sameroff, Bartko, Baldwin, Baldwin, and Seifer (1998) found that youth outcomes varied inversely with the number of promotion factors in a sample of Philadelphia families. Similarly, Pettit, Bates, and Dodge (1997) found that a warm and supportive family climate for prekindergarten children facilitated adjustment in sixth grade and moderated the relation between family adversity and later problem behaviors.

The promotion processes we considered concern a cluster of family variables: high positive and low negative emotionality of the caregiver, low family conflict and high family cohesion, and positive and firm parental discipline. As with the risk indicators, the representation of a positive family climate is problematic. We used two solutions. First, we constructed a cumulative promotion index from positive extremes on these variables as a way of representing the totality of a positive climate a child may experience. Sameroff et al. (1998), Fergusson and Lynskey (1996), and others (Pettit et al., 1997) also aggregated individual variables for this purpose. Second, our promotion index reflected indicators culled from two points in time (i.e., preschool and first grade). Given the assumption that persistent processes relate most strongly to child behavior (Bolger et al. 1995; Duncan & Brooks-Gunn, 1997; McLoyd, 1998), one goal was to represent promotion processes that persist over time. Another goal was to construct a promotion index comparable to the risk indexes. Many of the variables in these contextual indexes reflect aspects of life histories (e.g., school dropout status, alcohol abuse), and any influence of the underlying variable on a child's life is likely to be chronic rather than episodic.

Research Plan

This study extends the research of Ackerman et al. (in press), who related a single-index representation and an additive model of poverty cofactors to teacher reports about the total problem behaviors of 6- and 7-year-old children from economically disadvantaged families. One of our goals was to explore the power and specificity of cluster indexes in predicting child aggressive and anxious/depressed behaviors. We included tests of a multiple risk index and an additive model of individual variables to provide comparison conditions. In addition, we explored the usefulness of

the cluster indexes and the multiple risk index in predicting clinical levels of problem behaviors, and we explored the moderating role of the family structure cluster. A second goal was to explore the relation between a family promotion index and child problem behavior and the role of the promotion index in moderating the relations for the risk indexes. This study also differs from that of Ackerman et al. (in press) in that we used somewhat different cofactors and controlled for earned income.

Method

Participants

The sample consisted of 158 first-grade children and their caregivers. About 51% of the children were boys, 75% were African American, and the rest were European American. The mean age of the children was 84 months, with a range of 19 months. The primary caregivers were the children's biological mothers (94%) or adult female relatives. The children and their caregivers are participating in a longitudinal study of children from disadvantaged families that began when the children were in preschool.

We determined the economic status of the child's family of residence in two ways. First, we recruited the families through Head Start Centers. Head Start is a means-tested preschool program. Second, we obtained self-reports from the caregivers about total family earned income at the first-grade assessment. Family earned income included the earned incomes of all the adults living in the same house as the caregiver. The mean family earned income was \$18,000 ($SD = \$13,900$), and the mean per capita income was \$3,300. The poverty line in 1994 was about \$18,000 for a family with three children and two adults (Hernandez, 1997). Our families averaged about three children. About 46% of the families were on welfare, and the family earned income in another 30% of the families was less than \$22,000. These data suggest that a large proportion of the families in our sample were poor or "near poor."

Procedure

We assessed family process characteristics in both the Head Start and first-grade assessments. The caregivers also participated in a structured demographic interview at both assessments. The first-grade interview, however, was more extensive and is a primary basis of the contextual risk indexes. A second basis was the first-grade family history interview. We recruited the children and families from eight Head Start Centers, and the children attended first grade in 48 elementary schools in northern Delaware. Caregiver and child assessments took place primarily in the elementary schools during the months of January through June. Trained experimenters read questionnaires to the caregivers and facilitated completion of the items. We completed missing questionnaires by phone interview. The first-grade teachers of the children filled out behavior inventories during April and May. All teacher reports were self-administered and were collected in person or by mail. We compensated caregivers and teachers for their participation.

Context Measures

Demographic interview. Caregivers participated in a structured demographic interview at the first-grade assessment. The interview consisted of 30 questions addressing such information as residence (i.e., by address) and relationship changes prior to and since the preschool assessment; number and ages of children in the family; number, names, occupations, and earned income of residential adults; and welfare eligibility. We collected much of the same information at the preschool assessment and used the duplicate information for reliability checks. The duplicate information supports the conclusion that the caregivers were reliable informants. For

example, information about the number of residence changes (by address) prior to the preschool assessment differed in only four instances between the preschool and first-grade assessments. We resolved the inconsistencies in favor of the preschool reports.

Family history interview. Caregivers reported about the family history of psychiatric and behavioral problems. The structured interview involved completing a grid with a list of behavioral problems in the left-hand column and descriptions of biological relations across the top row. The behavior problems included learning disabilities, dropping out of school, psychiatric episodes (i.e., clinical depression), anxiety disorder, alcohol and substance abuse, antisocial behavior (i.e., violence, arrests), and other police contacts. The biological relatives included the index child, the biological mother, the father, the grandparents, and the siblings. The caregivers wrote *yes* or *no* in the boxes in the grid.

Life events. Caregivers completed a modified version of the Life Events Survey (Sarason, Johnson, & Siegel, 1978) at both assessments. The survey consisted of a 33-item checklist about events that had happened to the caregiver in the past 6 months. We counted negative events that were not included in the contextual risk indicators. These events primarily concerned the death or serious illness of relatives and close friends, and job and income loss. The score for each caregiver reflected the number of checked negative events.

