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Configurations of common childhood psychosocial risk factors

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Abstract

Background: Co-occurrence of psychosocial risk factors is commonplace, but little is known about psychiatrically-predictive configurations of psychosocial risk factors.

Methods: Latent class analysis (LCA) was applied to 17 putative psychosocial risk factors in a representative population sample of 920 children ages 9 to 17. The resultant class structure was retested in a representative population sample of 1420 children aged 9 to 13. In each sample, the child and one parent were interviewed with the Child and Adolescent Psychiatric Assessment. Concurrent psychiatric status was used to validate class membership.

Results: LCA identified five latent classes in both samples: two low risk classes; two moderate risk classes both involving family poverty configured with various other risk factors; and a high risk class characterized by family relational dysfunction and parental risk characteristics. Of the primary sample, 48.6% were categorized as low risk, 42.8% as moderate risk, and 8.6% as high risk. Moderate risk classes differed in their prediction of disruptive and emotional disorders depending on their specific risk factor configurations. High risk youth had the highest levels of both emotional and disruptive disorders. Combining our latent classes with a cumulative risk approach best accounted for the effects of risk factors on psychopathology in our primary sample.

Conclusions: Particular risk configurations have *specific* associations with psychiatric disorders. Configurational approaches are an important asset for large-scale epidemiological studies that integrate information about patterns of risk and disorders.

Keywords

Psychosocial risk factors; psychiatric disorders; development; sex differences; epidemiology

Different psychopathological symptoms commonly co-occur. Researchers have used person-oriented approaches to model such co-occurrences, in an effort to identify more homogeneous diagnostic groupings and subtypes of disorders (Frazier, Youngstrom, & Naugle, 2007; Shevlin, Murphy, Dorahy, & Adamson, 2007; Sullivan, Kessler, & Kendler, 1998), to clarify relations between comorbid symptoms and disorders (Fergusson, Horwood, & Lynskey, 1994), and to refine psychiatric phenotypes for genetic analyses (Eaves et al., 1993; Rasmussen et al., 2004; Todd et al., 2005). Co-occurrence of psychosocial risk factors for psychopathology is also ubiquitous (Evans, 2004; Kessler, Davis, & Kendler, 1997; Mullen, Martin, Anderson, Romans, & Herbison, 1996; Rutter, 2000). However, empirical risk research commonly uses variable-based approaches to the study of risk, relying on variants of the general linear model

and typically focusing on additive linear contributions of individual risk factors or interactions among two or three risk factors.

In the real world, children may ‘face a daunting array of suboptimal psychosocial and physical conditions’ (Evans, 2004, p.77) that interact in complex ways in the development of psychopathology. For example, poverty may be associated with parental unemployment and living in a single parent household for one group of children, but with parental mental illness and parental criminality for others. According to the cumulative approach, which relies on the assumption that all risk factors can be summed with unit weights, both groups would be seen as having an overall risk score of three, when, in fact, these differing configurations might be related to different psychopathological outcomes. The identification of valid risk *profiles* (or configurations, or clusters) could contribute to the identification of etiological pathways to childhood disorders.

Model-based approaches to risk factor classifications

Earlier examples of person-oriented analyses in psychosocial risk factor research involving *a priori* classifications of risk factor profiles (Greenberg, Speltz, DeKlyen, & Jones, 2001) and hierarchical cluster analysis (e.g., Deater-Deckard, Dodge, Bates, & Pettit, 1998; Gorman-Smith, Tolan, & Henry, 2000; Keller, Spieker, & Gilchrist, 2005; Yoshikawa & Seidman, 2001) have yielded two important findings. First, taking into account the number of risk factors, some combinations of risk factors are more predictive of psychopathology than are others, suggesting possible specificity in links between configurations and outcomes. Second, the same psychiatric outcome (e.g., conduct problems) can be linked with various configurations of risk factors, indicating equifinality in different developmental pathways to psychopathology. However, these earlier studies typically relied upon small and non-representative samples and broadly-defined risk factor categories, such as ‘family ecology’ (Greenberg et al., 2001), which subsume conceptually distinct variables. Furthermore, the classification methods used in these studies have been criticized for their lack of statistical criteria for the selection of risk configurations (DiStefano & Kamphaus, 2006).

