USING ECOMAPS TO ASSESS SOCIAL AND EMOTIONAL FUNCTIONING IN
SCHOOL-BASED UNIVERSAL SCREENING

AN ABSTRACT

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BY

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Abstract

This study investigated potential ways in which student-reported stress and support levels, represented by the Ecomap stress-support index (SSI), could inform school-based universal screening efforts. Participants included 260 students in grades K to 3 attending an urban elementary charter school in New Orleans, Louisiana, during the academic year of 2011-2012, for whom specific data relevant to the study’s variables were available in school records. Child self-report of stress and support (SSI), measured by the Ecomap, was hypothesized to enhance the prediction of school academic and behavioral outcomes, measured by achievement and behavior reports, beyond teacher report of social emotional functioning and school functioning, as reported on the Behavioral Assessment System for Children: Behavioral and Emotional Screening System (BESS). Step-wise regression analyses were conducted. Results indicated that the BESS and Ecomap SSI together predicted variance in behavior reports and academic scores; however, the SSI did not account for significant additional variance. The Ecomap SSI also was hypothesized to explain variances in student self-reports of internalizing difficulties, whereas teacher reports of student functioning on the (BESS) were hypothesized to explain variances in reports of externalizing difficulties. Multiple regression analyses were used to explore this relationship. The Ecomap SSI was found to predict Attention Difficulties reported by students on the Behavioral Assessment System for Children: Self-Report Protocol C (BASC-2, SRP), with higher reports of stress corresponding to higher reports of attention problems. Findings indicate that data on student stress can be useful in the mental health screening process and provide important information that could inform intervention.
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Introduction

Social-emotional wellness, mental health, behavioral difficulties and early intervention have become central parts of educational discourse and vocabulary. Understanding of the link between difficulties in social-emotional domains and in academic performance outcomes has grown (e.g., Algozzine, Putnam, & Horner, 2010; Catalano, Haggerty, Osterle, Fleming, & Hawkins, 2004; Juechter, Dever, Kamphaus, 2012; Reinke, Herman, Petras, & Ialongo, 2008). Moreover, researchers have found that if the behaviors and emotional states of struggling students are ignored, their problems may escalate into more severe issues (Arnold, 1997). Consequently, students experiencing difficulties in early grades may be at even greater risk for failure and school dropout (Bradley, Doolittle, & Bartolotta, 2008), which makes early identification and intervention critical.

This study is designed to contribute to ongoing scholarship on school-based prevention of social-emotional and behavioral problems by exploring and reporting on the impact of a universal, school-based screening process. With the aim of enhancing educational and mental health outcomes for children, school-based mental health professionals are calling for more focus on methods for early identification of needs within the context of the school environment (Juechter et al., 2012). Specifically, researchers, government agencies and school systems now advocate for the implementation of universal screening programs to aid in both the identification of
intervention needs and the assessment of whether the school climate promotes success (e.g., Cook, Volpe, & Livanis, 2010; Feeney-Kettler, Kratochwill, Kaiser, Hemmeter, & Kettler, 2010; Glover & Albers, 2007; Kamphaus, Thorpe, Winsor, Kroncke, Dowdy, & VanDeventer, 2007; Lane, Lane, Kalberg, Menzies, Bruhn, Eisner, & Crnobori, 2011; President’s New Freedom Commission on Mental Health, 2003; Thapa, 2013; U.S. Department of Health and Human Services, 2005; Weist, Rubin, Moore, Adelshem, & Wrobel, 2007).

The purpose of this study was to establish whether an understanding of student perceptions of stress and support can enhance universal screening initiatives. By identifying the perceived balance of stress and support of elementary school children at risk for academic, behavioral and/or social emotional difficulties, the goal was to address the following questions: What types of stresses do elementary school children report? Is there a correlation between the balance of perceived stress and support reported by students and teacher-reported indicators of school-related problems? Might elevated levels of stress and lack of support explain unaccounted-for variance in the reporting of problems such as depression and anxiety on other standardized self-report measures of emotional functioning? Can the balance of perceived relational stress and support predict academic performance?

This research also aimed to further the understanding of how stress may impact functioning, particularly in the context of the school environment. Research indicates that stress from a variety of sources, including chaotic homes or classroom environments or problems with family or peers, impedes learning (Blair & Raver, 2012). With the larger goal to improve the well-being of children and to facilitate school success, this
study aimed to identify pathways that may enhance school programming and intervention initiatives by identifying common areas of underlying stress that may be related to emotional and behavioral problems.

The need for this study arises from federal mandates to provide intervention services to students, the shift in school-based mental health fields to utilize a population approach to service provision, and research on the fundamental role of data-based decision-making in the provision of services (Hess, Short, & Hazel, 2012). Additionally, this study rests upon an ecological perspective that considers the integrative nature of development and human functioning while also incorporating a phenomenological view that recognizes the importance of individual perceptions of functioning (Bronfenbrenner, 1977 & 1986; Garcia Coll et al. 1996; Nastasi, Varjas, Berstein, & Jayasena, 2000; Spencer, Dupre, & Hartman, 1997).

Several national initiatives, including federal government efforts, have placed social, emotional, and behavioral well-being as priorities. Accordingly, the movement to make social, emotional and behavioral (SEB) screening part of regular school practice has won widespread support (Doll & Cummings, 2008). In 2003 the President’s New Freedom Commission on Mental Health set as a primary goal that early mental health screening, assessment, and service referral become common practice in schools. The commission agreed that school-based mental health professionals have the potential not only to help identify mental health problems early on but also to facilitate interventions by either providing or linking families and children to needed services. In December 2009, the Federal Academic, Social and Emotional Learning Act (H.R. 4223) was introduced. The bill, although yet to be enacted, set into motion an initiative for the
establishment of a national training and technical assistance center for social and emotional learning and for the support of schools in their efforts to implement evidence-based social–emotional learning initiatives including screening. Finally, in their position statement for service provision and overall mission, the National Association of School Psychologists (NASP) supports the use of population-wide information including universal screening data (NASP, 2013).

Broad scale implementation of screening for social, emotional, and behavioral (SEB) difficulties in schools has yet to become common practice, although many schools and districts have begun to attempt implementation (Dowdy, Ritchey, & Kamphaus, 2010). Consequently there is still much to learn about application of universal social, emotional, and behavioral (SEB) screening in the context of schools (Dowdy, Doane, Eklund & Dever, 2011; Eklund, et al., 2009). There remain questions on what measures to use, what data are most relevant and how data should be analyzed and used. Even though reasons abound for use of universal screening in the identification of social, emotional and behavioral difficulties of school children, the process by which early identification is best accomplished needs further investigation (e.g., Chafoulous, Volpe, Gresham & Cook, 2010; Dowdy et al., 2010; Dowdy et al., 2011; Glover & Albers, 2007).

School-based mental health researchers are tackling this subject through the development, implementation, and evaluation of screening measures as well as through the creation of school-wide protocols for screening and intervention that mirror the Response-to-Intervention (RTI) framework currently in place for students struggling in academic areas (Baker, 2008; Doll & Cummings, 2008b; Hess, Short & Hazel, 2012;
NASP, 2013; Short & Strein, 2008). Similar to its academic counterpart, the RTI model for SEB screening and intervention has three tiers, each of which aims to identify students in need of intervention as well as to assess school capacity for meeting student needs at each of these levels (Dever, Barclay, & Raines, 2012). However, even with RTI as a guiding framework, what data are best to use and how they should be collected and utilized needs further research.

The identification of students for additional services has traditionally been the responsibility of teachers (Dowdy et al., 2011). This referral process relies upon teacher nomination of students to school-based mental health professionals, special education coordinators, or other administrators, and commonly asks teachers to identify students who are experiencing the most difficulty in the classroom environment or school setting. However, sole reliance on teacher nomination presents a number of concerns including both under- and over-reporting of behavioral and emotional problems of some students (McIntosh, Frank, & Spaulding, 2010). Dowdy and colleagues (2011) explain that the lack of consistency from subjective teacher referrals and the use of informal data create opportunities for students to be over-referred or overlooked. For example, teachers tend to refer students with behavioral or externalizing symptoms, perhaps neglecting other students, with less-pronounced symptoms. Despite teachers’ best intentions to help support at-risk students a number of students may be under-identified if the referral system relies solely on teacher nomination. Specifically, models that rely solely on teacher referral end up directing intervention resources to those children whose behaviors most overtly affect the overall functioning of the classroom. However, the reliance on teacher referral may not necessarily help identify and meet the needs of children
experiencing anxiety, depression, or other internalizing disorders, nor does it consider the needs of individuals who may have experienced trauma or difficulties at home.

Current research on school-based screening for emotional and behavioral risk suggests that a systematic approach to early identification that targets multiple domains of functioning and incorporates data from a variety of sources may improve identification accuracy (Eklund et al., 2009). Dowdy and Kim (2012) recommend that each student in a classroom, grade, and/or school be considered in the determination of social, emotional, and behavioral risks. Evidence suggests that universal screening that considers functioning of all students can successfully predict emotional and behavioral outcomes and can aid in early intervention of problems (Dowdy et al., 2011; Kamphaus, Thorpe, Winsor, Dowdy & VanDeventer, 2007).

Doll and Cummings (2008b) concur that school-based mental health professionals need to look at assessment from a population perspective, which, potentially, better serves larger groups of children. With Bronfenbrenner's ecological model (1977, 1986) as foundational theory, Doll and Cummings (2008b) explain that in order to create the most effective screening and intervention programs, schools must also consider the contexts, resources, and interactions among the dynamic systems at play the lives of children. Along with the behavioral indicators traditionally relied on for referral and intervention in schools, Doll and Cummings argue that contextual information related to risks and protective factors for children must be understood. Moreover, data that represents multiple perspectives, such as parental feedback and student perceptions of functioning, should be considered and utilized in the process (Doll & Cummings, 2008; Hess et al., 2012). This perspective is also embraced by the National Association of

Within school populations that have greater numbers of students presenting need for intervention, the evaluation model must certainly be redesigned to enable school professionals to better understand the strengths and needs of the population they serve and to distribute resources appropriately. Overstreet (2011), in her advocacy for the utilization of a public health framework to enhance intervention initiatives for individuals who have experienced trauma, explains that risk and resilience are part of a dynamic process of interactions between systems, not simply characteristics of a given individual, child, family or school. Moreover, many professionals and researchers (e.g., Baker, 2008; Hess et al., 2012) argue that regardless of population characteristics, comprehensive social, emotional assessment should include the assessment of elements of the larger ecology that place children at risk and/or offer support or protection. Consequently, school-based assessment practices and interventions should utilize knowledge of the culture and context-specific factors at play. Nastasi and Varjas (2008) explain that in an effort to approach school-based assessment from an ecological perspective one must recognize the need for sensitivity to an array of cultural factors. One must aim to understand and utilize the values, beliefs, language, and behavioral norms that are part of the culture and are, in turn, relevant to the school, family, peer group, and community. Therefore, a comprehensive model of assessment (Baker, 2008; Hess et al., 2012) that targets the multiple domains within which children exist, such as those represented by Figure 1, should be utilized.
Figure 1: Foundational Elements of Comprehensive School-Based Mental Health Assessment.

