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Patterns of Risk and Resilience: Cluster Analysis and the Relation to Later Outcomes

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Abstract

This study identifies specific patterns of risk and protective factors using a person-centered approach (cluster analysis) in low-income ethnic-minority early adolescents, and then used variable centered approaches to examine how these patterns are related to developmental outcomes 6 years later. The present study used data from Welfare, Children, and Families: A Three Cities Study, and comprised of 939 African American and Latino adolescents ages 10-14 at the initial assessment. Three distinct clusters of risk and protective variables were identified; one cluster was high on protective factors, one high on risk factors, and another mixed. These risk, protective, and mixed clusters assessed at wave 1 were then differentially related to delinquency, psychological distress, peer and romantic relationships, and sexual history at wave 3 (6 years after the first assessment). Individuals in the protective cluster were more likely to have positive developmental outcomes, and individuals in the risk cluster were more likely to display negative adaptation. These results indicate that different variables come together in common ways to distinguish children in low-income minority families, and that these patterns predict later outcomes. Identifying these patterns is important in order to target those individuals and help them overcome their risks, increase positive factors, and promote resilient outcomes.
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Introduction

In the United States, 42% of children (31,298,590) are in low-income families, and 21% of children (15,616,423) live below the federal poverty level (Addy & Wight, 2012). This is particularly alarming because socioeconomic disadvantage can have detrimental effects on IQ, achievement, and socioemotional functioning, as well as have negative impacts on a child’s health (Garmezy, 1993; Rutter, 1979; Werner & Smith, 1982, 1992). Low income children experience less social support, are exposed to increased family turmoil, and are more likely to live in neighborhoods that are dangerous, offer lower quality municipal services, and have increased air and water pollution (Evans, 2004).

Minority children are particularly at risk for experiencing the negative effects of socioeconomic disadvantage; though research on ethnic minorities is limited, minority children are overrepresented in the at-risk population, with over 70 percent of children in low-income families being ethnic minorities (Addy & Wight, 2012). Perhaps as a result of their greater likelihood for living in socioeconomically disadvantaged households, much higher proportions of ethnic minority youth live in dangerous, disordered neighborhoods, when compared to European American children (McLoyd, 1998). Unsurprisingly, ethnic minority youth are also more likely than European American children to experience violence, be exposed to drug and alcohol use, and to experience teenage pregnancy (Vargas & Willis, 1994). The interplay of environmental and social conditions that minority youth are more likely to be exposed to may predispose those youth to negative outcomes (Ramos, Jaccard, & Guilamo-Ramos, 2003). These negative
outcomes can be demonstrated through multiple indicators, including poor psychosocial competence, psychopathology, and health (Masten, 2001; Rutter, 1979).

Nonetheless, the bleak picture of these negative outcomes as the inevitable result of poverty that has been painted by research findings such as those above is misleading. Not all children who grow up in poverty display negative outcomes later in life. This is reassuring, as it indicates that something can be done to ameliorate the negative effects that are associated with poverty. However, in order to establish targeted interventions for minority children growing up in poverty, research must first establish what differentiates children with negative outcomes from those who display positive adaptation.

What factors put a child at risk?

Socioeconomic disadvantage is associated with a wide variety of factors that can impact a child and lead to later negative adaptation; these factors are identified in the literature as risk factors. Risk factors are aspects of the child and his or her environment that have been shown to increase the likelihood for poor outcomes (Garmezy & Rutter, 1983; Werner, 1995). Risk can impact individuals of all ages; psychological disorders have been shown to be related to risk factors such as poverty and family psychiatric history as early as two years old (Briggs-Gowan, Carter, Skuban, & Horwitz, 2001; Egger & Angold, 2006). In addition, risk factors in childhood have been associated with adverse outcomes 30 years later (Werner & Smith, 1982; Werner & Smith, 1992). The examination of risk factors is particularly important when investigating the development of children who are raised in poverty, because they are more likely to experience a wide variety of risk factors from birth onward (Evans, 2004; Garmezy, 1993). In addition,
poverty can also result in additional environmental risk factors in the family and neighborhood that are associated with negative outcomes (Anderson & Mayes, 2010).

It is does not surprise that there is rarely just one risk factor impacting an individual; instead, research strongly suggests that risk factors tend to cluster together in the same individual (Carnegie Council on Adolescent Development, 1995; Gutman, Sameroff, & Eccles, 2002). Researchers have consistently found that it is not any particular risk factor, but rather the accumulation of a number of risk factors experienced that impacts developmental outcomes (Rutter, 1979; Sameroff, Seifer, Baldwin, & Baldwin, 1993; Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987). For example, in Rutter’s (1979) study of cumulative risk, the risk of a psychiatric disorder in 10-year olds rose from 2% in families with one or fewer risk factors to 20% in families with four or more risk factors.

Research that has been conducted on the topic of child development has frequently treated risk factors as discrete rather than interdependent. This view of risk factors as distinct and separable arises primarily from the traditional “medical model” that is dominant in the field of psychology (Sroufe, 1997). The medical model embraces a view where disorders are often seen as discrete and arising from singular and endogenous causes (Sroufe, 1997; Rutter, 1996). Many researchers have argued that a singular focus on an individual risk factor fails to capture the complexity of any phenomena (Luthar, 2006; Sroufe, 1997). For research to adequately capture the picture of children’s developmental context, it is important to understand that risk factors do not occur in isolation and instead have interactional effects with each other and with the child (Garber, 2010).
If one moves away from the medical model and towards a developmental model, a more complete view of development emerges. Within the developmental model, in contrast to the medical model, the child and the context are viewed as inseparable, and behavioral and emotional disturbance is viewed as developmental adaptation (Sroufe, 1997). With a developmental model, one moves away from the search for a singular linear ‘cause’ and towards the search for a complex interaction of influences that may initiate a developmental pathway towards dysfunction (Sroufe, 1997). In this view, the etiology of disturbance is not singular, but a combination of diverse risk and protective factors.

One particular theoretical model of development was posited in 1979 by Urie Bronfenbrenner. This ecological systems theory of development argues that factors within the child, his or her immediate environment, and his or her larger contextual environment can impact a child’s developmental trajectory. These influential systems can put a child at risk for adverse outcomes and exist at many levels; the micro system includes environments that directly effect a child (such as family and peers), the mesosystem involves the relationships between microsystems (such as the relationship between the child’s parent and school), the exosystem involves a larger environmental context that the individual participates in (such as a school district), and the macrosystem as an even larger cultural context (such as socioeconomic status or ethnicity). Each of the different levels of this model are contexts which can affect a child; risk factors within the child can include male gender (Rutter, 1979; Werner & Smith, 1992), being a member of an ethnocultural minority group (Gutman et al. 2002), and genetic risk for psychopathology (van Meurs, Reef, Verhulst, & van der Ende, 2009). Risk within the
child’s microsystem include factors within the family, such as having a parent with a mental disorder (Connell & Goodman, 2002). Growing up in larger families (Rutter, 1979), lower parental involvement, harsher discipline (Deater-Deckard, Dodge, Bates, & Pettit, 1998; Elgar, McGrath, Wachsbusch, Stewart, & Curtis, 2004), and marital conflict (Cummings, Keller, & Davies, 2005; El-Sheikh & Flanagan, 2001; Schermerhorn et al., 2011) have all been shown to be associated with less optimal developmental outcomes for low socioeconomic status (SES) children. In addition, there are also factors outside of the family that can affect children’s outcomes; these factors include dangerous neighborhoods and exposure to violence (McLoyd, 1998), peer rejections and instability in peer relations (Deater-Deckard et al., 1998; Hymel, Rubin, Rowden, & LeMare, 1990), as well as associations with delinquent peers (Seidman et al., 1999). Additional factors in the child’s larger macrosystem that can affect their outcomes and put them at risk include society’s attitude towards the child’s ethnicity, or societal resources for individuals in poverty (Bronfenbrenner, 1979).

It is important to note that in this conceptualization, these multi-level factors are not isolated, but interact with each other and with the child to produce outcomes. Risk factors do not add up cumulatively so that one and one means twice the risk, but instead risk factors interact in complex and bi-directional ways. These interactions are often examined between a child’s genetic and environmental risk. For example, a children’s genetic risk for psychopathology may impact their perceptions of family conflict in their environment, which may combine to impact the child’s later development of psychopathology (Schermerhorn et al., 2011). Parental psychiatric disorders may affect children through an interaction where genetic risk influences the parent’s choice of risky
environment, as well as through epigenetic effects where environmental exposure to risk influences the expressions of specific genes (Cicchetti, 2010; Ramchandani & Psychogiou, 2009). Studies have demonstrated that due to an interaction between genes and environment, parents who pass on a genetic risk to their children also tend to create environments that may further increase the risk of maladjustment (Silberg & Rutter, 2002). Thus, children who have a parent with a psychiatric illness are more likely to be carrying genes that put them at risk, and are also more likely to be exposed to adverse life events (Ramchandani & Psychogiou, 2009).

There are additional factors that exist within the child that can interact with and change the impact of risk factors. For example, Silberg and colleagues (2010) argue that age also modifies the effect of genetic risk. Early in childhood, the effect of parental depression may be primarily environmental, but as the child develops, the association between parental and child depression may become increasingly genetically influenced (Silberg et al., 2010). Male gender appears to be a risk factor within the child that can interact with external risk. For example, boys seem to be more vulnerable than girls to the effects of paternal depression than that of maternal depression (Ramchandani & Psychogiou, 2009).

In addition, factors outside of the child can also interact to moderate the effect of environmental risk on a child. Low SES in particular creates multiple environmental risk factors associated with psychopathology and other negative outcomes (Anderson & Mayes, 2010). For example, living in poverty may impact the child directly, but also put strain on family functioning and parenting behaviors (Evans, 2004). Paternal psychopathology can affect the child directly, but can also increase marital conflict and
put strain on the relationship between the parents (further impacting the child) (Ramchandani & Psychogiou, 2009). Children who live in risky environments with high levels of violence and drug use are more likely to interact with children who are also exposed to these factors, and are more likely to have relationships with deviant peers (Brody et al., 2001). Thus, risk factors interact to create a complex picture of a child’s risk for poor outcomes, and examining one single factor does not fully capture this picture.

