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IDENTIFYING PROFILES OF RESILIENCE AMONG A HIGH-RISK ADOLESCENT
POPULATION

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
at Virginia Commonwealth University

By

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Abstract

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Virginia Commonwealth University, 2016.

Major Director: Wendy L. Kliewer, Ph.D.
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The purpose of the present study was to determine whether distinct patterns of adolescent adjustment existed when four domains of functioning were considered. The study included a sample of 299 high-risk urban adolescents, predominantly African American, ages 9-16 and their maternal caregivers. Cluster analysis was used to identify patterns of adjustment. Logistic regression analyses were used to explore whether variations in levels of five theoretically and empirically supported protective factors predicted cluster membership. A four-cluster model was determined to best fit the data. Higher rates of goal directedness and anger regulation coping predicted membership within the highest functioning cluster over a cluster demonstrating high externalizing problem behaviors, and neighborhood cohesion predicted highest functioning cluster membership over a cluster demonstrating high internalizing symptoms. Findings suggest that within a high-risk population of adolescents, significant variability in functioning will exist. The presence or absence of specific protective factors predicts developmental outcomes.

Identifying Profiles of Resilience among a High-Risk Adolescent Population

Understanding resilience can help us understand typical and atypical human development. Research shows that both certain life experiences, and characteristics of a person's genetics, leave them with a significantly increased likelihood of developing psychopathology or other negative outcomes (DuMont, Widom, & Czaja, 2007; Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009; McGloin & Widom, 2001; Petterson & Albers, 2001). For example, growing up in poverty causes detrimental effects on children in a number of ways. Petterson and Albers (2001) reviewed numerous studies of poverty, finding that children's cognitive abilities, intelligence scores, physical growth and physical health all suffer after even just a couple of years living in poverty. Studies examining the effects of community violence on children have found that this experience can lead to a number of mental health problems such as posttraumatic stress disorder and internalizing problems, as well as externalizing problem behaviors which can have a rippling effect on those around the child (Fowler et al., 2009). Children who have been abused or neglected are at a higher risk of mental health problems, delinquency, and substance abuse among other things (McGloin & Widom, 2001). Fortunately, despite these odds, a fair number of individuals develop positively in the face of adversity. Longitudinal studies following children who have experienced maltreatment have shown that anywhere from 22-48% demonstrate resilience in adolescence and early adulthood (DuMont et al., 2007; McGloin & Widom, 2001). Closer investigation of what individual characteristics or environmental elements have been present for those who show resilience has been an area of increasing interest to researchers in psychology.

Studying resilience is a crucial part of understanding how to prevent the development of negative outcomes (Cicchetti & Garmezy, 1993). It takes far fewer resources to promote

resilience in a population than it does to repair the damage created by psychopathology and other negative developmental outcomes (Luthar & Cicchetti, 2000). Increased research and a deeper understanding of the key elements present in the development of resilience will allow intervention and prevention programs to target at-risk individuals more precisely, and promote resilience, which will lead to greatly improved outcomes among these populations. In a longitudinal study identifying predictors of resilience in high-risk urban youth, Tiet, Huizinga and Byrnes (2010) found that a feedback loop existed for resilience, such that early resilience was predictive of and predicted resilience later on. Although it is not a guarantee, children who develop resilience early on are more likely to continue on a resilient path through development than are children who were not resilient from the beginning. DuMont et al. (2007) found the same trend in resilience continuity; in their study of 676 neglected or abused adolescents, over half of those identified as resilient in early adolescence remained resilient into young adulthood, while only 11% of non-resilient adolescents became resilient during young adulthood. These findings show how early intervention can set children up for a path of resilient adjustment, potentially reducing the need for intervention later on. If we intervene early, fewer resources will be required than would be if intervening later on when children have not developed a history of resilient functioning.

Defining Resilience

Definitions of resilience vary somewhat across the literature. At one point in time, resilience was considered a trait, or innate characteristic of an individual which would extend across all situations and time points in their life. Since then, most researchers have moved to a more dynamic definition, identifying resilience as a process which may be developed or promoted at one point in an individual's life, and potentially weakened or lost at another. Ann

Masten (2014) defines resilience as the “capacity of a dynamic system to adapt successfully to disturbances that threaten system function, viability, or development.” (p. 6). Although agreeing that resilience is a more varied process than initially believed, there is still some debate over whether resilience requires the maintenance of positive functioning through adversity (Brody et al., 2013), or the ability to bounce back after a brief drop in functioning during hardship (Curtis & Cicchetti, 2003). Despite these slight variations, the overarching principal of positive adaptation or outcome despite adversity expands across them all is seen across definitions. Luthar, Cicchetti, and Becker (2000) conducted a thorough review of the resilience research, comparing definitions across the literature, and settled on the definition of resilience as the “dynamic process encompassing positive adaptations within the context of significant adversity” (p. 543).

Understanding Typical Development

In addition to defining the construct of resilience, it is also necessary to understand what we consider to be “normal” or “typical” functioning, so that we have something against which to compare atypical functioning and development. Some argue for a definition based on statistical norms, with atypical functioning being a significant difference from the mean, set at whichever bar they choose (Masten & Obradović, 2006). Others look at this as a more subjective construct; one which must be evaluated with careful consideration of the context within which an individual lives (Luthar et al., 2000). Many prominent researchers within the field have made the call for future studies to take cultural context into careful consideration (Cohler, Stott, & Musick, 1995; Masten, 2014). What one society values as healthy functioning, or views as typical, may be vastly different from another society, and when studying resilience across cultures we need to pay close attention to these differences. Another important consideration to emphasize when

looking at healthy, normal functioning is that typical children do not excel in all areas of functioning; it is common for children to have strengths in certain areas and weaknesses in others. Therefore, it is unreasonable for us hold children in adverse or traumatic situations to such a high standard (Luthar et al., 2000).

Risk and Vulnerability

A final construct to define, and one which likely has the most variability, is risk, or vulnerability. While some researchers use the terms interchangeably, others separate the two, making the distinction between individual characteristics and external factors. Many researchers define risk factors using statistical cutoffs, and see them as elements of the environment which forecast negative outcomes or development in the future (Masten & Obradović, 2006; Sameroff & Rosenblum, 2006). Others allow for a broader, more flexible definition of risk factors, using self-perceptions of risk to the individual in addition to statistical cut-offs, meaning that one's perception of disadvantage or adversity is considered when deciding if they are actually experiencing risk which will put them at a disadvantage (Ferraro, 2009). Vulnerability has been defined as an individual characteristic that exacerbate the negative effects of risk factors (Luthar, 2006). Cohler et al. (1995) differentiate between the two by saying that vulnerabilities themselves do not necessarily implicate a pathway to negative outcomes, but in the presence of risk factors, these poor outcomes are exacerbated.

Review of the Literature

Resilience

Emmy Werner (1989) and colleagues conducted one of the most thorough studies to date examining the development of high-risk children. The research team recruited every infant born on the island of Kauai, Hawaii in 1955 ($n = 698$) and tracked their development from the prenatal

period through early and middle childhood, late adolescence, and into adulthood. The goals of the study were to document the development of an entire community of children, while evaluating the outcomes and consequences of early adversity in terms of physical health as well as cognitive and psychosocial abilities. The research team included nurses, pediatricians, social workers, and psychologists, creating a multidisciplinary perspective for data collection. Mothers were interviewed regarding family health history and early childhood development; teachers provided reports on children's academic performance and classroom behavior; children were interviewed when they reached age 18, and again at 30-32 to gain their personal perspectives. Parents also consented to the researchers accessing records of public health, education, social service usage, police files, and family court hearings. Data on family material possessions, intellectual abilities, and emotional competence was also continuously recorded, including the occurrence of stressful life events which may have led to disruption in the family. The extensive collection methods used allowed for a comprehensive picture of each child's environment and functioning across multiple time points.

The *Kauai Longitudinal Study* determined that about a third of the children could be considered high-risk, due to having been born into poverty, raised by mothers with little education, or brought up in homes where high amounts of conflict or parent psychopathology were present (Werner, 1989). Of these high-risk children, two thirds developed learning, behavior, or mental health problems. The researchers identify the other third of the high-risk children, or about 10% of the overall sample, as being resilient. However, a clear definition of resilience is not present in Werner's work. Werner (1989) claims that these 72 children did not develop learning, behavior, or mental health problems, and that instead they grew up to be "competent, confident, and caring young adults" (p. 73) who had coped well during periods of

stress throughout their life. Resilience in this study appears to be successful adjustment across all domains; it was not determined whether the individuals who developed problems in some areas had succeeded in others.

Albert F. Osborn (1990) conducted a similar study of resilience, with a 1970 British birth cohort. The study used a sample of 14,906 participants who had been recruited for the *Child Health and Education Study*. Researchers recruited every child born in England, Scotland, and Wales between April 5th and 11th in 1970, and conducted interviews with mothers and children at birth, age 5, and age 10. Teachers were also interviewed in order to gain insight into the classroom environment, child behavior at school, and child academic performance. Children were evaluated based on verbal, nonverbal, reading, and math abilities, as well as a number of behavioral dimensions. A Competency Index was created to represent each child's overall cognitive and behavioral ability. At age 10, 20% of the children were identified as being in the "problem group" based on their Competency Index score. 30% were identified as "exceptional", and the remaining 50% fell somewhere in between. To be classified as "exceptional" a child had to demonstrate above-average abilities on all cognitive tests administered, and not have any behavioral problems.