With such a multifaceted model in mind, prescient questions arise regarding the nature of other information that needs to be collected in order to best serve a school population: What are the contexts within which students are developing? What strains and protective factors exist within these contexts? What supports have the potential to be bolstered or tapped to enhance functioning? What characteristics describe the student populations, particularly those who present elevated at-risk behaviors?

This study roots itself in theories that recognize the potential of all children; embraces the ability of children to display resilience, adapt and change; considers the potential for differing outcomes regardless of experience; and respects diversity of families. Specifically with the greater aim of improving the likelihood of success for all children, this study attempts to help school-based mental health professionals gain awareness of ways in which children’s perceptions of stress and support relate to school outcomes and social, emotional, and behavioral functioning. Additionally, this study
seeks to explore whether child-reports of stress and support can serve as a beneficial component of school-based screening initiatives providing a phenomenological perspective to the screening initiative. In the case of this study, students’ perceptions of relational stress and support were explored and the impact of stress and support were investigated.
Literature Review

This study explores indicators of social and emotional well-being and difficulty as they relate to school success from an academic, mental health, and social emotional perspective. The literature review addresses key elements that concern the implementation of systematic and comprehensive school-based mental health support at the population level. Current frameworks that guide intervention practices, in particular the Response-to-Intervention model, are discussed as well as trends toward ecologically-oriented and population-specific frameworks and how these shifting paradigms of thought about student well-being necessitate consideration of functioning that lie outside of pathological indicators of distress. With the aim to promote school success for all, possible determinates of well-being, such as relationships among stress, support and general functioning, are explored. Extensive research has been undertaken on effective prevention and intervention programs; however, a review of those programs lies beyond the context of the current study. Exploration of the implementation of such programs in diverse contexts may be useful as follow-up to the current study.
Theoretical Frameworks

This study is guided primarily by two major frameworks that blend theory and practice: Ecological Systems Theory (Bronfenbrenner, 1977, 1989, 2006) and Response-to-Intervention (Fuchs, Mock, Morgan, & Young, 2003). The guiding principles of Response-to-Intervention offered a practical framework, and Ecological Systems Theory guided inquiry. Primary elements of these frameworks, including the BioEcological Developmental Model (Bronfenbrenner & Ceci, 1994), social-emotional response-to-intervention and universal screening, are discussed here.

**Bioecological developmental model.** Bronfenbrenner (1977, 1989, 2006) first introduced his ecological conceptual framework in 1977 to describe nested and interlocking aspects of the environment that affect, and interact with, individuals. The model consists of five primary elements. The microsystem reflects the most immediate environment where the individual lives and functions. The mesosystem illustrates the ongoing relationships among and between various microsystems. The exosystem represents a more distant relationship in which there exists direct impact but no direct interaction (e.g., school board decisions). The macrosystem represents very distant and yet highly influential systemic-level processes such as the No Child Left Behind Act (2001) and the United States Department of Education’s Blueprint for Reform (2010), and, finally, the chronosystem takes into account the time in which one lives and consequently pays heed to time-specific events, norms, and competencies. Ecological systems theory artfully demonstrates how changes in any part of the overall system reverberate through the entire system. Consequently this model has the ability to reflect
the ever-evolving complexity of human interactions and functioning (Gutkin, 2012; Kress & Elias, 2013).

Bronfenbrenner and Ceci (1994) outlined a developmental model that complemented the Ecological Systems Theory (Bronfenbrenner, 1979, 1989, 2006): The BioEcological Developmental Model (Bronfenbrenner & Ceci, 1994) illustrates how bi-directional interactions between proximal processes have the ability to actualize or hinder genetic potentials. The model reflects the power of interactions among and between all aspects of the ecological model and how these interactions affect childhood development, functioning, and overall well-being. Bronfenbrenner and Ceci explain that structures and situations within the environment play a role in the ways in which the development of a child is nurtured. For example, complex and multi-dimensional factors, including opportunities, stresses and supports, affect the ability of adults to care for children. Similarly, the ability of adults to tap resources is impacted by internal and external factors. In turn, these complex factors play a role in the development and functioning of children. Importantly, the BioEcological Model illustrates that adult caregivers alone are not the only element impacting a child’s outcome (Bronfenbrenner & Morris, 2006).

Bronfenbrenner incorporated the notion of a transactional nature of development in which systems and individuals potentially impact one another. With this notion in mind, he illustrated how one’s actions and proclivities may shape the environment. At its essence, the BioEcological Developmental Model rests on the idea that context counts.

According to Fish and Jain (1988), ecological systems theory (Bronfenbrenner, 1977, 1989, 2006) in unison with the bioecological developmental model have the potential to provide frameworks for guiding school-oriented mental health providers,
consultants, and researchers in provision of services to children. Because ecological systems theory appreciates influences of various contexts as well as the interconnectedness of elements of systems, school-oriented psychologists can utilize the model to better understand systems at play at the system, school, classroom, and individual levels. By approaching problem solving from such a perspective, one gains a more comprehensive picture that considers contextual and interactional variables. Using this dynamic model enables consultants, direct service providers, and researchers a way to understand multi-and equi-finality at the individual level and offers a framework for understanding the many factors that may be at play in the lives of children.

**Response-to-intervention.** Response-to-Intervention (RTI) has been championed as the most promising identification and intervention model for academic achievement issues in schools (Bradley, Danielson, & Doolittle, 2005) and has become a major force in education reform, now codified into federal law as a method for LD identification (Individuals with Disabilities Education Improvement Act, 2004). Its basic premise is that students should receive effective instruction with progress monitoring before being considered for special education (Fuchs, Mock, Morgan, & Young, 2003). The early and accurate identification of children with needs is critical to ensuring that students receive services that can help them be successful within the school environment. Successful RTI models guide decision making through the use of structured, data-based problem solving, flexible service delivery, regular monitoring of student progress on socially valid measures, and a focus on natural classroom contexts. The basic RTI model has been conceptualized as three-tiered with primary intervention consisting of general education programming, secondary intervention involving evidence-based small group
interventions, and tertiary intervention involving individualized, intensive services. The core features of RTI have been identified as (a) high quality, research-based classroom instruction, (b) universal screening, (c) continuous progress monitoring, (d) research based secondary interventions, (e) progress monitoring during interventions, and (f) fidelity measures (Fuchs & Vaughn, 2012).

Since the start of its widespread implementation in schools in the early 2000s, one of the accomplishments of the RTI reform movement is the increase in the use of data-based screening procedures to identify students at risk for academic difficulties (Martínez & Nellis, 2008). However, questions have arisen as to whether one-time brief universal screening offers adequate data to make decisions about the allocation of services and funds for intervention, and, increasingly, researchers are recommending multi-stage and multidimensional screening for identification of academic risk.

**Social-emotional response-to-intervention.** Traditionally, Response-to-Intervention (RTI) has focused on academic concerns (Fuchs et al., 2003); however, it has been identified as a promising model for children experiencing difficulties in social, emotional, and behavioral functioning within the context of schools (Gresham, 2004, 2005; Pavri, 2010). Particularly in the domain of behavioral support, RTI has begun to be utilized to make decisions about how best to target intervention services, building on extensive research on positive behavioral interventions, functional behavior assessment (FBA), and early intervention (e.g., Fairbanks, Sugai, Guardino & Lathrop, 2007; Sugai & Horner, 2002; Vaughn, Linan-Thompson & Hickman, 2003).

RTI models vary not only with respect to the instruments used to collect data and the interventions put into place, but also with respect to the number of tiers (levels) in the
process (National Dissemination Center for Children with Disabilities: NICHCY, 2012). Even so, the basic structure of the RTI model mirrors that of its academic counterpart. At Tier 1, all students are universally included in school-wide prevention efforts and assessed to identify who may need or benefit from more targeted intervention efforts. At Tier 2, those students who were determined to be at risk are provided with more selective interventions, which may include small group programs. Finally, those students who do not benefit from Tier 2 interventions should receive more intensive individual interventions at Tier 3 (Fuchs & Fuchs, 2009; Severson, Walker, Hope-Doolittle, Kratochwill, & Gresham, 2007).

How the social-emotional RTI model should be shaped and defined is also under investigation. Severson and colleagues (2007) contend that similar to the academic model, social-emotional-behavioral RTI should begin with universal screening, which will allow for early identification of children at risk for difficulties that might not be reflected by classroom behavior problems. Severson and colleagues also advocate inclusion of multiple informants during data gathering and the use of a variety of data collection methods. They go further to explain that when selecting universal screening resources, the techniques should be accurate, sensitive, and specific to the population being served in order to identify and target risk factors specific to students within differing contexts. Researchers and school-based mental health professionals remind us that well-being is locally and contextually defined by the values of the school’s stakeholders, tolerance levels of school personnel, and overall school culture (Gresham, 2004; Jones, Caravaca, Cizek, Horner, & Vincent, 2006). Therefore, when defining the social-emotional-behavioral RTI model and making data collection decisions, schools
should be encouraged to balance evidence-based practices with efforts to tailor processes to meet the ecology of the school and the needs of the current student body.

**Universal screening.** When assessing the emotional and behavioral functioning of students, information is generally sought from key informants that may have specialized knowledge about the student’s functioning, including teachers, parents, and the individual students through self-report (Dowdy & Kim, 2012). However, it is important to recognize that depending upon the informant, the data may only partially reflect the reality of behaviors and/or emotional state. According to Achenbach, McConaughy, and Howell (1987) there is low agreement found among parent, teacher, and child self-reports on emotional well-being, which can confuse or at the least complicate decision making on what data to collect. In particular correlation between raters for internalizing and externalizing problems are low (Merrell, 1999). For example, risks for depression and anxiety may be most accurately reported by self-report from students while reports from teachers and parents may more accurately portray behavioral difficulties (Shapiro & Kratochwill, 2000). Merrell (1999) recommends that different raters be used and information be aggregated to help develop a larger and more complete picture of emotional well-being and functioning in different domains.

Other indicators recommended to be part of the decision-making process for socio-emotional RTI include student attendance, patterns of tardiness, and academic performance. Office discipline referrals are another source of data that schools utilize to evaluate social emotional functioning; however, the behaviors referred for disciplinary action may not be consistent across teachers unless extensive lists and precise definitions of referable behaviors are determined in advanced (e.g., Horner, Sugai, Todd, & Lewis-
Dowdy and Kim (2012) call for more attention to how different informants and different types of universal data can contribute to the screening process in order to help professionals develop an evidence-based decision making framework. Even though a variety of unanswered questions about the optimal instruments and process for universal screening in schools remains, school-based mental health practitioners and researchers agree that selection of screening measures should depend on their technical adequacy, their usability within the context of a school, their developmental appropriateness, their appropriateness for the population, and the goals of screening (e.g., Dever, Raines, & Barclay, 2012; Dowdy & Kim, 2012; Glover & Albers, 2007). Shapiro and Kratochwill (2000) also caution against using any one standardized measure for a population unless that measure has been standardized with the specific population.