Two studies (Menard, Bandeen-Roche, & Chilcoat, 2004; Parra, DuBois, & Sher, 2006) have sought to overcome these problems by applying model-based approaches such as latent class analysis (LCA; Lazarsfeld, 1968; McCutcheon, 1987), which provide statistical indices to assist in model selection (DiStefano & Kamphaus, 2006; Muthen & Muthen, 2000), to larger-scale representative samples of youth. Menard et al.’s (2004) LCA on 8 childhood stressors suggested 6 configurations of childhood stressors, a reduction from all 2⁸ possible configurations. For example, household member substance abuse commonly co-occurred with physical and emotional abuse in one class of children, with physical abuse, parental mental illness, and non-nuclear family structure in a second class, with only parental mental illness in a third class, and with all other stressors in a fourth class.

This study was also informative about the prevalence of risk configurations in their sample: 47% of the sample were either in the low risk ‘Healthful Childhood Environments’ class or in the ‘Non-nuclear family’ class (i.e., high endorsement for non-nuclear family structure, but low endorsements for all other risk factors). An additional 46.2% of the children were in classes characterized by a moderate number of childhood stressors. Only 6.8% of the sample were in the high risk ‘Broad Spectrum Traumatic Childhood Environments’ class.

Parra and colleagues (2006) derived latent risk classes from the Add Health study for 7th and 11th graders. Their classes for 7th graders were either low on all risk indicators, or high on one risk indicator (e.g., family environment, substance-using peers, or neighborhood unemployment rate). As such, the solutions were consistent with mainly additive effects of risk factors rather than indicative of important configurational contributions. There was some

prediction from risk classes to depressive symptoms and conduct problems cross-sectionally and over the course of one year. However, the analyses did not control for comorbidities, thereby limiting the possibility of drawing inferences regarding the specificity of risk configurations for depressive symptoms versus conduct problems.

These two recent studies provide some support for the idea that distinct configurations of risk factors can be empirically identified and linked to specific classes of psychiatric symptoms. However, Menard et al.'s study (2004) did not include a range of traumatic life events, such as loss events, or non-traumatic childhood stressors. Furthermore, several of Parra's (2006) risk indicators (e.g., problem solving, school connectedness) have not been firmly established as strong predictors of psychopathology, whereas other well-established risk factors (e.g., parental mental illness) were not considered.

Methods

Sample and procedures

Primary sample—The Caring for Children in the Community study (CCC) is a representative study of psychiatric disorders, impairment and service use in African American and White youth in four rural counties in North Carolina. The two-stage sampling design and methods are described in detail elsewhere (Angold et al., 2002). Briefly, a random sample of 17,117 9–17-year-olds in the public schools database generated a screening sample of 4,500 youth. Of these, 3,613 were contacted and agreed to complete screens (the externalizing scale of the CBCL). Of these families, 1,302 were selected to participate in the interviews, and 920 (70.7%) interviews were completed. Fifty-four percent of the participants were African American.

LCA replication sample—The Great Smoky Mountain Study (GSMS) is a longitudinal, representative study of psychiatric disorder in 11 predominantly-rural counties of North Carolina (Costello et al., 1996; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). Three cohorts of children, age 9, 11, and 13 years, were recruited from a pool of some 20,000 children using a two-stage sampling design similar to the CCC, resulting in $N = 1,420$ participants (see also Costello et al., 1996, 2003). American Indians were oversampled to constitute 25% of the sample; 7% of the participants were African American. Taken together, the replication sample was larger than the CCC, had a different ethnic/ racial composition, and covered a narrower age-range (ages 9–13). LCA was conducted on the first wave of CCC and GSMS data.

Before interviews in each study began, the parent and child signed informed consent/assent forms approved by the Duke University Medical Center Institutional Review Board. Although both the CCC and the GSMS oversampled certain groups (i.e., high CBCL externalizing scores in both samples, American Indians in the GSMS), participants were assigned a weight inversely proportional to their probability of selection, so that the results from our analyses reported here are representative of the original populations from which the samples were drawn.