Cognitive ability. At the Head Start assessment, trained graduate students assessed caregiver cognitive ability with the Vocabulary subtest of the Wechsler Adult Intelligence Scale—Revised (WAIS-R; Wechsler, 1981). Wechsler (1981) reported excellent reliability for the Vocabulary subtest ($r = .96$). The mean standard score for the caregivers in our sample was 5.6 ($SD = 2.0$; range = 1–12).

Family Measures

Caregiver emotionality. The Differential Emotions Scale (DES-IV; Izard, Libero, Putnam, & Haynes, 1993) measured caregiver negative and positive emotionality at both the preschool and first-grade assessments. The DES-IV is a self-report questionnaire that consists of 9 three-item negative emotion scales and 3 three-item positive emotion scales. The negative emotions concern inner-directed hostility and eight discrete emotions, including anger, sadness, fear, shame, disgust, guilt, contempt, and shyness. The positive emotions include joy, surprise, and interest. On each scale, the caregivers estimated the prevalence of each emotion in their daily lives on 5-point frequency scales ranging from *rarely or never* to *very often*. Izard et al. (1993) reported that the average 2-month test–retest reliability coefficient was .68 for the 9 negative scales and .67 for the 3 positive scales. We aggregated the scales to form single negative emotionality and positive emotionality composites. Across the two assessments, Cronbach's alpha averaged .74 for positive emotionality and .92 for negative emotionality. The correlations for the preschool and first-grade assessments were .60 and .40 ($ps < .001$), respectively. The correlations between the negative and positive composites were $-.02$ at the preschool assessment and $-.08$ at the first-grade assessment.

Family conflict and cohesion. The Family Environment Scale (FES; Moos & Moos, 1994) was used to measure family conflict and cohesion at both the preschool and first-grade assessments. The FES is a self-report questionnaire completed by the caregiver. Each subscale consists of nine items scored true or false. The Cohesion subscale concerns the degree of commitment, help, and support family members provide for one another. Moos and Moos (1994) reported an internal consistency of .78 for this subscale and a 2-month test–retest reliability of .86. The Conflict subscale concerns the amount of openly expressed anger and conflict among family members. Moos and Moos reported an internal consistency of .75 for the Conflict subscale and a test–retest reliability of .85. For the present sample, Cronbach's alpha ranged from .66 to .79 for the two scales for both assessments. The mean alpha was .74.

Parental discipline. At the first-grade assessment only, caregivers completed an adapted form of the parenting questionnaire of Arnold,

O'Leary, Wolf, and Acker (1993). We used the Overreactivity and Laxness scales of the questionnaire. These scales have a mixture of questions probing both effective and ineffective parenting behaviors when a child misbehaves. The 10 items on the Overreactivity scale, for instance, address the extent to which the parent uses more rational-inductive discipline (e.g., provides explanations, exhibits a calm demeanor) or harsh discipline (e.g., hitting, yelling, swearing). The 10 items on the Laxness scale address the extent of firm and consistent discipline (e.g., sets and enforces limits) and lax discipline (e.g., gives in to demands, uses bribes). We used the positive ends for each item, which variously describe both the presence of effective behavior and the absence of ineffective behavior. We labeled our interpretations of the two scales positive and firm discipline, respectively.

For each item on the questionnaire, the caregiver estimated the percentage of times (in 10% increments) she used specific parenting techniques when interacting with the target child. Arnold et al. (1993) reported a Cronbach's alpha of .82 for the Overreactivity scale, with a test–retest reliability of .83. For the Laxness scale, Arnold et al. reported an alpha of .81 and a test–retest reliability of .83. For the present sample, Cronbach's alpha was .57 for the Overreactivity scale and .61 for the Laxness scale. These moderate alphas raise a question about the appropriateness of the questionnaire for an economically disadvantaged sample.

Cumulative Indexes

Cluster indexes. We constructed risk indexes representing family instability, parent characteristics, and family structure from the information obtained from the demographic interview, the family history questionnaire, and the life events inventory. Each risk indicator for each cluster has an inclusion criterion, and the score computed for each family for each cluster index reflects the number of indicators for which the family met the inclusion criterion. The inclusion criteria were either theoretical or empirical. The criteria were theoretical in that developmental theory identifies the factor (e.g., single-adult family, school dropout status, psychiatric episodes) as risky for children. These criteria were categorical in that the caregiver reported presence or absence of the variable. The empirical criteria were based on continuous scales (i.e., number of residences, number of relationship changes), and the criteria cut off the most extreme 25% to 30% of the scores in the sample (about 0.8 SD from the mean). We adopted this criterion because it was comparable to the mean inclusion level for the categorical indicators (28% of the sample) and because increasing the criterion by one unit (e.g., from 3 to 4 relationship changes) resulted in an effective cutoff beyond 1.3 SD from the mean for one indicator.

Our logic in grouping the indicators involved some common aspect of the indicators that had theoretical significance. For the family instability cluster, for example, the indicators all referenced discrete life events that usually disrupt family life. The indicators included four or more residences, three or more changes in intimate adult relationships involving the caregiver, and five or more negative life events not including residence and relationship changes. Residence and relationship information concerned the child's entire life (i.e., through Age 7). The negative life events indicator reflected the sum of the events (i.e., in the past 6 months) taken from the Life Events Survey given at both the preschool and first-grade assessments. The mean number of indicators per family in the index was 0.9 ($SD = 0.9$).

