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Heterogeneity in risk and protection among Alaska Native/ American Indian and non-Native children

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Abstract

Currently, little is known about patterns of co-occurring risk and protective factors among young children. Understanding variations in co-occurring risk and protective factors among children in Alaska is important as experiences of collective trauma may contribute to differences in the intersection of risk and protective factors between Alaska Native/American Indian (AN/AI) and non-Native children. Using data from the Alaska Longitudinal Child Abuse and Neglect Linkage (ALCANLink) project, a linkage of the 2009–2011 Alaska Pregnancy Risk Assessment Monitoring System survey and administrative data sources, and the 2012–2014 Childhood Understanding Behaviors Survey, we conducted latent class analysis to identify classes of AN/AI (N=593) and non-Native (N=1,018) children in terms of seven risk factors (poverty, maternal

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Compliance with Ethical Standards

Research involving human participants or animals. This study was reviewed and approved by the University of North Carolina Chapel Hill Institutional (UNC) Review Board (IRB). All procedures performed in studies involving human participants were in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent. The University of North Carolina Chapel Hill IRB ruled that informed consent was not required given the use of secondary de-identified data.

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depression, maternal binge drinking, parental incarceration, intimate partner violence exposure, other violence exposure, child maltreatment) and four protective factors (father figure involvement, reading by adults, family meals, peer interactions) experienced prior to age three years. We identified two classes among AN/AI children: 1) high risk-moderate protection (29.1%) and 2) low socioeconomic status-high protection (70.9%). We identified two classes among non-Native children: 1) moderate risk-high protection (32.9%) and 2) low risk-high protection (67.1%). A test of invariance revealed that risk and protective factor probabilities differed significantly for corresponding classes of AN/AI and non-Native children. Overall, results demonstrate heterogeneity within and between AN/AI and non-Native children in early experiences of risk and protection and suggest that interventions will be more effective if tailored to the experiences and developmental needs of specific demographic groups of Alaska children.

Keywords

Alaska Native/American Indian; child development; risk factors; protective factors

Early childhood is a period of rapid social, emotional, and cognitive development and thus a critical period for establishing the foundations for health and wellbeing across the life course (Braveman & Barclay, 2009; Shonkoff & Garner, 2012). During early childhood, development is influenced by factors that either undermine (i.e., risk factors) or promote (i.e., protective factors) optimal outcomes (Braveman & Barclay, 2009; Shonkoff & Garner, 2012). Factors that consistently demonstrate associations with poor child development include poverty (Bitsko, 2016; Chaudry & Wimer, 2016), parental mental health and substance use disorders (Kingston & Tough, 2014; Solis et al., 2012), parental incarceration (Geller et al., 2012; Turney, 2014), exposure to violence (Holt et al., 2008; Kitzmann et al., 2003), and alleged or experienced maltreatment (Gilbert et al., 2009; Naughton et al., 2013). While less well studied, a growing body of research suggests that positive aspects of interpersonal relationships, such as the child engaging in activities with a caring adult (Cprek et al., 2015; Shah et al., 2015), connecting with peers through frequent, high-quality social play (Engle et al., 2011; Eggum-Wilkens et al., 2014), and spending time with a father figure (Lee & Schoppe-Sullivan, 2017; McMunn et al., 2017) can function as protective factors in promoting optimal development, even in the context of risk.

Alaska children

Children in Alaska represent a population with substantial cultural and historical diversity and are an important population for gaining a comprehensive understanding of early experiences of risk and protection. In Alaska, approximately 18% of the population identifies as Alaska Native/American Indian (AN/AI) (Alaska Department of Labor and Workforce Development, 2018). Over multiple generations, the AN/AI population in Alaska has experienced substantial collective trauma in the form of widespread death due to the introduction of small pox, influenza, and tuberculosis into AN/AI communities, forced assimilation and separation of families during the “boarding school era”, high rates of placement of AN/AI into foster care, and land and resource seizures (Alaska Department of Health and Social Services, 2018; Easley et al., 2005). These experiences of collective

trauma have had profound and enduring effects on AN/AI people, families, and communities in Alaska and continue to influence the broader social and economic context surrounding health and wellbeing (Sarche et al., 2011). Specifically, experiences of collective trauma among the AN/AI population are posited to be reflected in and contribute to disproportionate exposure to multiple risk factors, such as poverty and parental mental health and substance use disorders, among AN/AI compared to non-Native children (Alaska Department of Health and Social Services, 2018; Evans-Campbell, 2008).

Despite the lasting effects of collective trauma on experiences of risk among AN/AI children, there are also important sources of strength and resilience among the AN/AI population that co-occur with documented risks (Sarche et al., 2011). Various professionals have called for increased integration of protective factors into research and services for AN/AI children. Importantly, because there are substantial differences in both historical and contemporary experiences among the AN/AI and non-Native populations in Alaska, there may be differences in not only the prevalence of risk and protective factors between AN/AI and non-Native children, but also in the co-occurrence of risk and protective factors, with subsequent implications for how to effectively target and tailor early childhood intervention efforts.