**Protective factors**

Past investigations that looked at traditional risk factors, from inadequate caregivers to traumatic experiences such as exposure to community violence and child maltreatment, often focused on the many risks that can lead to disordered outcomes (Cicchetti, 2010). However, researchers quickly discovered that not all high-risk children are not subject to the dire pre-determined fate that these risk factors would have predicted, and instead some of these children display adaptive and positive outcomes (Cicchetti, 2010; Werner & Smith, 1982; Werner & Smith, 1992). It follows that not all children who live in poverty and are exposed to risk factors display negative outcomes, but instead display resilience by manifesting positive adaption. Resilience refers to a class of phenomena that is characterized by positive outcomes in spite of serious threats to adaptation and positive development (Masten, 2001). In order to have resilience, an individual must have been exposed to risks that could derail normative development but still display later success and positive outcomes (Masten, 2001).
The concept of resilience is never directly measured, but is indirectly inferred from the presence of adversity and/or risk with the demonstration of later positive outcomes and adaptation (Luthar, 2006). Demonstrable risks include all those discussed above, including low socioeconomic status, exposure to maltreatment or violence, inconsistent and poor parenting, community violence, and even low birth weight (Masten, 2001). Positive adaption, on the other hand, is commonly defined as adaption that is substantially better than would be expected given an at-risk child’s exposure to adversity (Luthar, 2006). This is often examined in research as success in reaching stage-appropriate milestones, or in manifesting social competences (Luthar, 2006; Masten, 2001). For example, in impoverished neighborhoods with a high risk for antisocial behavioral outcomes, demonstration of socially acceptable and conforming behaviors may be conceived as resilience (Seidman & Pedersen, 2003). Just as examining one risk factor provides an overly narrow view of risk, displays of competence should be assessed across multiple domains so that overly narrow definitions do not create a misleading picture of success in the face of adversity (Luthar, 2006). Competence can be manifested in terms of school achievement or completion, peer acceptance, emotional well-being, absence of behavioral and psychological problems (Luthar, 2006).

The examination of resilience is important because it informs research and the greater society on the ways that individuals can overcome the hardships to which they are exposed. Examinations of the factors and processes that enable children to manifest positive outcomes are essential for creating targeted interventions. What is important to realize is that these remarkable positive outcomes in the face of adversity are not a result of rare or extraordinary processes, but instead result from normative human resources
within the child, and within their family and community (Masten, 2001). These protective factors, like risk factors, can impact children as they develop and affect future outcomes. Protective factors are those factors in a child’s life, situation, or context that can help to reduce the likelihood of negative psychosocial outcomes that may have otherwise resulted from biopsychosocial risk factors and less than optimal conditions of development (Garmezy, 1993). Where risk factors can increase the likelihood of negative outcomes, protective factors can increase the likelihood that a child will demonstrate positive adaption.

One of the foundational studies in the examination of resilience was conducted by Michael Rutter (1979) who found that up to a fourth of at-risk children displayed resilience. Characteristics that increased the likelihood of positive outcomes included: being female, positive school environment, self-efficacy, and a close, warm relationship with an adult. In another study, Werner and Smith (1982; 1992) examined multi-racial children, and deemed that 200 of them were at high risk because of prenatal stress, poverty, daily instability, and serious parental psychopathology. These children were followed for 30 years, and it was found that of the 200 high-risk children, 72 were displaying positive outcomes and thrived in the face of their adversity. Some of the qualities that were identified as promoting resilience included being female, socially responsible, adaptable, having good self-esteem, and having a caring environment inside and out of the family (Werner & Smith, 1982; Werner & Smith, 1992).

Thus, research suggests that, like risk factors, there are many different types of protective factors that can positively impact children. The factors that have been repeatedly supported as promoting resilience include attributes in the child and within
their environment. Thus, these protective factors can also be conceptualized using Bronfenbrenner’s (1979) ecological systems theory. Within the child, these factors include good problem solving skills and cognitive abilities (Cicchetti, 2010; Masten et al., 1999), positive views of self (Cicchetti, 2010), motivation (Cicchetti, 2010), positive emotions (Ong, Bergeman, Bisconti, & Wallace, 2006), and positive coping abilities (Cicchetti, 2010). Like with risk factors, there are protective factors that can operate on a child from their family; these factors include a supportive and involved parent, as well as having a positive relationship with a parent, and positive parenting quality (Garmezy, 1993; Masten, 2001; Masten et al., 1999; Natsuaki et al., 2007). Important factors outside of the family context include the presence of a competent and caring adult in the child’s neighborhood or school context (Cicchetti, 2010; Garmezy, 1993; Masten, 2001), and having relationships with pro-social and well-regulated peers (Cicchetti, 2010; Masten et al., 1999). These protective factors, like social support or intelligence, can affect the relationship between stress and psychopathology (Garber, 2010). For example, for youth who live in highly disordered and dangerous areas, and who are exposed to gangs, harassment, and drug dealing, supportive parenting can serve as a buffer against the development of depressive symptoms (Natsuaki et al., 2007). Furthermore, the protective factors can also affect each other, where an intelligent child may be more likely to be brought to the attention of a capable teacher, or a child’s prosocial behaviors may influence their peers.

As can be seen, in the developmental view, pathology is not something that a child has; it is instead the pattern of adaptation reflecting the totality of the developmental context to that point (Sroufe, 1997). It is the dynamic interplay between both risk and
protective factors that influences the developmental course through the impact those factors have on the development of an individual’s biological and psychological systems. (Cicchetti, 2010). Indeed, many risk and protective factors are bipolar in nature, and may provide protective influence at one extreme, but place a child at risk for dysfunction at the other (Luthar, 2006). As a result of the complex nature of risk and resilience, examining child development can be difficult. However, understanding how different kinds of risk and protective factors can interact to impact a child in poverty, and further affect their future outcomes, is essential to creating targeted interventions to reduce risk in children in poverty. Thus, the question no longer is “do we study risk and resilience,” but has become a question of how to best approach implementing that research.

**How Do We Study Risk and Resilience?**

Two main design approaches have been used to examine variations in outcomes in high-risk children and adolescents. The first, a variable-focused approach, is characterized by the use of multivariate statistics to investigate links between constructs in order to examine resilience (Masten, 2001). These variable-based statistical analyses include multiple regression and ANOVA, and focus on changes in variables (Luthar, 2006). For example, a variable-focused analysis may look to see if changes in one variable (such as self-esteem) are related to changes in another variable (such as depression). This model can maximize statistical power and is best for searching for different links between predictors and outcomes (Masten, 2001). However, as a result of this approach’s focus on variables, it can lose sense of the whole individual and the developmental context in which individuals exist in favor of looking at specifics.
Furthermore, variable-centered analyses assume a heterogenous group, in that everyone in the group is the same, which may not always be appropriate (Muthén & Muthén, 2000). Since variables do not exist in isolation, but instead exist and function within and around people, a purely variable focus can lose the idiosyncrasies that individuals bring through their unique lives, circumstances, and internal characteristics. Variable-focused approaches have established the importance of some key variables, such as adaptive systems like cognition and parenting, on promoting lasting effects on adaptive behaviors in adverse environments (Masten, 2001). An example of research that used this approach is a study conducted by Garmezy and colleagues (1984) who used hierarchical multiple regressions to establish that in high stress life circumstances, being of high SES, female sex, and high intelligence can improve the likelihood of positive outcomes in school.

The other main model of resilience is to use person-focused approaches (Masten, 2001). Person-based approaches essentially compare groups of children to illuminate factors that might confer protection against adversity (Luthar, 2006). For example, this type of approach has been used to compare children with different risk and competency patterns in order to examine what differentiates the resilient children from other groups of children (Masten, 2001). This approach has the innate benefit of keeping variables in their naturally occurring configurations, and thus can better capture patterns that function in the real lives of people when compared to the variable-centered alternative (Masten, 2001). However, this approach is not as effective at examining specific links and explanatory processes to be targeted in interventions (Masten, 2001). The classic example of a person-centered approach is one that takes two groups from a high-risk sample and
compares the group with maladaptive outcomes against the group with adaptive outcomes (Luthar, 2006).

Another method of using person-centered approaches is to ascertain conditional effects of influences as an alternative to using interaction terms. This alternative method may use discriminant function analysis or cluster analysis to create comparisons of factors where using interactions would require an impossibly high number of interaction terms (Luthar, 2006; Masten, 2001). An example of this is the work of Seidman and Pedersen (2003) who used cluster analysis to create groups of youth based on seven different levels of engagement and activity involvement, and then used these analyses to illustrate that the benefits of engagement in one domain depended on the amount of engagement in others. An example of the way that person-centered approaches can be used to examine resilience was conducted by Masten and colleagues (1999). As a part of this study, the investigators used person-centered data techniques by establishing resilient (adequate competence, high adversity), maladaptive (low-competence, high adversity), and competent (adequate competence, low adversity) groups of urban children based on a priori cut scores and then comparing the groups on a number of measures (Masten et al., 1999). Results from this study indicated that individuals who were identified in the resilient subgroup of children had much in common with their low-adversity peers, including average or better IQ, positive parental influences, and psychosocial well-being (Masten et al., 1999). In addition, resilient individuals differed from their maladaptive peers, as resilient individuals had greater interpersonal resources, psychological healthy, and lower negative emotionality (Masten et al., 1999).
Both person- and variable- centered approaches have their advantages, but both also have their drawbacks. Thus, a balanced approach between person and variable-centered approach can better capitalize on the unique strengths of each model while avoiding the pitfalls and drawbacks. For example, combining person- and variable-centered approaches might allow a researcher to examine naturally occurring groups of individuals within the study, and then use longitudinal data analyses to see if these groups have different outcomes on specific variables. Combined person- and variable-centered approaches such as these have become increasingly used in the literature. For example, Seidman and colleagues (1999) used cluster analysis (a person-centered approach) to identify 6 patterns of family and peer interpersonal relationships. Next, the authors used a variable-centered approach (MANCOVAs) to demonstrate that these interpersonal patterns provided different concurrent risk and protective influences on psychological health. For example, children who demonstrated high levels of interpersonal hassles with low parental and peer interpersonal support and involvement also were at greatest risk for depression, while children who experienced high interpersonal support and low hassles were at the lowest risk for depressive and anti-social symptoms. Thus, a combination of variable- and person-centered approaches allows the investigator to investigate the complex picture of a person’s life while still examining how different clusters of factors are related to different outcomes, essentially capitalizing on the strengths of both approaches.