The logic of the parent adjustment cluster was that each indicator referenced some negative personal characteristic of a biological parent. The indicators included standard scores less than 5 on the Vocabulary subtest of the WAIS-R; high school dropout status (30% of the sample); alcohol or substance abuse by a biological parent (25%); antisocial behavior by the biological parent (43%), including assaults, domestic violence, and thefts; and psychiatric episodes of a biological parent (14%). The latter four indicators were categorical and reflect historical data. The mean number of indicators per family in the index was 1.4 ($SD = 1.2$).

The common aspect for the family structure cluster was that each

indicator referenced some salient aspect of daily family life. The indicators included lack of adult employment in the household (20%), whether the family currently contained a single adult (33%), and four or more children in the family. The first two indicators were categorical. The mean number of indicators per family in the index was 1.0 ($SD = 0.9$).

Multiple risk index. We constructed an overall multiple risk index by summing the scores for the risk clusters. The mean number of indicators per family in the sample was 3.3 ($SD = 1.9$).

Promotion index. The indicators for the promotion index included the most positive 25% of the scores on measures of negative emotionality (low), positive emotionality (high), family conflict (low), family cohesion (high), and positive and firm parental discipline. We computed separate scores for the preschool and first-grade assessments. The scores for the two assessments correlated significantly, $r(158) = .38, p < .01$. We then added these scores to construct a single promotion index for each family over time. Ten indicators contributed to the index. The mean intercorrelation among the variables was .17, with the range from .01 to .40. The mean number of indicators in the index per family was 2.5 ($SD = 1.8$).

Outcome Measures

The Teacher Report Form of the Child Behavior Checklist (TRF; Achenbach, 1991) provided measures of child problem behaviors in first grade. The measures were the scales indexing aggressive behaviors ($M = 10.1$, $SD = 11.0$) and anxious/depressed behaviors ($M = 4.2$, $SD = 4.8$). The Aggressive Behavior scale is composed of 25 items focusing on interpersonal conflict ("argues," "fights," "attacks people," "threatens") and disruptive behavior ("disobedient," "defiant," "disturbs others," "easily frustrated"). The Anxious/Depressed scale has 18 items focusing on sadness ("cries a lot," "unhappy, sad"), fearfulness ("fears impulses," "nervous, tense," "fearful, anxious"), and self-feelings ("feels worthless," "self-conscious"). Achenbach (1991) reported excellent test-retest reliability for the TRF.

Results

The organization of the Results section reflects the goals of testing increasing specificity in the relations between representations of environmental adversity and children's problem behaviors. We report raw scores for the measures of problem behaviors except where noted. The first section examines the relations between the overall multiple risk index, the promotion index, and children's aggressive and anxious/depressed behaviors. The second section focuses on the relations between the cluster indexes and problem behaviors. The third section examines the same relations for the individual risk indicators. The fourth section concerns the relations for the individual variables in the promotion

index. We controlled for family earned income in all of the regressions.

Table 1 shows the bivariate correlations among the indexes and children's problem behaviors. The table suggests some specificity in the relations in that the multiple risk index, the parent adjustment cluster, and the promotion index related significantly to aggressive behavior but not to anxious/depressed behavior. The family instability cluster, in contrast, related significantly to anxious/depressed behavior but not to aggressive behavior.

Multiple Risk Index

First we explore the relation between the multiple risk index and clinical levels of problem behaviors. Next we relate this index and the promotion index to each kind of behavior. Table 2 shows the numbers and percentages of families at each cumulative level for the multiple risk index and the means and standard deviations for the problem behaviors.

Clinical levels. Table 2 also shows the percentages of children who met a clinical criterion for serious levels of problem behaviors. The criterion was a standardized score (i.e., a T score) ≥ 70 . As shown in the sixth and ninth columns of the table, the cumulative levels differed in the likelihood of children's meeting the criterion for aggressive behaviors, $\chi^2(8, N = 158) = 23.33, p = .003$, but not for anxious/depressed behaviors, $\chi^2(8, N = 158) = 3.23, p = .92$.

Aggressive behaviors. A hierarchical regression examined the relations between the multiple risk index, the promotion index, and aggressive behaviors. We entered earned income first (i.e., as a control variable); the promotion index was second; the multiple risk index was third; and a term representing the interaction of the two indexes was fourth. The variable order reflected our interest in estimating promotion effects in the presence of contextual risk. Reversing the order of the indexes, however, did not change the results substantively. The interaction term tested the moderator hypothesis for the promotion index.