**Transactional Relationship Between Support and Psychological Well-Being**

The relationship between perceived social support and psychological well-being may be explained by several different theoretical orientations. One model, the stress-buffering model, posits that supports serve as an aid to children at risk or under stress (Barrera, 1986; Cohen, Underwood, & Gottlieb, 2000; Cohen & Wills, 1985). Another, the main-effect model, presumes that social supports have the potential to benefit any and all children (Cohen, Underwood, & Gottlieb, 2000; Cohen & Wills, 1985). Lazarus and Folkman’s (1984, 1999) transactional model describes an interaction that occurs among individuals and the stresses and supports in their environment. Specifically, they suggest
that when demands or stresses exceed one’s resources, coping skills or supports, a sense of stress resulting from this imbalance is experienced.

Regardless of model, researchers generally agree that lower levels of perceived support and higher levels of perceived stress are associated with poorer emotional outcomes for most. In relation to children and students, there is a substantial body of research that associates social support with student adjustment (e.g., Demarray & Malecki, 2002a, 2002b; Malecki & Demaray, 2003; Piko, 2000; Wenz-Gross & Siperstein, 1998). Relationships between low perceptions of social support and behavioral problems, withdrawn behaviors, perceptions of hopelessness, depression, delinquency, and lower self-concept have all been demonstrated. This places children with tenuous support networks and elevated perceptions of stress at particularly vulnerable positions (e.g., Cornwell, 2003). Fluctuations in stress and support are expected to occur over the course of a lifetime (e.g., Cornwell, 2003; Olsen, Iversen & Sabroe, 1991); however, losses of social support in particular have been associated with declines in emotional functioning (e.g., Berkman, 1985; Cornwell, 2003; Turner, Hays, & Coates, 1993) and increased social support has been shown to enhance well-being (Metts, Manns, & Kruzic, 1996).

**Support and student outcomes.** Extensive research documents a relationship between perceptions of support and demonstrations of internalizing problems, such as anxiety and depression (e.g., Caldwell, Antonucci, Jackson, Wolford, & Osofsky, 1997; Compas, Slavin, Wagner, & Vannatta, 1986; Licitra-Kleckler & Waas, 1993; Ostrander, Weinfurt, & Nay, 1998; Patten et al., 1997; White, Bruce, Farrell, & Kliewer, 1998). From decades of research it is evident that networks of support play a central role in
either exacerbating risk or protecting children from negative emotional and behavioral outcomes. Consequently, researchers encourage school-based mental health professionals to gain an understanding of these networks for their students. For instance, Demaray and Malecki (2002a) recommend that psychologists attend to these factors when working with children and adolescents in the school context, because of the role that support networks play in school outcomes. In their comprehensive work, they found significant relationships between perceived support and school-related performance indicators such as social skills, academic competence, self-concept, problem behavior, externalizing behavior, internalizing behavior, and adaptive skills. Specifically, students with low perceptions of support reported higher problem behaviors and received lower scores on positive behavior indicators.

In a longitudinal analysis of support and school functioning and adjustment, Demaray and colleagues (2005) also found a relationship between social support and student adjustment behaviors over time. Specifically, lack of parent support, classmate support, and/or school support were all related to negative outcomes with lasting qualities including negative psychological well-being and school maladjustment. In their earlier research, Demaray and Malecki (2002a) also found that perceptions of school support correlated with school maladjustment, and teacher support, specifically linked to attitudes toward school and factors related to academic competence.

**Stress, support, and minority populations: Families, children and New Orleans schools.** The transactional model of support and stress relates to all students; however, it is of essential importance to understand how this model of stress and support relates to minority students who are at greater risk for academic failure and school
difficulty due to poverty, racism, and violence. This study is set in an urban charter elementary school in New Orleans, Louisiana, which was founded in an environment of reform and rebuilding that resulted from devastation caused by Hurricane Katrina in 2005. Because of the unique nature of the school reform movement in New Orleans and the specific cultural qualities of public New Orleans schools, background on the New Orleans school population is pertinent to include here.

New Orleans has been characterized as having one of the highest levels of income inequality in the county (Fussell, 2006). Approximately 28% of residents and 42% of the city’s children live below the poverty line. Only 74% are high school graduates and twenty-seven percent of households do not have cars. Consequently, the children of New Orleans, particularly those served by the New Orleans public school system, face specific developmental risks associated with their environment and the city’s lack of community support.

According to the Cowen Institute of Tulane University (2012), New Orleans public schools have long struggled to meet the needs of the children of the city. Even with new schooling options arising from the growing charter system and with a revamped public education system within the district, many students remain inadequately served, and the educational system remains greatly flawed (Cowen Institute, 2012). Reports from the Louisiana Department of Education suggest that the system has systematically failed to fulfill obligations to many public school students, particularly those with disabilities, and, currently, the Southern Poverty Law Center (SPLC) is investigating civil liberty abuses in New Orleans and Jefferson Parish schools, together comprising the Greater New Orleans Metropolitan area (SPLC, 2012).
Furthermore, schools in the New Orleans area have been characterized as feeding the school-to-prison pipeline, a national trend of an increasing number of incarcerated minority youth. Criminal justice advocates associate this trend with zero-tolerance school discipline practices, hence the label of school-to-prison pipeline (Tuzzolo & Hewitt, 2006/2007). Zero-tolerance policies are discipline policies with predetermined consequences that are generally punitive in nature and often severe, with school suspension and expulsion being common practice (Skiba, et al., 2008). Some schools also refer children to local police that may result in school-based arrests (American Civil Liberties Union: ACLU, 2012; Children's Defense Fund: CDF, 2012). These consequences are implemented regardless of the severity of the infraction, extenuating circumstances, or situation specificity.

According to Nicholson-Crotty, Birchmeire, and Valentine (2009), children who have experienced suspensions, school expulsion, or other harsh disciplinary practices are more vulnerable to environmental risks such as drug abuse that enhance the likelihood of later criminal behavior. Reports from the ACLU (2012) suggest that students of color and students with disabilities are particularly vulnerable to harsh discipline practices and a trajectory of disengagement with school. Researchers and criminal justice advocates argue that these types of discipline practices contribute to the overrepresentation of African American males in prison (ACLU, 2012; CDF, 2012; Heitzeg, 2009; Nicholson-Crotty, Birchmeire, & Valentine, 2009). Such issues make it even more essential for education and mental health professionals to attempt to better understand the population of children being served by schools in order to attempt to address their needs and to create an atmosphere of support with the aim for academic success.
Poverty-related stress: Impacts on developmental processes and functioning in children. Numerous studies have found correlations between high levels of stress and lower indications of well being including poorer physical health and compromised psychological well-being. Poverty-related stress, in particular, has been associated with a range of negative health outcomes and psychological problems (Wadsworth & Achenbach, 2005; Wadsworth and Santiago, 2008). In impoverished circumstances, children may be exposed to forced transitions arising from restricted economic opportunity or conflicts related to neighborhood disadvantage. Neighborhoods may not be safe and adequate schools may not be in reach. Moreover, even though adults are generally responsible for finances, the burden placed on parents can result in elevated stress in the parents, which in turn can affect the parent care-giver relationship. Wadsworth and Santiago (2008) explain that poverty-related stress is most harmful for children and adolescents, exacerbating symptoms for them more than adults.

In their study of socioeconomic status, neighborhood disadvantage, and stress, Santiago, Wadsworth, and Stump (2011) investigated the relationship between economic stress and psychological syndromes among a diverse sample of low-income families. Twenty percent of the sample was African American, 33.7% European American, 38% Latino, 2% Native American, and 5% identified as Multiracial. Santiago and colleagues found many links among economic hardship, increased familial stress, and negative social-emotional outcomes for children and adolescents. They also found numerous age differences. Adults showed higher levels of withdrawn symptoms, somatic complaints, and thought problems. Children, however, showed higher levels of social problems, attention problems, and anxious/depressed symptoms. Additionally, poverty-related
stress exacerbated anxious/depressed symptoms for children. Their findings were consistent with other research demonstrating links between poverty-related stress and psychological problems for children (Wadsworth & Santiago, 2008). They concluded that poverty-related stress may be especially detrimental during development (Santiago, Wadsworth, & Stump, 2011).

**Cumulative stress and allostatic load.** From a biological perspective, allostatic load is identified by elevated physiological activity across multiple systems, including the sympathetic adrenomedullary system, the hypothalamic-pituitary-adrenal (HPA) axis, lipid metabolism, and fat deposition (McEwen, 1998). Allostatic load is also described as a physiological marker of cumulative wear and tear on the body caused by the mobilization of multiple physiological systems in response to environmental demands (McEwen & Stellar, 1993).

Allostatic load may play a critical role in understanding how early childhood exposures to cumulative risk factors translate into poorer adjustment and elevated morbidity across the lifespan (Brody et al., 2012). Positing a dynamic causal relationship between accumulated risk factors and psychological well-being, Evans, Ting, Tesher, and Shannis (2007) demonstrated that exposure to cumulative risk during childhood affects not only mental health but also is related to compromised functioning in physical health and academic domains. In their study, Evans et al. (2007) assessed outcomes for elementary-school children who had been exposed to a number of risk factors including both psychosocial (e.g., family turmoil, violence) and physical (e.g., noise, substandard housing). They found that the cumulative risk factors result in children experiencing higher allostatic load in comparison to children with lower levels of cumulative risk.
(Evans et al., 2007). Moreover, their study demonstrates how compounded risks over time may be associated with poorer developmental outcomes, including reports of psychological difficulties (e.g., depression, conduct problems), lower academic performance, dysregulated physical functioning including effects on the hypothalamic-pituitary axis associated with cortisol regulation, and cardiovascular health.

For members of minority or ethnic groups, additional risk factors may exist that relate to experiences with interpersonal and institutional racism (Brody et al., 2012). Factors such as limitations in occupational and educational opportunities, the need to move frequently as a result of economic hardship, difficulty in accessing medical care, and marginalization by health care professionals add stress and increase allostatic load even more (Evans et al., 2007).

In a study examining depression in immigrant Latino populations, Torres (2010) found that pressures and demands associated with being an immigrant in the United States and living in an environment that devalues one’s ethnic group increases the likelihood of experiencing mental health problems. The study also revealed multiple pathways to resilience outcomes including active coping strategies involving person–environment interactions and family supports. Because stressors and supports are unique to the experience of Latinos within the context in which they live, Torres (2010) argued that it was important to investigate context-specific levels of strain and networks of support, specifically in relation to acculturation to American society.