**The Current Study**

This study will integrate person- and variable-centered approaches in order to capitalize on person-centered approaches’ ability to examine individuals in their naturally
occurring configurations, while still being able to establish specific longitudinal outcomes as variable-centered approaches allow. Specifically, this study seeks to identify specific patterns (or grouping) of risk and protective factors using a person-centered approach (cluster analysis) in low-income ethnic-minority early adolescents, and to then further examine the differences in the patterns using variable-centered approaches (ANOVA). Research has found that children at risk for negative outcomes, such as children in poverty, are likely to develop a pattern of relatively enduring vulnerability factors, which places them at even greater risk for future maladaptation (Cicchetti, 2010). Thus, this study will use variable-centered methods in order to examine how each of the identified distinct patterns of risk and protective factors is related to later adaptive outcomes.

It is important to examine children in poverty because low SES creates multiple environmental risk factors associated with psychopathology (Anderson & Mayes, 2010). However, in studies of individuals living in impoverished areas, European American youth are usually used as the control group (Safren et al, 2000). It is important to examine the unique impacts of risk on the development if ethnic minorities without considering European Americans as normative. This study will establish patterns of risk and resilience, and determine if the prevalence of these patterns differs by ethnicity or gender, using only individuals who identify as African American and Hispanic. This investigation may better establish the unique picture of individuals, and whether that picture if different for people of different ethnicities. This is important in order to create targeted interventions that can help minority youth living in high-risk environment maximize potentially protective factors in their lives in order to achieve positive outcomes.
It is essential to examine the effects of risk and protective factors longitudinally, as factors that can impact a child in their youth can have a strong and lasting effect on their later outcomes (Luthar, 2006; Masten, 2001). Early adolescence is a critical developmental period (when risk and protective factors may be particularly salient) because in early adolescence youth experience rapid psychological and physical changes with the onset of puberty, make social transitions into middle school, have greater freedom and independence in their lives and also begin to engage in risky behaviors and develop life patterns that can have implications on future success (Guttman et al., 2002). However, in the long history of psychology, only recently has the period of early adolescence, spanning from ages 10 to 14, begun to receive attention in the realm of scientific inquiry, public policy, and public interest (Guttman et al., 2002). As a result, the world has just begun to understand the unique risks and opportunities presented to children of that age, and more research is necessary to understand those factors and their impact on the future (Carnegie Council on Adolescent Development, 1995; Guttman et al., 2002). For these reasons, this study will seek to identify co-occurring patterns of factors when the children are in their early adolescence in order to examine longitudinally how interconnected factors at this vulnerable age may be related to later outcomes.

As established above, when factors are considered in isolation, there is the risk of creating theories and making arguments that are incorrect, because the true interactional and complex nature of development is either being ignored or is unknown. Thus, it is important when designing a study that examines risk and protective factors that factors from a variety of life domains be considered. In accordance with Bronfenbrenner’s (1979) conceptualization of ecological systems, this study will use factors from several
domains that have been shown to be related to later adaptive outcomes. These factors include achievement, parent-child relationship and parenting behaviors, peer relationships, school engagement, and neighborhood factors.

Intelligence and school achievement, within-child micro-system factors, have been shown to be related to several outcomes, and are some of the most often studied potential assets found within a child (Luthar, 2006). Research indicates that academic achievement and associated cognitive abilities (such as problem-solving) is related to later adaptive outcomes (Cicchetti, 2010; Masten, et al. 1999; 2005). Academic achievement is related to long-term schooling outcomes (Finn, 1989), positive social behaviors and social aptitude (Welsh, Parke, Widaman, & O’Neil, 2001), and self-esteem (Finn, 1989). As children who are resilient are more likely to demonstrate strong academic achievement (Anthony, Alter, & Jenson, 2009), it is important to study achievement when considering factors that can impact an at-risk child’s future outcomes.

Parental factors are one the most studied factors in a child’s immediate environment that can impact their later outcomes. Of particular interest in the study of resilience has been the parent-child relationship as well as parenting behavior, both of which have been shown to have strong effects on later behavior (Luthar, 2006). Parental monitoring in particular may provide continuity and structure in the child’s life, which may be absent in high stress, impoverished environments (Luthar, 2006; Romer, 2003). Studies have indicated that when parents are aware of a child’s behavior and their daily associations, the child is much less likely to engage in non-adaptive behaviors such as delinquent behavior and drug use (Romer, 2003). Similarly, for youth who live in highly disordered and dangerous areas, supportive relationships with parents can be protective
against negative outcomes (Natsuaki et al., 2007). Positive family relationships in general have been shown to be related to a variety of positive adaptations, while dysfunctional relationships between a child and parent may instead exacerbate risk (Cicchetti, 2010; Luther, 2006). Interpersonal relationship and parenting may be related, but they are separate constructs that prove interesting when examined; while having a functional and positive relationship may mean high levels of monitoring and involvement and bring expected positive outcomes, having a good relationship with a parent who is less involved can still prove protective (Seidman et al., 1999). On the other hand, having high levels of parental involvement without the positive functional parent-child relationship can elevate the risk for negative outcomes such as depression and antisocial behavior (Seidman et al., 1999). Any study on residence must consider parents, as they have a strong effect on later developmental outcomes.

Another important factor within the child’s micro-system environment that can influence children’s adaptation and outcome is their peers. In her 2006 review, Luthar argues that resilience is, at it’s core, about relationships. Accordingly, it is unsurprising that peer rejections and instability in peer relations has been shown to be related to adverse outcomes (Hymel et al., 1990). On the other hand, just as dysfunctional relations with peers can be problematic, positive relationships with peers have been shown to be protective if those peers are themselves pro-social and displaying positive adaptation (Cicchetti, 2010; Hartup, 1996; Masten, 2001). Conversely, association with deviant peers has been consistently shown to increase the risk for negative and dysfunctional adaptation (Luthar, 2006; Seidman et al., 1999). Thus, it is important to consider peer factors in any investigation, including this one.
Influences at school can have an important effect on children. The presence of a competent and caring adult in the school context can be an important factor that can lead to positive adaptation to stress (Cicchetti, 2010; Garmezy, 1993; Masten, 2001). In addition, becoming engaged in school and community activities has been shown to be related to more positive outcomes (Seidman & Pederson, 2003). Research also suggests that behavioral engagement (being involved in school and school-related activities) is related to increased achievement and lower rate of dropping out (Fredricks, Blumendel, & Paris, 2004). The effects of school engagement are particularly important for minority students, whose group dropout rates are highest (Rumberger, 1987). However, while school and community engagement has received increased attention of late, it is still in need of additional research attention in order for its impact to be fully understood (Fredricks et al., 2004). In addition, the concept of school engagement has been researched mainly in the educational realm, and so the interconnection of school and community engagement with other factors of risk and resilience is in need of examination and clarification.

There are exosystem factors that can also attenuate the ill effects of stress and adversity, and it is important not to ignore the effects of a child’s neighborhood on their development. Neighborhood factors that can influence a child include living in dangerous neighborhoods and being exposed to violence (McLoyd, 1998; Deater-Deckard et al., 1998). These factors, like the others discussed above, should be considered within the larger picture of the child’s risk and resilience pattern. These neighborhood problems, including gang violence, drug use, and criminal activity, are more likely to occur in impoverished neighborhoods, and are related to later maladjustment in children (Luthar,
However, even in high-stress neighborhoods with many problems, other factors can buffer the impact of such structural characteristics of the community. These factors include a sense of belonging to the community, supervision of youth by community adults, and other social organizational processes (Sampson, Raudenbush, & Earls, 1997; Wilson, 2003). One particular neighborhood-level process that promotes resilience is collective efficacy, which is the level of social cohesion among individuals in the neighborhood combined with their willingness to intervene on behalf of the common good (Sampson, Morenoff, & Earls, 1999; Sampson et al., 1997). Results have indicated that high collective efficacy is particularly important in ameliorating the effects of stress and risk in impoverished neighborhoods (Odgers, et al., 2009). Thus, it is important to examine both the level of disorder within the neighborhood as well as social organizational processes which may buffer the negative factors of the larger neighborhood environment.

In addition, the risk factors impacting at-risk child may also have indirect effects on the child’s development and later outcomes. For example, impoverished neighborhood and poverty may have additional effects beyond those that directly impact the child; research indicates that economic crisis and poverty may impact a child my indirectly impacting the mood and interaction of parents, and undermine the effectiveness of parenting behavior (Conger, Conger, & Elder, 1997; Conger et al., 1992). Some researchers also propose that one of the primary mediators of the relationship between risk factors and negative outcomes is coping; specifically, researchers propose that family-child relationships or stress from dangerous and disordered living environments may impact a child’s coping strategies and emotion regulation, which in turn may impact
risk for negative outcomes (Barbarin, 1993). One benefit of research that uses person-centered rather than variable-centered approaches is that person-centered approaches addresses the important impact of these indirect effects by examining the risk and resilient variables in their original-occurring formation. Keeping variables in their original formation allows the researchers to examine the outcomes resulting from both indirect and direct pathways.