Individual and cumulative risk models

To understand risk factors experienced in early childhood, previous research has primarily relied on two types of models: individual and cumulative risk models (Burchinal et al., 2000; Evans et al., 2013; Menard et al., 2004; Rhoades et al., 2011). In individual risk models, the focus is on the effect of a single risk factor. In cumulative risk models, the focus is on the effect of accumulating risks, typically done by creating a cumulative risk score. A smaller, related body of research has focused on the modifying effects of single protective factors in individual and cumulative risk models (McMunn et al., 2017; Shah et al., 2015). While results from this research contribute substantially to our understanding of risk and protective factors experienced by children, these models have notable limitations. By focusing on a single risk factor, individual risk models often fail to account for the fact that risk factors are not independent and tend to co-occur (Burchinal et al., 2000; Evans et al., 2013). A drawback of cumulative risk models is that individual risk factors are often treated as interchangeable, such that children who have experienced very different types of risk factors are grouped together (Burchinal et al., 2000; Evans et al., 2013). Moreover, in individual and cumulative risk models, our ability to assess differences in associations between multiple risk and protective factors is limited, thereby limiting our ability to understand multiple co-occurring factors.

Latent class analysis

Latent class analysis (LCA) is a statistical method with the potential to address some of the limitations of individual and cumulative risk models. In LCA, the goal is to identify classes of individuals such that those within a class are similar to each other, but different from those in other classes, on a set of observed variables (McCutcheon, 1987). As such, LCA is a useful tool for describing differences in patterns of multiple variables between individuals

(Collins & Lanza, 2013). Several studies have used LCA to identify classes of children with similar experiences of risk factors (Cavanaugh et al., 2015; Grasso et al., 2016; Menard et al., 2004; Rhoades et al., 2011). However, this research has largely focused on identifying patterns of risk factors in isolation from co-occurring protective factors, providing an incomplete understanding of the larger context surrounding early development. This is an important limitation, as protective factors are not merely the absence of risk factors, and the experience of protective factors has been shown to have the potential to mitigate the adverse effects of exposure to risk. For example, data from the Fragile Families and Child Wellbeing Study showed that father engagement, including playing, reading, or singing with the child, attenuated the association between family poverty and child behavior problems (Lee & Schoppe-Sullivan, 2017). Several studies have found that among low-income children enrolled in Head Start, social play with peers was associated with improved child social and cognitive development over time (Van Ryzin et al., 2015; Sanders & Guerra, 2016).

Aims

The aims of the present study were to 1) identify, stratified by AN/AI and non-Native status, classes of children with similar patterns of risk and protective factors experienced from birth until approximately age 3 years and 2) examine differences and similarities in the probability of risk and protective factors between classes of AN/AI and non-Native children.

Methods

Data sources

We used data from the Alaska Longitudinal Child Abuse and Neglect Linkage (ALCANLink) Project, a population-representative data source linking 2009–2011 Alaska Pregnancy Risk Assessment Monitoring System (PRAMS; N=3,549) data with administrative data sources. Alaska PRAMS is a population-based survey that collects self-reported information on maternal behaviors and experiences before, during, and after delivery of a live-born infant through a mailed paper and pencil or telephone-based questionnaire. Each year, Alaska PRAMS samples approximately one in six live births through a stratified systematic sample of the state's birth certificate file, stratified by maternal race (AN/AI vs. non-Native) and birth weight (<2,500 grams vs. ≥2,500 grams). In ALCANLink, Alaska PRAMS respondents were linked to administrative data sources via the birth certificate file. Administrative data sources included data from the Alaska Office of Children's Services (OCS; Alaska's child protective services agency), Alaska Child Death Review, and death certificates. Additional details on data sources and linkage are provided elsewhere (Parrish et al., 2017).

We combined data from ALCANLink with data from the 2012–2014 Alaska Childhood Understanding Behaviors Survey (CUBS; N=1,699). CUBS is a follow-up survey to Alaska PRAMS conducted shortly after the child's third birthday that collects data on child health and experiences. Alaska PRAMS respondents living in Alaska and with their child at the time of CUBS administration are eligible to participate through a mailed paper and pencil or telephone-based questionnaire (Alaska Department of Health and Social Services, 2015).

The overall 2012–2014 CUBS participation rate was 48% of 2009–2011 Alaska PRAMS respondents.

Measures

Alaska Native/American Indian and non-Native status.—We categorized AN/AI or non-Native status based on maternal race as reported on the birth certificate. During 2009–2011, the Alaska birth certificate did not allow for multiple racial or cultural identities to be reported.

Risk factors.—We derived seven dichotomous risk factors experienced from birth until age three years using the mother's responses to the CUBS survey when the child was 3 years old (Supplemental Table 1). Risk factors included low socioeconomic status (SES), maternal binge drinking, maternal depressive symptoms, parental incarceration, maternal experience of intimate partner violence (IPV), child exposure to violence, and child contact with CPS for alleged maltreatment prior to age three years.