**Allostatic load and academic outcomes.** The most comprehensive research to date on stress and outcomes for children is being funded by the National Institute of Health and conducted by Blair and Raver (2012) of New York University. Their research
demonstrates how stress hormones inhibit brain function in children and potentially stifle achievement. The researchers explain that poverty-related stress caused by crowded conditions, financial worry, and lack of adequate childcare can be particularly insidious and is associated with impaired learning ability in children. Blair and Raver studied stress hormone levels and relationships to behavioral and school readiness tests of children from impoverished backgrounds. They found that high levels of stress hormones influence the developing circuitry of children’s brains, inhibiting higher cognitive functions, such as planning, impulse and emotional control, and attention. Known collectively as executive functions, these mental abilities are important for academic success. Altered stress response and its effect on executive function helps to explain one way in which poverty may be affecting classroom performance and even basic school readiness. Blair and Raven’s findings also suggest that stress in general, whether from divorce, harsh parenting, experiences of trauma, or struggles with a learning disability, has the potential to negatively affect children in all income groups and can have deleterious results on academic outcomes.

Support, protective factors and resilience. Theories related to stress (Haggerty, 1996; Lazarus & Folkman, 1986) are not only concerned with factors that create stress but also with resources and protective factors that preserve well-being in the face of stressful encounters. Coping is also a transactional process that involves both the person and environment. Lazarus and Folkman (1986) define coping as “the cognitive and behavioral efforts made to master, tolerate, or reduce external and internal demands and conflicts among them” (p. 223).

Wadsworth and Santiago (2008) argue that examination of protective factors in
those exposed to the stressors of poverty is exceedingly important. By exploring areas of strength, professionals have the opportunity to identify supports that, if bolstered, may prevent individuals from becoming overwhelmed. Likewise in the school-context, through the identification and strengthening of networks of student support, school-based mental health professionals can work toward better outcomes for the children they serve.

A variety of supports are evidenced to assuage the negative effects of poverty-based stress on children. For example, Sturge-Apple, Davies, and Cummings (2006) found that homes characterized by high levels of caregiver communication and support, which demonstrate nurturing and responsive parenting practices that include emotional availability, have better outcomes and report fewer problems meeting developmental milestones.

In a study with rural African American families, Jones et al. (2006) found that African American families, more than members of other ethnic groups, tend to view child care and parenting as communal tasks. Mothers not only rely on husbands and intimate partners to share in childcare but also on extended family and community networks. They found that such relationships appeared to buffer the effects of stress on the family. By operationalizing a set of systemic family supports that included levels and types of caregiving, communication between co-caregivers, and provision of nurturing-involved care, they assessed the relationship of caregiver quality on children’s reactions to stress. They predicted and found that exposure to less supportive family environments appeared to exert negative effects on the allostatic load for some children. They posited that emotionally supportive family environments appeared to decrease the need for youth to be hyper-vigilant in their social milieus by hypothesizing that the extended family
network provides an arena of comfort and sense of safety that is generalized to other contexts (Jones et al., 2006).

In a study of Latino families of single-parent households raising a child with a disability, Correa (2012) found that Latino families possessed unique support networks including grandmother-like fictive kin called *madrinas* who aided families. This may suggest protective elements bound in cultural traditions and social structures unique to the group, which are in turn vital in a situation of high need and vulnerability.

**Self-reports and perceptions of stress and support.** Questions arise as to whether reports from children should be collected and whether such reports offer accurate information (Levitt, Saka, Romanelli, Hoagwood, 2007). Understandably reports on well-being from children have potential for error. Children may be limited by their developmental stage, vocabulary, cognitive skill, and tendency toward impulsivity. When interpreting data, researchers and mental health providers should follow best practice of utilizing multiple informants rather than relying solely on single reports from an individual. Nonetheless, self-reports provided by children have great potential to add depth to one’s understanding of their social emotional functioning, and research has demonstrated that such reports can demonstrate both reliability and validity.

For example, Measelle, Ablow, John, Cowan and Cowan (2005) investigated the ability of children age 5 to 7 to report personality tendencies utilizing the self-report assessment of the Big Five personality traits. Their researcher found that children self-reports showed levels of consistency that mirrored the self-reports of a comparison sample of college students. In 2005, Saye evaluated the validity of the Behavior Assessment System for Children (BASC) Self-Report of Personality (SRP-C) child self-
reports as a measure of emotions and behavior for 8 to 11 year olds. Saye (2005) found that child ratings correlated with discipline reports and offered important information that contributed to comprehensive assessment when determining diagnosis.

In a qualitative investigation of children's knowledge and understanding of stress, Valentine, Buchanan, and Knibb (2010) found that children, ages 4 to 11, were not only able to demonstrate an understanding of stress but were also able to discuss their reactions to stress as well as pinpoint the situations that caused the stress. Valentine and colleagues conducted semi-structured interviews with fifty children (24 under the age of eight) to assess students’ understanding of stress and their direct and indirect experiences with stressful situations. Children were asked to define stress, to chronicle stressful experiences, and to explain their coping strategies. Most children were able to define stress with detail and accuracy although children six and older utilized a broader range of words and included behavioral, cognitive, emotional, and physical elements of the definition. Wadsworth and Santiago (2008) also found that children could discuss stress with relative ease. They found that children as young as 6 years of age reported a wide array of stressors, such as hunger, violence, illness, and accidents. Moreover, their results indicated that stressors discussed by children were associated with a variety of psychological symptoms (Wadsworth & Santiago, 2008). According to Mistry, Vandewater, Huston, and McLoyd (2002) children and adolescents may not be responsible for paying the family’s bills, but they are nevertheless subjected to food insufficiency, inadequate housing, and frustrated, irritable parents, each of which may result in stress and strain-related consequences that children can report and, in turn, that professionals can potentially address. Consequently, reports from children on their
perceptions of well-being, their management of stress, and their access to personal resources are integral to comprehensive mental health initiatives.

**Ecomaps as tools to assess stress and support networks.** This study utilizes Ecomaps (Hartman, 1978, 1995; Nastasi & International Psychological Well-Being Research Team, 2012; Nastasi, Jayasena, Summerville & Borja, 2011; see Appendix A) to investigate relationships among child perceptions of relational stress and support, school functioning (academic and behavioral), and reports of psychological functioning. Ecomaps are self-created diagrams that visually summarize an individual’s perceptions of social supports and stress. To create an Ecomap, a subject is prompted to draw individuals, groups, or entities (organizations, teams, places) that are considered to be important in the individual’s life. Participants then code the quality of each relationship using a guided system of Xs and Os that depict whether the relationship is considered stressful, supportive, or both. Figure 2 illustrates the basic format and components of an Ecomap. In its various uses in the clinical world, Ecomaps allow for a quick visual analysis that enables a professional to quickly gain an understanding of an individual’s perceptions of personal stress and support.
Ecomaps have been used as clinical and research tools in the fields of mental health, medicine, social work, education, and nursing (e.g., Cox, Keltner, & Hogan, 2003; McCormick, Stricklin, Nowak & Rous, 2008). A review of the literature on Ecomaps revealed their use in diverse contexts across the world with adults, children, and caregivers and for a variety of purposes including therapeutic, intervention planning, and exploration of unrealized opportunities for support (e.g. Carpenter-Aeby, Aeby & Boyd, 2007; Clausson & Berg, 2008; McCormick et al., 2008; de Oliveira, Nascif-Júnior & Rocha, 2010; Perlick et al., 2011; Ray & Street, 2005; Rempel, Neufeld, Kushner, 2007).

Note. Ecomap artwork designed by Kitt Bryce; Adapted with permission from Nastasi et al. (2000).
Although development and utilization of Ecomaps is rooted in clinical practice (Hartman, 1978), as research tools they provide data that can enhance understanding of family member experiences of stress and support (McCormick et al., 2008; de Oliveira, Nascif-Júnior & Rocha, 2010), as well as stress and support dynamics experienced by children (McCormick et al., 2008; Nastasi & International Psychological Well-Being Research Team, 2012; Nastasi, Jayasena, Summerville & Borja, 2011; Summerville, 2013).

McCormick and colleagues (2008) describe the Ecomap as especially useful with younger children as it is simple, easy to understand, and fun to complete. Moreover, it organizes and objectifies a great deal of information about relational networks and family systems in one space. Ecomaps are adaptable to any size network and therefore allow children to include all relationships they deem important. Finally, administration of the Ecomap utilizes resources, such as paper, pencil, and drawing instruments, such as crayons and markers, that are readily available in the school setting and are familiar to children. According to Pinkerton and Dolan (2007) and Summerville (2013), Ecomaps have the potential to provide ecologically-grounded perceptions of how a child views his or her place within their world.
**Current Study and Hypotheses**

The purpose of this study was to investigate whether information about children’s perceived stress and support levels can enhance school-based universal screening efforts by providing information that is indicative of psychological functioning and overall wellbeing but not otherwise available from school-based data such as academic progress and discipline referrals or from teacher reports of functioning. The specific research questions and corresponding hypotheses are as follows:

1. Does child self-report of stress and support enhance prediction of school academic and behavioral outcomes beyond teacher reports of social-emotional functioning and school functioning? Child report of stress and support on the Ecomap (Nastasi & International Psychological Well-Being Research Team, 2012; Nastasi, Jayasena, Summerville & Borja, 2011) will account for additional variance in school outcomes, measured by achievement and behavior reports, beyond that accounted for by teacher reports of social emotional functioning and school functioning on the BESS (Kamphaus & Reynolds, 2007).

2. Do student self-reports of stress and support and teacher reports of child social-emotional functioning differentially predict child reports of internalizing and externalizing difficulties? When considered simultaneously, child report of stress and support will significantly predict child-reported internalizing difficulties on the BASC-2 (BASC-2 SRP-I, Kamphaus & Reynolds, 2005; BASC-2 SRP-C,
Kamphaus & Reynolds, 2004, respectively), while teacher report of social emotional functioning from the BESS (Kamphaus & Reynolds, 2007) will significantly predict child-reported externalizing problems.
Methods

Participants

Participants included 260 students in grades K to 3 attending an urban elementary charter school in New Orleans, Louisiana, during the academic year of 2011-2012, for whom specific data relevant to the study’s variables were available in school records. All students included in the study were African American, 46% were female, and 100% qualified for free or reduced lunch.

Study Setting, Procedures, and Measures

This project is part of a larger international research project examining psychological well-being in children entitled Promoting Psychological Well-Being Globally (PPWBG; Nastasi, 2008). The project is under the direction of Dr. Bonnie Nastasi with partners from 12 countries and three sites within the United States. The elementary charter school included in this study is one of two sites in New Orleans, Louisiana. The initial data collection for the PPWBG began in December 2010 at this site and served to develop understanding of psychological wellbeing across environments while also serving to assist stakeholders in data-based decision making within the context of their school. This first phase led to a partnership with the school that included permission to use archival school data. Data to be used for this study are archival school record data from the 2011-2012 academic year and were obtained with permission from the school records in a de-identified format. Procedures for utilizing the archival data
were reviewed and approved by the Tulane University Institutional Review Board (IRB). Measures included in this study are described below.