In Bronfenbrenner’s (1979) original conceptualization of childhood development, he stressed that the picture of development would be a complicated one, for all the factors would impact each other as well as the child. Thus, it is impossible to separate out one factor, or even factors within one system, without losing some of the complexity of the whole. This study addresses this difficulty by attempting to get a measure of a part of each of the systems influencing the child. This study hypothesizes that distinct patterns of risk and protective factors in development will emerge for children in low-income environments. The empirically supported factors upon which these patterns may differ include within-child factors (academic achievement), within-family factors (parent-child relationship and parental monitoring), and factors within the school and neighborhood (school and community engagement collective efficacy and neighborhood problems). Furthermore, this study hypothesizes that these variables will be differentially related to psychosocial outcomes. Based on the literature reviewed, we hypothesize that a resilient pattern will be one where the child is motivated (high academic achievement scores), has a good relationship with an involved parent (a parent-child relationship high on trust with higher parental monitoring), lives in a safe neighborhood with neighbors who help watch other children and enforce safety (low neighborhood problems and high neighborhood
efficacy), and who feels connected and involved in school (high levels of school and community engagement).

In the history of the study of resilience, studies conducted on children at high risk for psychopathology frequently portrayed their developmental outcomes as predetermined and inevitably leading to maladaptive pathological and developmental outcomes (Cicchetti, 2010). However, it is clear that this is, in fact, not the case. As a result, it is important to investigate how different clusters of factors in an individual’s life may be differentially related to positive and negative adaptive outcomes. Examining these outcomes even a few years later enables us to draw longitudinal conclusions about the long-term impact of children in early adulthood and beyond, because achievements and successes in a child’s development can serve as valuable markers of how well development has been progressing and further serve as warning signs of trouble ahead (Cicchetti, 1990; Masten et al., 1999).

This study hypothesizes that the patterns of risk and resilience that are present in early adolescence will be differentially related to developmental, social, and psychological outcomes 6 years later. In this study, adaptational success is defined with respect to competence in salient developmental tasks and psychosocial adjustment. The outcomes to be investigated are outcomes that have been demonstrated in past variable-centered research on risk and resilience to be related to the measures in the initial portion of this study individually. These developmental outcomes include drug use and abuse, which has been shown to be highly prevalent in at-risk population, though this risk can be mitigated by a close relationship with a caregiver (Traube, James, Zhang, & Landsverk, 2012). Participating in delinquent or illegal behaviors has also been shown to be
significantly related to the risk and protective factors in this study. Murray and Farrington (2010) conducted a review of the literature and found that school achievement, parental supervision, parent-child relationship, low family income, and high crime neighborhoods are among the most important risk factors that predict conduct disorder and delinquency. In addition, getting pregnant or getting one’s partner pregnant (East, Khoo, & Reyes, 2006), and engaging in risky sexual activity (Davis, 2009) have been found to be related to family, school, and neighborhood factors such as familial poverty level (Russell, 2002; Woodward, Fergusson, & Harwood, 2001), parental monitoring (Scaramella, Conger, Simons, & Whitbeck, 1998), and school engagement (Fergusson & Woodward, 2000; Manlove, 1998). In addition, this study will also examine for other more adaptive outcomes that are often used as measures of resilience in past research. For example, reliance has historically been demonstrated by psychological adjustment (Masten et al., 2005). Risk and protective factors have also been related to positive and negative interactions with peers; thus this study will examine research-supported outcomes such as association with deviant peers (Brody et al., 2001; Seidman et al., 1999), friendships with prosocial and well-adjusted peers (Cicchetti, 2010; Masten et al., 1999), and intimate relationship health (Benson & Fox, 2004). As can be seen, like the variables in the cluster analysis, these outcome variables were chosen measure a variety of domains in order to create a fuller and more complete picture of the lives of at-risk youth. In the traditional research on risk and resilience, all of these variables have also been examined primarily using variable-centered methods, and thus predicting these outcomes from a person-centered analysis will add a richness of context and may bring unique relationships to light.
Method

Participants

This study conducted secondary analyses of data from Welfare, Children, and Families: A Three-City Study (Cherlin, 1999; Cherlin et al., 2001). The Three City Study was designed to examine the effects of welfare reform on children and their mothers living in low-income urban neighborhoods in Boston, Chicago, and San Antonio. Three waves of data were collected and used in this study. The first wave was collected between March and December 1999, and the second wave followed approximately 18 months later between September 2000 and June 2001. The third and final wave of data collection took place between February 2005 and January 2006. The Three-City Study recruited participants using a household-based, stratified-random sampling procedure in order to obtain a sample of low-income children and their families. The investigators used door-to-door screening interviews to first identify families that met pre-established sampling criteria with respect to income, ethnicity, and child’s age. From the eligible families, a random sample, using predetermined sampling rates, was selected to participate in the survey portion of the study. (See Winston et al., 1999 for further sampling procedure and recruitment details.) Trained field interviewers administered the survey to the participants in their homes, which took approximately 2.5 hours. The guidelines set by the Society for Research in Child Development’s Ethical Standards for Research with Children (1990–1991) were followed. The research conducted in this study was evaluated and approved by the Institutional Review Board at the University at Albany, State University of New York.
The present study uses families selected from the original dataset; criteria for selection were 1) the children were 10-14 during the first wave of collection 2) the children self-identified as Latino or African American. Children who self-identified as Caucasian/White were excluded for two reasons. First, lack of research on ethnic minority youth makes it important that these populations be examined more closely. Second, there were far fewer participants of European decent (less than 9% of the sample) compared to those of other descents (Non-Hispanic White = 8.50%, Non-Hispanic Black = 42.50%, Hispanic, any race = 46.40%, Other = 1.50%). The final sample for the present study was comprised of 981 young adolescents with a mean age of 11.89 (SD = 1.39) at wave 1, of which 479 were male (48.80%) and 502 were female (51.20%). Among the children, 457 identified as non-Hispanic Black (46.6%) and 524 (53.4) identified as Hispanic (any race). Hereinafter, these children will be referred to as “Black” and “Hispanic.”

Data was also collected from the child’s caregiver. Most of the caregivers (89.5%) were biological mothers with the remainder of caregivers including adoptive mothers (1.4%), stepmothers (0.7%), foster mothers (0.7%), grandmothers (4.8%), and aunts (1.3%). As in the article by Prelow, Weaver, Bowman, and Swenson (2010), we refer to all caregivers as mothers hereinafter. The average age of mothers at wave one was 38.03 (SD 8.36).

**Measures**

**Cluster analysis.** All variables for the cluster analysis were assessed at wave 1, giving a picture of children’s lives when they were 10-14. Measure selection was based on two considerations: a multi-systems ecological perspective, and empirical evidence of
the variable as a risk or protective factor. In line with previous research, these variables are bipolar and can act as a risk factor at one extreme and as a protective factor at the other (Masten, 2001).

**Academic Achievement.** The construct of Academic Achievement was assessed using two subsets of the Woodcock–Johnson III (WJ-III; Woodcock, McGrew, & Mather, 2001). The first, the letter-word identification, was administered as a measure of word identification skills, consisting of 58 items (α = .84). This test involves overtly pronouncing words correctly as they appear in large type on the participants’ side of the test book; participants are not required to know the meanings of words. The test was scored using the test manual, where “correct” responses were accurate and fluent pronunciation. In this subset, the items get progressively difficult as the selected words appear less and less frequently in the written English lexicon. The second subset, Applied Problems, is a mathematics test that assesses a child’s ability to comprehend the nature of a problem, identify relevant information, and perform simple calculations. This subset consisted of 60 items (α = .87). For both subsets, children start in each section depending on the grade they’re in at the time, though due to complex scoring rules (see Woodcock et al., 2001), some children went back to items that precede their starting points. For both tests, higher scores indicate higher levels of academic achievement. The Woodcock-Johnson III has been shown to have high validity and reliability in large geographically and ethnically diverse populations (Woodcock et al., 2001).

**Parental monitoring.** The construct of parental monitoring was assessed using an adapted 5 questions from Steinberg’s behavioral control scale (Steinberg, Mounts, Lamborn, & Dornbusch, 1991) which asks the child about their mother’s knowledge of
the child’s friends, monetary spending, activities and the way they spend their time. The original behavioral control scale has been shown to have adequate reliability and validity (Steinberg et al., 1991). For this study, the child responded on a 3-point Likert Scale (1—doesn’t know; 3—knows a lot) and these answers were summed to compute a total score, where higher scores indicated higher parental monitoring. This scale had adequate reliability in this sample using traditional reliability estimates ($\alpha = .69$). However, as Cronbach’s alpha can underestimate the reliability of a measure (Kenny, 1979; McDonald, 1985), and as these measures are being combined into a latent variable with adequate fit in LISREAL, this scale was used in this study.

**Parent-child relationship.** Selected questions from the Inventory of Parent and Peer Attachment (IPPA) were used for assessing mother-child relationship (Armsden & Greenberg, 1987). The IPPA has been shown to have adequate reliability and validity in diverse samples (Armsden & Greenberg, 1987). In this measure, the child responded to the question. Of the original three subscales in the measure, one unidimensional subscale in particular (Trust) was used in this study. Four questions from this scale were chosen for use in the Three Cities Study. The child answered on a 5-point Likert-scale (1=almost never or never true, 2=not very often true, 3=sometimes true, 4= often true, 5=almost always or always true). The variables were recoded according to instructions provided by Armsden & Greenberg (1987) for a score reflecting level of trust between mother and child. The mean total score was 16.13 and standard deviation was 3.46. Higher scores indicated higher levels of parent-child trust. This scale had questionable reliability in this sample ($\alpha = .65$). However, as Cronbach’s alpha can underestimate the reliability of a
measure (Kenny, 1979; McDonald, 1985), and as these measures are being combined into a latent variable with adequate fit in LISREAL, this scale was used in this study.