Measures

Both studies assessed psychiatric disorders and risk factors through parent and child interviews with the Child and Adolescent Psychiatric Assessment (CAPA; Angold & Costello, 2000). The child's psychiatric status was assessed over the preceding 3 months. A symptom was counted as present if it was reported by the primary caregiver, child or both, as is standard clinical practice (with the exception of attention-deficit/hyperactivity disorder (ADHD), for which only the more reliable primary caregiver report was used). Two-week test–retest reliability of CAPA diagnoses is comparable to that of other highly-structured child psychiatric interviews. Construct validity as judged by 10 different criteria, including relation to diagnostic

rates found using other interviews, relation of CAPA-identified disorders to mental health service use, and genetic findings was good (Angold & Costello, 2000, 1995). In the primary sample, unweighted *N* (and weighted prevalence) was 122 (9.0%) for combined disruptive disorders (conduct disorder (CD), oppositional defiant disorder (ODD), ADHD), 92 (7.8%) for combined emotional disorders (major depressive disorder (MDD), dysthymia, generalized anxiety disorder (GAD), seasonal affective disorder (SAD), and social phobia (SoP)), 93 (7.3%) for CD/ODD, 44 (2.6%) for ADHD, 40 (2.9%) for depression, and 63 (5.7%) for anxiety disorders (GAD, SoP, and SAD) at the time of assessment.

Psychosocial risk factors that have been associated with youth psychiatric disorders in previous studies (e.g., Sameroff, 2000) were also collected in the CAPA. Because risk factors and disorders were assessed concurrently, our risk variables should be considered ‘putative risk factors’ rather than ‘risk factors’ (i.e., factors that precede a disorder) here (e.g., Kraemer et al., 1997). The term ‘risk factor’ will be used hereon for brevity. Specifically, risk factors were drawn from the following domains: socioeconomic disadvantage, non-nuclear family structure, parental risk characteristics, family dysfunction, and stressful life events (see Table 1 for individual risk factors within each domain). All risk factors were coded dichotomously. As with psychiatric symptoms, most risk factors were counted as present if reported by either the primary caregiver, child or both, with the exception of risk factors for which one informant could not reliably report (e.g., child report of family income). Risk factors were excluded from analyses if they had a low prevalence (< 5%; i.e., foster home, dangerous neighborhood, dangerous school, interparental violence, child treated as scapegoat, harsh parenting, overintrusive parenting), or they were not collected in both samples (i.e., peer deviance, neglect). Additional information about the risk factors is available from the first author by request.

Analytic strategy

LCA is a mixture method, because it assumes unobserved population heterogeneity, and seeks to identify *M* unobserved subtypes (i.e., latent classes) of related cases. Each class is characterized by its own profile of endorsement probabilities for individual risk factors (item endorsement probabilities; IEPs), and each person is assigned a probability for membership in each class (Clogg, 1981). Subjects were assigned to the class with the highest membership probability.

Latent class models were fitted by means of an EM algorithm (Dempster, Laird, & Rubin, 1977) using the advanced module of the Latent Gold 4.0 program (Vermunt & Magidson, 2005), which allows for the inclusion of sampling weights to adjust parameter estimates and standard errors for the two-stage sampling design. Models estimating 1-class through 9-class solutions were compared. There is no single accepted statistical index for comparing LC solutions; multiple criteria must be considered, including: 1) Bayesian Information Criterion (BIC), a goodness-of-fit index that considers sample size, number of free parameters, and value of likelihood function, 2) comparison of the difference between the log-likelihood of the previous and current class via a chi square statistic, 3) successive runs of the model to estimate the likelihood of obtaining a local solution, and 4) exclusion of solutions with rare (< 1%) classes. Class solutions with lower BIC values typically provide the best fit to the data. However, because the BIC tends to underestimate the number of classes, we reviewed both the *M* solution with the lowest BIC value and the *M* + 1 solution (McLaughlan & Peel, 2000).

Results

Latent class solution in the primary sample (CCC)

Our four model selection criteria converged in suggesting that a 6-class solution provided the best fit for our risk factor data: 1) BIC = 14058.98; 2) Δ BIC from 1-class = -682.34; 3) successive runs suggested a low likelihood that this solution was local; 4) no rare classes emerged; entropy $r^2 = .78$. Figure 1 shows that this solution included two low risk (average IEP = .08 and .14), three moderate risk (average IEP = .27, .25, and .25), and one higher risk class (average IEP = .40). In describing and naming each class, we focus on risk factors with IEP values greater than .5 (i.e., >.5 likelihood that a risk factor would be endorsed by individuals assigned to a given class).