Once the subsample of high-performing children was identified, a measure of vulnerability was created in order to examine children who were high-functioning despite adversity (Osborn, 1990). Parental occupation, parental education level, housing, neighborhood environment, and ownership of a car and telephone were used to determine vulnerability. 818 participants were considered to be at the "most disadvantaged" level of the sample. Of these, 40% were considered to be part of the "problem group", 50% were in the "competent" group, and 10% could be considered "exceptional." Just as with the *Kauai Longitudinal Study*, the

definition of resilience required high-functioning across all domains measured. While resilient individuals could be identified using this definition, it was a tiny fraction of the overall sample. The researchers overlooked the possibility that children may have excelled in one or two areas, but not all. They also did not consider competent functioning in the face of high vulnerability to be resilient, which again made the expectations for resilience even more stringent.

Masten et al. (1999) followed 205 children in an urban setting over the course of 10 years in order to investigate which factors predicted resilient outcomes. Academic, behavioral, and social competence were measured from childhood through adolescence, as well as multiple measures of adversity and resources. Resilience was defined as adequate competence in all three domains despite the experience of high adversity. Of the 104 individuals who completed all measures across all time points, 32 were identified as having maladaptive adjustment, 29 were competent, and 43 were considered to be resilient. Just as with the previously discussed studies, the definition of resilience used here limits the exploration of variations in resilience across different domains of functioning. We are incapable of understanding the detailed differences between individuals' adaptations and adjustment when groups are based on such high, overarching standards of competence.

Taking a slightly different perspective on the qualifications for resilience, Egeland, Carlson, and Sroufe (1993) conducted an 18-year longitudinal study looking at children's achievement of salient stage-related developmental tasks. The team recruited 267 women who fell below the poverty line during their last stage of pregnancy, and measured child adaptation at each new developmental period until age 18. Resilience was defined as the successful resolution of stage-related developmental issues, such as forming attachments, learning to organize and coordinate environmental resources, developing successful peer relationships, and learning to

regulate one's emotions. Findings were that 62% of infants were securely attached, which was considered resilient, while only 30% remained resilient through preschool, when they were navigating new environments and interacting with peers. The researchers concluded that the effects of poverty are cumulative, and increase as a child gets older, meaning they are less likely to be resilient as they age (Egeland et al., 1993). This study provides a unique perspective on resilience, although their definition makes it difficult to objectively compare resilience across time points, as the criteria change with age.

Some studies have examined resilience in one specific area of functioning, alone. Fergusson and Lynskey (1996) used data from a 16-year longitudinal study of 1,265 children from a 1977 birth cohort in Christchurch, New Zealand to examine the rate of resilience in high-risk families. Risk was defined based on a 39-item measure assessing family circumstances, parent behaviors, and parent-child dynamics. Resilience was considered the lack of externalizing problem behaviors in adolescence. Within the high-risk group of participants, over 30% did not develop externalizing behaviors, and were classified as having achieved resilient development. The researchers went on to identify protective factors which distinguished the resilient from the non-resilient children. While the study had many strengths, the researchers failed to examine functioning in any domain other than externalizing problem behaviors. It is possible that some of these "resilient" children were excelling in all areas, or it is possible that they were experiencing extreme difficulty adjusting in other ways, but these questions remain unanswered due to the study design.

Only a small fraction of the empirical studies conducted on resilience examine functioning across a number of domains, without combining them into one overall competence index. One study began to address this gap in the resilience literature. Resilience was examined

in the areas of physical health, self-esteem, pro-social behavior, social relationships, anxiety and emotional distress, and academic performance for 472 Canadian children ages 5-15 who were living out-of-home (primarily in foster care) (Flynn, Ghazal, Legault, Vandermeulen, & Petrick, 2004). The sample was compared to national data collected through the *National Longitudinal Survey of Children and Youth*. Analyses were conducted in such a way as to compare the rate of below-average, average, and above-average functioning in each category for the sampled youth with the national sample. Average functioning was considered resilient, while above-average functioning was considered “highly resilient.” This research does a good job of comparing functioning in multiple domains in at-risk youth with the general population. However, each domain of functioning was evaluated separately. It is impossible to know how resilient functioning in one domain relates to functioning in another for a specific individual, based on this study design.

McGloin and Widom (2001) also evaluated resilience in multiple, distinct areas of functioning. For their study, 1,196 children who had experienced abuse or neglect were recruited and followed into young adulthood. Areas of functioning evaluated were employment, homelessness, education, social activity, psychiatric disorders, substance use, arrests, and self-reports of violent behaviors. Resilience was defined as successful functioning in six out of the eight domains. 22% of the children who had experienced abuse or neglect grew up to be resilient young adults (McGloin & Widom, 2001). Again, this study heads in the right direction by examining multiple areas of functioning, and realizing that individuals may be successful, or resilient, in some domains while not in others. However, findings were not broken down to look at where exactly participants showed resilient functioning and where they did not; they were just examined in terms of number of domains of competence.

Brody et al. (2013) conducted a longitudinal study of risk and resilience in rural African American youth. 489 high-risk adolescents were assessed at ages 11-13, and again at age 19. Areas of adjustment measured included depressive symptoms, externalizing behavior, and allostatic load. It was discovered that at age 19, adolescents who experienced adversity yet demonstrated high psychosocial competence had high allostatic load. The findings suggest that the ability to cope, or adapt while experiencing high levels of risk or adversity comes at a cost; certain areas of functioning will thrive at the expense of others. For these adolescents, it was their physical health that suffered in order to maintain competent functioning elsewhere. This study is an excellent contribution to the literature on resilience, and takes the first steps toward identifying varying patterns of resilience. However, continued investigation is necessary in order to identify patterns across numerous other areas of functioning.

Despite often referring to the possibility of variations in resilient outcomes, only a small percentage of the empirical literature actually has examined different domains of adjustment in at-risk youth, separately, rather than combined. The first purpose of this thesis is to determine whether varying patterns of adjustment are present in a high-risk adolescent sample.

Importance of Protective Factors

Protective factors are characteristics known to foster positive outcomes, or lessen the impact of risk factors. Protective factors do not necessarily cancel out disadvantage, or work in an equal and opposite way to risk factors. Instead, they influence the effects of high levels of risk and vulnerability (Masten, 2014). Protective factors can work as direct or indirect elements influencing exposure to risk. Direct (or main) effects of protective factors, often referred to as *additive* work in such a way as to provide positive influence on outcomes across all individuals for whom the protective factor is present; regardless of risk status. Indirect (or moderating)

effects, also referred to as *buffers* are seen when protective factors influence outcomes differently for individuals depending on their exposure to risk. Fergus and Zimmerman (2005) provide an excellent description, with graphs, to demonstrate the different ways protective factors may influence outcomes across varying levels of risk.

Identifying protective factors for at-risk youth is crucial for informing the direction of interventions. A number of studies have looked at protective factors present in the lives of children and adolescents, and their influence on a variety of outcomes. Protective factors can exist within the individual, the family and other social networks, or the surrounding environment.

Bronfenbrenner's Bioecological model of development is an excellent framework to use to understand the variations in sources of protective factors and how they interact to create positive development for an individual (Bronfenbrenner & Morris, 2006). This theory posits that factors influencing child development exist on a number of levels ranging in proximity to the individual. The first level is the individual themselves, including their genetics and temperament. Next is the microsystem which incorporates factors close to the individual which create a direct effect on the person, such as their family, friends, teachers, etc. Following the microsystem is the mesosystem which takes into the account the relationship between elements of the microsystem and how those relationships can impact development; for example, the relationship between one's parents can have a significant impact on home life as well as one's understanding of future relationships. An individual's exosystem incorporates somewhat more distal influences including neighborhood, mass media, or parent's work. The macrosystem is the furthest level which encompasses factors such as the current economics, laws, and culture among other things. Another factor included in Bronfenbrenner's model is the chronosystem which accounts for time – both the time point in the individual's life as well as the point in history. The same experiences

occurring when a child is five versus fifteen have the potential to produce very different effects due to the individual's own development and life experiences at that time, just as growing up in a point of history before electricity would presumably have a different effect on someone than growing up in the 21st century with access to the advanced technology we now have.

Using this theory as a framework for examining protective factors allows for the consideration of a number of different factors at varying levels of proximity to an individual. The bioecological model posits that factors do not have to be in close proximity to or of direct effect on an individual to be influential in developmental outcomes.