**School and Community Engagement.** To examine school and community engagement, six variables were selected based on the child’s reported experience in school. Five of these yes/no questions were coded as yes = 1 and no = 0. These questions included: In the past 12 months, have you been elected officer of a school class or of a school club? In the past 12 months, have you received an award or recognition for your school grades or performance? In the past 12 months, have you received an award or letter for sports, music or art? In the past 12 months, have you played on any sports teams through school or through a community group? In the past 12 months, have you participated in after-school or summertime clubs or programs either at school or in your community? The last of the six school and community engagement variables examined future perceptions of school achievement on a 7-point Likert Scale (1 = not finish high school, 2 = get a GED, 3 = graduate from high school, 4 = get training after high school, 5 = get a 2-year college degree, 6 = get a 4-year college degree, 7 = go to a professional school after college such as law school or medical school?). In line with research that suggests that motivation to continue education can be protective (Bryant, Schulenberg, O’Malley, Bachman, & Johnston, 2003), and the established use of graduating high school as a measure of resilience (Luthar, 2006) this variable was dichotomized to indicate motivation to continue beyond high school (0= not graduating high school, 1= high school and beyond). These six school and community engagement questions were summed so that higher scores indicated a higher endorsement of engagement. This scale had poor reliability in this sample (α = .53). However, as Cronbach’s alpha can
underestimate the reliability of a measure (Kenny, 1979; McDonald, 1985), and as these measures are being combined into a latent variable with adequate fit in LISREAL, this scale was used in this study to be combined into one variable.

**Neighborhood collective efficacy.** The scale used to measure neighborhood collective efficacy used nine items from the Sampson, Raudenbush, and Earls (1997) scale completed by the mother (α = .88). The original collective efficacy scale has been shown to be valid and reliable (Sampson et al., 1997). This scale included two subscales, informal social control and social cohesion and trust, and was completed by the child’s mother. The informal social control asks 5 questions on how likely individuals in the neighborhood would be to perform monitoring and other activities in the neighborhood (such as doing something if a fight broke out) on a 5-point Likert scale (from very unlikely to very likely). The social cohesion and trusts subscale asks the respondent 4 subjective assessments of the neighborhood and neighbors (e.g., “the neighborhood is a good place to raise kids”). This subscale is responded on a 4-point Likert scale (from strongly disagree to strongly agree). As was done with the original scale, participants were given the option of responding “don’t know,” and these responses were recoded to middle score of “50-50 chances,” giving the items a range of 1 to 5 to correspond to the social control index (Sampson et al., 1997). ¹ The social control items and the social cohesion items were then summed so that higher scores indicate higher levels of collective efficacy.

**Neighborhood problems.** Neighborhood problems was assessed using 11 items that combine into a composite scale of severity of various neighborhood problems (including

¹ J. Quane, personal communication, October 12, 2012.
unemployment, abandoned houses, burglaries and thefts, gangs, etc.; \( \alpha = .90 \). The child’s mother responded to these items on a Likert scale from 1 (not a problem) to 3 (a big problem). These items were summed, so that higher numbers indicate higher levels of neighborhood problems, and this scale was also completed by the child’s mother.

**Outcome Variables.** All outcome variables were assessed at wave 3, when the children were ages 15-20. All items were measured from the self-report of the child. Measure selection was based on use of that variable in previously conducted empirical studies to establish resilience, as well as availability in the dataset.

**Delinquency.** At wave 3, delinquency was measured using 17-items adapted from the National Longitudinal Study of Youth (NLSY; Borus et al., 1982) and the Youth Deviance Scale (Gold, 1970; used by Steinberg, Mounts, Lamborn, & Dornbusch, 1991). The items assessed the adolescents' problem behaviors at school, illegal activities, and drug and alcohol use within the past year on a 1 (never) to 4 (often) Likert-scale. Of the five available scales, the total score was used, which was calculated by summing the adolescents' responses (16-items, \( \alpha = .83 \)). Higher scores indicate greater endorsement of the items.

**Psychological distress.** The Brief Symptom Inventory-18 (BSI-18) is a psychological assessment instrument that is used to screen for elevation on reported depressive, anxious, and somatic symptom dimensions that has been shown to be valid and reliable in diverse samples (Derogatis, 2001). This inventory was derived from the Brief Symptom Inventory (Derogatis, 1993) and the Symptom Checklist- 90-Revised (SCL-90-R; Derogatis, 1994), which are both based on the Hopkins Symptom Checklist (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974). The BSI-18 is an 18 items self-
report measure that asks the respondents to rate how often they have experienced symptoms of anxiety, somatization, and depression within the past 7 days. This inventory uses a 5-point Likert scale ranging from “Not at all” to “Extremely”. The BSI-18 has been normed separately by gender on both a large oncology and community samples, and has been shown to have high reliability and validity (Derogatis, 2001). The BSI-18 has adequate to good internal consistency ($\alpha = .89$ in this sample). Higher scores indicate higher reports of psychological distress. Due to the non-normal distribution of the total BSI score variables, the variable was transformed using a square root transformation before conducting all analyses.

**Peer factors.** Association with deviant peers was measured by 11 items adapted from the Project on Human Development in Chicago Neighborhoods (see Rankin & Quane, 2002). These 11 items ($\alpha = .87$) asked the adolescent to respond on how many of his/her friends participate in delinquent activities including stealing, selling drugs, use drugs, have sex, and carry a weapon. The adolescent respond to these items on a Likert scale from 1 (none of them) to 4 (all of them). Higher scores indicate higher levels of peer delinquency. Due to the non-normal distribution of this variable, it was transformed using a square root transformation before conducting all analyses.

Positive neighborhood friends is a 6-item scale that measures the positive influence of the child’s neighborhood friends ($\alpha = .82$). This scale asked the child to respond “yes” or no to questions asking if their friends in the neighborhood get good grades, are interested in school, plan to attend college, attend classes regularly, are popular with others, and make fun of kids who study (reverse coded). These scores were
then summed, where higher scores indicate higher levels of positive neighborhood friends.

**Romantic relationships.** The measures of relationship violence was adapted from the Revised Conflict Tactics Scales (CTS2) (Straus, Hamby, Boney-McCoy, & Sugarman, 1996). This scale has been shown to be valid and reliable (Straus et al., 1996). These questions were responded by the adolescent, who was asked to respond yes or no if events had happened within the past year. These questions provided 5 scales. Total relationship quality consisted of 8 items ($\alpha = .84$), asking if the individual had performed positive relationship supportive acts towards their romantic partner (help them feel self confident, help them through difficult times, etc) or had been supported by their partner (tries to get the individual in a good mood when angry, etc). Responses were summed, so that higher scores indicated higher reported relationship quality. The moderate victimization scale consisted of four items that asked the individual if any romantic partner they had ever had had been moderately violent towards them (threatened to hit, thrown something at them, pushed grabbed or shoved, or slapped, kicked, bit or punched). The respondent answer yes/no, and the scores were summed to get a moderate victimization score ($\alpha = .84$). The extreme victimization scale consisted of four items that asked the individual if any romantic partner they had ever had had been violent towards them (including beaten, threatened/used a weapon against the individual, choked or burned, or forced the individual into sexual activity against their will). The respondent answer yes/no, and the scores were summed to get an extreme victimization score ($\alpha = .78$). The moderate violence perpetration scale ($\alpha = .82$) and the extreme violence perpetration ($\alpha = .26$) consisted of the same questions as the victimization scales, only
with the respondent performing the violent act towards their partner. As a result of the low reliability, extreme violence perpetration was excluded from the analyses.

**Sexual history.** To assess sexual history, several individual questions were used. The focal child was asked if they ever had had sexual intercourse (yes/no) and their age at first sexual intercourse (open response). In addition, the child was asked the number of partners they had had in the last year on a 6-point Likert scale (1=one, 2 = two, 3 = three to five, 4 = six to ten, 5 = eleven to twenty, 6 = more than twenty). Number of times focal child has been pregnant or gotten their partner pregnant (open response). In addition, an item was created to assess if the child had been infected with a sexual transmitted infections (STI). For this item, participants were asked eight questions asking if the child had ever been told by a doctor that they had chlamydia, gonorrhea, trich (Trichomoniasis), syphilis, genital herpes, genital warts, HIV, and/or AIDS. Due to low endorsement rates, the responses to these questions were then dummy coded to indicate if the child had ever been told they had an STI (where 1 was “no STI” and 2 was “had an STI”).

**Analyses**

Confirmatory factor analyses (CFAs) were conducted to empirically determine variables to be used in the cluster analyses (with the exception of the Woodcock Johnson Intelligence measures). These CFAs were used to establish that the individual questions for each of the factors in the cluster analyses could be combined into one variable for analyses. Use of CFAs in this study was important, not only in order to combine the items into a single latent variable for use in the cluster analysis, but also because some of the scales in the dataset (such as the IPPA) were not available in their originally developed
form. All CFAs were conducted using LISREL. The specific fit indices used to examine the model to data fit and their suggested values to retain a model are as follows: CFI ($\geq .90$), RMSEA ($\leq .06$), GFI ($\geq .90$), NNFI ($\geq .90$) and chi-square values.

The data were analyzed for outlying cases and missing data. The data were examined for both univariate and multivariate outliers. Univariate outliers were identified by examining individual z-scores and skewness of the distribution. If data were highly skewed, the data were transformed on a variable by variable basis. If transformation did not remove extreme outliers the outliers were deleted. For multivariate outliers, Mahalanobis distances were calculated both for the cluster analyses and the ANOVA variables. Data with extreme Mahalanobis scores were then deleted. This process resulted in the deletion of 17 subjects.