Table 3 shows the results. The model was significant, $F(4, 153) = 12.29, R^2 = .24, p < .001$, and the multiple risk index, the promotion index, and the interaction term accounted for significant change in R^2 . We interpreted the interaction in the manner suggested by Jaccard, Turrisi, and Wan (1990) by computing conditional unstandardized beta coefficients for the multiple risk index at low ($-1 SD$), medium (the mean), and high ($1 SD$) levels of the promotion index. This procedure allows a test of the hypothesis

Table 1
Correlations Among Earned Income, Risk Indexes, and Problem Behavior Variables

Variable	1	2	3	4	5	6	7	8
1. Earned income	—							
2. Multiple risk index	-.38**	—						
3. Family structure	-.57**	.45**	—					
4. Family instability	-.08	.38**	-.04	—				
5. Parent adjustment	-.20**	.63**	.25**	.04	—			
6. Promotion index	.10	.06	.16	-.07	-.14	—		
7. Aggressive behaviors	-.01	.37**	.03	.15	.40**	-.25**	—	
8. Anxious/depressed behaviors	.03	.10	-.14	.33**	.03	-.11	.33	—

** $p < .01$.

Table 2
Numbers and Percentages of Families, Means and Standard Deviations for Aggressive and Anxious/Depressed Behavior, and Percentages of Children Meeting the Clinical Criterion ($T \geq 70$) for Each Cumulative Risk Level

Cumulative level	N	%	Aggressive behavior			Anxious/depressed behavior		
			M	SD	$T \geq 70$	M	SD	$T \geq 70$
0	6	4	1.8	3.3	0	2.0	2.6	0
1	14	9	3.7	5.7	0	3.3	5.1	7
2	36	23	7.3	8.7	3	3.5	3.8	3
3	28	18	8.3	10.2	11	5.2	5.3	11
4	29	18	13.0	11.4	17	4.1	5.7	3
5	27	17	12.9	12.1	26	5.3	5.3	7
6	12	8	21.2	14.5	50	4.9	5.7	8
7+	6	4	18.3	12.4	17	4.3	4.9	0

that the promotion index mutes the relation between levels of multiple risk and children's total problem scores. The coefficients decreased with level of the promotion index (β s = 1.84, 0.98, and 0.11, respectively). The t test described by Jaccard et al. shows that the values were significant at the low level but not at the medium and high levels, $ts(155) = 2.16, 0.35$, and 0.02 , respectively. The results suggest that higher levels of the promotion index reduced the relation between the multiple risk index and children's total problem scores.

Anxious/depressed behaviors. A similar regression explored the relation of the variables to anxious/depressed behaviors and is also presented in Table 3. The model was not significant, $F(4, 153) = 1.27$, and none of the variables accounted for a significant change in R^2 .

Cluster Indexes

In this section we first describe the relations between the cluster indexes and serious levels of problem behaviors. Next we describe regressions for each kind of problem behavior. Table 4 shows the numbers and percentages of families at each cumulative level for each cluster and the means and standard deviations for each kind of problem behavior.

Clinical levels. The sixth and ninth columns of Table 4 show the percentages of children who met the clinical criterion. We

tested the differential ability of the cluster indexes to predict children above the clinical threshold in problem behaviors with a series of discriminant function analyses. For aggressive behaviors, the function was significant, Wilks's $\lambda = .92$, $\chi^2(3, N = 158) = 12.51$, $p = .006$. The canonical coefficients were 1.01 for the parent adjustment cluster, .18 for the family instability cluster, and $-.21$ for the family structure cluster. The sixth column in Table 4 shows large differences among the cumulative levels in the percentages of children meeting the clinical criterion for aggressive behaviors for the parent adjustment cluster but not for the other two clusters. Similarly, the function was significant for the anxious/depressed behaviors, Wilks's $\lambda = .94$, $\chi^2(3, N = 158) = 9.41$, $p = .024$. In this case, however, the canonical coefficients favored the family instability cluster (.83) over the parent adjustment cluster ($-.15$) or the family structure cluster ($-.50$). As shown in the last column in Table 4, the likelihood of a child's meeting the criterion for clinical levels of anxious/depressed behaviors differed with cumulative level for the family instability cluster but not for the other clusters.

This analysis for anxious/depressed behaviors is limited because only 9 children were above the clinical threshold. Accordingly, we lowered the threshold to the criterion for the clinical "range" (T score ≥ 66), and we conducted another discriminant function analysis; 16 children were above this threshold. The function was significant, Wilks's $\lambda = .90$, $\chi^2(3, N = 158) = 16.52$, $p = .001$, and the canonical coefficients showed a higher likelihood of children in the clinical range for Levels 2 and 3 (21% and 43%, respectively) than for Levels 0 and 1 (6% and 5%, respectively).

Aggressive behaviors. A hierarchical regression examined the relations between the cluster indexes, the promotion index, and aggressive behaviors. We entered family earned income first and the promotion index second. Third was a block containing the cluster indexes; fourth was a block with interaction terms for the clusters; and fifth was a block with terms representing the interactions of the cluster indexes and the promotion index. Reversing the order of the fourth and fifth blocks did not change the results. The specific goal of the fourth block was to determine if the family structure cluster moderated the effects for the other clusters.

Table 5 shows the results. The model was significant, $F(11, 146) = 4.22$, $R^2 = .24$, $p < .001$, and the promotion index and the cluster block accounted for significant R^2 change. Within the cluster block, however, only the parent adjustment index accounted for significant unique variance. The statistical index for a

Table 3
Regressions With the Multiple Risk Index Predicting Children's Aggressive and Anxious/Depressed Behaviors

Variable	Aggressive behaviors			Anxious/depressed behaviors		
	β	ΔR^2	F	β	ΔR^2	F
1. Earned income (A)	.00	.00	0.00	.06	.00	0.58
2. Promotion index (B)	-.23	.05	8.97***	-.08	.01	1.10
3. Multiple risk index (C)	.43	.16	32.29***	.13	.01	2.36
4. B \times C	-.39	.03	4.69*	-.21	.01	1.00
Model		.24	12.29***		.03	1.27

Note. The β values are standardized.