- **Behavioral Assessment System for Children: Behavioral and Emotional Screening System** (BASC-2 BESS, Kamphaus & Reynolds, 2007, Teacher Report Form for Grades K-3), is a brief, nationally-normed assessment used for measuring behavioral and emotional strengths and weaknesses in children particularly in relation to school functioning. Completion of an individual BESS by a teacher takes approximately 5 minutes per student. The BESS yields $t$-scores that fall into three levels of psychological risk: Normal ($t = 60$ or lower), Elevated ($t = 61$ to 70), and Extremely Elevated ($t = 71$ or higher). Results of the BESS do not include subscales. The developers report satisfactory internal consistency, test-retest reliability, and inter-rater reliability based on the normative sample, which closely matched recent US census population characteristics (DiStefano & Morgan, 2010; Kamphaus et al., 2007). Split-half, inter-rater, and test-re-test reliability estimates are above .70. Correlation values measuring inter-rater reliability range from .71 to .83 across all forms. Validity studies show high correlations between the BESS and other measures of behavioral and emotional problems such as the BASC-2 and the Achenbach System of Empirically Based Assessment (ASEBA). The BESS has also been shown to be an effective tool for use with more targeted populations including rural elementary students and Latino populations (Dowdy et al., 2011; King, Reschley, & Appleton, 2012). Studies evaluating the use of the BESS specifically within schools serving largely
African American populations have not been conducted. The current study uses data from teacher-reported BESS that were collected on all students in October 2011 as part of the school-wide universal screening process.

- **Behavioral Assessment System for Children: Self-Report Protocols-I and -C** (BASC-2 SRP-I, Kamphaus & Reynolds, 2005; BASC-2 SRP-C, Kamphaus & Reynolds, 2004, respectively) are nationally-normed self-report measures for children ages 6-7 and 8-11, respectively. Both forms of the BASC-SRP are designed to assess social-emotional-behavioral functioning in multiple domains and to facilitate identification of students with problems in these domains. The BASC-2 SRP is a multidimensional measure of children’s behavior, emotions, and adaptive functioning across home and school settings. Items evaluate functioning in four areas: Externalizing Problems, Internalizing Problems, Behavioral Symptoms, and Adaptive Skills and report results on 16 subscales. The narrative and scale classifications provided by the standard analysis are based on \( t \)-scores that compare ratings of same-age peers. \( T \)-scores that fall within the Clinically Significant range are scores equivalent to two standard deviations above the mean and suggest that an individual is demonstrating a high level of problems in that domain. \( T \)-scores in the At-Risk range are equivalent to one standard deviation above the mean and may identify a significant problem that needs careful monitoring. The BASC-2 SRP was normed on a national sample of children that represented US population estimates. The BASC-2 manual provides extensive report on factor analysis and construct validity. Criterion-related validity was evaluated
through correlational studies between the instrument and analogous assessment tools including the Achenbach Youth Self-Report and the Conners-Wells Adolescent Self-report Scale (Frick, Barry, Kamphaus, 2012). Overall, the BASC-2 demonstrated strong congruence. According to a review of assessment tools conducted by Frick, Barry and Kamphaus (2012), reliability for the instrument, as indicated by a variety of methods, is also good. Median internal consistency coefficients are generally in the .80s, and test-retest coefficients generally lie in the .70s. In the spring of 2012, during the months of February and March, BASC-2 SRPs were administered individually by the school-based mental health provider to students identified as at-risk for social, emotional, and behavioral problems, based on BESS results and school or family mental health referrals and whose parents consented to additional assessment. Data for the current study are based on BASC-2 SRPs, administered in 2011-2012 academic year, using either an oral interview (SPR-I) or self-report paper-and-pencil format (SRP-C) depending on the child’s age and reading level.

- **TerraNova** (CTB/McGraw-Hill, 2008) is a standardized, nationally-normed academic assessment for grades K-2. According to the publishers, TerraNova assessments undergo careful review by educational experts to insure that ethnic, racial, gender, regional, and age bias are avoided. Additionally, the publisher insures that TerraNova assessments are congruent with state and national teaching standards and coincide with grade-level expectations of students. TerraNova scores are reported in a scaled format with academic
achievement scores in Reading, Language Arts, and Math. TerraNova is administered by the school each spring in grades K-2. Data for the current study were derived from TerraNova, administered in a whole-class format during May 2012.

- **iLEAP**, The Integrated Louisiana Educational Assessment Program (Louisiana Department of Education, 2011) is Louisiana’s state assessment of mathematics and language arts performance for grades 3, 5, 6, and 7. The iLEAP is administered in the spring semester of third grade. The iLEAP is a combination criterion-referenced (CRT) and norm-referenced test (NRT) and is administered by 3rd grade teachers during the month of May at the end of the academic year. According to the iLEAP 2013 Technical Summary (Louisiana Department of Education, ND), the iLeap demonstrates direct alignment with standards for grade, content and other domains as outlined by the Louisiana Department of Education. The iLEAP was field-tested with students in Louisiana elementary and secondary schools, and results were analyzed to insure content validity. Additionally, reliability analysis demonstrated satisfactory reliability by content area and grade with Cronbach Alphas reported between 0.85 and 0.93. The criterion-referenced test (CRT) measures student progress toward meeting state academic standards and the norm-referenced test (NRT) compares the performance of Louisiana students to others across the nation. Data for this study were derived from iLeap administered to students in May 2012. NRT scores, reported in a scaled format, will be utilized for this study.
• **Discipline Referral to a Time-Out Room** data are maintained by the school-based mental health provider. Students whose behavior is deemed unacceptable for the classroom environment are referred to a Time-Out Room for disciplinary action. The number of referrals is tracked through the academic school year. The index to be used for this study is the total number of behavior incident reports by student for the academic year of 2011-2012. As a school-wide measure, discipline referrals are commonly used within school-based problem-solving models to identify rates of behavior problems and patterns of concern including high rates of referrals by certain teachers or grade levels or elevated numbers of referrals for certain students (McIntosh, Frank, Spaulding, 2010). Discipline referrals, however, lack reliability and are dependent upon not only school discipline policy but upon individual teacher expectations. Nonetheless, they can reflect the level of difficulty a student demonstrates in meeting classroom behavior expectations and have been demonstrated to coincide with other normed behavior assessment tools including the BESS (Dowdy et al., 2011).

• **Ecomaps** (Nastasi & International Psychological Well-Being Research Team, 2012; Nastasi, Jayasena, Summerville & Borja, 2011; see Appendix A) are self-report measures of social network and stressors and supports within that network. Respondents are asked to depict in drawings their relational networks (i.e., those that are important to them), and to identify each relationship as stressful, supportive, or both. Results are reported in a descriptive format and provide individual information and information on the
quantity, type, and quality of relationships included on Ecomaps for the local sample. An overall Stress/Support Index (SSI) that describes the balance of support and stress is provided for each student. Calculation of the SSI is based on the average rating of relationships depicted by each participant wherein supportive relationships are coded as 1, stressful relationships are coded as 2, and ambivalent relationships (i.e., both supportive and stressful) are coded as 1.5. Therefore, the range of SSI is between 1 and 2. An SSI closer to 1 indicates that an individual depicted more supportive relationships than ambivalent or stressful. A higher SSI indicates the depiction of more stressful than supportive relationships. Local norms that enable professionals to assess the overall level of perceived stress and support offer opportunity for further comparison as to whether an individual’s perceived stress level may be higher or lower than others in the sample. The Ecomap has not been normed on a national scale; consequently, data provides a general impression of the stress and support experienced by a sampled population. To gain an understanding of student perceptions of stress and support within self-described relationship networks, Ecomaps were administered in February and March to all students who completed the BASC-2 SRP in the spring of the academic school year. The administration of the Ecomap for this study follows a standard protocol for which students draw their relational network as they perceive it, label the types of relationships (e.g., parent, sibling, teacher, friend), and assign a quality for each relationship as stressful, supportive or both using Xs and Os. These responses have a direct numerical
code associated. The PPWBG Ecomap protocol was modified for use with young children. Basic modifications included simplifying vocabulary, using visual prompts, administering in small groups of 3 to 4 children, and engaging students in discussions about feelings, support, and stress aimed at insuring understanding of concepts. Children completed Ecomaps in groups of three to four with a doctoral-level graduate student in the Department of Psychology leading the facilitation and an undergraduate research assistant assisting with the process. The low facilitator/child ratio insures that children work independently and that children have the ease to ask clarifying questions. Active consent is obtained from parents, and confidentiality and reporting are discussed with children beforehand.

Table 1 provides a summary of the archival data used in the study to measure relevant constructs of school functioning, externalizing problems, internalizing problems, academic performance, and perceived networks of stress and support.
## Table 1

*Study Constructs and Related Indices*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Assessment Tool</th>
<th>Data to be Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>School functioning</td>
<td>BASC-2 BESS, (October, 2011)</td>
<td>t scores</td>
</tr>
<tr>
<td>Academic performance</td>
<td>TerraNova (grades K-2, May, 2012)</td>
<td>Standardized composite scores</td>
</tr>
<tr>
<td></td>
<td>iLeap (grade 3, May, 2012)</td>
<td></td>
</tr>
<tr>
<td>Externalizing difficulties</td>
<td>BASC-2 SRP (Feb.-March, 2012)</td>
<td>t scores</td>
</tr>
<tr>
<td></td>
<td>Discipline Referral (cumulative, 2011-12)</td>
<td>Number of referrals</td>
</tr>
<tr>
<td>Internalizing difficulties</td>
<td>BASC-2 SRP (Feb.-March, 2012)</td>
<td>t scores</td>
</tr>
<tr>
<td>Balance of stress and support perceived by children</td>
<td>Ecomap (Feb.-March, 2012)</td>
<td>Stress/Support Index (SSI)</td>
</tr>
</tbody>
</table>

*Note.* *BASC-2 BESS Behavioral Assessment System for Children, Behavioral and Emotional Screening System; ** BASC-2 SRP Behavioral Assessment System for Children, Self-Report Protocol*
Results

The original sample included 260 students including 60 kindergarteners, 77 first graders, 57 second graders, and 66 third graders. Data collected for this study followed a tiered model wherein teachers completed the BESS (Kamphaus & Reynolds, 2007) screening measure to assess social, emotional, and behavioral functioning of all students. Students whose screening results indicated elevated risk greater than one standard deviation above the mean were administered a second level of assessment. To conduct the second level of assessment, parental consent was required. Consequently, the number of participants varied by screening level and measure. Additionally, kindergarten students who were not six-years-old when second-tier assessments were conducted were only administered the Ecomap, which can be used with children under the age of six. Table 2 and Figure 3 represent the tiered assessment process and the matching sample size for each measure used in the study.
### Table 2