When it comes to individual-level protective factors, a number of characteristics have known beneficial effects. The presence of goals, hope, and a sense of purpose repeatedly has been shown to be beneficial. High individual levels of motivation and executive functioning are protective against risk and adversity (Masten, 2014). Bennett, Wood, Butterfield, Kraemer, and Goldhagen (2014) examined the presence of hope as a protective factor for adolescents growing up in highly disadvantaged environments. Hope was defined as the presence of goals, agency, and identification of pathways through which goals could be achieved. Lower rates of hope were associated with an increased risk for mental, emotional, and behavioral disorders (Bennett et al., 2014). Lower expectations for the future was associated with more risk-taking behavior, lower educational attainment, and worse health outcomes (Bennett et al., 2014). Having a strong belief that their lives had meaning, and that they had control over their fate, was predictive of resilient outcomes in the *Children of Kauai Study* (Werner, 1993).

Another protective factor present within the individual is the ability to successfully self-regulate. Self-regulation includes the ability to control one's thoughts, emotions, and behaviors. Buckner, Mezzacappa and Beardslee (2003) found that in a sample of low-income children,

greater ability to self-regulate was strongly associated with resilience, defined as “good overall adaptive functioning” (p. 146) and the absence of psychological or behavioral problems. Successful emotion regulation means the ability to appropriately express one’s feelings, and display them in a socially acceptable manner. Presence of this skill is associated with the decreased likelihood that a child will develop a mood or behavior disorder (Buckner et al., 2003).

When looking to the microsystem, studies have found that the presence of a nurturing adult, parent or otherwise, can act as a “buffer” against the risks associated with low socioeconomic status (Miller & Chen, 2013). Social support from one’s family reduces the likelihood of externalizing behavior problems in adolescents (Li, Nussbaum, & Richards, 2007). Effects of high maternal warmth offset the physical, metabolic consequences of stress relating to childhood poverty (Miller & Chen, 2013). Emmy Werner (1993) found that all of the children in her study who grew up to be considered “resilient” had experienced a close bond with at least one caregiver. In a study of homeless children, a close relationship with a parent predicted fewer behavior problems in school, as well as higher achievement, reported by teachers (Miliotis, Sesma, & Masten, 2010). Adolescent boys who have grown up in low-income urban families are at significantly lower risk of developing antisocial behavior, and show higher rates of positive social skills, when they have had a positive relationship with a nurturing parent (Vanderbilt-Adriance & Shaw, 2008). Adolescent boys are also at a lower risk of committing violent acts when they receive social support from a parent (Brookmeyer, Henrich, & Schwab-Stone, 2005). Lower rates of anxiety also are seen in African American children who have been exposed to violence, but have a good level of social support from their family (Hill & Madhere, 1996).

Protective environmental factors at the exosystem or macrosystem levels also have been identified. Sampson, Morenoff and Gannon-Rowley (2002) reviewed 40 studies of neighborhood

effects on child developmental outcomes. Sampson and colleagues found that higher neighborhood control and stability led to lower rates of adolescent delinquency (Sampson et al., 2002). Positive perceptions of one's neighborhood predicts lower rates of externalizing symptoms in adolescents who have been exposed to violence (Li et al., 2007). In a study of African American adolescent adjustment, higher levels of neighborhood cohesion attenuated the association between felt discrimination and externalizing behaviors (Riina, Martin, Gardner, & Brooks-Gunn, 2013). Perceptions of high neighborhood cohesion also is associated with fewer internalizing symptoms in urban African American adolescents (Hurd, Stoddard, & Zimmerman, 2013; Kliewer et al., 2004).

While many protective factors have overarching positive influence, it is crucial to consider the entire ecology of an individual when predicting outcomes. Some studies have shown that even factors typically considered to be protective can in fact be harmful under certain circumstances (Luthar & Cicchetti, 2012). High peer status is generally thought of as protective, but in the context of urban gang environments, is associated with increased risk for negative outcomes (Luthar & Cicchetti, 2012). Intelligence is often considered beneficial as well, although studies have found that when high levels of intelligence are in the context of poor neighborhoods, intelligence is often demonstrated through illegal behaviors (Luthar & Cicchetti, 2012).

Protective factors mitigate poor outcomes in high-risk youth. However, different protective factors work in different ways, and pathways to specific resilient outcomes have not been examined thoroughly. The second aim of this thesis is to determine whether the presence or absence of specific protective factors predict certain patterns of adjustment outcomes.

Statement of the problem

Although we know that many children overcome adversity, demonstrating resilience in the face of hardship and extreme risk, we also know that functioning does not usually excel in all areas of adjustment; certain areas suffer while others thrive. It is unclear whether patterns of resilience exist among high risk populations. If patterns do exist, it would be useful to know what these patterns are, and whether patterns can be differentiated by protective factors.

Present Study

The present study addresses a gap in the literature on child and adolescent resilience by empirically testing the presence of multiple profiles of adjustment, and perhaps resilience, in a high-risk population. Theory posits that multiple types of adjustment or resilience can be seen in individuals, yet few studies evaluate the evidence behind this theory. Second, this study will determine whether any of these profiles show resilience, defined as functioning at or above one standard deviation above the mean in one or more domains of adjustment. Third, protective factors present for the sampled adolescents will be evaluated to determine whether the presence or lack of specific protective factors predicts certain profiles of adjustment. The sample will consist of low-socioeconomic status, largely African American youth, recruited from an urban community in the United States. Results from this study will help advance the research on resilience in individuals who have grown up under high-risk circumstances. If specific protective factors are associated with patterns of resilience, these findings could help inform future intervention and prevention efforts in high-risk populations.

The areas of adjustment selected for this study are those shown in the developmental literature to have been affected by early adversity: academic achievement, somatic complaints, internalizing symptoms, and externalizing problems (Fowler et al., 2009; McGloin & Widom,

2001; Petterson & Albers, 2001). Protective factors measured are those that have been identified through previous research as having a positive effect on children and adolescents experiencing adversity (Gerard & Buehler, 2004; Masten, 2014; Miller & Chen, 2013). The selected protective factors also align with the Ecological Model; adolescent goal directedness and emotion regulation coping exist at the individual level, social support from maternal caregivers at the microsystem level, and neighborhood cohesion at the macrosystem level.

Cluster analysis, versus latent profile analysis (LPA), was used to identify distinct profiles of adjustment within the sample, due to a couple of reasons. First, LPA requires a somewhat large sample size, typically thought to be 300 or greater, which falls slightly above the present sample. Second, and more importantly, LPA makes the assumption that there is zero correlation between measures (DiStefano & Kamphaus, 2006) and the present study does not meet this assumption. Next, each profile was evaluated to determine whether scores of adjustment for each domain of functioning are at or above one standard deviation above the mean, indicating resilience. Profiles were plotted out in terms of level of functioning among areas of adjustment to show variations among groups. Finally, regression analyses were run to determine whether the presence of certain protective factors predicted specific profiles of adjustment for adolescents.

Statement of the Hypotheses

Hypothesis 1. In the present study, it is hypothesized that within a population of high-risk youth, different patterns of adjustment will emerge.

Hypothesis 1a. Youth displaying some patterns of adjustment will show levels of resilient functioning, while other youth will not appear to be resilient in any category of adjustment measured.

Hypothesis 1b. For those youth who do demonstrate patterns of resilient adjustment, high risk youth will not appear to have resilience across all areas examined; they will show higher functioning in one or more areas, while one or more areas will be below-average.

Hypothesis 2. It is hypothesized that different protective factors present in adolescents' lives will predict certain profiles of adjustment.

Hypothesis 2a. Increased social support is hypothesized to be associated with improved functioning across all profiles of adjustment, when present for an adolescent, because benefits from social support can generalize across many domains of functioning.

Hypothesis 2b. It is believed that higher levels of neighborhood cohesion will be associated with lower levels of externalizing problems; if an adolescent feels more connected to, supported by, they may be less likely to act out against their community, in externalizing ways such as drug use or delinquent behaviors.

Hypothesis 2c. Goal directedness will be associated with academic success, due to the adolescent's higher motivation to achieve in a structured setting.

Hypothesis 2d. Finally, it is believed that an adolescent's ability to regulate feelings of anger or sadness will be associated with lower levels of internalizing problems and somatic complaints, as emotional regulation is associated with enhanced emotional well-being and physical health.

Methods

Participants

The present sample includes 299 mother/female-caregiver (from here on referred to as mothers) and adolescent dyads, who participated in a larger community study, Project COPE. Project COPE was a four-year longitudinal study of adolescent exposure to violence, poverty,

and similar stressors, and the subsequent effects on physiological stress response and adolescent adjustment. Adolescents were in the fifth or eighth-grade at the time of enrollment in the study, and were recruited from an urban setting identified as having moderate to high rates of crime. Adolescents and their mothers were interviewed at wave 1, and then annually for the subsequent waves 2-4, in their homes. Participants were compensated for each wave of participation in Project COPE. The majority of participants were African American (92.6%). Participants for the present sample were included if they reported a weekly household income under \$800. A summary of participant demographics can be found in Table 1.

Table 1.