Both low risk classes were common. The *Low Risk: No Risk* class (see Figure 1a) was characterized by low IEPs on all risk factors. The *Low Risk: Interparental Problems* class (see Figure 1a) had low IEPs on all risk factors except interparental problems. This class was more common in non-African-American youth ($OR = 2.5$, $CI = 1.5-4.0$).

The three moderate risk groups each had at least two risk factors with IEPs of .5 or greater. The *Moderate Risk: Single Parent/Poor/Crime* class (see Figure 1b) included mostly youth from single parent families, who were also characterized by high rates of poverty and parental criminality. African-Americans were overrepresented in this class ($OR = 2.5$, $CI = 1.6-4.0$). The *Moderate Risk: Uneducated/Poor* class (see Figure 1b) included mostly youth with a parent who had not graduated from high school, who also tended to live in poverty. African-Americans were overrepresented in this class ($OR = 2.6$, $CI = 1.7-4.0$). Finally, the *Moderate Risk: Step-parent/Crime* class (see Figure 1c), was characterized by living with a step-parent, parental criminality, and step-parent psychiatric, substance or crime problems. This class was more common in non-African-American youth ($OR = 2.3$, $CI = 1.2-4.4$).

The High Risk: Poor Relations/Parental Dysfunction class (see Figure 1d), had four risk factors with IEPs greater than .5. These came from the domains of family relational dysfunction (parent-child conflict, interparental problems) and parental risk characteristics (parental mental illness, parental criminality). Compared to the other risk classes, this class also had the highest (but below .5) IEP values for poor supervision, parent-child tensions, mal-treatment, and violence and loss events.

Several of our putative psychosocial risk factors co-occurred at IEP .5 + with a variety of other risk factors, and our risk configurations capture risk factor interplay rather than risk factor main effects. For example, poverty co-occurred with low parental educational attainment in one class and with single parent households and parental criminality in another class.

Latent class solution in the replication sample (GSMS)

The GSMS was used to conduct LCA with the same risk factors and model-selection criteria. Our four model selection criteria suggested that a 5-class solution provided the best fit for our risk factor data: 1) BIC = 18907.95; 2) Δ BIC from 1-class = -1049.07; 3) successive runs suggested a low likelihood that this solution was local; 4) no rare classes emerged; entropy $r^2 = .84$. This solution differed from the original CCC solution in only one respect: A moderate risk class with a high step-parent IEP value was not identified, and may, therefore, be sample-specific. Despite differences in the age and race/ethnicity composition between the primary and the replication sample, five of the six original classes were replicated.

Latent risk classes and psychiatric outcomes in the CCC sample

Associations between membership in risk classes and psychiatric outcomes were examined through a series of weighted logistic regression models in the CCC sample. Each psychiatric outcome was regressed on latent class membership, controlling for age, race, sex, and other diagnoses (e.g., emotional diagnoses were controlled in the model for disruptive disorders; depression, anxiety, and ADHD were controlled in the model for CD/ODD).

Figure 2 displays the weighted rates of psychiatric disorders (in %) for the six risk classes. Psychiatric disorders were most common in the *High/Family Dysfunction* class, followed by one of the moderate risk classes. Psychiatric disorders were least common in the low risk classes. Figure 2 also shows contrasts among risk classes that emerged as significant in our weighted logistic regression analyses. The complete set of results is available from the first author upon request.

Disruptive disorders—Youth in the high risk class were more likely to have a disruptive disorder than were youth in all other classes ($ORs = 3.0$ to 12.1). Youth in the *Moderate/Single/Poor/Crime* class were at increased risk for disruptive disorders compared to youth in the *Low/No risk* ($OR = 4.0$) or the *Moderate/Uneducated/Poor* classes ($OR = 2.4$). Youth in the *Low/Interparental* class were at more risk for disruptive disorders than were youth in the *Low/No risk* class ($OR = 3.1$). The contrasts between the two low risk and the two moderate risk classes are noteworthy: Although the respective low and moderate classes had similar average IEPs (and both moderate classes included poverty), the *specific configuration* of risk factors distinguished youth in terms of their risk for having a disruptive disorder. Thus, examining configurations of risk factors complements cumulative risk approaches.