**Number Of Student Participants For Whom Data Were Collected**

<table>
<thead>
<tr>
<th>Measure</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher referrals to Time-Out Room (grades k – 3)</td>
<td>260</td>
</tr>
<tr>
<td>Standardized Academic Scores</td>
<td>241</td>
</tr>
<tr>
<td>BESS Teacher Report (grades k – 3)</td>
<td>239</td>
</tr>
<tr>
<td>Ecomap Stress Support Index (grades k – 3)</td>
<td>70</td>
</tr>
<tr>
<td>BASC-2, SRP</td>
<td>52</td>
</tr>
<tr>
<td>Interview form (ages 6-7) – 26 students</td>
<td></td>
</tr>
<tr>
<td>Child report form (age 8+) – 26 students</td>
<td></td>
</tr>
</tbody>
</table>

**Note.** The variable sample size reflects universally collected data versus targeted data collected on students demonstrating risk for social, emotional, or behavioral difficulty within the school environment. BESS Teacher Report = Behavioral and Emotional Screening System (Kamphaus & Reynolds, 2007). Ecomap Stress Support Index = \( \sum (\text{coded stress and supportive relationships})/n \) where \( n \)=total relationships in participant’s network. BASC-2, SRP = Behavior Assessment System for Children-2nd Edition, Self Report of Personality, (Kamphaus & Reynolds, 2004, 2005).
Figure 3. Tiered Process Of Data Collection

Figure 3. Flow of participants through a tiered process of identification for the need of social, emotional, and behavioral intervention and representation of relevant data collected for decision-making.

All data were reviewed for accuracy following data entry. Ecomap data were initially entered by undergraduate research assistants and cross-verified for accuracy by the researcher. BESS (Kamphaus & Reynolds, 2007) and BASC-2 (Kamphaus & Reynolds, 2004, 2005) data were entered utilizing an automated scanning program. Academic and behavioral data were collected and entered into spreadsheets by a school-based administrator. Academic scores and behavior records were reviewed and cross-verified by the researcher and two research assistants. After data were merged, the researcher reviewed the entire dataset for congruency.

Preliminary Analysis

Descriptive analysis of tier 1 data. Descriptive statistics of Tier 1 data were computed to examine local norms of the school population. BESS results, Time-Out Room referrals, and academic performance scores by grade are detailed.
**BESS-TRP.** BESS Teacher Reports (Kamphaus & Reynolds, 2007) were available for 239 students, \( n=239 \). The mean t-score reported for the student population was 56.64 and the mode was 53. Both are within the normal range of functioning. The standard deviation of reported scores was 11.39. Data from the sample revealed a slight positive skew of .067 with a kurtosis of -0.781. The reported t-scores ranged between 34 and 80. Figure 4 reflects the distribution of BESS results.

Figure 4. *Distribution of Results of BESS Teacher Report*

![Histogram](image)

Figure 4. Histogram representing distribution of t-scores as reported on the BESS teacher report (Behavioral and Emotional Screening System: Kamphaus & Reynolds, 2007) for students in kindergarten through grade 3. Norms for separate sexes were used, as they are considered more sensitive to sex differences in reported patterns of behavior.

Results of the standardized BESS teacher report, outlined in Table 3, indicate that 40% of the student population demonstrated elevated or extremely elevated risk with t-score results greater than one standard deviation from the mean. Generally, less than 20% of a school population is expected to show elevated results on teacher report of functioning. BESS results indicated elevated overall risk for the study sample.
Table 3

Results of School-wide Universal Screening Utilizing the BESS, Teacher Report

<table>
<thead>
<tr>
<th>Level of functioning</th>
<th># of students</th>
<th>% of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>143</td>
<td>59.83%</td>
</tr>
<tr>
<td>Elevated</td>
<td>59</td>
<td>24.69%</td>
</tr>
<tr>
<td>Ext. Elevated</td>
<td>37</td>
<td>15.48%</td>
</tr>
<tr>
<td>Total At Risk</td>
<td>96</td>
<td>40.17%</td>
</tr>
</tbody>
</table>


Results by grade level indicate that 51.85% of kindergarten and 41.67% of 1st grade students are perceived by teachers as experiencing difficulties and are at risk for school problems. Third grade teachers also reported that a high proportion of their students were presenting marked difficulty with 20% of the 3rd grade classes rated with extremely elevated scores that fall two standard deviations above the mean.
### Table 4

**Results of BESS Teacher Report by Grade Level**

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Normal Range</th>
<th>Elevated</th>
<th>Extremely Elevated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>48.15%</td>
<td>37.04%</td>
<td>14.81%</td>
</tr>
<tr>
<td>1st grade</td>
<td>58.33%</td>
<td>26.39%</td>
<td>15.28%</td>
</tr>
<tr>
<td>2nd grade</td>
<td>79.25%</td>
<td>16.98%</td>
<td>3.77%</td>
</tr>
<tr>
<td>3rd grade</td>
<td>61.67%</td>
<td>18.33%</td>
<td>20.00%</td>
</tr>
</tbody>
</table>


**Time-out room referral.** Time-Out Room referral is an exclusionary behavior management practice used by the participating school in which children who are disruptive in the classroom are sent to a room about the size of a small classroom to address the issue with a behavior monitor. The school tracks each time a student is sent to the Time-Out Room and keeps a qualitative log describing reasons for each referral. Only the number of Time-Out Room referrals per student was included in this analysis. Table 5 illustrates the distribution of Time-Out Room Referrals across grades. Over the course of the 130 days, nearly 3000 incidences of children being sent to the Time-Out Room were tracked. The average number of times students were sent to the Time-Out Room was 11. Thirty-three percent of Kindergarteners were sent to the Time-Out Room more
than 10 times. Sixty-four percent of 1st graders were sent to the Time-Out Room 10 times or more.

Table 5

*Discipline Referrals to Time-Out Room by Grade*

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Mean</th>
<th>Median</th>
<th>Range</th>
<th>% with 10+ referrals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>749</td>
<td>13</td>
<td>2</td>
<td>0 to 157</td>
<td>32.76%</td>
</tr>
<tr>
<td>1st Grade</td>
<td>1297</td>
<td>17</td>
<td>8</td>
<td>0 to 77</td>
<td>64.29%</td>
</tr>
<tr>
<td>2nd Grade</td>
<td>344</td>
<td>6</td>
<td>2</td>
<td>0 to 102</td>
<td>15.79%</td>
</tr>
<tr>
<td>3rd Grade</td>
<td>419</td>
<td>6</td>
<td>1</td>
<td>0 to 59</td>
<td>16.67%</td>
</tr>
<tr>
<td>Overall</td>
<td>2809</td>
<td>11</td>
<td>2</td>
<td>0 to 157</td>
<td>29.07%</td>
</tr>
</tbody>
</table>

*Academic performance.* iLeap scaled scores for English Language Arts (ELA) and Mathematics were averaged by the researcher to create a composite iLEAP score that represents overall academic performance similar to the composite score provided by Terra Nova. Z Scores, with a mean of zero and standard deviation of 1, were calculated for iLEAP and Terra Nova composite scores following the standard procedures for the calculation of standardized scores in SPSS (Field, 2009). Data were then merged across grade levels to represent a standardized academic performance score for students in kindergarten through grade 3. The two instruments, while different, offer similar indications of academic performance and were used in this study as comparable measures of academic functioning.
Partial data for eight students were missing due to absence. These eight missing scores were imputed using the mean of the missing portion of the test (Field, 2009). iLEAP scores were available for all third grade students included in the sample. A total of 241 standardized academic performance scores were included in the data.

Table 6  
*Academic Performance Based on Standardized Tests Scores for Kindergarten through 3*rd* Grade*

<table>
<thead>
<tr>
<th>Level of Performance</th>
<th># of students</th>
<th>% of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1 std. dev.</td>
<td>34</td>
<td>14.11%</td>
</tr>
<tr>
<td>-2 std. dev.</td>
<td>7</td>
<td>2.90%</td>
</tr>
<tr>
<td>+1 std. dev.</td>
<td>33</td>
<td>13.69%</td>
</tr>
<tr>
<td>+2 std. dev.</td>
<td>2</td>
<td>0.83%</td>
</tr>
<tr>
<td>Within +1 and -1 std deviation</td>
<td>165</td>
<td>68.46%</td>
</tr>
</tbody>
</table>

Note. Original scores were reported as scaled scores then converted to z-scores.

As noted in Table 6, 68% of students, performed within one standard deviation of the mean. Seventeen percent (n = 41) of students performed less than one standard deviation below the mean. Students scoring one standard deviation above the mean performed better than 85.9% of the total student body. Overall, scores reflected a slight negative skew of -.539 with kurtosis of .786 illustrated in Figure 5.
Figure 5. Distribution of Standardized Academic Scores

Correlation analysis of tier 1 data. Preliminary zero-order correlations were conducted to evaluate the relationship between data collected school-wide, including BESS Teacher Reports of social emotional and behavioral functioning, discipline referrals to the Time-Out Room, and standardized academic scores. Results are illustrated in Table 7. For this and all further statistical analysis, pairwise comparisons and alpha of .05 were used.
Table 7

*Correlation between BESS Teacher Report on Social, Emotional, and Behavioral Functioning and Other Universally Collected Data of Student Performance*

<table>
<thead>
<tr>
<th>Time-Out Room Referrals</th>
<th>Academic Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>.492</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000**</td>
</tr>
</tbody>
</table>

\[ r(237) = .492, \ p = .000 \]

\[ r(218) = -.387, \ p = .000 \]

\[ n=239 \]

\[ n=220 \]


Significant correlations were found between teacher reports of functioning and end of the year student outcomes. Results demonstrated that the more elevated a BESS score, the more Time-Out Room Referrals a student was likely to have with \( r(237) = .492, p = .000 \). Likewise, the more elevated the BESS scores, the lower the academic performance of the student, \( r(218) = -.387, p = .000 \).

