

Analysis and Influence of Demographic and Risk Factors on Difficult Child Behaviors⁶.

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Abstract

This descriptive study examines the distribution of risk factors in a sample that was selected on the basis of existing potential for difficult child behaviors. We inquire into whether exposure to risk factors is distributed equally across different contexts of ethnicity, locality, and child gender. Participants include 731 mother-child dyads recruited from WIC Programs in rural, suburban, and urban localities. Cumulative risk indices are constructed using neighborhood, family, and individual risk factors. The findings generally revealed that African American children and children in urban localities are exposed to higher numbers of risk factors and cumulative risk in relation to other ethnic children and localities. On the other hand, Caucasian children expressed higher levels of vulnerabilities to risk for internalizing behaviors than did other children. The results are discussed in terms of differences in contextual specific rates of risk exposure, vulnerability, and their implications for prevention and intervention research.

Ideally, family implies a functional group living situation in which opportunities exist for economic and instrumental cooperation, informal communications, and reciprocated social and emotional obligations among family members (Wilson & Tolson, 1990). Family interaction and living provides the context for physical maintenance, familial affection, and social control of family members. Often, family involves the rearing of and caring for children. Thus, family is a manifestation of an important human characteristic of our nature as social beings.

Family is a naturally occurring entity that is influenced by the larger social context of its existence (Myers, 1982). Because the family is an ever-evolving system which responds to normal and non-normal changes and events by adapting available family resources (Carter & McGoldrick, 1980; Duvall, 1971), the typical instances of normal changes and events such as marriage, the birth of the first child, the entrance of the first child into school, and the young adult child leaving home are readily incorporated into the family system. Likewise, unanticipated changes and events, such as, divorce, hospitalization, and unemployment (Carter & McGoldrick, 1980; Duvall, 1971), are resolved using family-oriented support systems.

Economic deprivation and neighborhood disorganization have been hypothesized to relate to elevated exposure to risk factors (McLoyd, 1998). Poverty-related family risk factors include having: a single-parent household, residential crowding, an incarcerated family member, and drug use among a family member. In particular, several researchers have suggested that economic deprivation and neighborhood problems are associated with externalizing and internalizing problem behaviors in young children, postulating that economic hardship renders parents more vulnerable to negative life events and diminish their capacity for consistent and involved parenting (McLoyd, 1998; Shaw, Vondra, Dowdell, Hommerding, Keenan, & Dunn, 1994).

Contextual risk and individual risk. Risk has been conceptualized as negative life circumstances that are known to have statistical association with adjustment difficulties (Cowen et al., 1996, Masten, 2001; Luthar & Cicchetti, 2000). In this paper we are concerned with contextual and individual risk factors. Contextual risk factors are part of the larger constellation of risk factors that families encounter and can include societal, demographic, and cultural risk factors, whereas individual risk includes personal characteristics and interpersonal relationships. Moreover, statistical construction permits categorization of other types of risk. Risk exposure refers to the extent to which that risk factor is present to a greater degree among a particular group relative to another group. Risk vulnerability represents the extent to which a given risk factor differentially relates to a particular outcome such as difficult child behavior. Several researchers have found that risk factors are associated with the most vulnerable members of society (Schell, 1997).

For instance, children of color and children living in resource-poor settings are more likely to be exposed to risk and/or be more vulnerable to risk exposure than are other children (Burchinal, Roberts, Hooper, & Zeisel, 2000; Brown, Miller, & Clayton, 2004; Spoth, Redmond, Shin, Lepper, Haggerty, & Wall, 1998; Wallace & Muroff, 2002). In one study, Hope and Bierman (1998) examined the cross-situational patterns of behavior problems shown by children in rural and urban communities at school entry. Although the rates of behavior problems exhibited in home settings were not different across urban and rural settings, child behavior at school was more heavily influenced by the increased exposure to aggressive models and deviant peer support experienced by children in urban as compared to rural schools.

Socio-cultural forces such as poverty and racism tend to allocate risk disproportionately in societies to subsets of the population such as the poor and ethnic minorities (Cowen, 1998).

Thus, a concentration of physical and social risks is often focused on the most vulnerable population strata in many cultures (Shell, 1997). Although there is a need to determine some invariant predictors that are usable in large scale research and intervention studies, it is equally vital to understand the context-specific aspects of risk factors. Thus, it is expected that families living in urban areas will be exposed to more risk factors as compared with those living in rural and suburban areas; African Americans and Hispanic Americans also are expected to be exposed to greater numbers of risk factors compared to Caucasian Americans.

Several researchers have investigated dysfunctional aspects of the family living situation, including overcrowding in the home, family financial strain (i.e., income-need ratio), mental and physical health, and neighborhood quality (Masten, Miliotis, Graham-Bermann, Ramirez, & Neemann, 1993; Pungello, Kupersmidt, Burchinal, & Patterson, 1996). Additional studies have indicated that individual and cumulative risk were significant predictors of different domains of child adaptation such as child achievement, social competence, externalizing and internalizing behavior (Ackerman, Kogos, Youngstrom, Schoff, & Izard, 1999; Shaw & Emery, 1988). For example, Masten and colleagues (1993) investigated the differences between school-age children in homeless families and school-age children in low income families living at home. They found homeless children to have greater stress exposure and fewer resources than low-income children with homes, specifically more recent adversity, disrupted friendships, lower incomes, and more changes in school. Other studies have found that children in families with the highest risk levels were more likely to develop difficult child behaviors (Burchinal et al., 2000; Pines & Yoshikawa, 2006; Spoth et al., 1998).