Protective factors.—We derived four protective factors experienced by the child from birth until age three years using responses from the CUBS data (Supplemental Table 1). Protective factors included father figure involvement, reading by an adult, family meals, and peer interactions. Protective factor categorization was based on the response options provided on CUBS, an examination of the distribution of responses given, and a review of the relevant research literature (Cprek et al., 2015).

Statistical analysis

We conducted latent class analysis (LCA) separately by AN/AI and non-Native status to identify children with similar patterns of risk and protective factors. In LCA, two parameters are estimated using maximum likelihood estimation: latent class prevalences, indicating the size of each class, and item-response probabilities, indicating the probability of a particular risk or protective factor within each class (Collins & Lanza, 2013). To determine the number of classes that best fit the data, we fit a series of latent class models specifying one to six classes. We used several indices of statistical fit to select among competing models. We used four information criteria including the Akaike Information Criterion (AIC), sample size adjusted Bayesian Information Criterion (ssBIC), Bayesian Information Criterion (BIC), and consistent Akaike Information Criterion (cAIC), with lower values indicating a more optimal balance of model fit and model parsimony (McCutcheon, 1987). We also used the Lo-Mendell-Rubin adjusted likelihood ratio test to examine the fit of a K-1 class model to that of a K class model, with a p-value<0.05 indicating the K class model was a significantly better fit to the data (Collins & Lanza, 2013). We used entropy, a measure of the degree to which the model produces classes that are well separated, as a descriptive measure of the final model given that entropy can be a poor tool for model selection (Collins & Lanza, 2013). We also considered the absolute and relative frequencies of the smallest class and the interpretability of each identified class. To protect against locally optimal solutions, we specified that each estimated latent class model begin with 1,000 random start values, optimizing the best 100, and confirmed that the maximum log likelihood value was replicated.

Because we found that the same number of classes provided the best fit among AN/AI and non-Native children, we examined invariance of the final latent class model. This allowed us to determine whether a single model for both AN/AI and non-Native children was sufficient, or whether separate models by AN/AI and non-Native status were indicated (i.e., the nature of the identified latent classes differed by AN/AI vs. non-Native status). Specifying the previously determined number of classes, we compared the fit of a latent class model in which risk and protective factor probabilities were freely estimated by AN/AI and non-Native status to that of a latent class model in which probabilities were constrained to be equal by status (Collins & Lanza, 2013). Model comparison was based on a likelihood ratio test ($G^2\Delta$) with a p-value<0.05 indicating that one or more risk or protective factor probabilities differed by AN/AI and non-Native status and supporting the use of separate models for AN/AI and non-Native children (Collins & Lanza, 2013). We then compared individual risk and protective factor probabilities in corresponding classes of AN/AI and non-Native children using Wald Chi-Square tests (Collins & Lanza, 2013).

We conducted data management in SAS 9.4 and statistical analyses in Mplus 8. Mplus generates latent class parameter estimates using the full information maximum likelihood procedure to address missingness for class indicators (i.e., risk and protective factors). All analyses accounted for the complex sampling design of Alaska CUBS. Results are representative of the entire population of mothers who delivered a live born infant in Alaska in 2009–2011 (Alaska Department of Health and Social Services, 2015). This study was reviewed and approved by the Institutional Review Board (IRB) at the University of North Carolina Chapel Hill. Alaska PRAMS and CUBS are reviewed by the IRB at the University of Alaska Anchorage and PRAMS is reviewed by the IRB at the Centers for Disease Control and Prevention.

Results

The prevalence of the risk and protective factors used to define the latent classes is presented in Table 1. AN/AI children had a statistically significantly higher prevalence of low SES (69.3% vs. 33.8%), parental incarceration (17.0% vs. 3.6%), maternal experience of IPV (9.2% vs. 3.2%), exposure to violence (8.6% vs. 3.1%), and contact with CPS for alleged maltreatment (27.6% vs. 8.4%) compared to non-Native children. AN/AI children had a statistically significantly lower prevalence of being read to by an adult 7 days per week (27.8% vs. 52.4%) and having regular interactions with peers outside of the family (70.1% vs. 83.9%) compared to non-Native children. Further information on the demographic characteristics of study population are provided in Supplemental Table 2.

Class enumeration

Based on model fit statistics (Table 2), we selected the two-class model for both AN/AI and non-Native children. The BIC, cAIC, and the Lo-Mendell-Rubin adjusted likelihood ratio test each indicated that a two-class model best fit the data for AN/AI children and for non-Native children. We conducted a likelihood ratio test of invariance revealed that one or more risk or protective factor probabilities differed significantly in corresponding latent classes for AN/AI and non-Native children ($G^2\Delta$ =52.753, p=0.000245). This indicated that the nature

of the identified latent classes differed by AN/AI vs. non-Native status and that separate two-class models for AN/AI and non-Native children were needed.