**Descriptive Analysis Tier 2 Data. BASC-2 SRP.** Of the 52 children who completed the BASC-2, 85% indicated elevated risk in one or more domains. An overview of BASC-2 results is represented in Table 8.
Table 8

<table>
<thead>
<tr>
<th>Range</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>At risk at +1SD</td>
<td>23</td>
<td>44.23%</td>
</tr>
<tr>
<td>Clinically significant risk at +2SD</td>
<td>21</td>
<td>40.38%</td>
</tr>
<tr>
<td>Normal range</td>
<td>8</td>
<td>15.38%</td>
</tr>
</tbody>
</table>


**Ecomaps.** Seventy of the 239 children presenting elevated risk from initial screening completed Ecomaps. A description of local norms based on the study sample is included in Table 9. On average, children included 10 relationships on their Ecomaps, with a range of 5 to 19 relationships depicted. Stress-support indices (SSI) ranged between 1 and 1.63. An SSI of 1 indicates that a child perceives all relationships to be positive. An SSI of 1.63 indicates that more relationships were perceived as negative than as positive. Average SSI for the represented sample was 1.27. Based on local norms, 17% of students identified levels of stress greater than one standard deviation from the mean.
Table 9

_Ecomap Distribution for Local Sample_

<table>
<thead>
<tr>
<th>Average Network Size</th>
<th>Average (SSI)</th>
<th>SSI $\geq$1 Std Dev.</th>
<th>SSI $\geq$2 Std Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1.27</td>
<td>12.86%</td>
<td>4.29%</td>
</tr>
</tbody>
</table>

_Note._ SSI = balance of stress and support = $\sum$ coded stress and supportive relationships/$n$ where $n$=total relationships in participant’s network. Std. Deviation = .146, 1 Std. Dev. = 1.41, 2 Std. Dev. = 1.56

The Ecomap data collected for this sample of students revealed a slight positive skew of .429 with a negative kurtosis of -.256. As depicted in Figure 6, most relationships were reported as having a positive balance of stress and support, which is consistent with other data collected as part of the PPWBG project (Nastasi, 2008; Nastasi & International Psychological Well-Being Research Team, 2012).
Figure 6. Distribution of Ecomap Stress Support Indices

Figure 6. Histogram representing distribution of Ecomap results describing the balance of stress to support reported by students in Kindergarten to Grade 3. EcoSSI = balance of stress and support = \( \sum \) coded stress and supportive relationships/\( n \) where \( n \)=total relationships in participant’s network.

Supplementary descriptive analyses were conducted to provide further detail on the types of relationships represented on the Ecomap. These additional results about the characteristics of Ecomap relationships are provided in Table 10. The most common relationships were extended family members. Caregivers, such as parents and grandparents, were grouped together for this analysis, as many children indicated that grandparents had a caretaking role. All non-related individuals identified as friends, classmates, or peers were typed as peers. A small group of children identified the school as a general construct separate from individual teachers. Because specific research questions did not pertain to differentiations between the school system and school personnel, school and teachers are categorized together for purposes of this analysis.

Peers, followed by school and teachers, were identified with the highest average SSI,
which indicates that these relationships were coded as having more stressful qualities than other relationships.

Table 10

Ecomap Descriptive Characteristics

<table>
<thead>
<tr>
<th>Relationship Type</th>
<th># of Times Included</th>
<th>Average Relationship SSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peers</td>
<td>121</td>
<td>1.45</td>
</tr>
<tr>
<td>School and teachers</td>
<td>72</td>
<td>1.39</td>
</tr>
<tr>
<td>Self</td>
<td>36</td>
<td>1.29</td>
</tr>
<tr>
<td>Extended family (siblings, cousins, aunts, uncles)</td>
<td>290</td>
<td>1.28</td>
</tr>
<tr>
<td>Caregivers (parents and grandparents)</td>
<td>223</td>
<td>1.19</td>
</tr>
</tbody>
</table>

Note. SSI = balance of stress and support = ∑ coded stress and supportive relationships/n where n=total relationships in participant’s network.

Students also included other individuals and/or concepts on their Ecomaps including celebrities, God, pets, home, and church. However, the inclusion of such items was not common and did not reflect a unique pattern that could represent how students overall rated such relationships. Therefore these data were not included in Table 11. However, all relationship ratings were included in calculations of the SSI for each
Zero order correlations. Zero order correlations were conducted for all variables. Included in Appendices B through G are the results of all correlations regardless of significance. Significant results of analysis between Tier 1 and Tier 2 data are represented in Table 11 and highlighted by this discussion. The Ecomap SSI was not significantly correlated with the BESS, academic scores, or Time-Out Referrals (TOR), indicating Ecomap may describe patterns of functioning and well-being not described by these Tier 1 measures. Further correlational analysis between Tier 1 and Tier 2 data revealed no significant relationship between the BESS and the eight primary domains used in this analysis from the BASC-2 nor between the BESS and child reports of attention or hyperactivity from the BASC-2, schedule C. Likewise, there were no significant relationships found between the Ecomap SSI and the same eight BASC-2 domains used for this analysis. However, a significant relationship between the Ecomap SSI and reports of attention difficulty on the BASC-2, schedule C was found. Higher levels of stress, indicated by a higher SSI, correlated with greater reporting of attention difficulties with $r (70) = .480, p = .015, n=25$. The relationship between the Ecomap SSI and child reports of hyperactivity were not significant.
Table 1

Correlation between Attention Difficulties and Ecomap Stress Support Index

<table>
<thead>
<tr>
<th></th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention Problems and Ecomap SSI</td>
<td>.480</td>
<td>.015</td>
</tr>
</tbody>
</table>


Results by Hypothesis and Research Question

Question #1. This study explored whether child self-report of stress and support, represented by the Ecomap SSI, enhanced the prediction of school academic and behavioral outcomes beyond teacher report of social emotional functioning and school functioning, as reported on the BESS. Child report of stress and support on the Ecomap was hypothesized to potentially account for additional variance in school outcomes measured by achievement and behavior reports, beyond that accounted for by the BESS. Separate stepwise, hierarchical regression analyses were conducted utilizing the BESS-TRP and the Ecomap SSI to predict achievement scores and behavior reports. Results are illustrated in Table12 and Table 13. The SSI was not found to significantly enhance the prediction of academic performance or behavioral referrals to the Time-Out Room beyond the BESS. However, the combined BESS and Ecomap SSI predicted outcomes on both measures. Results indicate that the SSI does not account for a significant amount of additional variance in the measured school outcomes, although the variables together
are predictive of variations in both academic performance and discipline referrals to the Time-Out Room.

Table 12

Regression Analysis Predicting Academic Performance from BESS and Ecomap Stress Support Index

<table>
<thead>
<tr>
<th>Predictor</th>
<th>△R²</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.150</td>
<td>- .387***</td>
</tr>
<tr>
<td>BESS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.005</td>
<td>- .383***</td>
</tr>
<tr>
<td>BESS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EcoSSI</td>
<td>.070</td>
<td></td>
</tr>
<tr>
<td>Total R²</td>
<td>.155</td>
<td></td>
</tr>
</tbody>
</table>

Note. BESS Teacher Report = Behavioral and Emotional Screening System (Kamphaus & Reynolds, 2007). EcoSSI = Ecomap Stress Support Index = \( \sum \) (coded stress and supportive relationships) / \( n \) where \( n \) = total relationships in participant’s network. \( n = 66 \). ***p < .001
Table 13

*Regression Analysis Predicting Time-Out Room Referrals from BESS and Ecomap Stress Support Index*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>ΔR²</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.156</td>
<td></td>
</tr>
<tr>
<td>BESS</td>
<td>.395***</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.027</td>
<td></td>
</tr>
<tr>
<td>BESS</td>
<td>.405***</td>
<td></td>
</tr>
<tr>
<td>EcoSSI</td>
<td>.166</td>
<td></td>
</tr>
<tr>
<td>Total R²</td>
<td>.184</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* BESS Teacher Report = Behavioral and Emotional Screening System (Kamphaus & Reynolds, 2007). EcoSSI = Ecomap Stress Support Index = \( \sum \) (coded stress and supportive relationships)/\( n \) where \( n \)=total relationships in participant’s network. \( n=67 \). ***p<.001

**Question #2.** The question of whether student self-report of stress and support and teacher report of child social-emotional functioning differentially predict child reports of internalizing and externalizing difficulties was explored in the second portion of the analysis. Child report of stress and support represented by the Ecomap SSI and teacher report of social emotional functioning as reported on the BESS were predicted to differentially predict internalizing difficulties and externalizing problems as self-reported
by children on the BASC-2 SRP. The Ecomap SSI was hypothesized to predict internalizing difficulties, and the BESS was hypothesized to predict externalizing difficulties. Separate multiple regression analyses were conducted to investigate these relationships. BESS-TRP and Ecomap SSI were entered simultaneously in each regression analysis with the BASC-2 SRP-C & -I domains of Attitude Toward School, Attitude Toward Teacher, Atypicality, Social Stress, Anxiety, Depression, Emotional Symptoms, and Interpersonal Relationships as separate dependent variables. There were no significant results. Neither the BESS nor the Ecomap predicted outcomes on composite domains of emotional functioning for BASC-2 SRP C & I combined.

Reports of Attention Problems and Hyperactivity are only included in the BASC-2-C, for children age 8 and older, and are not a part of reports of functioning based on the BASC-2-I, for children ages 6 and 7. Difficulties with attention and hyperactivity, however, are common in elementary aged children, as are teacher reports of attention-related difficulties in students (Frick, Barry Kamphaus, 2010). Although often grouped together, attention and hyperactivity represent different domains of functioning with attention reflecting executive function capacities involving self-regulation of thoughts and hyperactivity reflecting patterns of active behavior. Therefore attention difficulties may be described as characteristic of an internal difficulty, whereas hyperactivity can be characterized by difficulty regulating external behavior. Moreover, attention difficulties and hyperactivity have been demonstrated to occur more readily with children experiencing high stress levels (Westphal, 2012). Zero-order exploratory correlation revealed a positive relationship between reports of stress and attention difficulty. Consequently, the relationship between reported stress and support levels (SSI) and
reports of attention difficulties and hyperactivity were used in the analysis. Ecomap SSI and BESS did not predict child report of Hyperactivity for children age 8 and above. However, the Ecomap SSI did predict variances in SRP-C reporting of Attention Problems. Results of this aspect of the regression analysis are depicted in Table 14. As noted in Table 14, BESS did not contribute significantly to the prediction of child reported Attention Problems.

Table 14

*Multiple Regression Analysis Predicting Attention Problems from BESS and Ecomap Stress Support Index*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$R^2$</th>
<th>$\beta$</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>EcoSSI</td>
<td>.487**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BESS</td>
<td>.114</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


*p<.05  **p<.01
Discussion

A significant proportion of school-aged children in the United States will experience behavioral, social-emotional, or mental health difficulties or demonstrate serious risks for academic failure in the course of their childhood (Juechter, Dever, & Kamphaus, 2012). National Alliance on Mental Illness (NAMI: n.d.) identifies that more than 20% of American school-aged children experience social-emotional and behavioral disorders. Research has also consistently demonstrated the negative relationship between problems in children and later academic achievement (Juechter, Dever, & Kamphaus, 2012). If left unaddressed, children who demonstrate emotional and behavioral difficulties are more likely to experience severe emotional and/or behavior disorders, and with the exacerbation of those difficulties, their likelihood for school failure and dropout increases dramatically. Evidence demonstrates that early identification combined with comprehensive intervention services and preventative efforts can ameliorate mental health difficulties and enhance the likelihood of academic success and the improvement of general functioning and well-being (Albers, Glover & Kratochwill, 2007). For years, however, schools, families and mental health practitioners have followed a model that waits for children to demonstrate serious distress before intervention ensues. Now, policymakers, educators, and psychologists have begun to acknowledge the limitations of this wait-to-fail model, recognizing that it does not meet the needs of children, schools, or families. Instead they recognize that the ability to identify problems early allows for the
provision of evidence-based prevention and early intervention services, which can ease problems and have the potential to prevent the onset of more serious issues.