* $p < .05$. *** $p < .005$.

Table 4

Numbers and Percentages of Families and Means, Standard Deviations, and Percentages of Children Meeting the Clinical Criterion ($T \geq 70$) for Aggressive and Anxious/Depressed Behaviors for Each Level of the Cluster Indexes

Cumulative index	N	%	Aggressive behaviors			Anxious/depressed behaviors		
			M	SD	T ≥ 70	M	SD	T ≥ 70
Parent adjustment cluster								
0	44	28	6.9	8.6	7	4.6	5.6	11
1	49	31	6.0	7.8	4	3.1	3.0	0
2	35	22	14.0	12.0	23	5.2	4.6	6
3	26	17	18.6	12.4	35	5.0	6.6	8
4	4	8	19.8	11.9	25	3.5	3.0	0
Family instability cluster								
0	53	34	8.8	10.4	9	3.1	3.7	4
1	65	41	10.5	11.4	19	3.5	3.3	2
2	33	21	11.9	10.8	15	6.6	6.9	12
3	7	4	17.0	14.5	14	10.0	7.2	29
Family structure cluster								
0	42	27	9.9	11.8	14	5.2	6.4	10
1	61	39	10.6	11.2	13	4.4	4.9	7
2	38	24	10.9	10.9	18	3.5	3.5	3
3	17	11	10.7	10.5	12	3.4	2.5	0

unique effect was the squared semipartial correlation coefficient. None of the interaction terms in either block was significant.

Anxious/depressed behaviors. Table 5 also shows the results for a similar regression for anxious/depressed behaviors. The model was significant, $F(11, 146) = 3.10$, $R^2 = .19$, $p < .001$, and the cluster block and the block with the cluster interaction terms accounted for significant R^2 change. Within the cluster block, the

family instability index accounted for significant unique variance. Among the interaction terms, the Family Instability \times Family Structure interaction accounted for significant variance.

We interpreted the interaction by combining Risk Levels 0 and 1 into one level and Risk Levels 2 and 3 into the second level for each variable and exploring the relations among the levels with a 2×2 analysis of variance. We lost little with this categorical treatment (i.e., of a continuous variable) because of the small number of levels for each variable. The interaction term was significant, $F(1, 156) = 8.96$, $R^2 = .06$, $p < .01$. The results showed that the relation between family instability and anxious/depressed behaviors was stronger for low levels of structural risk than for high levels of structural risk. For Level 0–1 of the family structure variable, the means were 3.25 ($N = 75$, $SD = 3.46$) for low instability and 8.71 ($N = 28$, $SD = 7.75$) for high instability. For Level 2–3 of the family structure variable, the means were 3.40 ($N = 43$, $SD = 3.44$) for low instability and 3.58 ($N = 12$, $SD = 2.35$) for high instability. In sum, high instability mattered most for families with more than one adult, a small number of children, and adult employment. This result was unexpected.

Individual Risk Indicators

To save space, we do not show the correlations between the individual variables and the problem behaviors. The mean correlation with aggressive behaviors was .13 (range = .00–.32), and antisocial conduct, drug or alcohol abuse, negative life events, number of relationship changes, and number of residences correlated significantly ($p < .05$). The mean correlation with anxious/depressed behaviors was .07 (range = .01–.16), and only negative life events correlated significantly. Independent hierarchical regressions examined the relations between the individual risk indicators, the promotion index, and the measures of problem behaviors. Earned income was first; the promotion index was second;

Table 5

Regressions With Cluster Indexes Predicting Children's Aggressive and Anxious/Depressed Behaviors

Variable	Aggressive behaviors				Anxious/depressed behaviors			
	β	sR^2	ΔR^2	F	β	sR^2	ΔR^2	F
1. Earned income (A)	.03	.00	.00	.00	.06	.00	.00	0.58
2. Promotion index (B)	-.23	.05	.05	8.97**	-.08	.01	.01	1.10
3. Clusters			.16	10.08**			.11	6.41**
Structure (C)	.03	.00			-.12	.01		
Instability (D)	.12	.01			.31	.10**		
Adjustment (E)	.38	.13**			.04	.00		
4. Cluster interactions			.02	1.28			.06	3.44*
C \times D	-.18	.01			-.44	.05*		
C \times E	-.22	.01			-.10	.00		
D \times E	.05	.00			.18	.01		
5. Promotion interactions			.01	0.64			.01	0.61
B \times C	-.12	.00			-.11	.00		
B \times D	-.12	.00			.17	.01		
B \times E	-.10	.00			-.01	.00		
Model			.24	4.22**			.19	3.10**

Note. The β values are standardized, and sR^2 represents the squared semipartial correlation coefficient.

* $p < .05$. ** $p < .01$.

and third was a block containing the individual risk indicators. We did not have sufficient power to test interaction terms.

Aggressive behaviors. Table 6 shows the results for children's aggressive behaviors. The model was significant, $F(13, 144) = 3.97$, $R^2 = .27$, $p < .001$, and the promotion index and the risk indicator block accounted for significant change in R^2 . Only antisocial behavior accounted for significant unique variance.