Class description

Figure 1 plots the probability of each risk and protective factor in the identified latent classes for AN/AI and non-Native children. Individual probabilities are provided in Table 3. Among AN/AI children, class 1 comprised 29.1% of the sample and was characterized by a high probability (>0.50) of low SES (0.861), CPS contact (0.603), father figure involvement 7 days per week (0.572), reading by an adult <4 days per week (0.575), family meals 7 days per week (0.685), and regular peer interactions (0.569). Class 1 was also characterized by moderate probabilities of maternal depressive symptoms (0.444), parental incarceration (0.442), and child violence exposure (0.331). Class 2 comprised 70.9% of the sample and was characterized by a high probability of low SES (0.628), father figure involvement 7 days per week (0.837), family meals 7 days per week (0.813), and regular peer interactions (0.746).

Among non-Native children, class 1 comprised 32.9% of the sample and was characterized by a high probability of low SES (0.599), father figure involvement 7 days per week (0.534), family meals 7 days per week (0.667), and regular peer interactions (0.757). Class 1 was also characterized by a moderate probability of maternal depressive symptoms (0.304) and reading by an adult 4–6 days per week (0.494). Class 2 was characterized by a high probability of father figure involvement 7 days per week (0.874), reading by an adult 7 days per week (0.648), family meals 7 days per week (0.819), and regular peer interactions (0.878).

Class comparison by Alaska Native/American Indian and non-Native status

Class 1 and class 2 among AN/AI children were characterized by a statistically significantly higher probability of low SES, parental incarceration, CPS contact for alleged maltreatment, child violence exposure, and reading by an adult <4 days per week compared to corresponding classes among non-Native children (Supplemental Table 3). In addition, class 1 and class 2 among AN/AI children had a statistically significantly lower probability of regular peer interactions compared to corresponding classes among non-Native children.

Discussion

Existing research has focused on the effects of individual risk factors and accumulating risks in child development with a smaller body of research examining the effects of individual protective factors. More recently, researchers have used LCA to identify patterns of risk factors among young children. The purpose of the present study was to build on prior research by identifying patterns of co-occurring risk and protective factors among young children in Alaska to provide a more comprehensive understanding of underlying heterogeneity in early experiences both within and between AN/AI and non-Native children. To the best of our knowledge, this is the first study to examine co-occurring risk and protective factors experienced during early childhood.

Heterogeneity within Alaska Native/American Indian and non-Native children

Overall, the results provide evidence that there are differences in the co-occurrence of risk and protective factors experienced by AN/AI and non-Native children. We identified two classes among AN/AI children: 1) a smaller class characterized by a high probability of multiple risk factors and 2) a larger class characterized by a high probability of low SES and most protective factors. We also identified two classes among non-Native children: 1) a smaller class characterized by a high probability of low SES, maternal depressive symptoms, and most protective factors and 2) a larger class characterized by a high probability of all protective factors. These classes reveal underlying heterogeneity within each population and highlight specific risk and protective factors that tend to co-occur. Examining co-occurring risk and protective factors among AN/AI and non-Native children separately is important given that experiences of collective trauma have the potential to contribute to differences in the intersection of risk and protective factors between populations.

Class 1 among AN/AI children was comprised of several co-occurring risk and protective factors including low SES, CPS contact for alleged maltreatment, maternal depressive symptoms, parental incarceration, child exposure to violence, father figure involvement 7 days per week, reading by an adult <4 days per week, family meals 7 days per week, and regular interactions with peers. Notably, although this class was characterized by a high probability of multiple risk factors, it was also characterized by a high probability of several protective factors. This finding suggests that early intervention efforts aimed at promoting wellbeing among at-risk AN/AI children should be multifaceted and tailored to children's experiences of multiple sources of adversity, particularly poverty, violence, poor maternal mental health, and separation of families due to parental incarceration. It also points to the possibility of designing early interventions to target and enhance the quality of existing sources of strength, such as father figure involvement or family meals, as a strategy for mitigating adverse experiences among AN/AI children. In class 2 among AN/AI children, co-occurring risk and protective factors included low SES, father figure involvement 7 days per week, family meals 7 days per week, and regular interactions with peers. Although this class was characterized by a high probability of low SES, it was also characterized by a high probability of multiple protective factors, revealing substantial resilience despite economic hardship. Importantly, class 2 represented approximately two-thirds of AN/AI children, indicating that most AN/AI children do not live in high risk environments.

In class 1 among non-Native children, risk and protective factors that clustered together included low SES, maternal depressive symptoms, father figure involvement 7 days per week, reading by an adult 4–6 days per week, family meals 7 days per week, and regular peer interactions. In class 2, factors that co-occurred included father figure involvement 7 days per week, reading by an adult 7 days per week, family meals 7 days per week, and regular peer interactions. These findings indicate that low SES and maternal depressive symptoms are common risk factors among non-Native children and may be important targets for early intervention in this population. These findings also indicate that protective factors such as father figure involvement, reading, family meals, and interactions with peers are common among non-Native children, offering insights into potential sources of strength to reinforce in intervention efforts.