Sample Demographics

Variable	N	Percent
Adolescent Gender		
Male	142	47.5
Female	157	52.5
Adolescent Age		
9	1	.3
10	56	18.7
11	89	29.8
12	24	8.0
13	47	15.7
14	62	20.7
15	17	5.7
16	3	1.0
Adolescent Race		
Asian American or Oriental	1	.3
African American or Black	277	92.6
Hispanic or Latina	1	.3
White, Caucasian, or European	15	5.0
Multiracial	1	.3
Other	4	1.3
Mother's Marital Status		
Never Married	132	44.1
Married	61	20.4
Living Together	19	6.4
Separated	47	15.7
Divorced	32	10.7

Widowed	7	2.3
Mother's Education Level		
No Diploma	79	26.4
High School Diploma	75	25.1
GED	22	7.4
Some College, No Degree	65	21.7
Associate's Degree	16	5.4
Vocational Degree	19	6.4
Bachelor's Degree	18	6.0
Master's Degree	1	.3
Advanced Degree	2	.7
Mother's Employment		
Full Time	115	38.5
Part-time	47	15.7
Homemaker/Caregiver	46	15.4
Unemployed	43	14.4
Unable to work	28	9.4
Student	5	1.7
Student and Employed	12	4.0
Retired	3	1.0
Household Income		
Less than \$100 per week	23	7.7
\$101-200 per week	39	13.0
\$201-300 per week	59	19.7
\$301-400 per week	55	18.4
\$401-500 per week	39	13.0
\$501-600 per week	36	12.0
\$601-700 per week	28	9.4
\$701-800 per week	20	6.7
Federal Poverty Line		
Above	112	37.5
Below	178	59.5

The demographic characteristics of this sample qualify adolescents for being considered at high risk for negative developmental outcomes. Low socioeconomic status, or living in poverty have repeatedly been linked to poor mental health outcomes, and increased psychological stress in children (Atzaba-Poria, Pike, & Deater-Deckard, 2004; Evans & English, 2002; Miller & Chen, 2013). Family and social environments are also potential risk factors; negative sibling relationships, lack of positive friendships, lower parental support, and harsher

parental discipline all lead to worse outcomes for individuals (Atzaba-Poria, Pike, & Deater-Deckard, 2004). High levels of parental conflict, and negative parental job spill-over are risk factors for children and adolescents living in the home with parents (Atzaba-Poria, Pike, & Deater-Deckard, 2004). Evans & English (2002) identified certain neighborhood characteristics such as housing quality, noise, and crowding as significant risk factors for poor outcomes of physiological stress and mental health.

Cumulative risk theory posits that it is not only the effect of specific risk factors that need to be considered when attempting to predict outcomes, but also the number of risk factors and vulnerabilities present in an individual's life (Evans, 2003). Studies have shown that higher cumulative risk scores, created by summing the number of risk factors present, are associated with an extensive list of negative developmental outcomes such as higher physiological indicators of allostatic load, higher rates of learned helplessness, and increased rates of conduct problems (Atzaba-Poria, Pike, & Deater-Deckard, 2004; Evans, Li, & Whipple, 2013; Evans, 2003).

Only 22.7% of the present sample had 1-2 risk factors present, while 76.3% had 3 or more risk factors present. As the cumulative risk literature has shown, the increase in number of risk factors present in one individual's life will lead to an increase in negative outcomes (Appleyard, Egeland, van Dulmen, & Sroufe, 2005; Sameroff & Rosenblum, 2006). Risk factors work in a progressive manner, with each additional factor creating additional strain and likelihood of poor adjustment (Appleyard et al., 2005). None of the participants had zero risks present, which was expected due to the intentional recruitment of a high-risk population.

Measures

Demographics Questionnaire. The Demographics Questionnaire is a parent-report measure used to assess a number of general descriptive questions in order to gain insight into the composition of the sample. For the present study, maternal and adolescent race, household income, maternal education, maternal marital status, and adolescent gender and grade level were included.

Adjustment. Four classifications of adolescent adjustment, assessed at Wave 3, two years after baseline, were evaluated in the present study: academic achievement, somatic complaints, internalizing problems, and externalizing problems. Parents' report on adolescent academics and somatic complaints were used, while adolescent report was used for internalizing and externalizing behaviors. A multiple reporter design was used to avoid biased reports from adolescents, while achieving the most accuracy possible. Adolescents are better reporters of their internalizing symptoms and often engage in externalizing behaviors that go undetected; therefore adolescents were the chosen reporters for these two adjustment categories. However, at this age parents are still aware of their children's academic achievement and physical health, since they are typically overseeing these areas of their child's life.

Academic Achievement. As part of the demographic questionnaire, parents reported on their child's academic achievement at all four waves of data collection. Parents reported their child's grades for the past year. Response options ranged from 1 to 9, with 9 = "Mostly A's" or 8 = "A's and B's" all the way to 2 = "D's and F's" or 1 = "Mostly F's". Scores were reverse coded such that higher values indicated lower grades, or higher levels of academic problems.

Somatic Complaints. The 10-item somatic complaints subscale of the Child Behavior Checklist (CBCL; Achenbach, 1994), completed by parents, was used to assess physical

complaints that did not have a known medical cause. The CBCL has been adapted for use across a number of different countries and cultures, all of which have been shown to have concurrent validity with the original U.S. measure (Achenbach, 1994; Ivanova et al., 2007). Response options were “*not true*”, “*sometimes true*”, and “*very true*”. Higher scores indicate higher frequency of a specific behavior or category of behaviors. The alpha for the somatic complaints subscale in the current study was $\alpha = .75$.

Internalizing Symptoms. Three indicators were used to quantify internalizing symptoms – the Children’s Depression Inventory (CDI; Kovacs, 1984), the Revised Children’s Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1997), and the Trauma Symptom Checklist for Children (TSCC; Biere, 1996). The CDI is a 27-item child self-report measure modeled after the Beck Depression Inventory for adults. This questionnaire is used with school-aged kids to measure severity of depression symptoms such as sadness, suicidal thoughts, and sleep problems. For each item, the child must select one out of three sentences that best describes him or her for the past two weeks. Sentence choices range in severity from absence of symptom to definite presence of symptom. Higher scores indicated more symptoms of depression. The CDI has good sensitivity and specificity, as well as high test-retest reliability, and internal consistency coefficients ranging from 0.71 to 0.89 (Kovacs, 1992). The alpha for the total score in the current study was $\alpha = .85$. The RCMAS is a 37-item child self-report revision of the original 73-item Children’s Manifest Anxiety Scale. The measure assesses manifest and trait anxiety in children and adolescents. Response options are “*yes*” or “*no*” for each question. In the original study, 28 items were administered, and a total anxiety score was calculated for each participant. Higher scores indicated greater presence of anxiety. Reynolds & Richmond (1997) report a reliability estimate for the total anxiety score of .85. The alpha for the total anxiety score in the current

study was $\alpha = .89$. The TSCC is a self-report measure for children and adolescence ages 8-16 to assess psychological symptomatology relating to posttraumatic stress following the experience of traumatic events such as witnessed violence, abuse, natural disasters, or major loss. Respondents answer using a four-point Likert scale indicating the frequency of symptoms, ranging from “never” to “almost all of the time”. Only the posttraumatic stress symptom subscale were included in the present study. Higher scores indicated more trauma symptoms. Construct, convergent, and discriminant validity have all been well-established for the clinical subscales, including the posttraumatic stress symptom scale (Biere, 1996). The alpha for the posttraumatic stress symptom subscale in the current study was $\alpha = .86$.

Externalizing Problem Behavior. Four subscales on the Problem Behavior Frequency Scales (PBFS; Farrell, Kung, White, & Valois, 2000) were used to quantify externalizing problem behavior. The PBFS is an adolescent self-report measure used to assess the frequency of multiple problem behaviors. Respondents report the frequency in which they engage in certain behaviors, using a six-point scale with options ranging from “never” to “20 times or more” for the past 30 days. The relational aggression, delinquency, drug use, and physical aggression subscales were used in the present study to create a latent construct of externalizing behaviors. Higher scores indicated more externalizing behavior. The PBFS has good internal consistency and reliability in an African American, urban adolescent sample, with $\alpha = .87$. The alphas in the current study were $\alpha = .77$ for the relational aggression subscale, $\alpha = .72$ for the delinquency subscale, $\alpha = .88$ for the drug use subscale, and $\alpha = .82$ for the physical aggression subscale.

Protective Factors. The degree of presence, or absence, of four protective factors was examined at wave 3 for the present sample. Protective factors considered included social support, neighborhood cohesion, emotion regulation abilities, and adolescent goal directedness.

Adolescents were the sole reporters for these items. The developmental literature has shown that perception of disadvantage and risk is a better predictor of health outcomes than is the actual number of risk factors present (Ferraro, 2009). Based on this, it is believed that an adolescent's perception of protective factors predicts adjustment more robustly than the actual number or level of protective factors present.

Social Support. The 7-item social support from mom subscale from the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985) was used to assess adolescent's perceptions of social support received from their mothers. Response options range from “*little or none*” to “*the most possible*” on a 5-point scale. Higher scores indicated higher levels of perceived support. A satisfactory internal consistency for the entire NRI has been found in previous studies; $\alpha = .80$ (Furman & Buhrmester, 1985). The alpha for the support from mom subscale used in the current study was $\alpha = .92$.