Using SPSS, a hierarchical cluster analysis was conducted to determine the optimum number of clusters using Ward’s method and applying squared Euclidean Distance as the proximity measure. Hierarchical methods were chosen to determine the optimal number of clusters as research indicates that hierarchical clustering provides better estimates of the correct number of clusters to extract than other extraction methods (Rapkin & Luke, 1993). As recommended by Milligan and Cooper (1988), all variables were first standardized by dividing by the range in order to prevent the variables contributing unequally to the cluster analysis based upon the different scales. Next, the hierarchical tree diagram (or dendogram) and the changes in coefficients in the agglomeration schedule table were examined to determine the optimum number of clusters in this data. After this step, a nearest centroid sorting method, or k-means cluster analysis, was run with the determined number of clusters (3), using the standardized
variables. The k-means cluster allows every case in the sample to be assigned to one of the clusters while optimizing the distance between those clusters and minimizing within-cluster variance (Hartigan, 1975). The results of the cluster analysis were then tested for reliability using methods conducted by Kuhn and Culhane (1998). First, the dataset was randomly split into subsets. Next, the same k-means clustering that was run on the whole dataset was run for each of the subsets and cluster membership saved. Next, a discriminant function analysis was conducted on the first subsample, predicting cluster in terms of the seven original standardized cluster variables. To test the level of misspecification, the discriminant model from the first subsample was used to predict cluster membership on the second subsample and these predictions were compared to the solution produced by the cluster model of subsample 2.

After the cases were assigned, one-way ANOVAs were used to determine which of the classifying variables were significantly different between groups. Additionally, chi-square analyses were run to determine if there were significant associations of gender or ethnicity with specific clusters. Finally, one-way ANOVAs and chi-square tests were run using the third-wave outcome variables in order to determine the risk and resilience outcomes for each of the clusters.

**Results**

**Confirmatory factor analyses**

Confirmatory factor analyses were run to confirm that the scales in this study could be combined for analyses. All variable CFAs were judged to be a good fit and combined for use in the cluster analysis (see Table 1). The six questions on school and community engagement were combined into one factor when the CFA was identified as a
good fit on all fit indexes ($\chi^2 = 23.94$, df=9, RMSEA=.04, CFI=.97, GFI=.99, NNFI=.95). The factors loadings ranged from .2 to .6. The five questions on parental monitoring showed a good fit based on incremental (CFI=.95), absolute (GFI=.97, $\chi^2=63.02$, df=5), relative (NNFI=.90) but not based on parsimonious fit (RMSEA=.11). These results suggest that the model provides good absolute fit for the data (assessing discrepancy between observed and model-implied variance) and good incremental fit for the data (fit relative to the null model), but insufficient parsimonious fit (absolute fit that takes into account model simplicity). Factor loadings ranged from .54 to .83. The questions were judged as adequate overall and were combined into one factor. The nine questions on collective efficacy were judged using a CFA to be an adequate fit using a second-order confirmatory factor analysis, and were judged to be an adequate fit on all fit indexes ($\chi^2=25$, df=25, RMSEA=.04, CFI=.99, GFI=.99, NNFI=.99). Factor loadings ranged from .53 to .80. In accordance with the theoretical structure proposed by Sampson et al. (1997), the questions factored into the subscales of “informal social control” and “social cohesion and trust,” which then fit in the higher-order factor of “collective efficacy”. Thus, the nine questions were combined into one collective efficacy score. The 11 questions on neighborhood problems were assessed using a CFA. The factor was judged to be a good fit on incremental (CFI=.97), absolute (GFI=.93, $\chi^2 = 397.79$, df=44), and relative (NNFI=.96) fit indexes, but had insufficient parsimonious fit (RMSEA=.09). Factor loadings ranged from .39 to .69. Again, these results suggest that the model provides good absolute fit for the data (assessing discrepancy between observed and model-implied variance) and good incremental fit for the data (fit relative to the null model), but insufficient parsimonious fit (absolute fit that takes into account model
simplicity), and as a result the questions were judged as adequate overall to be combined into one factor and so the variables were combined into one factor.

In order to establish a latent variable to be used for mother-child relationship, CFAs were conducted on the trust subscale of the IPPA. Higher-order factor analyses were conducted to see if a hierarchical model (as found by Armsden & Greenberg, 1987) was the best fit for the mother-child relationship scales. The responses were recoded in the manner required for combination into one large scale. The recoded scores were combined into their respective subscales of trust, communication, and alienation, and these were then further combined into a higher-order factor of mother-child relationship.

Results of the hierarchical CFA indicate that the factor structure was not a good fit for the data ($\chi^2 = 602.04 \text{ df}=51$, RMSEA=.12, CFI=.91, GFI=.88, NNFI=.88). Factor loadings ranged from .39 to .79. A second CFA was conducted to see if a single factor could better account for the data. The fit indices of this CFA indicated that a single factor does not account for the data well, and was a worse fit than the higher-order CFA ($\chi^2 = 746.88 \text{ df}=54$, RMSEA=.15, CFI=.89, GFI=.83, NNFI=.86). Factor loadings ranged from .24 to .58. The data was then recoded in the manner suggested by Armsden and Greenberg (1987) for examining individual subscales. Finally, the data was examined and it was determined that the sub-scale of “trust” could be used on its own as the moderating influence of mother-child relationship. The factor was judged to be a good fit on incremental (CFI=.99), absolute (GFI=.99, $\chi^2 =10.66 \text{ df}=2$), and relative (NNFI=.96) fit indexes, but had insufficient parsimonious fit (RMSEA=.09). Factor loadings ranged from .32 to .69. Again, these results suggest that the model provides good absolute fit for the data (assessing discrepancy between observed and model-implied variance) and good
incremental fit for the data (fit relative to the null model), but insufficient parsimonious fit (absolute fit that takes into account model simplicity). This subscale was judged to be an adequate fit for the data, and so was used for subsequent analyses instead of the entire IPPA scale.

Cluster analysis

A cluster analysis was run on 930 cases, each responding to questions on the seven within-child, within-family, neighborhood and school factors (see Table 2 for variable correlations). A hierarchical cluster analysis using Ward’s method provided a hierarchical tree diagram and an agglomeration table (see Table 3) that both identified three clusters of unique risk and resiliency patterns as optimal. The k-means cluster analysis was then run to identify membership in each of the three distinct clusters (see Table 4). The results of the discriminant analysis test of reliability tests indicated that the cluster membership was replicable, with 91.20% of the cases being placed in the proper clusters of subsample 2 based on the results from subsample 1 (94.4% Cluster 1, 95.8% Cluster 2, 75.3% Cluster 3).

Cluster 1 \((n = 190)\) was characterized primarily by risk factors (see figure 1). Specifically, individuals in cluster 1 showed high levels of risk factors in the neighborhood (average neighborhood problems and low collective efficacy), below-average academic achievement, and low school and parental scores. Individuals sorted into cluster 2 \((n = 403)\) showed patterns of generally high traditionally protective factors. Specifically, this cluster was characterized by high levels of traditionally protective neighborhood factors (highest levels of collective efficacy and lowest neighborhood problems), high levels of protective within-child factors (high academic achievement),
and average to high school and parental protective factors (this cluster had the highest levels of school and community engagement, parental monitoring, and parent-child trust). Finally, cluster 3 \((n = 337)\) was characterized by being generally average in traditional risk factors, but with high risk neighborhood factors. Individuals in this cluster reported high/average school and community engagement, high/average parental protective factors (high monitoring and high parent-child trust), average academic achievement, and high neighborhood risk (low collective efficacy and high neighborhood problems).

Cluster 1, which was characterized primarily by risk factors, was more likely to be related to negative outcomes, and thus will be referred to as the Risk Cluster. Cluster 2, which was characterized by protective factors, was related to more positive outcomes, and thus will be referred to as the Resilient Cluster. Finally, cluster 3, which was characterized by being generally average in traditional risk and protective factors with high-risk neighborhood factors, demonstrated some positive and some negative outcomes and will be referred to as the Mixed Cluster.

Results of ANOVAs revealed that the three clusters differed on the seven outcome variables. Specifically, the clusters were different overall on levels of parent trust \((F(2,929) = 118.70, p \leq .001)\), parental monitoring \((F(2,929) = 427.27, p \leq .001)\), school and community engagement \((F(2,929) = 12.05, p \leq .001)\), collective efficacy \((F(2,929) = 397.83, p \leq .001)\), neighborhood problems \((F(2,929) = 538.28, p \leq .001)\), and Woodcock Johnson Letter Word \((F(2,929) = 17.85, p \leq .001)\) and Applied Problems \((F(2,929) = 13.50, p \leq .001)\) achievement measures. Post-hoc tests revealed that the Risk Cluster was significantly different from both the Resilient Cluster and the Mixed Cluster at \(p \leq .001\) for all of the seven variables. However, the Resilient Cluster and the Mixed Cluster...
Cluster were the most similar, and did not statistically differ at $p \leq .05$ for: parent-child trust ($p = 1.00$), parental monitoring ($p = .97$), and school and community engagement ($p = .99$). All other ANOVAs were significant at $p \leq .05$.