In terms of toddlers, Shaw and Vondra (1993) found cumulative family risk factors to differentiate secure from insecure attachment status among toddlers when there were three of

four risk factors present. Vondra and her colleagues (Vondra, Shaw, Chrisman, Cohen, Swearingner, & Owens, 2001) subsequently found that the insecure attachment classification predicted maternal report of externalizing and internalizing behavior problems at age 3½. In addition, Shaw, Vondra, Dowdell, Hommerding, Keenan, and Dunn (1994) found cumulative family risk factors at ages 1 and 2 were associated with child externalizing at age 3 among 100 low-income families. Other risk factors identified by Shaw and his colleagues include maternal depression, rejecting parenting, and disorganized home (Shaw, Owens, Giovannelli, & Winslow, 2001) and child's persistent low inhibition status (Shaw, Gilliom, Ingoldsby, & Nagin, 2003). Brotman, Gouley, O'Neal, and Klein (2004) observed 99 siblings of adjudicated adolescents and found that risk factors for conduct disorders include poverty, large family size, living in a single adult household, low parental education attainment, parental stress, psychopathology, harsh parenting, lack of family warmth, and low household stimulation.

The accurate identification of risk factors is central to the development of effective efforts to prevent difficult child behaviors in young children. There are two strategies for modeling risk. Rutter (1983) suggested a simple statistical approach to modeling the essential characteristics of the social and physical environment, including both proximal and distal qualities, termed collectively as *cumulative risk* models. Cumulative risk models also reflect the typical, natural concurrence of many childhood and family risk factors. Rutter has argued that the accumulation of risk often overwhelms the family resource system to a point of dysfunction.

The second strategy used by several investigators involves analyses of single risk factors influence on behavior. Generally, investigators have shown single risk factors vary in their respective impacts on behavior (Ackerman et al., 1999; Liaw & Brooks-Gunn, 1994; Sameroff, 1998). Thus, it is common to contrast models of cumulative stress indices with single risk

factors. For prevention interventions, a risk measurement strategy represents a potential opportunity to track specific changes in the rate of vulnerability over time. Hence, risk and challenges are important concerns of this analysis.

We examine several models of risk including cumulative and ecological models, and look at differential exposure and vulnerabilities. We examine a general premise regarding the distribution of risk indices in a sample that was selected on the basis of existing risk for difficult child behaviors. Specifically we are concerned with whether there are equal distributions of risk factors across ethnicity, locality, and gender. Similar to the Wallace and Muroff (2002) study of adolescent drug use, we expect that different ethnic groups will not be equally exposed or vulnerable to risk. That is, greater risk exposure will be demonstrated for African Americans relative to other ethnic groups. However, we expect that the rate of vulnerability will reveal that African Americans are not more vulnerable than other groups.

In terms of localities, population density does matter. In this instance, we anticipate that urban areas will demonstrate the highest exposure rates of risk as compared to rural and suburban communities. Most research has reported on the existence of challenges and difficulties for urban dwellers as compared with other rural and suburban dwellers (Hope & Bierman, 1998). However, it is expected that families living in rural areas will demonstrate higher rates of exposure than families living in suburban areas.

Finally, with regard to child gender, boys are expected to demonstrate higher risk exposure rates and vulnerabilities. Developmental psychologists have reported for some time that boys are more vulnerable to a whole host of environmental, genetic and educational concerns including still births, death in the first year of life, neuro-psychiatric disorders in early childhood, and academic and behavior problems during early childhood and the primary school years (see

Keenan & Shaw, 1997). In this study, the difficult child behaviors under consideration are internalizing, inhibitory control problems, and problem behavior intensity.

Method

Participants

Participants included 731 mother-child dyads recruited between 2002 and 2003 from WIC Programs in the metropolitan areas of Pittsburgh, PA, and Eugene, OR, and within and outside the town of Charlottesville, VA (Dishion, Shaw, Connell, Gardner, Weaver, & Wilson, 2008). Families were approached at WIC sites and invited to participate if they had a child between 2 years 0 months and 2 years 11 months of age. Risk criteria for recruitment were defined at or above one standard deviation above normative averages on several screening measures within the following three domains: (a) child behavior (conduct problems, high-conflict relationships with adults), (b) family problems (maternal depression, daily parenting challenges, substance use problems, teen parent status), and (c) socio-demographic risk (no more than 2 years post high school education, and low family income). Two or more of the three risk factors were required for inclusion in the sample.