Neighborhood Cohesion. The Neighborhood Cohesion Scale (NCS; Seidman et al., 1995) was used to assess adolescents' perceptions of neighborhood dynamics and the support received from their neighborhood. This measure was specifically designed for poor, urban settings in culturally diverse areas. The NCS consists of 11 statements about one's neighborhood, to which adolescents have the opportunity to respond on a 1-4 scale of “*very true*” to “*not at all true*”. Higher scores reflect greater neighborhood cohesion. Previous studies have found adequate to good internal consistency as well as good stability for the NCS (Seidman et al., 1995). The alpha for the total scale in the current study was $\alpha = .79$.

Goal Directedness. The 11-item absence of goals subscale from the Personal Experience Inventory (PEI; Winters & Henly, 1989) was used as an index of adolescent goal directedness. Questions relate to present levels of motivation and thoughts on plans for the future.

Respondents may select answers to questions based on a 4-point scale, ranging from 1 (strongly disagree) to 4 (strongly agree). Research has supported the PEI subscales as valid measures of adolescent behaviors (Winters, Stinchfield, & Henly, 1993). The alpha for the original 11-item measure of goal directness was only $\alpha = .46$ for the present sample. Due to this, three of the original items were excluded to increase construct validity. The alpha for the new 8-item measure of goal directness used in the current study was $\alpha = .77$. Items were coded such that higher scores indicate higher levels of goal directedness.

Emotion Regulation. The 5-item anger regulation subscale and the 5-item sadness regulation subscale from the Children's Emotion Management Scales (CEMS; Zeman, Shipman, & Suveg, 2002) were used to assess emotion regulation coping. Children rate each statement on these scales on a 3-point scale ranging from 1 (hardly ever) to 3 (often). Higher scores reflected greater anger or sadness regulation coping. The CEMS has demonstrated good validity, and test-retest reliability ranging from .61 to .80 (Zeman et al., 2002). The alphas for the anger regulation subscale and sadness regulation subscale in the current study were $\alpha = .60$ and $\alpha = .64$, respectively.

Procedures

Participants were recruited through in-person recruitment events, flyer postings, and neighborhood agencies and events. Participant inclusion criteria included the ability to speak and understand English, and the adolescent had to be in the fifth or eighth grade. In-person interviews were conducted with adolescent and mother in the home, in separate rooms. Interviewers had a Bachelor's or Master's degree (plus a small subgroup who had not yet completed their Bachelor's degree) and underwent extensive training before actively participating in recruitment and interviewing. Approximately half of the interviewers were

African American, although tests of interviewer race and sex effect revealed no biases, $ps > .10$. Interviewers read through the maternal consent forms with the family, and reviewed the assent form with the adolescent privately. Consent and assent was obtained prior to beginning the interviews. Interviews lasted approximately 2.5 hours. Families were compensated \$50 in Wal-Mart gift cards at each wave.

Data Analysis

To begin, descriptive analyses were conducted to understand the distribution of each variable of adolescent functioning that would form the profiles of adjustment. Next, log transformations and square root transformations were applied as needed to the internalizing (CDI, TSCC, and RCMAS) and externalizing (PBFS) variables to adjust for skewness and kurtosis. It happened to be that log transformations were the best adjustment for all externalizing variables, while square root transformations were best for all internalizing variables.

All adolescent outcome variables (CDI, TSCC, RCMAS, PBFS, grades and somatic complaints) were standardized for ease of comparison and interpretation across domains of functioning. Confirmatory factor analyses were used to obtain factor loadings of the internalizing variables and then the externalizing variables. Next, the factor loadings were used to create one index of ‘internalizing symptoms’ and another index of ‘externalizing behavior problems’. Higher scores indicated higher reported internalizing symptoms or externalizing problems. Correlations were run to examine the relationship between the internalizing and externalizing composite scores, and the grades and somatic complaints variables.

Next, a cluster analysis was conducted using the Ward method, in SPSS version 22. Variables included were the internalizing composite and externalizing composite scores along with parent-reported grades and somatic complaints. Analyses were run with the possibility of 2-

6 clusters, to determine the model that best fit the data. Based on the dendrogram, icicle plot, and the significance of between-cluster differences, a four-cluster solution was optimal.

Once the model was established, clusters were evaluated to determine each cluster's pattern of adjustment in terms of high (1 standard deviation above the sample mean), low (1 standard deviation below the sample mean), or average/expected level of functioning (between 1 standard deviation above and below the sample mean) for the four areas of adjustment measured. Comparing individual's scores to the sample mean rather than national averages was decided upon due to fact that this sample has experienced a drastically different upbringing and life history. Comparing their functioning to peers who have had significantly more resources available to encourage positive development would not result in appropriate comparisons. The goal is was to identify individuals who function significantly better than peers of similar life circumstances, not to identify individuals whose functioning is above the average of all age-mates. Comparing functioning to the sample mean rather than national norms is also common in the resilience literature (Fergusson & Lynskey, 1996).

The 1 standard deviation cutoff was chosen as this is a common indicator of high or low functioning in the resilience literature (Brody et al., 2013). Resilient functioning was classified as having high functioning in one or more areas of adjustment. This cut-off was selected in order to allow for the possibility of different patterns of resilience to emerge (e.g. one group showing resilience in academics while another is resilient in terms of their internalizing behaviors). This is somewhat different from past studies of resilience which have examined multiple domains of functioning, which have required average or above average in multiple or all domains in order to be classified as "resilient" (Flynn et al., 2004; McGloin & Widom, 2001).

Clusters were examined to see whether demographic differences existed between groups using Chi-Square analyses and one-way Analyses of Variance (ANOVA). Demographic variables examined included adolescent age and gender, as well as mother's education level, employment status, household income, and marital status. A Oneway ANOVA was used to examine descriptive information on each protective factor at Wave 1 for all four clusters. Means were plotted to show variations in the presence of protective factors for each cluster.

Finally, a series of logistic regression analyses were used to determine whether the presence or absence of the four protective factors examined in the study predicted one pattern of adjustment over another. Each protective factor acted as an independent variable, while cluster membership was the dependent variable. The "highest functioning" cluster was compared to each of the other three clusters, while controlling for adolescent age and sex. Regression analyses were selected over ANOVA because a predictive model was preferred, rather than just examining the association between variables without understanding directionality. Identifying whether protective factors predict resilient outcomes can lead to important clinical implications; significant findings will provide meaningful evidence in support of intervention programs increasing the presence of said protective factors.

Results

As seen in Table 2, initial descriptive analyses revealed high kurtosis and moderate skewness for a number of the adolescent functioning variables. With minimum scores on each measure being zero, the moderate positive skewness suggests that, while mean scores fall in the lower range of possible scores for each scale, some adolescents endorsed higher scores, which is expected in a high-risk sample. High kurtosis indicates that, although there is some variability in scores, a high frequency of adolescents and their parents reported scores close to the mean for the overall sample.

Table 2.

Waves 3 Sample Size, Means, Standard Deviations, Range, Skewness, and Kurtosis for All Adolescent Functioning Variables

Variable	N	Mean (SD)	Range	Skewness	Kurtosis
Somatic Complaints	224	1.84 (2.48)	0 - 14	2.04	4.78
Child Depression Inventory (CDI)	226	7.16 (6.09)	0 - 29	1.08	0.93
Total Anxiety score from RCMAS	226	6.77 (5.66)	0 - 22	0.98	0.14
Physical Aggression score from PBFS	225	3.44 (4.75)	0 - 30	2.32	6.70
Non-Physical Aggression score from PBFS	227	3.68 (4.77)	0 - 23	1.91	3.55
Relational Aggression score from PBFS	226	1.99 (3.41)	0 - 21	3.06	10.59
Delinquency score from PBFS	225	1.85 (3.27)	0 - 19	2.78	9.27
Drug Use score from PBFS	225	1.21 (3.54)	0 - 28	4.91	29.55
Post-Traumatic Stress score from TSCC	227	4.68 (4.90)	0 - 23	1.57	2.46

After composite scores were created, Pearson correlations were conducted to examine the relationship between each domain of adolescent functioning (e.g. internalizing, externalizing, academic achievement and somatic complaints) (Table 3). Adolescent externalizing behavior problems were significantly correlated with internalizing symptoms, and both measures were significantly associated with grades. Parent report of adolescent somatic complaints was not significantly associated with adolescent internalizing, externalizing, or grades.