Breaking down the results by individual disorders, findings for CD/ODD were similar to the combined disruptive disorders, with the exception that the contrast between the two low risk classes was no longer significant. As for ADHD, youth in both, the high risk class and the *Moderate/Single/Poor/Crime* classes were more likely to have ADHD than were youth in the *Low/No risk* class ($ORs = 8.1$ and 6.7 , respectively).

Emotional disorders—Youth in the high risk class were at higher risk for emotional disorders than were youth from all other classes, with the exception of the *Moderate/Uneducated/Poor* class ($ORs = 3.3$ to 6.0). Youth in the *Moderate/Uneducated/Poor* class were at higher risk for emotional disorders than were youth in both low risk classes, and youth in the *Moderate/Single/Poor/Crime* class ($ORs = 2.4$ to 3.7). Thus, as was the case for disruptive disorders, the specific moderate risk configuration distinguished youth in terms of their risk for having an emotional disorder.

For individual emotional disorder groups, the significant findings for depression mirrored those described for the combined emotional disorders with the highest rates of psychiatric disorders in the high risk class as compared to all other classes, with the exception of the *Moderate/Uneducated/Poor* and the *Moderate/Step-parent/Crime* classes ($ORs = 4.2$ to 12.2). The contrast between the two moderate risk classes was no longer significant, however. There was only one significant contrast for anxiety disorders: Youth in the *Moderate/Uneducated/Poor* class were at higher risk for anxiety disorders than were youth in the *Moderate/Single/Poor/Crime* class ($OR = 2.7$).

Follow-up analysis 1: Comparisons of configurational and cumulative risk models—Because the highest risk class was the only class associated with psychiatric status across disruptive and emotional disorders, it could appear that this class serves as a proxy for non-specific high risk and that the observed effect supports a cumulative risk model. This potential interpretation was tested by comparing youth in the high risk class to youth who were

not categorized in the high risk class but had an equal or greater number of risks (i.e., 6 + risk factors; 171 youth met these criteria). Compared to children with any 6 + risks factors, youth in the *High/Relations/Parental Dysfunction* class had higher rates of both disruptive ($OR = 2.3$, $CI = 1.1-4.7$) and emotional disorders ($OR = 2.4$, $CI = 1.0-5.5$). This comparison suggests that the *particular configuration* rather than the sheer number of risk factors is associated with psychiatric functioning.

Follow-up analysis 2: Integrating configurational, cumulative, and individual risk factor approaches—An additional follow-up analysis examined whether adding a cumulative risk score and individual risk factors to our models linking risk classes and psychiatric outcomes would contribute unique information above and beyond the configurational contributions discussed so far. We examined a series of nested regression models: 1) Model 1 included dummy variables for the six risk configurations (i.e., the model from which Figure 2 was derived); 2) Model 2 added a cumulative (i.e., count) risk variable to the dummy variables representing the six risk configurations; and 3) Model 3 added the 17 individual risk factors to Model 2. Negative 2 log-likelihood difference tests and Akaike information criterion values were used to compare the model fits of these three models.

Adding the cumulative risk variable to the dummy variables representing the six risk configurations (Model 2) significantly improved model fit for both disruptive and emotional disorders ($\Delta -2 \log \text{likelihoods} = 22.3$ and 15.1 , $df = 1$, $p < .001$; $\Delta AIC = 21.0$ and 13.2). Model 3, in which all individual risk factors were added to Model 2, failed to improve model fit for disruptive disorders, but modestly improved model fit for emotional disorders ($\Delta -2 \log \text{likelihood} = 30.5$, $df = 17$, $p < .05$, $\Delta AIC = -3.6$). However, the negative difference in AICs between Models 3 and 2 for emotional disorders suggests a loss of parsimony. Results for the specific emotional and disruptive disorders were similar and are available upon request from the first author. After information from both latent class and cumulative risk approaches were taken into account, the inclusion of separate psychosocial risk factors does not improve the fit for models explaining psychiatric functioning.

Discussion

Co-occurrence of multiple psychosocial risk factors in childhood is commonplace. We used latent class analysis to identify common patterns of risk co-occurrence. The five replicable risk classes yielded from our analyses represent more complexity than a single cumulative risk score, but considerable parsimony over approaches that enter each of multiple individual risk factors and their interactions into one statistical model. The usefulness of cumulative risk approaches has been firmly established (Appleyard, Egeland, Van Dulmen, & Sroufe, 2005). Building on this knowledge to establish which risk factor combinations from a large array of potential risk factors are most deleterious for youth is an important next step in risk research.