Of the 1666 parents who were approached at WIC Programs across the three study sites and had children in the appropriate age range, 879 families met the eligibility requirements and 731 agreed to participate. Of the 731 families (49% female children), 272 (37%) were recruited in Pittsburgh, 271 (37%) in Eugene, and 188 (26%) in Charlottesville. More than two-thirds of the families enrolled in the project had an annual income of less than \$20,000, and the average number of family members per household was 4.5 ($SD = 1.63$). Because of missing ethnicity information, 13 families were excluded. Thus, we report on the data of 718 families.

Measures

All measures were selected based on their previous performance with low-income and ethnically diverse populations. The psychometric properties presented are representative of the different ethnic, local, and gender groups considered in this study.

Demographics Questionnaire. This form includes questions in which we assess the following eight variables: *Income-Need Ratio* is calculated by dividing family income (ranges are coded zero through 13) by the number of people living in the home, we then recoded so higher scores equals fewer financial resources per person. *Residential density* is equal to the number of people living in the home divided by the number of rooms, we then recoded so higher scores equal fewer rooms per person. *Marital status* is reported as married, living together, widowed, divorced, separated, or single. *Education* is coded so higher scores equals more educational risk (i.e., less years of education). *Financial Aid* is a total score of the number of government provided assistantships received by the family (e.g., food stamps, TANF, social security, heating). *Transitions* are the number of times the child has moved to a different residence. *Child Abuse* includes any persons living in the home who have been charged with child abuse. *Treatment or Trouble with the Law* includes any persons in the home who have received mental health treatment or had trouble with the law in the past year.

Depression. Primary caregivers completed the Center for Epidemiological Studies on Depression Scale (CES-D; Radloff, 1977). The CES-D is a 20-item measure of depressive symptomatology; internal consistency is .76 in the current sample.

Substance Use. Primary caregivers completed the Parent Substance Use (SUBST; Dishion & Kavanagh, 2001). This questionnaire focuses on basic patterns of substance use for the

primary caregivers. Questions are asked concerning caregivers' use of tobacco, alcohol, marijuana, and illicit drugs.

Daily Hassles. Primary caregivers completed the Parenting Daily Hassles (HASSL; Crnic & Greenberg, 1990). How hassled caregivers felt by each event was measured on a 5-point scale. Internal consistency is .90 in the current sample

Conflict with Child. Primary caregivers completed the Adult Child-Relationship Scale (ACRS; Pianta & Steinberg, 1991). This has a 10-item conflict factor that taps the frequency and intensity of parent-child disagreements. Internal consistency is .85 in the current sample.

Neighborhood Danger Caregiver was measured by the Me and My Neighborhood Questionnaire (MMNQ; Ingoldsby & Shaw, 2002) and reported by the primary caregiver. For the current study, we used the 15-item dangerousness factor to assess the presence of criminogenic factors. Internal consistency is .88 in the current sample.

Chaotic Home Environment (Dumas, Nissley, Nordstrom, Phillips Smith, Prinz, & Levine, 2005). The CHAOS is a 15-item measure of environmental confusion as reported by the primary caregiver. Internal consistency is .84 in the current sample.

Discrimination (MIC; Child and Family Center, 2004). The MIC is an 18-item measure assessing experiences of discrimination related to ethnicity/race and income/education as reported by the primary caregiver. This questionnaire was adapted from a measure used to assess experiences of discrimination of Native Americans (Dishion, 2001). Internal consistency is .92 in the current sample.

Financial Stress (FINCE, Lochman, Conduct Problems Prevention Research Group, 1995). The Financial Stress Questionnaire is a 9-item measure of perceived adequacy of household

funds for bills and expenses as reported by the primary caregiver. Internal consistency is .66 in the current sample.

Internalizing Behaviors. Primary caregivers completed the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000). The Internalizing scale was used to measure the frequency of behaviors. Internal consistency is .82 in the current sample.

Problem Behavior Intensity. The Eyberg Child Behavior Inventory (Robinson, Eyberg, & Ross, 1980) is a 36-item behavior checklist which asks caregivers whether or not each item is currently a problem for them. The intensity of problem behaviors scale was used in the current study. Internal consistency is .84 in the current sample.

Inhibitory Problem Behavior. The Temperament Scale (TEMP; Rothbart, Ahadi, Hershey, & Fisher, 2001) is a 26-item measure that captures child inhibitory control problems and was completed by primary caregivers. Temperament includes irritability, reactivity, and cooperation. Higher scores indicate greater amounts of inhibitory control problems. Internal consistency is .62 in the current sample.

Neighborhood Danger Observed. Me and My Neighborhood is a 3-item measure (MMNQ: Ingoldsby & Shaw, 2002). Examiners reported observations about neighborhood danger. Internal consistency is .51 in the current sample.

Assessment Protocol. Parents (i.e., mothers and, if available, alternative caregivers such as fathers or grandmothers) who agreed to participate in the study were scheduled for a 2.5-hour home visit. Alternative caregiver reports were not used in this study. Families received \$100 for participating in the age-2 home visit.