Table 3.*Correlation Table of Adolescent Functioning Domains across Entire Sample*

	1.	2.	3.	4.
1. Externalizing Problem Behaviors	1			
2. Internalizing Symptoms	.42***	1		
3. Academic Achievement	.33***	.22***	1	
4. Somatic Complaints	.10	.11	.08	1

* $P < .05$, ** $P < .01$, *** $P < .001$ *Cluster Analysis*

A Ward Method cluster analysis was conducted with the potential for a two- to six-cluster solution. Results revealed that both the three-cluster solution and four-cluster solutions fit the data, with clusters being significantly different in terms of internalizing symptoms, externalizing behavior problems, academic achievement and somatic complaints for both solutions. However, evaluation of the frequency distribution of cluster membership suggested that a four-cluster solution was better fit to the data. With the three-cluster solution, cluster sizes were 46, 126, and 48; for the four-cluster solution, the sizes are 46, 85, 48, and 41. Because there was no significant difference in model significance between the three- and four-cluster solutions, four was deemed better due to the more even sample distribution across clusters. Fishers Least Significant Difference (LSD) was used as a post-hoc analysis for multiple comparisons testing between

cluster groups. Descriptive, ANOVA, and LSD analysis results for the four-group solution are summarized in Table 4.

Table 4

Wave 3 Four-Group Cluster Analysis and Post-Hoc LSD Test Results

Cluster	N	Area of Functioning			
		Internalizing Symptoms	Externalizing Behavior Problems	Academic Achievement	Somatic Complaints
High Internalizing (1)	46	3.34 (1.46) *** (2,3,4)	2.20 (2.23) *** (2,3,4)	0.40 (1.02) *** (2) ** (4)	0.16 (1.08)
Highest Functioning (2)	85	-1.98 (0.75) *** (1,3,4)	-1.74 (1.42) *** (1,3)	-0.27 (0.95) *** (1,3)	-0.15 (0.90) * (3)
High Externalizing (3)	48	-0.16 (1.09) *** (1,2) ** (4)	3.30 (1.93) ** (1) *** (2,4)	0.32 (1.04) *** (2) ** (4)	0.29 (1.22) * (2,4)
Average Functioning (4)	41	0.54 (1.30) *** (1,2) ** (3)	-1.46 (0.98) *** (1,3)	-0.21 (0.78) ** (1,3)	-0.18 (0.74) * (3)
Overall Sample	220	0.19 (2.78)	-0.003 (2.25)	0.007 (1.00)	0.006 (1.00)
F Statistic		128.04	231.65	7.39	2.83

*(x) Denotes significant difference from cluster x based on Fishers Least Significant Difference multiple comparisons analysis

* $P < .05$, ** $P < .01$, *** $P < .001$

Chi-Square analyses revealed no significant differences across cluster groups for child age, child gender, parent marital status, mother’s education level, household income, or mother’s employment status (Table 5). These results suggest that there are not significant differences in risk level or other demographic variables across clusters.

Table 5
Chi-Square Analysis of Demographic Variables by Cluster

	Chi-Square Value	Significance (2-sided)
Adolescent Age	20.94	.46
Adolescent Gender	.89	.83
Mother’s Marital Status	13.23	.59
Mother’s Employment	25.22	.24
Weekly Household Income	22.86	.35
Mother’s Education Level	25.02	.41

Means from the four-cluster solution were plotted in order to visualize patterns in cluster functioning (Figure 1). Clusters were named based on functioning patterns resulting in a “High Externalizing Behavior Problems” group who displayed externalizing problems more than one standard deviation above the mean, a “High Internalizing Symptoms” group who displayed internalizing symptoms more than one standard deviation above the mean, an “Average Functioning” group whose mean scores were within one standard deviation of the overall sample mean for each category of functioning, and the “Highest Functioning” group who showed above-average functioning in the internalizing and externalizing categories, with average functioning in academic achievement and somatic complaints.

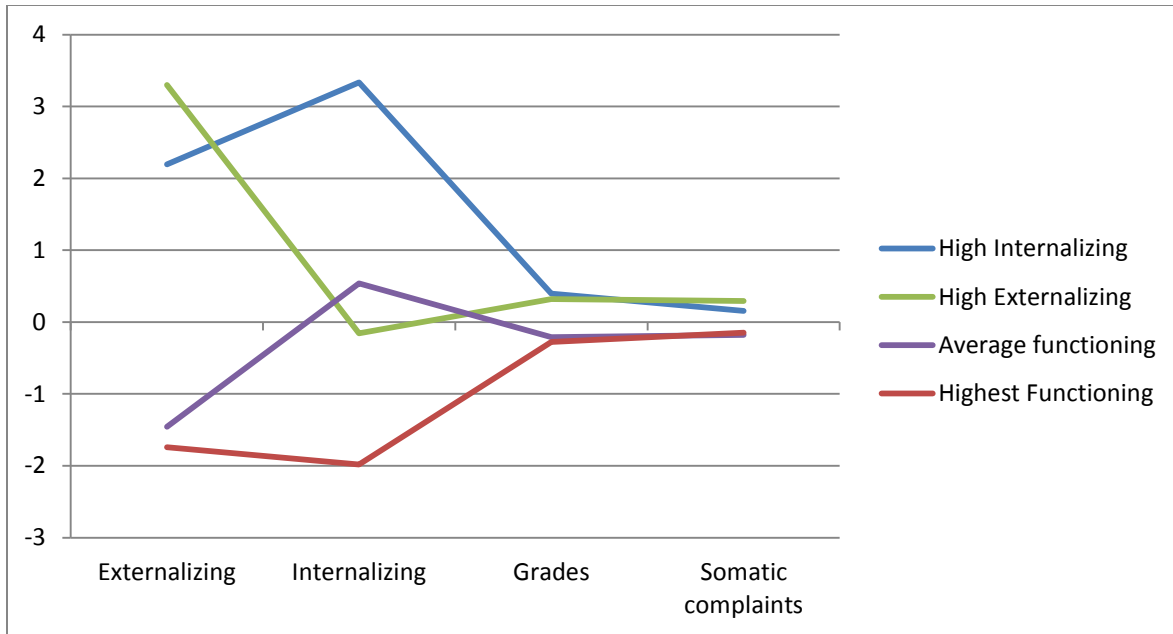


Figure 1. Means of Functioning for Four-Cluster Solution.

Protective Factors ANOVA

Overall levels of protective factors were evaluated across the entire sample to provide comparison for each individual cluster (Table 6). Varying levels of protective factors were then examined between the four clusters using Chi-Square analyses and a oneway ANOVA (Figure 2). The oneway ANOVA revealed that three of the five protective factors varied significantly between clusters: anger emotion regulation coping $F(3, 211) = 3.66, p = .013$, goal directedness $F(3, 211) = 3.64, p = .014$, and neighborhood cohesion $F(3, 213) = 3.95, p = .009$. Sadness emotion regulation and social support from mom did not vary significantly across clusters: $F(3, 210) = 2.26, p = .083$ and $F(3, 211) = 1.77, p = .154$ respectively.

Table 6

Protective Factor Levels by Cluster and Overall Sample

	Group	N	Mean	Standard Deviation	Minimum	Maximum
Sadness Emotion Regulation Coping	1	44	10.28	2.01	7.00	15.00
	2	84	10.90	1.94	5.00	15.00
	3	46	10.10	2.30	5.00	15.00
	4	40	10.00	2.66	6.00	15.00
	Total	214	10.43	2.20	5.00	15.00
Anger Emotion Regulation Coping	1	45	8.20	1.68	4.00	12.00
	2	84	8.96	1.86	4.00	12.00
	3	46	7.91	1.92	4.00	12.00
	4	40	8.43	1.96	4.00	12.00
	Total	215	8.48	1.89	4.00	12.00
Goal Directedness	1	45	34.73	4.23	22.00	41.00
	2	83	35.86	3.40	24.00	42.00
	3	47	33.64	3.88	25.00	41.00
	4	40	35.34	3.82	26.00	40.70
	Total	215	35.04	3.84	22.00	42.00
Social Support from Mom	1	44	27.91	6.08	7.00	35.00
	2	84	29.39	5.03	16.00	35.00
	3	47	27.75	5.18	14.00	35.00
	4	40	27.42	5.29	12.00	35.00
	Total	215	28.36	5.37	7.00	35.00
Neighborhood Cohesion	1	45	29.71	6.39	15.00	42.00
	2	83	33.62	6.37	18.00	44.00
	3	48	30.77	6.68	15.00	43.00
	4	41	32.24	7.53	18.00	44.00
	Total	217	31.92	6.81	15.00	44.00