Anxious/depressed behaviors. Table 6 also shows the results for children's anxious/depressed behaviors. The model was not significant, $F(13, 144) = 0.87$, $R^2 = .07$, and none of the variables accounted for significant unique variance.

Promotion Indicators

An alternative to cumulating the promotion indicators is to determine the relation between the individual indicators and the measures of problem behaviors. The preschool indicators included extreme scores on the measures of family cohesion, family conflict, caregiver negative emotionality, and caregiver positive emotionality. The first-grade indicators included these four and parental positive and firm discipline. Our initial pass in examining this alternative was to compute partial correlation coefficients (i.e., partialing earned income) for the relation between each indicator and each measure of problem behavior. None of the coefficients exceeded .16. Our second pass was to aggregate the common variables at the two assessments and again compute partial correlation coefficients for the relation between each aggregate and each measure of problem behavior. Again, none of the coefficients exceeded .16. Thus the ability of the individual indicators in the promotion index to predict problem behaviors was poor.

Discussion

This study examined the relations between poverty cofactors, family promotion processes, and the problem behaviors of first-

grade children from economically disadvantaged families. In previous research, these relations often have been obscured by the use of economically heterogeneous samples of children from more advantaged and disadvantaged families and by the collinearity of the cofactors with economic resources. Heterogeneous samples may be disadvantageous in this context because the cofactors may have different effects in different cultural settings (Deater-Deckard & Dodge, 1997) and because controlling for economic resources in these samples also tends to control for the cofactors and obscures the diversity among disadvantaged families (Coll et al., 1996). We focus the discussion on issues concerning the representation of contextual cofactors and the importance of promotion processes.

Cofactor Representation

We examined the relation between 11 contextual risk indicators and teacher reports of children's problem behaviors. This restricted focus on contextual indicators enabled an exploration of a wide range of poverty cofactors, but it also raises the problem of cofactor representation. A substantial contribution of this study is that we explored alternative representations at three levels of aggregation. We discuss the comparison models and then the cluster indexes.

One possible solution is to represent individual cofactors and examine relations to problem behaviors with an additive-factors model. Table 6 shows that the block of individual variables accounted for a robust amount of the variance in children's aggressive behaviors (19%) with other variables controlled and that parent antisocial behavior accounted for significant unique variance within the block. Thus, this additive-factor model was particularly useful in identifying a specific predictor of child aggressive behaviors. The model did not predict anxious/depressed behaviors. Overall, the findings are consistent with claims that individual risk indicators in additive models often lack power in

Table 6
Regressions With Individual Risk Indicators Predicting Children's Aggressive and Anxious/Depressed Behaviors

Variable	Aggressive behaviors				Anxious/depressed behaviors			
	β	sR^2	ΔR^2	F	β	sR^2	ΔR^2	F
1. Earned income	.00	.00	.00	0.00	.07	.00	.00	0.77
2. Promotion index	-.27	.07	.07	11.86**	-.09	.01	.01	1.10
3. Risk indicators			.19	3.42**			.06	0.86
Single-adult family	.05	.00			.01	.00		
No. of children	.00	.00			-.10	.00		
Unemployment	.00	.00			-.05	.00		
No. of residences	.06	.00			.01	.00		
No. of relationship changes	.14	.02			-.05	.00		
Negative life events	.13	.01			.16	.02		
WAIS-R Vocabulary	.07	.00			-.06	.00		
Antisocial behavior	.31	.06**			-.03	.00		
Alcohol or substance abuse	.03	.00			.14	.01		
School dropout status	.11	.01			.06	.00		
Psychiatric episodes	-.02	.00			-.10	.00		
Model			.27	3.97**			.07	0.87

Note. The β values are standardized, and sR^2 represents the squared semipartial correlation coefficient. WAIS = Wechsler Adult Intelligence Scale—Revised.

** $p < .01$.

predicting child problem behaviors (Rutter, 1990a; Sameroff et al., 1993). In addition, the size of the block effect suggests that the number of risk factors may be a powerful determinant of children's problem behaviors. Thus, there may be some utility in cumulating the risk indicators.

We explored this second solution to the representation problem by adding the indicators for which each family met the inclusion criterion and constructing an overall multiple risk index. Like Sameroff et al. (1993), we found that the contextual multiple risk index also accounted for a robust portion of the variance in child aggressive behaviors in school (16%) and that only higher cumulative levels were associated with serious levels of aggressive behaviors. Table 2 shows, for example, that families at Cumulative Levels 0 and 1 did not have any children meeting the criterion for clinical levels of aggressive behaviors and that the percentages of such children increased with higher cumulative levels. About 50% of the children from families at Level 6 were above the clinical threshold. Level 7+ represents an exception to this linear trend, but the number of families at this level was small.

These findings reveal the usefulness of a single quantitative representation of poverty cofactors in predicting clinical levels of children's aggressive behaviors in school, and the findings attest to the importance of examining the diversity of economically disadvantaged families in that prediction. In support of these points, Table 2 shows that children in the 18 families with 6 or 7+ cofactors averaged more than six times the number of aggressive behaviors that the children from the 20 families with 0 or 1 cofactor did. Note that the cofactors do not involve family discipline processes often associated with aggressive behavior (Dodge et al., 1994; Harnish et al., 1995), nor are they reducible to a relation between economic resources and child problem behaviors. A unique feature of this study is that we treated family earned income as a control variable rather than as a risk indicator. The control allowed a narrow focus on poverty cofactors.