Heterogeneity between Alaska Native/American Indian and non-Native children

Though we found a similar two-class solution among AN/AI and non-Native children, we found evidence of heterogeneity between classes of AN/AI and non-Native children. In terms of individual risk and protective factors, corresponding classes differed in the probability of low SES, parental incarceration, CPS contact, reading by an adult, and regular interactions with peers. As these differences have implications for the services that may be needed and effective in each population, potential drivers of such heterogeneity are worth further consideration.

The finding that the probability of low SES was significantly higher among both classes of AN/AI children compared to non-Native children is consistent with U.S. census data indicating a higher prevalence of poverty among AN/AI families compared to non-Native families (United States Census Bureau, 2016). Given the high probability of low SES among both classes of AN/AI children (>0.60). The high probability of low SES among AN/AI children may be indicative of broader economic challenges encountered by the AN/AI population such as poor availability and stability of jobs in rural areas of Alaska (Driscoll et al., 2010; Zuckerman et al., 2004). It may also reflect societal-level factors such as discrimination that undermine educational and employment opportunities for AN/AI people (Evans-Campbell, 2008). Of note, our measure of economic disadvantage was based on annual income below the Federal Poverty Level and child participation in Medicaid or CHIP. Subsistence lifestyles are common in AN/AI communities (Magdanz et al., 2016), and thus there may be additional family resources not captured by our traditional definition of SES. However, even families participating in subsistence activities for food, fuel, or shelter need sufficient monetary resources to meet basic needs in modern society. Thus, addressing poverty and its underlying causes among the AN/AI population through both individual- and policy-level interventions will likely be important.

Among both classes of AN/AI children, the probability of parental incarceration and child contact with CPS for alleged maltreatment was significantly higher compared to non-Native children. These risk factors reflect child and family interaction with systems, specifically the criminal justice and child welfare systems. Previous studies have considered competing explanations for disproportionate incarceration and CPS contact among minority populations (Drake et al., 2011; Mauer, 2011). In this research, it is difficult to determine whether racial differences are due to differing distributions of other factors, such as poverty and substance abuse, between populations, racial bias, or both. As these systems-level interactions have been shown to undermine child development (Geller et al., 2012; Hussey et al., 2005), determining the causes of disproportionate contact among AN/AI families is key to developing appropriate prevention strategies.

The probability that the child was read to by an adult 7 days or 4–6 days per week was significantly lower among both classes of AN/AI children compared to non-Native children. Previous research shows multiple benefits of reading aloud by an adult for young children including enhanced social, emotional, and cognitive development (Mendelsohn et al., 2018), strengthened parent-child relationships (Tomopoulos et al., 2006), and promotion of school readiness (Duursma et al., 2008). In some AN/AI communities, reading may not be prioritized until school entry (M. Castaneda, personal communication, May 14, 2018.).

Parents and adults may engage in other activities with young children such as fishing, drumming, and storytelling (M. Castaneda, personal communication, May 14, 2018.). While the positive effects of reading by an adult have been well researched (Duursma et al., 2008; Mendelsohn et al., 2018; Tomopoulos et al., 2006), other activities relevant to the AN/AI culture have received less attention in the peer-reviewed literature. This may be because these activities do not confer the same developmental or school readiness benefits as reading, or this may be due to the fact that activities aligned with the dominant, non-Native culture are often given greater priority in scientific research (Walls et al., 2017). Understanding the potential benefits of culturally-relevant activities for AN/AI children's development by including such measures in future research will be important to determining whether promotion of early reading should be prioritized in the AN/AI population.

We also found that the probability of playing with children outside of the family on a regular basis was significantly lower among both classes of AN/AI children compared to non-Native children. In AN/AI communities, greater emphasis may be placed on interactions with children in the immediate and extended family than with children outside of the family (M. Castaneda, personal communication, May 14, 2018.). In addition, in smaller, rural communities, geographic isolation may limit opportunities for play with non-relative children. While interactions with siblings and other relatives can provide opportunities for developmentally appropriate social interactions, some studies have found that peer interactions confer specific developmental benefits for child development as these relationships are often more symmetric and reciprocal (Engle et al., 2011).

Though we found several differences between corresponding classes of AN/AI and non-Native children, it is important to note that we also found several similarities. We found no significant differences in the probability of maternal binge drinking, maternal depressive symptoms, father figure involvement, and family meals between corresponding classes of AN/AI and non-Native children. Class 1 among both AN/AI and non-Native children was characterized by a moderate probability of maternal depressive symptoms, suggesting this risk factor is a common challenge regardless of AN/AI or non-Native status. There were no significant differences in the probability of maternal binge drinking between corresponding classes of AN/AI and non-Native children, challenging stereotypes regarding maternal substance use among AN/AI mothers. Both classes of AN/AI and non-Native children were characterized by a high probability of father figure involvement and family meals 7 days per week, underscoring the presence of potential sources of protection among most AN/AI and non-Native children. Moreover, though the prevalence of maternal experience of IPV was higher among the overall population of AN/AI compared to non-Native children, class 2 among AN/AI and non-Native children did not differ with respect to the probability of this risk factor, indicating that only a portion of AN/AI children have an increased likelihood of IPV exposure compared to non-Native children.