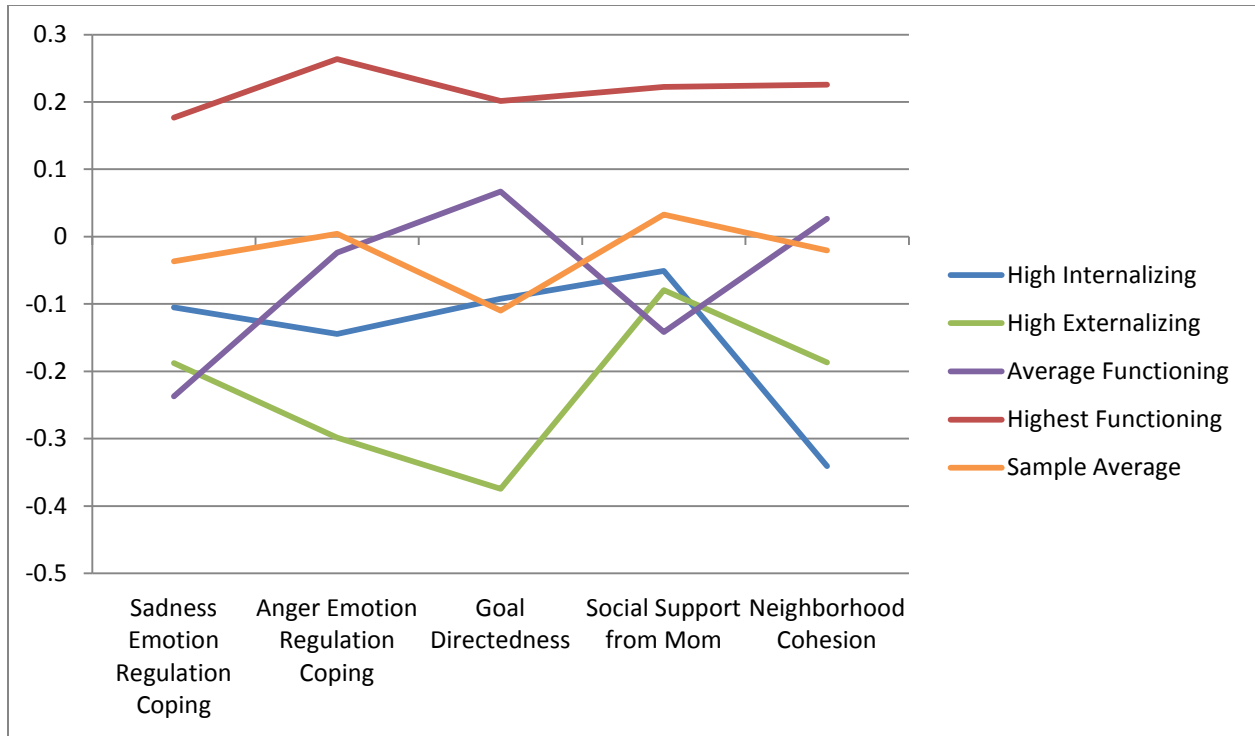


Figure 2. Mean Levels of Standardized Protective Factors by Cluster.

Logistic Regressions

A series of logistic regression analyses were used to assess whether each of the included protective factors significantly predicted cluster membership when comparing each cluster to the Highest Functioning cluster. These select comparisons were chosen due to the goal of identifying significant protective factors which could be targeted through intervention or prevention programs in order to increase positive outcomes among high risk children and adolescents. Adolescent age and gender were controlled for in each regression analysis.

When comparing the High Internalizing group to the Highest Functioning group, with all five predictors included, they significantly predicted whether or not a participant was categorized in the Highest Functioning cluster $\chi^2 = 22.25$, $df = 7$, $N = 125$, $p = .002$. The model effect size was small, with Nagelkerke $R^2 = .23$. When all predictors were included in the model, 68.8% of

cases were correctly predicted. According to the Wald criterion, neighborhood cohesion was a significant predictor of cluster membership, Wald = 9.10, df = 1, $p = .003$. The change in odds associated with a one-unit change in neighborhood cohesion rating was 1.11, indicating that for every one-unit increase the adolescent was 1.11 times more likely to be classified in the Highest Functioning cluster. Sadness regulation, anger regulation, social support from mom, and goal directedness were not significant predictors when comparing the High Internalizing group to the Highest Functioning group (Table 7).

Table 7
Logistic Regression of Protective Factors Predicting Highest Functioning Cluster Membership

Highest Functioning cluster compared to High Internalizing cluster

	B	S.E.	Wald	df	Sig.	Exp(B)
Adolescent Gender	.10	.48	.04	1	.84	1.10
Adolescent Age	.26	.13	3.77	1	.05	1.29
Sadness Regulation Coping	.13	.13	.99	1	.32	1.14
Anger Regulation Coping	.17	.13	1.50	1	.22	1.18
Social Support from Mom	.01	.04	.04	1	.85	1.01
Goal Directedness	.09	.06	2.05	1	.15	1.09
Neighborhood Cohesion	.10	.03	9.10	1	.003	1.11

When comparing the High Externalizing group to the Highest Functioning group, with all five predictors included, the model significantly predicted whether or not a participant was categorized in the Highest Functioning cluster $\chi^2 = 25.19$, $df = 7$, $N = 128$, $p = .001$. The effect size was small, with Nagelkerke $R^2 = .25$. When all predictors were included in the model, 71.1%

of cases were correctly predicted. According to the Wald criterion, anger regulation and goal directedness were both significant predictors of cluster membership, Wald = 4.36, df = 1, $p = .04$ and Wald = 6.41, df = 1, $p = .01$, respectively. The change in odds associated with a one-unit change in anger regulation was .78, indicating that for every one-unit increase in anger regulation score the adolescent was .78 times more likely to be classified in the Highest Functioning cluster. The change in odds associated with a one-unit change in goal directedness was .85, indicating that for every one-unit increase in goal directedness score the adolescent was .85 times more likely to be classified in the Highest Functioning cluster. Sadness regulation, social support from mom, and neighborhood cohesion were not significant predictors when comparing the High Externalizing group to the Highest Functioning group (Table 8).

Table 8

Logistic Regression of Protective Factors Predicting Highest Functioning Cluster Membership

Highest Functioning cluster compared to High Externalizing cluster

	B	S.E.	Wald	df	Sig.	Exp(B)
Adolescent Gender	-.43	.45	.90	1	.34	.65
Adolescent Age	-.09	.13	.48	1	.49	.91
Sadness Regulation Coping	-.08	.12	.44	1	.51	.92
Anger Regulation Coping	-.25	.12	4.36	1	.04	.78
Social Support from Mom	-.02	.04	.19	1	.66	.98
Goal Directedness	-.16	.06	6.41	1	.01	.85
Neighborhood Cohesion	-.06	.03	2.87	1	.09	.95

When comparing the Average Functioning group to the Highest Functioning group, with all five predictors included, the protective factor variables did not significantly predicted whether participants were in the Highest Functioning cluster $\chi^2 = 8.99$, $df = 7$, $N = 122$, $p = .25$. The model effect size was small, with Nagelkerke $R^2 = .10$. When all predictors were included in the model, 67.2% of cases were correctly predicted. According to the Wald criterion, none of the protective factors examined were significant predictors in differentiating the Average Functioning cluster from the Highest Functioning cluster (Table 9).

Table 9

Logistic Regression of Protective Factors Predicting Highest Functioning Cluster Membership

<i>Highest Functioning cluster compared to Average Functioning cluster</i>						
	B	S.E.	Wald	df	Sig.	Exp(B)
Adolescent Gender	.01	.46	.00	1	.98	1.01
Adolescent Age	-.06	.13	.20	1	.65	.95
Sadness Regulation Coping	-.14	.11	1.76	1	.18	.87
Anger Regulation Coping	-.09	.12	.64	1	.42	.91
Social Support from Mom	-.06	.04	2.11	1	.15	.94
Goal Directedness	-.04	.06	.41	1	.52	.96
Neighborhood Cohesion	-.02	.03	.49	1	.48	.98

Discussion

Previous research has demonstrated time and time again that exposure to risk factors during childhood and adolescents leads to detrimental developmental outcomes (DuMont et al., 2007; Fowler et al., 2009; McGloin & Widom, 2001; Petterson & Albers, 2001). Fortunately, a

number of individuals beat the odds and demonstrate average or above-average functioning, often considered “resilience” (Fergusson & Lynskey, 1996; Masten & Obradović, 2006; McGloin & Widom, 2001; Osborn, 1990; Werner, 1989). The present study sought to identify whether high-risk adolescents develop different patterns of adjustment across four domains of functioning – internalizing symptoms, externalizing behavior problems, academic achievement, and somatic complaints – and whether any of the displayed patterns could be classified as being resilient. Furthermore, five specific protective factors were evaluated to see whether variations in the presence or absence of protective factors predicted group membership.

Varying Patterns of Functioning

Results supported the hypotheses that varying patterns of adjustment would be found. The four clusters identified demonstrated variation in functioning levels across domains, as hypothesized. That is, clusters of youth were higher in functioning in some domains while being lower in others. These findings have valuable implications for the interpretation of past and future studies on resilient development. When studies label individuals as “resilient” overall, or use general overarching evaluations of functioning that do not allow for evaluation of functioning in specific areas, they overlook the possibility highlighted by the present study that individuals may be high-functioning in some areas while struggling in others (Masten, 1989; Osborn, 1990; Werner, 1989). A broad label of resilience glosses over the variability of functioning in multiple domains. This could lead to neglectful oversight in identifying individuals who may be struggling and in need of added support. A broad categorization of resilience also implies that the pressure and stress from growing up in high-risk circumstances does not impact certain individuals in any way. This study, along with that conducted by Brody et al. (2013) show that this may not be the case.