As indicated on Table 4, these results indicate that for school and community engagement the Resilient ($M = 3.34, SD = 1.41$) and the Mixed Cluster ($M = 3.35, SD = 1.37$) were not significantly different, but both were significantly higher than the Risk Cluster ($M = 2.79, SD = 1.36$). Similarly, parental monitoring, the Resilient Cluster ($M = 13.80, SD = 1.33$) was not significantly different than the Mixed Cluster ($M = 13.83, SD = 1.24$), but individuals in both the Resilient Cluster and the Mixed Cluster were significantly higher than the Risk Cluster ($M = 10.34, SD = 2.00$). For parent-child trust, again the Resilient Cluster ($M = 17.03, SD = 2.85$) and the Mixed Cluster ($M = 17.03, SD = 2.85$) were statistically the same, but both were higher than reported levels of parent-child trust in the Risk Cluster ($M = 13.30, SD = 3.43$). For collective efficacy, the Resilient Cluster ($M = 33.57, SD = 6.58$) had the highest scores, followed by the Risk Cluster ($M = 26.27, SD = 8.22$), and finally the Mixed Cluster with the lowest scores ($M = 18.94, SD = 6.83$). Individuals in the Mixed Cluster ($M = 25.57, SD = 4.18$) had the highest reported levels of neighborhood problems, followed by the Risk Cluster ($M = 20.55, SD = 5.23$), which in turn was followed by the Resilient Cluster ($M = 15.55, SD = 3.48$). For academic achievement levels, it appears that individuals in the Resilient Cluster had the highest academic achievement and individuals in the Risk Cluster the lowest. Specifically, Woodcock Johnson Letter Word test, individuals in the Resilient Cluster ($M = 104.67, SD = 21.87$) scored highest, followed by individuals in the Mixed Cluster ($M = 100.92, SD = 20.50$), and the Risk Cluster ($M = 93.57, SD = 20.51$). For the
Woodcock Johnson Applied Problems test individuals in the Resilient Cluster had the highest scores ($M = 99.56, SD = 14.35$), followed by individuals in the Mixed Cluster ($M = 96.67, SD = 16.05$), and with individuals in the risk cluster having the lowest scores ($M = 92.76, SD = 14.79$). Chi-square tests revealed that the three clusters did not differ by ethnicity ($\chi^2 (2, N = 930) = 3.34 , p=.20$) or by gender ($\chi^2 (2, N = 930) = .44, p=.80$).

However, interestingly, the likelihood of being a member of the different clusters did vary based on the city they lived in ($\chi^2 (4, N = 742) = 20.65, p < .001$). Specifically, individuals in the Risk Cluster were 28.50% from Boston, 35.80% from Chicago, and 35.80% from San Antonio. Individuals in the Resilient Cluster were 37.70% from Boston, 25.50% from Chicago, and 36.80% from San Antonio. Individuals in the Mixed Cluster were 32.20% from Boston, 41.9% from Chicago, and 25.90% from San Antonio.

**Outcomes**

Results of the variable-centered longitudinal analyses demonstrated that cluster membership predicted different outcomes (see Table 5). The results of each specific analyses are discussed below.

**Delinquency.** Results of the ANOVA indicated that total delinquency varied significantly with cluster membership ($F(2,812) = 26.55, p \leq .01$). Specifically, individuals in the Risk Cluster ($M = 15.47, SD = 5.04$) reported significantly higher delinquency than individuals in both the Resilient Cluster ($M = 13.30, SD = 2.88, p < .01$) and in the Mixed Cluster ($M = 13.62, SD = 2.88, p \leq .05$). However, there was no significant difference between the Resilient Cluster and the Mixed Cluster ($p = .44$).

**Psychological Distress.** ANOVA results indicate that total scores of the Brief Symptom Inventory varied significantly by cluster membership ($F (2,735) = 6.68, p \leq .
.01). Post-hoc analyses demonstrated that mean BSI scores for the Risk Cluster ($M = 2.74, SD = 1.62$) were significantly higher than the Resilient Cluster ($M = 2.25, SD = 1.23, p \leq .001$). However, the scores of individuals in the Mixed Cluster ($M = 2.45, SD = 1.31$) were not significantly different than those in the Resilient Cluster ($p = .20$) or the Risk Cluster ($p = .08$).

**Peer Factors.** Statistical analyses revealed that levels of peer delinquency varied significantly by cluster membership ($F(2,730) = 6.06, p \leq .01$). Specifically, individuals in the Risk Cluster ($M = 4.25, SD = .64, p \leq .01$) and the Mixed Cluster ($M = 4.17, SD = .61, p \leq .05$) reported higher levels of peer delinquency than individuals in the Resilient Cluster ($M = 4.06, SD = .55$). However, reported levels of peer delinquency were not different between individuals in the Mixed Cluster and the Risk Cluster ($p = .43$). Analyses of the positive neighborhood friends variable indicate that there were no significant differences between the Risk Cluster ($M = 2.98, SD = 2.22$), the Resilient Cluster ($M = 3.28, SD = 2.13$), and the Mixed Cluster ($M = 2.93, SD = 2.19; F(2,386) = 1.17 p = .31$)

**Romantic Relationship Quality.** Analyses of the total relationship quality variable indicated that mean scores varied based on cluster membership ($F(2,437) = 8.08, p \leq .001$). Specifically, average total relationship quality was lower for individuals in the Risk Cluster ($M = 3.36, SD = .57$) than the Resilient Cluster ($M = 3.53, SD = .45, p \leq .05$) and the Mixed Cluster ($M = 3.60, SD = .43, p \leq .001$). However, there was no significant difference between the Resilient Cluster and the Mixed Cluster ($p = .34$). Individuals in different clusters significantly differed in levels of extreme violence victimization $F(2,625) = 7.63, p \leq .01$). Again the Risk Cluster had the highest reported
victimization \((M = .09, SD = .22)\), which was higher than both the Resilient Cluster \((M = .04, SD = .15, p \leq .01)\) and the Mixed Cluster \((M = .03, SD = .13, p \leq .01)\). However, there were no significant differences between the Resilient and Mixed clusters \((p= .80)\).

For moderate violence victimization cluster membership again significantly predicted scores \((F(2,625) = 6.41, p \leq .01)\). Here, the Risk Cluster again had the highest level of reported moderate violence \((M = .29, SD = .37)\), which was significantly higher than the Resilient Cluster \((M = .18, SD = .32, p \leq .01)\) and the Mixed Cluster \((M = .18, SD = .32, p \leq .01)\), however there were no significant differences between moderate relationship victimization between the Resilient Cluster and Mixed Cluster \((p = .98)\). For moderate violence perpetration there were no significant differences between the Risk Cluster \((M = .24, SD = .35)\), the Resilient Cluster \((M = .18, SD = .30)\), and the Mixed Cluster \((M = .18, SD = .32; F(2,625) = 2.08, p = .12)\).

**Sexual History.** Chi-square analyses revealed that probability of the individual having had sexual intercourse did not vary based on cluster membership \((\chi^2 (2, N = 734) = 1.70, p= .42)\). Specifically, 72.2% of individuals in the Risk Cluster, 66.7% of individuals in the Mixed Cluster, and 70.2% of individuals in the Resilient Cluster reported having had sexual intercourse. When examining the age at first sexual intercourse, results indicate that the age of initiation did not vary based on cluster membership \((F(2,501) = 2.94, p = .054)\). Specifically, there were no significant differences between the Risk Cluster \((M = 14.89, SD = 1.94)\), the Resilient Cluster \((M = 15.24, SD = 1.73)\), and the Mixed Cluster \((M = 14.76, SD = 2.31)\). The number of partners the focal child had had in the previous year varied by cluster membership \((F(2,428) = 3.74, p \leq .05)\). Specifically, there were no differences between the number of
partners of sexual partners between the Risk Cluster \((M = 2.16, SD = 1.32)\) and the Mixed Cluster \((M = 2.06, SD = 1.19, p = .72)\) or between the Mixed Cluster and the Resilient Cluster \((M = 1.81, SD = .92, p = .11)\). However, individuals in the Risk Cluster had significantly higher numbers of partners than those in the Resilient Cluster \((p<.05)\).

Similarly, the number of times the focal child had been pregnant or gotten their partner pregnant varied by cluster \((F(2,177) = 3.94, p < .05)\). Specifically, individuals in the Risk Cluster \((M = 1.91, SD = 1.06)\) had a significantly higher number of reported pregnancies than individuals in the Resilient Cluster \((M = 1.43, SD = .81, p < .05)\), however there were no differences between individuals in the Mixed Cluster \((M = 1.60, SD = .83)\) and the Risk Cluster \((p = .22)\) or between individuals in the Mixed Cluster and the Resilient Cluster \((p = .48)\). Chi-square analyses indicated that the likelihood of having a sexual transmitted infection did not significantly vary based on cluster membership \((\chi^2 (2, N = 728) = 2.50, p=.29)\).

**Discussion**

The results of this study support the hypothesis that patterns of risk and resilience that are present in early adolescence are differentially related to developmental, social, and psychological outcomes 6 years later. In addition, these results also support previous findings that risk factors tend to cluster together in the same individual (Gutman et al., 2002).

Results from these cluster analyses support the hypothesis that discrete patterns of risk and resilient factors are present in the lives of at-risk children, and so provide an interesting glimpse into lives of ethnic minority youth living in low-income neighborhoods. These results indicate that vast majority of individuals have a pattern of
protective factors \((n = 403)\), or of some protective and some risk factors \((n = 337)\). However, a significant portion of the youth \((n = 190)\) had a variety of risk factors impacting them. These youth appear to be at risk for a variety of negative outcomes, and thus may be the most important group to be targeted for future interventions. It is also notable that there were no significant differences in cluster membership between genders or ethnocultural groups, which indicates that children of any gender and either Black or Latino ethnicity may present with this pattern of risk and protective factors. This is particularly notable for gender, as previous research on resilience has shown females as being more likely to have positive outcomes than their male peers (Garmezy et al., 1984; Rutter, 1979; Werner & Smith, 1982; Werner & Smith, 1992). However, person-centered research by Masten and colleagues (1999) also found that the proportion of females in their Competent, Resilient and Maladaptive cluster groups did not differ significantly. Thus, the findings of this study may simply indicate that females are less likely to demonstrate different patterns of risk and protective factors than males, and instead provides a positive influence through unexamined mechanisms.