The tables also reveal limitations of this cumulative representation of the multiple risk indicators. One limitation is that all risk indicators were weighted equally in predicting child problem behaviors. This treatment obscures the relative power of some variables, such as antisocial behavior for our sample and economic resources for other samples, and may misrepresent the importance of other variables. Similarly, included in the index are variables that seemingly endure over time as well as other more transitory variables. Antisocial behavior and low WAIS-R Vocabulary scores are examples of the former for our sample, and single-adult family status is an example of the latter. This distinction too may be important in avoiding misrepresentation of indicators that are not risky for particular samples and underestimation of the predictive power of particular groups of variables.

Another limitation is that this representation forfeits the possibility of identifying specific or qualitative relations between particular groups of variables and child problem behaviors. The multiple risk index did not predict anxious/depressed behaviors, for example. Some evidence suggests, however, that variables that disrupt family stability specifically predict anxious/depressed behaviors (Ackerman et al., 1999) and that variables describing parent adjustment difficulties relate more strongly to aggressive behavior (Dishion et al., 1995). This limitation suggests the potential usefulness of a representation of contextual cofactors that is

midway between the individual variable approach and the overall multiple risk index.

We propose cluster indexes as a third solution to the representation problem. This solution retains the quantitative advantages of the cumulative index approach and adds a qualitative dimension. The results support several conclusions. The first is that particular groupings of variables may relate to specific kinds of problem behaviors. Our results showed, for instance, that parent adjustment variables related powerfully to child aggressive behaviors. Indeed, these five cofactors accounted for most of the variance in aggressive behaviors (13%) associated with the larger multiple risk index (16%) with 11 variables. In contrast, the family instability cluster with three variables related specifically to child anxious/depressed behaviors ($R^2 = .10$). Neither the multiple risk model nor the additive-factors model predicted children's anxious/depressed behaviors.

The second conclusion is that some groupings of variables may contribute little to children's problem behaviors, even in adding meaningfully to quantitative risk. Our family structure cluster, for instance, accounted for no variance in children's aggressive behaviors. Most important, this cluster did not even contribute much additively, because the other two clusters accounted for almost all of the variance for the cluster block. Other evidence for this point is that the zero-order correlation between the family structure cluster and aggressive behaviors was .03. To further document the argument, we ran the regression summarized in Table 3 again with a modified multiple risk index that was missing the structural variables. This new index accounted for the same percentage of variance in children's aggressive behaviors (16%) as did the original index. In general, the results suggest that the kinds of variables in a multiple risk index may matter as well as the number of variables in predicting child problem behaviors. More specifically, the results invite a reconceptualization of the structural variables as risk indicators for a disadvantaged sample. There is a robust literature, for example, linking single-adult family status to child outcomes (McLanahan & Sandefur, 1994). Our findings converge with others, however, to suggest that single-adult family status may be normative for a disadvantaged sample (McLanahan, 1997; Spencer, Dupree, & Hartmann, 1997; Thomas et al., 1996).

The third conclusion is that specific clusters do well in predicting serious levels of child problem behaviors. Table 4 shows, for example, that the likelihood of a child's meeting the clinical criterion for aggressive behaviors was near zero for Levels 0 or 1 of the parent adjustment cluster but rose to about one third of the families for Level 3. The other two clusters showed no increase in likelihood with cumulative level. In contrast, the results differed dramatically for children with serious levels of anxious/depressed behaviors in that the likelihood was near zero for Levels 0 and 1 of the family instability cluster but substantial for Level 3. Likelihood did not vary with cumulative level for the other two clusters. Thus, the cluster indexes showed a substantial ability to predict serious levels of child problem behaviors, just like the multiple risk index, but with the added advantages of specificity in prediction and the prediction of anxious/depressed behaviors.

Finally, fourth, we found evidence that family structure may moderate the relation between instability and children's anxious/depressed behaviors. Our expectation was that instability would matter more in situations of fewer economic and emotional resources. What we found instead was that instability mattered only

for those families with more resources, that is, for families with an employed adult, more than one adult, and fewer than four children. This interaction was not predicted, and any interpretation is speculation. One possibility is that instability matters most for those families with more to lose. In support of this interpretation, we computed an index of negative family emotional climate culled from the opposite ends of the variables composing the promotion index. We found that the levels of negative climate were considerably higher for the high-instability/low-structural-risk families ($N = 28$, $M = 3.73$, $SD = 2.60$) than for the high-instability/high-structural-risk families ($N = 12$, $M = 1.92$, $SD = 1.89$), $t(38) = 3.18$, $p < .01$. Thus, high instability seemed to have more of an impact on families with more to lose.

In evaluating the implications of this cluster solution to the representation problem, it is important to note two caveats. First, like the multiple risk index, the cluster solution also incurs the cost of an inability to specify relations between individual variables and child problem behaviors. Second, variable domains have figured in several studies with multiple risk indexes (cf. Deater-Deckard et al., 1998; Shaw et al., 1998). Our clusters differ from domains in several ways, however. One difference is that the clusters distinguished groupings of variables within a domain of poverty cofactors. Another difference is that we compared models using alternative representations of risk indicators. With the exception of Deater-Deckard et al. (1998), few other studies have done likewise. Third, we explored and found specificity in the relations between the clusters and particular kinds of problem behaviors. Fourth, we explored and found interactions among the cluster indexes.