Approximately 49% of the sample was categorized in one of two low risk classes, another substantial minority (42.8%) fell into one of the three moderate risk classes, and 8.6% percent of the sample was classified in the high risk class. These relative proportions are remarkably similar to those obtained in the Menard et al. study (2004) (47% low risk, 46.2% moderate risk and 6.8% high risk). On the one hand, the consistency of these rates across studies with different risk variables suggests that only one in 12 to 15 youth contend with the highest levels of psychosocial risk. On the other hand, moderate levels of risk seem to be as common as low levels.

To date, risk factor selection across configurational studies has varied, limiting our ability to compare our risk factor configurations with those that emerged from previous person-oriented studies. For example, Menard and colleagues (2004) used separate emotional, physical, and

sexual abuse categories of trauma (which we had to aggregate on account of their low prevalences in our sample), but left out other, non-traumatic, childhood risk factors. Furthermore, the Add Health study (2006) used only one or two composite risk factors to represent four distinct risk domains, which might account for the fact that, unlike our risk classes, the Add Health risk classes mostly appeared to represent additive risk effects. The heterogeneity in risk factor selection across studies may, however, also increase the likelihood of identifying particularly deleterious combinations of risk factors.

Our two replicable moderate risk classes were both characterized by socioeconomic disadvantage, one by non-nuclear family structure and the other by higher rates of parental crime, all of which may be plausible targets for public efforts at alleviating psychosocial risk. Although children from the high risk class also had somewhat elevated item endorsement probabilities on some of the socioeconomic variables, they were primarily characterized by higher rates of parent-based (e.g., parental mental illness and crime) and family relational dysfunction (e.g. parent–child conflict and interparental problems). Children from this class had the highest rates of all psychiatric problems. Simultaneously addressing all of the risk factors that were elevated in the high risk configuration may present great challenges to clinical therapies and public policies.

As expected, the high and low risk classes had the strongest and weakest links with psychopathology. This is generally consistent with findings from cumulative risk approaches. Yet, there were several instances in which youth with similar levels of risk had different rates of psychiatric outcomes based on their unique configuration of risk factors, suggesting some specificity in risk class–outcome associations. For example, youth in *Moderate/Single/Poor/Crime* had higher rates of disruptive disorders than did youth in the *Moderate/Uneducated/Poor* class. This pattern was reversed for emotional disorders. Furthermore, our first follow-up analysis comparing youth in the high risk class to other youth with a similar number of risk factors suggested that the specific pattern of risk factors was as important as the sheer number of risk factors. Our second follow-up analyses suggested that simultaneously considering both configurational and cumulative risk models strikes the best balance between parsimony and complexity. That approach effectively summarized in six parameters the effects of the original 17 risk variables.

Caveats and directions for future research

The results of the LCA are a product of the interrelations between a set of psychosocial risk factors within two samples. As such, any derived class solution may be specific to the risk factors chosen for inclusion. It is also possible that an important risk factor has been omitted (or was too low in prevalence to be included in our models) or that additional risk factors may be identified in the future that may amend and update the identified structure of risk. Solutions can also be sample-specific, as was observed with non-replicated *Moderate/ Step-parent/Crime* class. Nine risk factors did not meet our IEP > .5 criterion for naming risk classes (although the IEPs of several of these risk factors were somewhat elevated in at least one of the risk classes). These tended to be less common factors. Because many of these variables have been linked with psychopathology in individual studies, future research is needed to examine whether the limited configurational contributions of these less common risk factors were due to methodological causes, and whether their configurational contributions could be increased. Although we were able to replicate 5 of 6 classes, our analyses should be replicated in samples that include Latinos, Asian Americans, and urban populations. DSM-IV diagnoses are useful but imperfect measures of criterion validity that have documented reliability and validity limitations. Future research should examine links between risk configurations and other measures of psychopathology.