Limitations

Several limitations are important to note. First, data from Alaska CUBS are based on maternal self-report and are subject to limitations common to self-report data including social desirability, recall, and non-response bias. In the case of missing data for the risk and

protective factors used to define latent classes, parameter estimates were generated using the full information maximum likelihood procedure, addressing issues related to differential non-response to these items (Enders, 2010). Second, data on protective factors, including father figure involvement, family meals, and peer interactions, did not include indicators of the quality of these relationships or activities, which may have important implications for child development. Third, stratifying analyses by AN/AI and non-Native status represents a crude stratification that fails to capture considerable diversity within both populations. Data including maternal and child cultural or tribal affiliation, region of residence, and multi-racial/ethnic background were not available from our data sources. Even so, examining patterns of both risk and protective factors stratified AN/AI and non-Native children furthers our understanding of early experiences among Alaska children, a population that has received relatively little attention in the extant research literature and provides insight into heterogeneity in these early experiences among populations of Alaska children with substantial cultural and historical diversity. Fourth, the 2012–2014 CUBS participation rate was 48% of 2009–2011 Alaska PRAMS respondents. CUBS non-participants differed from participants on some factors measured on Alaska PRAMS. For example, non-participants were younger in age at childbirth (26.2 vs. 27.6 years) and had a higher prevalence of financial (52.9% vs. 47.8%) and partner (29.7% vs. 24.2%) stress in the 12 months prior to childbirth compared to CUBs participants. However, participants and non-participants did not differ with respect to several other factors including maternal substance use during pregnancy (35.0% vs. 32.8%) and traumatic (22.7% vs. 21.8%) and emotional (19.8% vs. 20.0%) stress in the 12 months prior to childbirth. Notably, most observed differences between participants and non-participants were small in magnitude.

Conclusion

Results from this study suggest that there are differences in patterns of co-occurring risk and protective factors within and between AN/AI and non-Native children in Alaska. The results offer valuable insights into early experiences of risk and protection, providing a more comprehensive understanding of the larger context surrounding early development and underscoring the importance of considering both risk and protective factors in research and practice. Although more research is needed, the results indicate that taking a one-size-fits-all approach to promoting healthy development among AN/AI and non-Native children is likely not appropriate. Early intervention programs may be more effective if tailored to the experiences and developmental needs of specific groups of Alaska children. In particular, given the high probability of low SES among both classes of AN/AI children and one class of non-Native children, poverty reduction strategies may be important for several groups of Alaska children. Future research should build on the present study by collecting data on additional factors, such as neighborhood and community context, that may influence early experiences of risk and protection, considering culturally-relevant protective factors for AN/AI children, conducting LCA to identify patterns of risk and protective factors in additional child populations to further our understanding of heterogeneity in early experiences among diverse groups of children, and exploring the causes and consequences of various risk and protective factor patterns among various populations of children.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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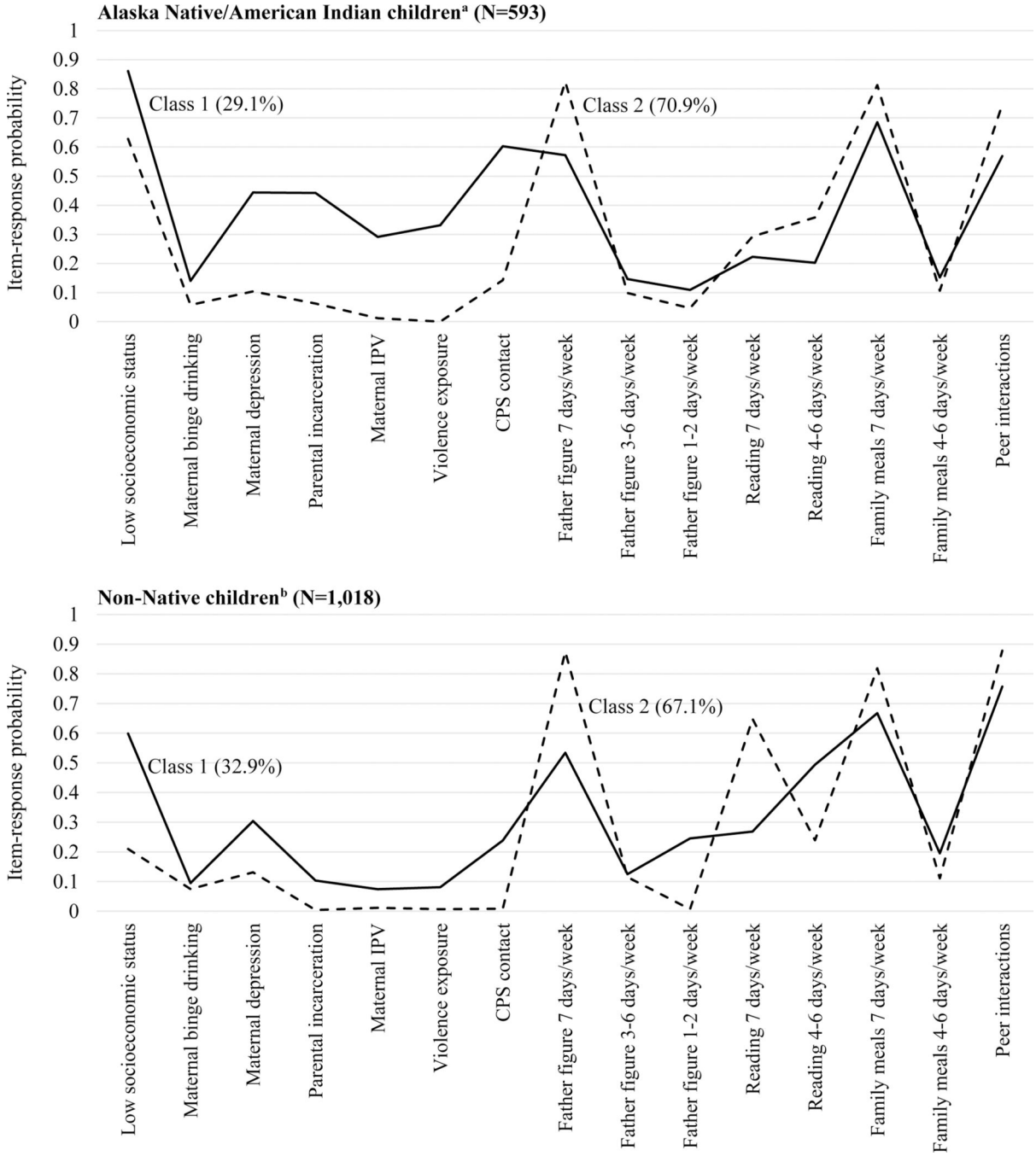