Statistical Procedures

The current analysis is cross sectional at age 2. We assigned each participant a total score on four cumulative risk indices: total, neighborhood, family, and individual. Total scores on the risk indices were created by first scoring participants into one of three risk categories on each of the 17 risk factors (see Table 2). Participants who scored between 0 and .5 standard deviations above the mean were given a risk score of 0, or no risk. Scores that fell between .5 and 1 standard deviation above the mean were assigned a risk score of 1, or low risk. A risk score of 2, or high risk, was assigned to participants who scored over 1 standard deviation above the mean. Five exceptions in risk scoring include the child abuse variable, which was automatically scored as 2 if endorsed and 0 if not, as well as mental health treatment and trouble with the law. The financial aid variable was scored such that participants who endorsed no financial aid received a risk score of 0, one source of financial aid was scored as 1, and two or more was assigned a risk score of 2. Education was scored such that participants who reported partial college or more received a risk score of 0, high school graduates received a 1, and participants who did not complete high school received a 2. Marital status was scored such that participants who were married or living together received a risk score of 0, widowed was scored 1, and single, separated, or divorced was scored 2. Scores on the risk factors were summed to create a total score on the four cumulative risk indices. The anchors of the cumulative risk indices include 0-34 for the total risk, 0-6 for neighborhood risk, 0-20 for family risk, and 0-8 for individual risk. Higher scores indicate greater levels of risk. The 17 risk factors plus 4 cumulative risk indices resulted in a total of 21 risk measures tested in the current analysis.

Similar to Wallace and Muroff (2002), who assessed measure the extent of children's exposure to risk measures, we computed a series of analysis of variance models and compared the means on risk measures within groups of ethnicity, locality, and gender followed by post hoc

analysis. Where the means differed significantly within groups, we concluded that the children were unequally exposed to that particular risk. Vulnerability to a risk is the extent to which a risk measure differentially relates to internalizing, inhibitory control problems, and problem intensity behaviors between groups of children. We tested for vulnerability differences by running a series of regression models in which the child outcome variable (i.e., internalizing, inhibitory control problems, or problem behavior intensity) was regressed on group membership (i.e., ethnicity, locality, or child gender), the risk measure, and a group membership by risk measure cross-product term. When the cross-product term showed statistical significance, we then measured group differences in vulnerability. To measure vulnerability we compared group differences in the strength of the correlation between the risk measure and the difficult child behavior outcome. The group of children with the larger positive correlation indicates a greater vulnerability to that particular risk measure. In order to minimize the chances of type II error, we ran all exposure and vulnerability tests at a conservative level, in which $p < .01$.

Results

Descriptive Statistics

Table 1 presents the 718 families used in the present study partitioned by ethnicity and locality. Caucasian Americans are distributed in double digit proportions across all localities, as compared with African Americans and Hispanic Americans who are unevenly distributed. Caucasian Americans are seen in 72% of the suburban, 46% of the rural, and 44% of the urban sample. African Americans are represented in 51% of the urban, 34% of the rural, and 1% of the suburban sample. Although their proportions are small, Hispanic Americans are seen in 17% of the rural, 16% of the suburban, and 2% of the urban samples. The risk variables are grouped by index and displayed in Table 2. The means and standard deviations from the sample as a whole,

and the percentage of children categorized as low and high risk are listed in columns one through four respectively.

Ethnic Differences in Risk Exposure

The risk exposure and vulnerability results are presented in Table 3 by ethnicity. The first four columns present mean values for the 21 risk measures separately for Caucasian, African American, Hispanic, and other children, which we interpret as exposure. An asterisk by the number indicates that an analysis of variance revealed statistically significant differences among ethnic groups in exposure to the risk measure; the post hoc outcomes are detailed below. Consistent with our hypothesis, African American children were exposed to higher levels of risk compared to Caucasian or Hispanic children. There were a total of 14 significant ethnic group differences found in exposure to risk. African American children were exposed to the highest number of risks (8). Counter to our hypothesis, Caucasian children were exposed to slightly more risk factors (4) than Hispanic children (2).

Specifically, the data indicate that 1 of the 3 neighborhood level risk factors show exposure differences among ethnic groups. African American caregivers report higher mean levels of neighborhood danger compared to Caucasian and Hispanics. Seven of the ten family level risk factors show exposure differences among ethnic groups. African American children have higher rates of single-parent status (i.e., single, separated, or divorced) and report high levels of income-need ratio (i.e., less money per household member) relative to Caucasian, Hispanic, and other children. African American, Caucasian, and other families report more daily hassles compared to Hispanic families. The average residential density of Hispanic children's homes is greater than that of Caucasians children. Caucasian children live with a greater average number of family members who have received mental health treatment or have had trouble with

the law than do African American or Hispanic children. Caucasian caregivers report a more chaotic home environment compared to Hispanic caregivers. In addition, Caucasian children are exposed to more family members charged with child abuse relative to African American or Hispanic children. Three of the four individual level risk factors show exposure differences among ethnic groups. Caregivers of Caucasian children report more substance use, on average, than Hispanic or other caregivers. African American and other caregivers report more discrimination than Caucasian caregivers. Hispanic caregivers have higher levels of educational risk relative to Caucasians, African Americans, or others. Of the three of four cumulative risk indices demonstrating ethnic differences in exposure to risk, all are highest among African Americans. African American children have a higher mean exposure to total risk compared to Caucasian, Hispanic and other. African Americans and Caucasians experience a higher mean level of family risk relative to Hispanics. African American families live in more dangerous neighborhoods, on average, than Caucasians, Hispanics, or others.