Potential implications

While more complex than an additive cumulative risk approach, risk classes capture common configurations of risk that are not reducible to a purely additive model. Our results highlight the contributions of considering both particular patterns of co-occurrence of risk and the overall accumulation of risk factors. This approach is reminiscent of the DSM-IV approach to psychiatric disorder, in which the individual is given both a diagnosis to capture their particular symptom profile and a GAF score that indicates overall level of functioning. Indeed, simple interviews could be developed to assess both risk class membership and overall cumulative risk. Although it may be important, at times, to focus on individual risk factors (e.g., neglect) or on an individual psychiatric symptom (e.g., suicidality), the imperatives of clinical practice and large-scale research may soon require a taxonomy of psychosocial risk to match that of mental illness.

What's known

- Co-occurrence of psychosocial risk factors is commonplace, but little is known about configurations of common risk factors.

What's new

- Latent class analysis identified five risk configurations: Two low risk classes, two moderate risk classes which both involved family poverty; and a high risk class characterized by dysfunctional family relations and parent mental health and crime problems.
- Combining these classes with a cumulative risk approach best accounted for the effects of risk factors on psychopathology.

What's clinically relevant

- Particular configurations of risk have *specific* associations with psychiatric disorders.
- Clinical practice and large-scale research could benefit from considering both particular patterns of co-occurrence of risk and the overall accumulation of risk factors.

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Abbreviations

LCA, latent class analysis; CCC, Caring for Children in the Community study; GSMS, Great Smoky Mountain Study; CAPA, Child and Adolescent Psychiatric Assessment; BIC, Bayesian information criterion; OR, odds ratio; IEP, item endorsement probability.

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Figure 1.

Six-class solution for psychosocial risk latent class analysis for 920 children ages 9 to 17. Each chart includes latent classes organized by overall severity (i.e., low, moderate, and severe). Endorsement probabilities on the Y axis indicate the likelihood that the item will be endorsed by an individual within a given class. The vertical grid lines delineate the different risk domains of socioeconomic disadvantage, non-nuclear family structure, parental risk characteristics, family dysfunction, and negative events. R1 to R17 correspond to the individual risk factors listed in the order presented in Table 1.

Figure 2.

Rates of DSM-IV disorders for CCC participants in each risk factor class

Table 1Definition and weighted cumulative prevalence of risk factors in the CCC ($N = 920$)

Risk factors	% observations (N unweighted)
Socioeconomic disadvantage	
1. <i>Poverty</i> : Meets the federal guidelines for poverty based on income and family size	30.6 (327)
2. <i>Parental unemployment</i> : At least one parent registered as unemployed at time of interview	13.3 (143)
3. <i>Poor parental education</i> : At least one parent left school before 11th grade	28.3 (305)
4. <i>Teenage parent</i> : At least one parent was younger than 18 years old at subject's birth	19.5 (202)
Non-nuclear family structure	
5. <i>Single-parent household</i>	30.4 (314)
6. <i>Step-parent household</i>	14.8 (143)
Parental risk characteristics	
7. <i>Parental mental illness</i> : Interviewed parent scored 9 or higher on the Short Mood and Feelings Questionnaire (SMFQ) or has a history of mental health treatment	30.7 (313)
8. <i>Parental drug use</i> : At least one parent has been treated for drug and alcohol problems	10.4 (122)
9. <i>Parental crime</i> : At least one parent has been convicted of a crime	37.1 (372)
10. <i>Step-parent dysfunction</i> : History of mental illness, substance abuse, or criminality in step-parent	11.9 (125)
Family dysfunction	
11. <i>Poor supervision</i> : Parents do not exert age-appropriate control over child's activities or friends	8.4 (96)
12. <i>Tense or disinterested parent</i> : Many parent-child activities involve tension, worry or disinterest in the child	18.7 (193)
13. <i>Parent-child conflict</i> : Frequent arguments between a parent and the child	19.4 (207)
14. <i>Interparental problems</i> : Arguments, apathy, dissatisfaction, or poor communication between parents	31.7 (284)
Stressful life events	
15. <i>Maltreatment</i> : Physical or sexual abuse of the child by a family member	9.7 (110)
16. <i>Loss life events</i> : e.g., death of a parent, sibling, or friend, separation from parents	9.2 (98)
17. <i>Violent life events</i> : e.g., victim of physical violence, witness of a death caused by violence	10.2 (105)

Note: When possible, risk factors with a prevalence of < 5% were aggregated into one category (e.g., physical and sexual abuse were aggregated into the maltreatment category).