Interestingly, there were significant differences in cluster membership by city of residence. This finding may indicate that there are systemic differences that may be targeted within certain cities to reduce the probability of children developing high-risk patterns. For example, individuals in the Mixed cluster, which was primarily distinguished by high-risk neighborhood factors, were more likely to living in Chicago, but individuals in Boston were most likely to be in the Resilient cluster, and least likely to be in the Risk cluster. Interestingly, city of residence may be confounded with ethnocultural groups. For example, there were significantly more Hispanic than Black
children living in San Antonio and Boston, while there were more Black children in Chicago. Though European American adolescents were excluded from the analyses, these results also have implications for them as well. If the neighborhood one grows up in has an effect on an individual’s membership in the risk and mixed cluster (and thus on later outcomes) then European Americans are protected as they are less likely to live in dangerous and disorder neighborhoods (McLoyd, 1998). Further research should be conducted to establish what systemic differences might be influencing the development of different patterns in these different cities in order to create interventions targeted towards promoting the development of positive factor patterns.

The results of this study also support the hypothesis that the discrete patterns of risk and resilience would be related differently to developmental outcomes. A noteworthy finding from this study is the vast difference between outcomes for individuals in the Resilient Cluster and the Risk Cluster. Specifically, compared to the Resilient Cluster, individuals in the Risk Cluster were more likely to report higher incidences of delinquent behavior, and a greater numbers of delinquent peers. These individuals were more likely to have had poor relationship quality with their romantic partners, and were more likely to have experienced extreme or moderate violence in their intimate relationships.

Furthermore, these individuals were more likely to be having sexual intercourse and have been pregnant or have gotten their partner pregnant. These findings support research that suggests that individuals in poverty were more likely to experience poor relationship quality and higher relationship violence (Benson & Fox, 2004), higher sexual risk experiences and behaviors (Davis, 2009), and that life contexts are related to early sexual activity in Latino and Black adolescents (Smith, 1997). In addition, in support of previous
research linking risk factors with decreased psychological health (Masten et al., 1999), in this study individuals in the Risk Cluster reported higher levels of psychological distress. Thus, identification of individuals in the Risk Cluster may be crucial in order to identify those in greatest need of services.

However, the results of the Mixed Cluster outcomes, though not as clear, are also extremely interesting. Despite the high neighborhood risk, individuals in this cluster showed many positive outcomes. Specifically, individuals in the Mixed Cluster demonstrated significantly better outcomes than the Risk Cluster individuals (and not significantly different than the Resilient Cluster) on a number of factors including delinquent behaviors, total relationship quality, as well as extreme and moderate relationship violence victimization. However, these individuals were not significantly different than the Risk Cluster, and did significantly worse than the Resilient Cluster on reports of association with delinquent peers. The mixed cluster was also in the middle of the risk and protective clusters, and not significantly different from either, on three factors: psychological distress, number of sexual partners, and incidence of pregnancy.

These results indicate that the mixed cluster had many of the same more positive outcomes that the resilient cluster demonstrated. Indeed, these outcomes indicate that individuals in the mixed cluster were more like the resilient cluster than the risk cluster. Indeed, this is not surprising, since the mixed and resilient clusters themselves were the most similar, and did not significantly differ on school and community engagement, parental monitoring, and parent-child trust. It is interesting that the risk factor that particularly distinguished the mixed cluster were high neighborhood problems and low collective efficacy, and this may explain some of the outcomes. Individuals in this Mixed
Cluster reported higher levels of peer delinquency, and this may be a result of this high-risk neighborhood environment, and the greater exposure to delinquent peers. Indeed, research supports this, indicating that children who live in environments with high levels of violence and drug use are more likely to interact with children who are also exposed to these factors, and are as a result more likely to have relationships with deviant peers (Brody et al., 2001).

In addition, this high-risk neighborhood, characterized by high levels of violence and disruption, may in itself create psychological distress. Research indicates that individuals living in low SES neighborhoods that demonstrate poor neighborhood stability and high reports of disorder experience significantly more psychological distress than those in stable neighborhoods with few problems (Hill & Angel, 2005; Ross, Reynolds, & Geis, 2000). Furthermore, research suggests that high levels of neighborhood problems and low collective efficacy are related to earlier adolescent sexual activity in minority youth (Browning, Leventhal, & Brooks-Gunn, 2004). Unfortunately, one of the drawbacks of the person-centered nature of the cluster analysis is that we are unable to know what factors in the mixed cluster are providing a buffering or protective influence against the effect of the risk factors, and which may be providing increased risk.

It is also interesting that for individuals in the Mixed cluster, while they associated with deviant peers, showed few other outcomes that were significantly more dysfunctional than their Resilient peers. This finding stands in contrast to findings by Seidman and colleagues (1999) who found that associations with deviant peers increased the risk for negative, dysfunctional adaptation. It may be the risk conferred by deviant
peers affects can have a stronger impact on individuals who are already at risk (in the risk cluster) than others with protective factors (the mixed cluster). Unfortunately, this study was unable to include peer factors in the original cluster analysis due to constraints from the original study. It may be that adding peer information into the person-centered aspect of this study would provide additional information that may be of use. Additional research will need to be conducted in order to understand the role of peers in outcomes for at-risk youth.

The primarily positive outcomes of the mixed cluster also support previous research that emphasizes the effect of cumulative risk. Research by Rutter (1979) and Sameroff and colleagues (1987; 1993) used variable-centered methods to demonstrate that the number of risk factors in a child’s background impacts developmental outcomes more than any one factor alone. The finding of this study, that children who demonstrated higher number of risk factors (Risk Cluster) also demonstrated higher numbers of negative outcomes than their peers (Mixed Cluster), supports their findings. Additional research is needed to examine outcomes over longer periods of time in order to expand upon these findings. This study examined outcomes 6 years after the initial data collection. It may be that as individuals continue to age, their outcomes continue to diverge from individuals in other clusters and differences become larger and more significant as children begin to have more ability to select and be reinforced by their environment. Additional research should examine to see if differences that were non-significant at age 16 to 20 might become significant in adulthood.

This study has many strengths, including its longitudinal design, the multiple reporters and methods that established the cluster analysis factors, and the unique mixture
of person-centered and variable centered approaches. The person-centered nature of the cluster analyses allowed this study to capture more of the complexity of child development, and (in line with Bronfenbrenner, 1979) understand the interconnection of risk factors. However, this study also has some limitations. One of the biggest potential drawbacks of this study is that due to the person-centered nature of the cluster analyses, the results do not establish specific variables that can be targeted for interventions. Instead, these results indicate specific patterns of individuals that should be targeted, which may make designing interventions more difficult.

In addition, though the cluster analysis used both parental and child-report items, the outcome variables were all measured using child self-report questionnaires. Future studies could improve on this study by adding additional reporters for the outcome measures. Finally, within the cluster analysis, there were no measures assessing the child’s friends. This omission resulted because the focal child reported on their peers only on wave 3, and not on wave 1, and so the data was unavailable for use in the cluster analyses. As a child’s peers can have an important impact on their development, this may be an important addition in the future. Future studies could benefit from adding additional factors, such as peer factors, that may also impact children’s risk and resiliency into the patterns of risk and resilience.

Despite any limitations, these results indicate that different variables come together in common ways to distinguish children in low-income minority families. Furthermore, these patterns are related to different outcomes six years later. These results support the ecological systems perspective that stresses the importance of considering the entire picture of a child’s life rather than individual factors (Bronfenbrenner, 1979). In
line with this model and these results, one must move away from the search from a singular linear ‘cause’ and consider the complex interaction of influences in a child’s life.

These considerations have practical implications for intervention and treatment of at-risk individuals. For example, if a therapist were to look merely at within-child and familial factors, then they could miss important risk factors that could make the child more likely to demonstrate negative outcomes. For example, the Resilient and Mixed cluster have similar levels of parental monitoring and parent-child trust, and both demonstrate average to above average academic achievement. However, individuals in the Mixed cluster were also resided in high risk neighborhoods that was characterized by high numbers of neighborhood problems and low collective efficacy. If the therapist were to look only at individual or familial factors, they may miss the neighborhood factors that may lead to negative outcomes (such as association with deviant peers). This is particularly problematic because the Mixed cluster was the second most common pattern of the three, and while the outcomes for individuals in that cluster were not as entirely negative as those for the Risk cluster, there is still a large number of individuals who need services or intervention for some problematic domains.

In addition, just as one must be cautious when examining risk factors to avoid creating an overly narrow view of risk, this study demonstrates the importance of assessing outcomes across multiple domains so that overly narrow definitions do not create a misleading picture of outcomes. If one were to only measure the individuals in this study on a small number of outcome variables, they may classify individuals in the Mixed and Resilient clusters as the same. This would be problematic because, as discussed above, individuals in the Mixed cluster do demonstrate some negative
outcomes (such as age of sexual intercourse initiation) that may require access to services, interventions, or treatment. Thus, this study demonstrates that one must not only establish the complex factors that may be impacting a specific individual, but must also consider and assess across multiple contexts and domains of the impact themselves, in order to understand possible outcomes and potentially intervene.

In conclusion, these results indicate that there are distinct patterns of risk and protective factors in at-risk low-income minority children and that these patterns are related to different outcomes six years later. Thus, identifying these patterns is important in order to target those individuals and help them overcome their risks, increase positive factors, and establish resilient outcomes. These results could also be useful for intervention targeting youth, families, and communities in need of interventions, and suggest the importance of designing policies and interventions that target the multidimensional contexts of children.
References


_Clinical Psychology Review, 24_, 441-459.


Table 1

*Confirmatory Factor Analyses Fit Statistics*

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<tr>
<th>Cluster Variables CFAs</th>
<th>$\chi^2$</th>
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Mother-Child Relationship (IPPA)

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*Cluster Analysis Variables Correlations*

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*Note. *p ≤ .05, **p ≤ .01*
### Table 3

**Re-Formed Hierarchical Cluster Analysis Agglomeration Table**

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Table 4

*Cluster Statistics*

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*Note: results of ANOVA indicated by* $^1$ *= significant overall, $^2$ = significant overall, but not significant difference between risk and resilient clusters*
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*Note. *p ≤ .05, **p ≤ .01*
Figure 1

Graphical Representation of Cluster Means Relative to Risk and Protective Factor Means