In sum, African Americans reported significantly higher exposure rates on 5 risk factors (caregiver reported neighborhood danger, income-need ratio, daily hassles, marital status, and discrimination) and 3 cumulative risk indices (total risk, family risk, and neighborhood risk). Caucasians reported significantly higher exposure rates on 4 risk factors (family member treatment or trouble with the law, child abuse, chaotic home environment, and substance use), and Hispanics reported significantly higher exposure rates on 2 risk factors (residential density and education).

Ethnic Differences in Vulnerability

The last nine columns of Table 3 present the correlations among the risk measure and child behavior outcome separately by ethnicity, only if the vulnerability differences were

statistically significant as evidenced by the interaction term of the regression model. As predicted, although African American children are exposed to the highest levels of risk, their vulnerability to risk measures for difficult child behaviors is not consistently the highest across all three outcomes. For example, although African American children are the most frequently exposed to risk factors and cumulative risk indices associated with internalizing behaviors, Caucasian children are the most vulnerable (with a marginal exception of income-need ratio). An examination of the inhibitory control problems and problem behavior intensity outcomes reveals that African American children are often the most exposed to the corresponding risk factors (with the exception of substance use and transitions) as well as the most vulnerable.

Overall, of the ten ethnic differences in vulnerability discovered, African American children are the most vulnerable to four risk factors (transitions, income-need ratio, daily hassles, and substance use) and two cumulative risk indices (total risk and family risk) for internalizing, inhibitory control problems, and problem behavior intensity. Caucasian children are the most vulnerable to one risk factor (neighborhood danger caregiver reported) and two cumulative risk indices (total risk and neighborhood risk) for internalizing. Hispanic and African American children are equivalently more vulnerable to one risk factor (substance use) for inhibitory control problems.

More specifically, when examining child vulnerability to internalizing behaviors, the magnitude of the correlations reveal that Caucasian children are more vulnerable to internalizing behaviors associated with caregiver reported neighborhood danger, the total risk index, and family risk index, compared to African American or Hispanic children. African American children are marginally more vulnerable to internalizing behaviors associated with their income need ratio, relative to their Caucasian and Hispanic counterparts. Inspection of inhibitory control

problems shows that African American and Hispanic children are equivalently more vulnerable to inhibitory control problems associated with substance use than Caucasian children. African American children are the most vulnerable to inhibitory control problems associated with the total and family risk indices when compared to Caucasian and Hispanic children. The results for problem behavior intensity show that African American children were the most vulnerable to problem behavior intensity associated with transitions, daily hassles, and substance use when compared to Caucasian and Hispanic children.

Locality Differences in Risk Exposure

Table 4 presents differences in risk exposure by locality. Consistent with our hypothesis, of the 15 statistically significant locality differences in exposure to risk, 11 are highest among urban families (caregiver reported neighborhood danger, observed neighborhood danger, financial aid, income need ratio, daily hassles, marital status, substance use, depression, total risk index, family risk index, and neighborhood risk index). Counter to our hypothesis, suburban families reported significantly higher exposure rates on 3 risk factors (transitions, treatment or trouble with the law, and child abuse) compared to rural families who reported one (education).

Specifically, exposure differences by locality exist in all 3 neighborhood risk factors. The data indicate that the mean level of observed neighborhood danger is higher in urban areas compared to rural and suburban. Caregivers in the urban locality report a higher level of danger than those in rural or suburban localities. Suburban children are experiencing transitions between homes at a higher rate than urban or rural children. Locality differences in risk exposure exist in 6 of the 10 family level risk factors. On average, suburban children are exposed to more persons in the home who have been reported for child abuse, and who have received mental health treatment or had trouble with the law compared to rural or urban children.

Urban families receive a higher mean level of financial aid compared to rural. Urban children more often live in single-parent homes (i.e., single, separated, or divorced) than suburban children. Urban families have more exposure to income-need ratio risk, relative to suburban families. Urban caregivers report a higher level of perceived daily hassles compared to rural caregivers. Exposure differences by locality exist in 3 of the 4 individual level risk factors. Urban caregivers report a higher mean level of substance use than suburban caregivers, and more depression compared to rural caregivers. Rural caregivers report more educational risk compared to urban and suburban. In terms of cumulative risk indices, urban families report higher rates on three of four indices. Urban families are exposed to more total and family level risk than rural, and more neighborhood risk than rural or suburban.

Locality Differences in Vulnerability

Table 4 presents vulnerability differences by locality in the last nine columns. In sum, urban children are more vulnerable to 3 risk factors (i.e., income-need ratio, conflict with child, and education) and 1 cumulative risk index (i.e., family risk index) for internalizing, inhibitory control problems, and problem behavior intensity. Rural children are more vulnerable to 3 risk factors (conflict with child, chaotic home environment, and income-need ratio) for inhibitory control problems and problem behavior intensity. Suburban children are no more vulnerable to risk factors associated with difficult child behaviors relative to urban or rural children.