Figure 1.

Probability of risk and protective factors in identified latent classes by Alaska Native/ American Indian and non-Native status

[a]Interpretation of classes for Alaska Native/American Indian children: Class 1=high risk-moderate protection; Class 2=low socioeconomic status-high protection. [b]Interpretation of classes for non-Native children: Class 1=moderate risk-high protection; Class 2=low risk-high protection

Table 1.

Prevalence of risk and protective factors by Alaska Native/American Indian and non-Native status

	Alaska Native/American Indian children (N=593)		Non-Native children (N=1,018)		
	N	%[a] (95% CI)	N	%[a] (95% CI)	χ^2 p-value
Low socioeconomic status					<0.0001
No	175	30.7 (26.8, 34.6)	692	66.2 (62.2, 70.1)	
Yes	402	69.3 (65.4, 73.2)	323	33.8 (29.9, 37.9)	
Maternal binge drinking					0.9558
No	517	91.9 (89.7, 94.2)	914	91.8 (89.6, 94.1)	
Yes	50	8.1 (5.8, 10.3)	66	8.2 (29.9, 37.8)	
Maternal depressive symptoms					0.5296
No	468	79.7 (76.2, 83.1)	811	81.2 (78.0, 84.4)	
Yes	114	20.3 (16.9, 23.8)	201	18.8 (15.6, 22.0)	
Parental incarceration					<0.0001
No	475	83.0 (79.7, 86.2)	966	96.4 (94.7, 98.0)	
Yes	102	17.0 (13.8, 20.3)	44	3.6 (2.0, 5.3)	
Maternal experience of intimate partner violence					<0.0001
No	521	90.8 (88.5, 93.2)	976	96.8 (95.3, 98.3)	
Yes	59	9.2 (6.8, 11.5)	35	3.2 (1.7, 4.7)	
Child violence exposure					0.0004
No	503	91.4 (89.0, 93.9)	973	96.9 (96.4, 98.5)	
Yes	51	8.6 (6.1, 11.0)	30	3.1 (1.5, 4.6)	
Child protective services contact					<0.0001
No	424	72.4 (68.6, 76.2)	924	91.6 (88.2, 94.0)	
Yes	166	27.6 (23.8, 31.4)	94	8.4 (6.0, 10.8)	
Father figure involvement in typical week					0.1340
7 days	421	76.8 (73.1, 80.5)	779	76.3 (72.7, 80.0	
3–6 days	59	11.0 (8.3, 13.7)	121	11.8 (9.2, 14.4)	
1–2 days	38	6.2 (4.1, 8.2)	66	8.4 (5.9, 11.0)	
0 days	33	6.0 (3.8, 8.2)	31	0.8 (1.7, 5.0)	
Reading by an adult in past week					<0.0001
7 days	149	27.8 (23.8, 31.7)	540	52.4 (48.4, 56.5)	
4–6 days	180	31.8 (27.7, 35.8)	311	32.2 (28.3, 36.1)	
<4 days	212	40.4 (36.1, 44.8)	150	15.4 (12.4, 18.4)	
Family meals in past week					0.4995
7 days	425	77.8 (74.2, 81.4)	779	76.9 (73.5, 80.4)	
4–6 days	92	16.2 (13.0, 19.3)	173	18.3 (15.0, 21.5)	
<4 days	32	6.1 (4.0, 8.2)	49	4.8 (3.1, 6.5)	
Peer interactions					<0.0001
No	158	29.9 (25.9, 33.9)	158	16.1 (62.2, 70.1)	