Predictive Nature of Protective Factors

The protective factors included in the present study did predict cluster membership, although not in the exact ways hypothesized. Social support and sadness regulation coping were not significant predictors of cluster membership at all. It is likely that the lack of variability between groups for each of these protective factors lead to an inability to detect their potential to act as differentiating protective factors. All four groups endorsed high levels of social support from their mothers, as well as somewhat high sadness emotion regulation coping strategies. Future studies with samples endorsing a wider range in level of social support or sadness emotion regulation coping may be able to find significant protective effects of these two variables.

Anger regulation coping and goal directedness both significantly predicted Highest Functioning group membership over High Externalizing group membership. These findings did not support the present study's hypotheses about these protective factors, although they are not illogical. The ability to regulate one's emotions when coping with feelings of anger may lead to fewer instances of externalizing behavior problems as a means to cope with these feelings. Having more positive expectations or hope for the future has been found to be associated with lower risk-taking behaviors (Bennett et al., 2014). Adolescents who are future-oriented and have goals may be aware of the negative consequences of behaviors such as drug use and aggression and therefore might avoid these behaviors so as not to interfere with their goal achievement.

Neighborhood Cohesion was a significant protective factor with increased perception of cohesion leading to higher likelihood of Highest Functioning membership as opposed to High Internalizing group membership. It was hypothesized that this protective factor would predict lower externalizing behavior problems, not internalizing symptoms. Multiple studies found

neighborhood cohesion to be protective against delinquency and externalizing problems (Li et al., 2007; Riina et al., 2013; Sampson et al., 2002). However, other studies have demonstrated similar results to the present study, with higher neighborhood cohesion predicting lower internalizing symptoms in urban adolescents (Hurd et al., 2013; Kliwer et al., 2004).

The protective factors included in this study were not able to differentiate significantly between the Highest Functioning group and the Average Functioning group. There are a couple of potential explanations for this. First, although the two groups were statistically significantly different, they may not have been different enough for protective factor effects to be detected with the present study's sample size. A larger sample would have allowed for the detection of smaller effects if they do in fact exist. Alternatively, the five selected protective factors may not be the factors that actually differentiate between these two groups at all, regardless of sample size. There are a number of other protective factors that may be present in this sample's lives which were not evaluated here, and it may be one or more of those factors that explains the difference in group membership.

When framing the protective factor results within Bronfenbrenner's Ecological model, we see that higher levels of individual-level protective factors differentiate between the Highest Functioning group and the High Externalizing group. Higher levels of the macrosystem protective factor, neighborhood cohesion, predicted Highest Functioning group membership over High Internalizing membership. The Microsystem protective factor included, social support from mom, did not have high enough variance to act as a predictor of group membership. These findings highlight that protection can come from multiple levels of proximity to an individual; they do not need to be solely within. In addition, it appears as though factors at varying levels protect against different negative outcomes.

Strengths, Limitations, and Future Directions

As with all studies, the present study includes a number of strengths as well as limitations. One strength was the intentional recruitment of a high-risk sample. This sample characteristic improves the external validity of the study, allowing for smoother generalization from the present sample to other similar high-risk urban adolescent populations. The use of validated measures of functioning reduces threat to internal validity which is another strength.

The present study used the sample mean functioning levels as a marker against which cluster functioning could be compared. This decision was made intentionally to avoid comparing adolescents of drastically different backgrounds and risk levels. The results of the present study did not identify any cluster of individuals functioning one standard deviation or more above the mean. Due to the lack of national norms for comparison, it is unknown whether the sample overall is functioning at, above, or below national norm levels. However, it is expected that they are not above national averages, which would mean using this as a comparison to norms would still not lead to the classification of resilience for any cluster. Future studies could incorporate comparisons to both sample means as well as national norms in order to address this question.

Another major strength and purpose of the study was to include multiple domains of functioning and multiple protective factors. Past studies limited themselves by defining resilience broadly and not allowing flexibility in variation of functioning. Along this line, the inclusion of only one protective factor would have limited this study by ignoring the fact that there is not one, single, most important protective factor; instead, there are many highly important protective factors that can all lead to positive development. Including multiple potential protective factors

acknowledges the reality that variability in protective factors is likely, but there are multiple pathways to positive development.

The methods of the present study included some measurement issues which deserve mention. First, the levels of protective factors were measured at wave 1 of the initial study, while functioning was measured at wave 3, a couple years later. It is possible that the levels of protective factors present in an adolescent's life could have changed over this period of time, but the present study did not measure or control for this. The difference in measurement time point allowed for predictive modeling and interpretation, but future studies could strengthen this argument by confirming that protective factors are still present in an individual's life at the point of functioning level measurement.

Another limitation was the use of somatic complaints as a proxy for physical health. Although similar and related, number of somatic complaints is not always an exact indicator of one's physical health. Unfortunately the present study did not include objective or more direct measures of physical health. Future studies should include better measures to assess this area of functioning, since it is a valuable area of study and a domain of functioning known to be influenced by one's environment.

The method for measuring adolescent academic functioning is a significant limitation of the present study. Academic functioning was measured using one broad question asked of parents. It failed to measure trends or patterns in academic functioning across academic subjects. It also did not take into account the difficulty level of courses adolescents were enrolled in at the time. This limitation could be improved upon in future studies by using school records of adolescent academic achievement, and weighting based on course difficulty level (e.g. general level, college preparatory, and advanced placement).

An additional factor that could be considered a measurement issue was the resilience cut-off, set at one standard deviation above the mean. None of the clusters identified through the present study demonstrated “resilient” functioning in any domain as set by this standard. Although this cut-off was chosen due to its consistency with past literature, it may have been too ambitious of a standard for the current sample. It is unclear whether a better cut-off could have been used, or if the sample truly doesn’t demonstrate functioning that should be considered resilient. Future studies should consider whether this cut-off is in fact appropriate. Future samples may have greater variability in terms of functioning, which would mean this resilience definition would work.

Although the use of the sample mean as a comparison for cluster functioning could be considered a strength, it could also be considered a limitation. Because this sample is unique, the sample means will be unique from those of other samples, making comparison across the present and future studies difficult. This limitation is a tough one to address, because the obvious solution would be to compare to national averages, but this is not an ideal decision based on the vast differences between high-risk samples and nationally representative samples, as mentioned earlier. The ideal comparison would be to norms based on high-risk populations, but as of now such norms do not exist for the included measures.

The study sample size was not particularly small, but the complex statistical analyses performed and the division of the sample into four clusters with subsequent analyses could have benefitted from a larger sample. A larger sample would have provided the power to detect even smaller effects which may have been present in the current study but may have gone undetected due to sample size and statistical power. A future replication study with significantly increased sample size may detect additional significant results that the present study was unable to.

A final limitation was the fact that the present study neglected to measure culturally-specific stressors or protective factors for this population. Level of felt discrimination against this urban, African American adolescent sample may be a risk factor playing a significant role in developmental outcomes. However, it went unmeasured and therefore uncontrolled for or evaluated. Perception of cultural congruency is another important factor which was overlooked. Feeling as though one is living in a culture in which the culture one identifies with is incongruent can be a significant stressor. Future studies should strengthen their cultural considerations by measuring culture-specific stressors or risk factors as well as protective factors.

Continued research on the development of resilience is still warranted. Future studies would do well to address some of the limitations of the present study, as well as explore new directions. One potential direction would be to extend the current design to a longitudinal design, exploring whether patterns of resilience stay the same or change over time, and what changes in protective factors may lead to improved or reduced levels of functioning across multiple domains. Presently the literature on resilience seems to be divided into two camps: those that define resilience broadly and follow its development over long periods of time, and those that break generalized resilience down into multiple domains but do so only cross-sectionally. There are huge gains to be made through merging these two methods. It is plausible that certain areas of functioning are more sensitive to changes in protective factors while others may be more stable. Understanding which is which would highlight areas of particular effectiveness for intervention or prevention programs to target; domains of functioning which are more stable could be set aside while sensitive areas could be focused on more intensely in order to foster and maintain successful or resilient functioning in that area.

Another potential focus of future studies would be to identify and examine additional areas of functioning and protective factors. The present study identified only four domains of functioning and five protective factors. There are still many more areas of possible study for each, such as social functioning or physical growth as areas of functioning, and intelligence, optimism, or self-efficacy, among many others as potential protective factors. Continuing to frame protective factors within Bronfenbrenner's Ecological model will allow added insight into what areas of functioning are most strongly impacted by protective factors at varying levels. These results could then be used to inform intervention and prevention programs targeting specific adjustment outcomes, or working at specific levels of the ecological model.

Summary

The present study addressed an important gap in past resilience literature, by identifying varying patterns of adolescent functioning across four domains. It is clear that adolescents may demonstrate positive functioning in certain areas, while struggling in others. Protective factors play a significant role in predicting who will do better and who will do worse. Although significant advances were made with the present study, this is only the tip of the iceberg; extensive additional research is needed. There are additional domains of functioning as well as a vast number of additional protective factors which could be examined through future research. Identifying important protective factors and the areas of functioning they influence can inform intervention and prevention programs designed to foster positive development in high-risk children and adolescents.

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