Specifically, when examining the internalizing outcomes, the correlations show that urban children are the most vulnerable to internalizing behaviors associated with their income-need ratio than rural or suburban children. Results from inhibitory control problems show that rural children are most vulnerable to inhibitory control problems associated with conflict with children and chaotic home environments compared to their urban and suburban counterparts.

Urban children are most vulnerable to inhibitory control problems related to caregiver education. Inspection of problem behavior intensity reveals that rural children are most vulnerable to risk associated with income-need ratio. Urban children are more vulnerable to problem behavior intensity associated with conflict with child and the family risk index when compared to rural and suburban children.

Gender Differences in Risk Exposure and Vulnerability

Counter to our hypothesis, no mean differences were found between boys and girls in exposure to risk factors or cumulative risk indices. Vulnerability differences by gender are presented in the last nine columns of Table 5. In sum, the magnitude of the correlations show that females are more vulnerable to 4 risk factors (transitions, financial aid, income-need ratio, and discrimination) and 2 cumulative risk indices (total risk and individual risk) when compared to boys. Boys are more vulnerable to only 1 risk factor for difficult child behaviors (observed neighborhood danger).

Specifically, examination of internalizing behaviors show that females are more vulnerable to risk associated with the income-need ratio. Inspection of inhibitory control problems shows that males are more vulnerable to the effects of observed neighborhood danger. Females are more vulnerable to risk associated with transitions and financial aid for inhibitory control problems. The problem behavior intensity outcome shows females are consistently more vulnerable to risk than males, specifically, caregiver discrimination, the total risk index, and the individual risk index.

Alternative Explanations

We found that African American children are significantly more exposed to risk factors and indices for internalizing behaviors; however, they were not the most vulnerable when

compared to Caucasian children. In order to determine if African American parents perceive fewer internalizing behaviors, which in turn may account for the anomaly, we compared the mean level of reported internalizing behaviors Caucasian ($M = 55.55$ $SD = 8.53$) and African American ($M = 56.60$ $SD = 8.34$) caregivers. No statistically significant difference was found, $t(593) = -1.42, p = .15$.

Correlations among Outcome Measures

Pearson correlation coefficients were used to determine the relationship among outcome measures. All outcome measures are significantly, but modestly correlated with each other. Internalizing behaviors are positively correlated with problem behavior intensity, $r(716) = .26, p < .01$ and inhibitory control problems, $r(716) = .18, p < .01$. Problem behavior intensity is positively correlated with inhibitory control problems, $r(716) = .29, p < .01$.

Summary of Results

We found that although different groups of children are exposed to risk at different rates, their tendency to be vulnerable to that risk can be characterized by ethnic, locality, and gender distinctions. African American children were more exposed to risk measures for internalizing behavior; however, Caucasian children showed higher rates of vulnerability to the outcome. Sometimes, rural children were exposed to equivalent levels of risk (i.e., conflict with child, chaotic home environment) compared to their urban and suburban counterparts, yet rural children demonstrated more vulnerability to difficult child behaviors (i.e., inhibitory control problems) associated with that risk. Although female children showed equivalent risk exposure compared to males, females were significantly more vulnerable to certain risk factors (i.e., transitions, financial aid, income-need ratio, and discrimination) and the cumulative effects of risk (i.e., individual risk index and total risk index) associated with difficult child behaviors.

Discussion

Models of risk

Risk exposure and vulnerability. Overall, the findings of this descriptive analysis were similar to previous papers published on risk analysis (Burchinal et al., 2000; Masten et al., 1993; Spoth et al., 1998). Although families were selected based on the presence of three different domains of risk, the families possessed varying amounts of risk and were distributed in varying ways across the 21 risk measures identified and analyzed for this paper. Like Wallace and Muroff (2002), we found that risk exposure and vulnerabilities were not necessarily consistent with each other. In the present study exposure was determined by context of the risk. Inasmuch as African American children showed higher rates of exposure to many of the risk variables, they were not as vulnerable to internalizing behaviors when compared to Caucasian and Hispanic children. Hence, the differential exposure and vulnerability rates suggest that research and intervention activities must consider additional kinds of information when working with disadvantaged populations. The differential rate of exposure and vulnerability may suggest some implications for screening and intervention strategies, as it appears that African American children might be less vulnerable to risk associated with internalizing behaviors than their Caucasian and Hispanic counterparts despite having higher rates of risk exposure. In terms of localities, the urban children were reported as having higher levels of exposure to eleven risk factors, suburban children to three, and rural children to one. The greater risk exposure of the urban locality was associated with greater vulnerability to difficult child behaviors. Although scant literature has focused on the relationship between locality and risk, Ackerman et al. (1999) and Schell (1997) suggest that the concentration of risk related factors does lead to an unavoidable exposure for a variety of issues.