We think the cluster approach adds to other representations in generating a more differentiated view of the diversity among economically disadvantaged families (cf. Coll et al., 1996). Our families were diverse in many ways, and it seems important to represent that diversity in a dedicated way and not simply as part of an overall multiple risk index. For example, about 22% of our caregivers reported moving their families five or more times in a child's life span, and 26% reported a single residence. About 11% of the caregivers reported five or more intimate adult partners, but 49% reported a single partner. In a cluster representation, this diversity contributes uniquely to the construct of family instability, and family instability may contribute uniquely to child internalizing behavior.

Understanding the developmental mechanisms linking clusters to specific problem behaviors is a challenge. We did not design this study to address this issue, but we can offer some speculations. Concerning the family instability cluster, the results of Ackerman et al. (1999) suggest that temperamental adaptability moderates the relation between instability and the anxious/depressed behaviors of children. Extremely unpredictable environments may challenge the development of emotion regulation and coping processes for some children (Cummings & Davies, 1996; Levine & Wiener, 1989), and constant environmental change and loss of personal relationships in particular may accentuate the fearfulness and social withdrawal tendencies of some children. In contrast, the link between parent adjustment (i.e., antisocial or violent behavior, drug and alcohol abuse, psychiatric episodes) and child aggressive behavior could reflect the interaction of biological mechanisms and the socialization of aggressive behavior in the context of an aggressive family environment (Dishion et al., 1995).

Promotion Index

The other focus of our study concerned family variables that promote adaptive behavior by children from disadvantaged families. Most studies that have included disadvantaged families have used a risk framework for conceptualizing environmental adversity. Only a few studies have explored factors that promote adaptation by such children, and the representations of such factors typically have involved individual variables. Studies by Pettit et al. (1997), Sameroff et al. (1998), and Fergusson and Lynskey (1996) are exceptions in that they used an aggregate representation of more positive variables. An aggregate representation of promotion factors may be useful empirically for the same reasons a multiple risk index is useful; that is, the number of promotion variables may trump the type of promotion process. Moreover, a representation of multiple promotion variables has the theoretical advantage of treating the child's experience of the family climate as an integrated whole rather than as a collection of independent variables.

Three aspects of our results are interesting. First, the promotion index consistently related inversely to children's aggressive behaviors. Thus, the index tapped processes that seemed to promote competent behavior for our sample of children. Second, the promotion index interacted with the multiple risk index in predicting aggressive behaviors, though not with the cluster indexes. Our statistical interpretation suggested that medium and high cumulative promotion muted the relation between the multiple risk index and aggressive behaviors. This reduction of risk impact is consistent with the logic defining the protective factors of Rutter (1990b) and Masten et al. (1990). Third, the individual variables in the promotion index related weakly to children's aggressive behaviors. Thus, the results suggest that there is indeed some empirical advantage to using a cumulative representation of promotion variables.

These results provide strong evidence for the importance of promotion variables in understanding the development of children from disadvantaged families. We also note, however, that our promotion index reflected processes that persisted over time, and it is unclear whether the results extend to a more time-limited measure. Our promotion index is unique in this regard, and we conceptualize the temporal dimension of the index as an advantage.

Finally, we note some limitations of this study. One limitation is that our sample was composed mostly of African American families. Generalizability may be limited. A second limitation is that our earned income measure does not reflect the economic resources available to families from sources other than employment (e.g., child support). Third, we had only a single caregiver informant about the risk and promotion variables, and the measures are retrospective for some variables and based on a crude family history questionnaire. Thus, our conclusions must be considered cautiously. Fourth, we tapped only a subset of poverty cofactors specifically describing parent variables, stressful events, and structural variables that frame family interactions. Representations of peer, school, and neighborhood variables, among others, await future research.

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Call for Nominations

The Publications and Communications Board has opened nominations for the editorships of *Behavioral Neuroscience*, *JEP: Applied*, *JEP: General*, *Psychological Methods*, and *Neuropsychology* for the years 2002–2007. Michela Gallagher, PhD; Raymond S. Nickerson, PhD; Nora S. Newcombe, PhD; Mark I. Appelbaum, PhD; and Laird S. Cermak, PhD, respectively, are the incumbent editors.

Candidates should be members of APA and should be available to start receiving manuscripts in early 2001 to prepare for issues published in 2002. Please note that the P&C Board encourages participation by members of underrepresented groups in the publication process and would particularly welcome such nominees. Self-nominations are also encouraged.

To nominate candidates, prepare a statement of one page or less in support of each candidate. The search chairs are as follows:

- Joe L. Martinez, Jr., PhD, for *Behavioral Neuroscience*
- Lauren B. Resnick, PhD, and Margaret B. Spencer, PhD, for *JEP: Applied*
- Sara B. Kiesler, PhD, for *JEP: General*
- Lyle E. Bourne, Jr., PhD, for *Psychological Methods*
- Lucia A. Gilbert, PhD, for *Neuropsychology*

Address all nominations to the appropriate search committee at the following address:

[Name of journal] Search Committee
c/o Karen Sellman, P&C Board Search Liaison
Room 2004
American Psychological Association
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Washington, DC 20002-4242

The first review of nominations will begin December 6, 1999.