	Alaska Native/American Indian children (N=593)		Non-Native children (N=1,018)		
	N	%[a] (95% CI)	N	%[a] (95% CI)	χ^2 p-value
Yes	392	70.1 (66.1, 74.1)	838	83.9 (80.8, 87.0)	

[a]All percentages are weighted to account for the complex sampling design of the Childhood Understanding Behaviors Survey

Table 2.

Latent class analysis fit statistics by Alaska Native and non-Native status

Alaska Native/American Indian children (N=593)								
Number of Classes	**Parameters**	**Loglikelihood**	**AIC**	**BIC**	**CAIC**	**ssBIC**	**Entropy**	**LMR adj. LRT (p-value)**
1	15	−3460.96	6951.92	7017.63	7032.63	6970.01	NA	NA
2	31	−3334.50	6731.00	6866.78	6897.78	6768.37	0.668	250.31 (0.000)
3	47	−3297.34	6688.68	6894.54	6941.54	6745.33	0.689	73.60 (0.3032)
4	63	−3266.67	6659.34	6935.28	6998.28	6735.28	0.719	60.75 (0.4226)
5	79	−3241.14	6640.27	6986.30	7065.30	6735.50	0.765	50.54 (0.1688)
6	95	−3220.52	6631.04	7047.15	7142.15	6745.55	0.753	40.83 (0.6837)
Non-Native children (N=1,018)								
Number of Classes	**Parameters**	**Loglikelihood**	**AIC**	**BIC**	**CAIC**	**ssBIC**	**Entropy**	**LMR adj. LRT (p-value)**
1	15	−5050.69	10131.39	10205.27	10220.27	10157.63	NA	NA
2	31	−4928.32	9918.64	10071.34	10102.34	9972.88	0.541	242.56 (0.0501)
3	47	−4884.22	9862.44	10093.94	10140.94	9944.67	0.552	87.41 (0.4774)
4	63	−4855.05	9836.09	10146.41	10209.41	9946.31	0.656	57.83 (0.3639)
5	79	−4824.08	9806.17	10195.29	10274.29	9944.38	0.688	61.44 (0.7787)
6	95	−4805.06	9800.11	10268.04	10363.04	9966.31	0.727	37.72 (0.8239)

Note: LMR adj. LRT=Lo-Mendell-Rubin adjusted likelihood ratio test

Table 3.

Probability of risk and protective factors in identified latent classes by Alaska Native/American Indian and non-Native status

	Alaska Native/American Indian children (N=593)[a]		Non-Native children (N=1,018)[b]	
	Class 1 (29.1%)	**Class 2** (70.9%)	**Class 1** (32.9%)	**Class 2** (67.1%)
Low socioeconomic status				
No	0.139	0.372	0.401	0.790
Yes	0.861	0.628	0.599	0.210
Maternal binge drinking				
No	0.860	0.943	0.905	0.925
Yes	0.140	0.057	0.095	0.075
Maternal depressive symptoms				
No	0.556	0.896	0.696	0.869
Yes	0.444	0.104	0.304	0.131
Parental incarceration				
No	0.558	0.938	0.897	0.996
Yes	0.442	0.062	0.103	0.004
Maternal experience of intimate partner violence				
No	0.709	0.988	0.926	0.989
Yes	0.291	0.012	0.074	0.011
Child protective services contact				
No	0.397	0.858	0.762	0.992
Yes	0.603	0.142	0.238	0.008
Child violence exposure				
No	0.669	1.000	0.919	0.993
Yes	0.331	0.000	0.081	0.007
Father figure involvement in typical week				
7 days	0.572	0.837	0.534	0.874
3–6 days	0.146	0.098	0.125	0.115
1–2 days	0.109	0.046	0.245	0.007
0 days	0.173	0.020	0.095	0.004
Reading by an adult in past week				
7 days	0.223	0.293	0.268	0.648
4–6 days	0.202	0.358	0.494	0.239
<4 days	0.575	0.349	0.238	0.113
Family meals in past week				
7 days	0.685	0.813	0.667	0.819
4–6 days	0.151	0.106	0.195	0.111
<4 days	0.164	0.081	0.138	0.070
Peer interactions				
No	0.431	0.254	0.243	0.122

	Alaska Native/American Indian children (N=593)[a]		Non-Native children (N=1,018)[b]	
	Class 1	**Class 2**	**Class 1**	**Class 2**
Yes	0.569	0.746	0.757	0.878