Instead of operationalizing risk as a monolithic category, it was important to describe and examine the variation of risk among a sample of low-income families (Rutter, 1983; Luthar & Cicchetti, 2000). In this study, we explored a variety of risk models for difficult child behaviors of 2 year old children from economically disadvantaged families. Although the sample represented disadvantaged families, the subgroups of families at risk vary according to the presence of individual risk factors. Moreover, the initial contextual distinctions of this sample demonstrated other variations of risk, most noticeably in ethnicity and locality. The results of this analysis suggest that risk must be examined from various perspectives (Ackerman, et. al, 1999). Rather than think of one model of risk as accounting for more variance than another, we argue that each cumulative and specific risk exposure and risk vulnerability model provides a different perspective on risk for child problems. Put another way, certain risk may exist for specific groups and may represent a critical occasion in a family's life event history (McLoyd, 1998; Wilson & Tolson, 1990). Thus, it is important to consider quality and quantity of risk.

Moreover, the findings have general implications to prevention science regarding the application of universal, intended and selected preventive efforts for risk exposed and vulnerable populations. Consistent with the Institute of Medicine (1994) resolution, it is important to understand whether an intervention is *universally* applied without an identified risk, *selectively* applied because of risk exposure is determined to be better than chance, or *indicated* application because of minimal but detectable signs or symptoms of risk forecast problems. Consequently, the difference between risk exposure and vulnerability proffer the possibility of tailoring a specific approach to the preventive efforts. For instance, Dishion and Kavanagh (2000) described a universal, selected, and indicated strategy for helping families with adolescents. Dishion and associates' (2008) early child intervention in difficult child problems represents a

selected intervention strategy since none of the children were diagnosed but represented risk for such problems. Likewise, Leonard, Rotko, and Gostnell (2007) described an indicated prevention project focused on problem drinking with mothers who were HIV-positive. Hence, this study suggests the importance in determining whether the anticipated prevention effects have general relevance for persons regardless of any human concern, persons who are exposed to certain risk, or persons whose exposure will likely lead to vulnerability.

There are several limitations that must be discussed. With the exception of observed neighborhood danger, the data for this analysis are based on one source, the primary caregiver, leading to reporting of all independent variables and difficult child behaviors by one informant. Consequently, social desirability and informant bias might have influenced the results. Also, there is a confound between ethnicity and locality, that is, there was a disproportionate percentage of African American families living in urban areas and Caucasian families living in suburban localities, making it difficult to disentangle ethnicity from locality when interpreting the findings that were statistically significant for both. In addition, when comparing pre-existing groups, there is always a question of how well each sample represents the population from which it is drawn. Whereas this is an important sample because of its ethnic diversity and use of families from multiple types of localities, the findings' generalizability are limited to families identified on the basis of socioeconomic, family, and child risk rather than families with greater economic resources and fewer family and child risk factors. In a related vein, it is unclear if there was some selection bias among families who qualified to be in the study and who agreed to participate in the project versus those who qualified and chose not to be involved in the study. Although this was a relatively small percentage of families (i.e., less than 10%) and rates of refusal did not vary by site, it is possible that families who chose not to participate might be

characterized by different types of risk and/or show different patterns between risk and child problem behaviors.

Ultimately, we strived to understand and describe risk patterns in our data set in order to better appreciate our anticipated intervention results. By accounting for our sample's characteristics and contextual challenges we are better able to explain the precise nature of our intervention effects. A next step as a prevention project will be to fully explore the role of protective variables in mitigating some of the effects of risk on children's early development.

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Table 1: Distribution of Ethnicity by Locality

Child Ethnicity	Locality of Family			Total
	Rural	Suburban	Urban	
Caucasian	83	193	118	394
African American	61	3	137	201
Hispanic	31	43	4	78
Other	7	28	10	45
	182	267	269	718

Table 2: Descriptive Statistics, Low and High Risk

Risk Measures	Mean	SD	% of Sample in low risk	% of Sample in high risk
Neighborhood Context				
Neighborhood Danger Observed	7.58	2.63	20.5	11.6
Neighborhood Danger Caregiver	2.93	2.61	11.2	16.8
Transitions	0.41	0.72	34.7	5.1
Family Context				
Financial Stress	3.32	0.81	56.5	8.5
Treatment / Law Trouble	0.73	0.75	0.0	54.8
Child Abuse	0.08	0.26	0.0	8.1
Financial Aid	2.70	1.12	17.0	82.9
Income Need Ratio	2.75	1.30	16.3	10.1
Residential Density	0.93	0.40	10.9	13.0
Conflict with child	28.33	7.43	9.2	17.0
Chaotic Home Environment	20.87	2.81	9.8	19.6
Perception of Daily Hassles	47.24	13.22	13.1	15.3
Marital Status			7.7	36.3
Individual Context				
Substance Use	7.21	8.40	24.4	13.3
Depression	16.75	10.66	8.3	17.2
Discrimination (age 3)	3.03	1.20	19.4	13.1
Education			42.7	23.4
Risk Indices				
Total Risk	11.76	4.09	13.4	14.2
Individual Risk	2.29	1.62	0.0	21.2
Family Risk	8.13	2.68	9.7	13.3
Neighborhood Risk	1.34	1.33	0.0	19.8
Outcome Measures				
Internalizing	56.33	8.53		
Inhibitory Control Problems	3.97	0.78		
Problem Behavior Intensity	59.03	7.96		

Table 3: Ethnic Differences in Exposure and Vulnerability to Risk Factors for Child Internalizing, Inhibitory Control Problems, and Problem Behavior Intensity

Risk Measures	Exposure				Vulnerability					
	African American			Other	Internalizing		Inhibitory Control Problems		Problem Behavior Intensity	
	Caucasian	American	Hispanic		Caucasian	African American	Caucasian	African American	Caucasian	African American
Neighborhood Context										
Neighborhood Danger Observed	6.99	8.98	7.13	7.20						
Neighborhood Danger Caregiver	*2.50	4.18	1.76	3.23	0.21	0.15	-0.02			
Transitions	0.41	0.36	0.38	0.62					-0.08	0.12
Family Context										
Financial Stress	3.38	3.24	3.09	3.55						
Treatment / Law Trouble	*0.86	0.56	0.49	0.82						
Child Abuse	*0.11	0.03	0.04	0.07						
Financial Aid	2.68	2.79	2.60	2.80						
Income Need Ratio	*2.45	3.42	2.37	2.41	0.02	0.04	0.02			
Residential Density	*0.90	0.95	1.12	0.99						
Conflict with child	28.90	28.34	26.31	27.64						
Chaotic Home Environment	*21.46	20.20	19.51	20.93						
Daily Hassles	*48.03	48.82	40.59	45.52					0.51	0.55
Marital Status	*2.57	4.55	2.22	2.38						
Individual Context										
Substance Use	*8.40	7.67	2.12	5.63				-0.06	0.06	0.06
Depression	16.81	17.26	14.17	18.09						
Discrimination (age 3)	*2.82	3.42	3.00	3.34						
Education	*4.68	4.83	5.82	4.51						
Risk Indices										
Total Risk	*11.48	13.03	10.06	11.80	0.42	0.36	0.19	0.14	0.28	0.07
Individual Risk	2.19	2.51	2.27	2.24						
Family Risk	*8.24	8.52	6.81	8.09	0.36	0.27	0.14	0.21	0.36	0.20
Neighborhood Risk	*1.03	2.02	0.99	1.47						

*p<.01

Table 4: Locality Differences in Exposure and Vulnerability to Risk Factors for Child Internalizing, Inhibitory Control Problems, and Problem Behavior Intensity

	Exposure			Vulnerability		
	Internalizing			Inhibitory Control Problems		
	Rural	Suburban	Urban	Rural	Suburban	Urban
Risk Measures						
Neighborhood Context						
Neighborhood Danger Observed	*7.74	6.63	8.44			
Neighborhood Danger Caregiver Transitions	*2.21	2.38	3.97			
	*0.34	0.56	0.30			
Family Context						
Financial Stress	3.32	3.36	3.26			
Treatment / Law Trouble	*0.64	0.91	0.61			
Child Abuse	*0.05	0.13	0.04			
Financial Aid	*2.37	2.69	2.95			
Income Need Ratio	*2.63	2.59	2.99	0.02	-0.09	0.11
Residential Density	0.95	0.96	0.89			
Conflict with child	27.85	27.97	29.01		0.36	0.30
Chaotic Home Environment	20.66	20.97	20.91		0.40	0.26
Daily Hassles	*43.58	47.42	49.60			
Marital Status	*2.79	2.51	3.84			
Individual Context						
Substance Use	*6.82	5.86	8.93			
Depression	*14.69	16.65	18.27			
Discrimination (age 3)	3.00	2.93	3.14			
Education	*5.09	4.79	4.71		-0.06	-0.02
						0.14
Risk Indices						
Total Risk	*10.55	11.43	12.90			
Individual Risk	2.26	2.13	2.47			
Family Risk	*7.28	8.28	8.56			
Neighborhood Risk	*1.04	1.02	1.85			
					0.30	0.34
						0.37

*p<.01

Table 5: Gender Differences in Exposure and Vulnerability to Risk Factors for Child Internalizing, Inhibitory Control Problems, and Problem Behavior Intensity

Risk Measures	Exposure		Vulnerability					
	Male	Female	Internalizing		Inhibitory Control Problems		Problem Behavior Intensity	
			Male	Female	Male	Female	Male	Female
Neighborhood Context								
Neighborhood Danger Observed	7.68	7.38			0.08	-0.11		
Neighborhood Danger Caregiver Transitions	2.94	2.91			-0.14	0.10		
	0.45	0.36						
Family Context								
Financial Stress	3.27	3.36						
Treatment / Law Trouble	0.76	0.71						
Child Abuse	0.08	0.06						
Financial Aid	2.75	2.68			-0.06	0.10		
Income Need Ratio	2.74	2.76	-0.03	0.04				
Residential Density	0.93	0.92						
Conflict with child	28.40	28.43						
Chaotic Home Environment	20.88	20.86						
Daily Hassles	47.55	46.98						
Marital Status	3.04	3.04						
Individual Context								
Substance Use	7.17	6.71						
Depression	16.81	16.62						
Discrimination (age 3)	2.97	3.08					-0.03	0.17
Education	4.79	4.83						
Risk Indices								
Total Risk	11.71	11.36					0.24	0.39
Individual Risk	2.18	2.17					0.07	0.28
Family Risk	8.18	8.01						
Neighborhood Risk	1.33	1.19						

*p<.01