This study focused on two primary questions designed to extend the research on universal screening methods and data collection and to enhance efforts designed to improve early intervention practices and population-oriented models of mental health service provision in schools. First, does a measure of perceived stress and support within relationships, as reported on the Ecomap and represented by a calculated Stress Support Index (SSI), explain additional variance in school outcomes, beyond that accounted for by teacher reports on a universally administered social-emotional and behavioral screening instrument, in this case the BESS-TRP. Results of the initial regression analysis indicate that the Ecomap does not predict academic outcomes or discipline referrals.

Although the ability of the Ecomap to predict outcomes on school-performance measures was not demonstrated in this analysis, the utility of the tool is not called into question. Instead, the Ecomap likely describes a component of well-being apart from academic performance and office discipline referrals. For instance, descriptive analysis of the Ecomap revealed patterns of stress in certain relationships. The primary areas of stress found for this sample of students were school, teachers, and peers. When considered alongside the nearly 3000 discipline referrals to a Time-Out Room that occurred over the course of the school year, one may consider the impact of the exclusionary discipline practice of Time-Out Room referral and whether this practice may play a role in the stressful perceptions of the school environment.
In their 2013 study, Mitchell and Bradshaw found that exclusionary practices, such as the Time-Out Room referrals used by the participating school in this study, were associated with lower ratings of school order and discipline. While the number of Time-Out Referrals was not associated with overall SSI, further investigation into whether specific stress and support ratings of teachers, peers, and the school, related to the number of Time-Out Referrals, may be useful in assessing whether perceptions of stress-support for targeted relationships corresponded to certain practices within the school. Mitchel and Bradshaw (2013) found that in schools that rely primarily on exclusionary discipline practices even students who do not experience a high number of discipline referrals describe the general school environment as unstable and less orderly or disciplined. For this sample of students, Ecomap data suggests a need for further exploration, particularly in areas where patterns of perceived stress emerged. These areas might reflect specific problems that students are experiencing at a school-population level. Mitchell and Bradshaw also explain that if students perceive a sense of disorder, this can potentially result in more behavior difficulties. High levels of classroom disruption not addressed effectively may indicate that classroom management is out of the teacher’s control and could contribute to less positive perceptions of the classroom and school climate. Further qualitative exploration including interviews with students, observations of classrooms, and in-depth analysis of discipline reports may offer further explanation on possible causes of the pattern of school stress found in the current Ecomap data and would in turn demonstrate the usefulness of the Ecomap in depicting student well-being within the context of the school and classroom.
Results of regression analysis did demonstrate the ability of the BESS-TRP to predict behavioral and academic outcomes for students. Administered to teachers in October, BESS-TRP results predicted these important year-end school outcomes and lent proof to the importance of universal screening and its usefulness in schools. These results suggest that teacher consideration of student behavior and emotional functioning is important to the identification of children who are likely to struggle meeting school demands through the year. Moreover, data collected can help identify teachers and grade-levels in need of additional classroom management support as well as academic and social-emotional intervention resources. Along those same lines, results of this analysis indicate that universal screening data can guide administrators to system-wide changes that may need to be put into place, including, but not limited to, broad-scale social-emotional programming and positive behavior response systems. Hess, Short and Hazel (2012) explain that schools have been reticent to implement universal screening, giving non-academic, social-emotional and behavioral functioning a low priority and arguing that screening was outside the domain of a school’s responsibility and not directly related to school aims. These results demonstrate however that universal screening can not only help schools identify students who may struggle meeting school demands, but also the classrooms that may have the most difficulty meeting student needs. Therefore, these results indicate that teacher reports on the social, emotional and behavioral functioning of students can prove useful in helping schools intervene early rather than waiting for demonstrated failure at the end of a school year. The results of this analysis are important, because they provide additional proof that universal screening needs to become a part of regular school practice.
Regression analysis and zero-order correlations yielded no significant relationships between BESS-TRP and BASC-2 results, regardless of domain. Consequently, results did not demonstrate predictive ability of BESS-TRP data on self-reported psychological functioning either for internalizing or externalizing problems. These results demonstrate the importance of utilizing multiple informants when conducting screening, as perceptions of a child’s functioning may vary among informants. Moreover, the practice of utilizing multiple data points aligns with professional guidelines for mental health practitioners (van der Ende, Verhulst, & Tiemeier, 2012).

In their examination of the validity of the BESS (Kamphaus & Reynolds, 2007), King, Reschly and Appleton (2012) did not find significant agreement between student-report and teacher-report of psychological functioning. King and colleagues explain that low correlation between student reports of risk and functioning and teacher reports is not uncommon, however, and, like other researchers and practitioners, they argue for the use of multiple informants to gain a more comprehensive understanding of well-being. They also suggest that perception of functioning and multiple rater-reliability is an area worthy of further research similar to that which has been conducted in this study. Nonetheless, as demonstrated by King and colleagues, this analysis demonstrated the ability of the BESS-TRP to predict academic and behavioral outcomes, consequently confirming its usefulness as a screening measure in the school environment.

Secondly, the study investigated the ability of the Ecomap to predict internalizing problems as reported by children on the BASC-2-SRP. It was predicted that child reports of stress and support (Ecomap SSI) and teacher reports of social emotional functioning
(BESS-TRP) would differentially predict internalizing difficulties and externalizing problems as self-reported by children on the BASC-2-SRP. Results of regression analysis indicated that the Ecomap SSI demonstrated some predictive ability to describe self-reported emotional functioning. Specifically, Ecomap SSI predicted child-reported Attention Problems on the BASC-2-SRP-C; whereas results of the BESS-TRP did not predict such problems. Higher levels of reported stress on the Ecomap corresponded to higher reports of Attention Problems on the BASC-2-SRP-C. Additionally, there was a significant correlation among Attention Problems, Anxiety, and Depression, showing a relationship between the subscales representing other domains of internal functioning. The Ecomap SSI did not predict self-reported internalizing difficulties in other domains, such as anxiety and depression; nor, however, did the BESS-TRP.

DuPaul (2011) describes attention as an important cognitive process central to completing goal-directed tasks. Most school activities necessitate attentiveness. Students must focus attention on directions, maintain focus through lessons, and attend to the completion of tasks at hand. Because of the central role attention plays in learning, many school-related problems can emerge as a result of attention difficulty. DuPaul explains that mild or even subtle attention impairments can result in clinically significant difficulties in daily tasks, especially since these contexts involve more complex processing demands due to distractions in the environment.

Many factors may contribute to attention difficulty, including environmental situations and experience of stressful events (Goodman & Poillion, 1992). For instance, Garbarino, Durbrow, Kostelny, and Pardo (1992) explain that children living with chronic community violence demonstrate difficulties with concentration and attention,
possibly resulting from chronic sleep disruptions and intrusive thoughts. Children with Post Traumatic Stress Disorder (PTSD) may report difficulties with concentration, attention, and memory (Sattler & Hoge, 2006). Similarly, research conducted by Santiago and colleagues (2011) demonstrate a relationship between poverty-related stress and numerous negative social-emotional outcomes including attention difficulties. The pernicious long-term effects of chronic and acute stress on children and the link between stress and attention difficulties suggest that the assessment of levels of stress perceived by children can be especially useful in early intervention efforts. Children who report a pattern of high stress, particularly those for whom an imbalance of stress and support exists, with the level of stress outweighing the perceived supports available, may be especially vulnerable to the stressors they experience. With the ability of the Ecomap to represent a child’s perceptions of stress within relationships, it can an be a useful tool for school-based mental health practitioners in identifying children for whom chronic or acute stressors are being, or have been, experienced and thereby have the potential to help schools potentially provide intervention or services.
Limitations and Future Directions

Results from the current study should be considered in light of several methodological limitations. Student data utilized for analysis of Ecomaps and BASC-2 results were more homogenous than the full sample utilized for analysis of universally collected data including the BESS-TRP, academic progress, and discipline referrals. Seventy students were administered the Ecomap and 52 students were administered the BASC-2. The truncation of the sample resulted in a reduced range of scores amongst participants for whom Ecomap and BASC-2 SRP data were collected. The resulting reduction in variability may have reduced overall power and contributed to the nonsignificant findings. Consequently, interpretation of results must be conducted with some caution and with this limitation in mind. Nonetheless, data utilized for the study was part of an actual system for identification of student needs and reflects the type of data that can be collected in a school setting from an authentic school-based data collection process. Using existing data is convenient, less obtrusive to a school, and can inform the school about limitations to data-collection systems in place within the environment. However, results garnered from the use of convenient samples can limit the generalizability of results. Future research may benefit from consideration of these limitations in advance. For example, incorporation of similar data across several schools would strengthen further studies and provide more generalizable results.
Future projects may also explore in more detail the discipline practices of the participating school and their use of the exclusionary practice of referral to a time-out room. Although no significant correlations between discipline referrals and Ecomap results were found, it is notable that the most stressful relationship identified by students was school. The ability of the Ecomap to offer descriptive information about school climate could be useful and provide a starting point for investigation into school climate. Schools that rely on exclusionary discipline practices have been found to have lower student engagement and higher rates of problem behavior and are associated with less orderly and less disciplined student descriptions of the environment. School-wide administration of the Ecomap may shed light on the qualities of school relationships and the stress-support balance of the larger population.

The associations between high stress and inattention demonstrated by this study and others (e.g., Santiago et al, 2011; Wadsworth & Santiago, 2008) and the ability of the Ecomap to identify students experiencing high stress levels should be explored more fully. The established relationship between high stress and reports of attention difficulty demonstrate a need for further research on culturally-relevant tools, such as the Ecomap, that can be used with children in the context of schools. Not only are children who report attention problems at greater risk of developing anxiety and/or depression, but also children may exhibit attention difficulties due to other emotional difficulties such as anxiety or PTSD (Weissman, Chu, Reddy, & Mohlman, 2012). Moreover, attention difficulties are among the most commonly referred initial problems for children at risk for emotional and behavioral disorders (Cormier, 2008; Jarrett & Ollendick, 2008). Consequently, screening tools that provide information about children who may be
experiencing attention problems may be useful in better understanding contributing factors. A tool such as the Ecomap has the potential to enhance screening practices and, in turn, early intervention efforts by enabling children to identify areas of stress while providing information on areas where difficulties such as inattention may originate.
Appendix A

ECOMAP PROTOCOL (Nastasi & International Psychological Well-Being Research Team, 2012 (reprinted with permission); Nastasi, Jayasena, Summerville & Borja, 2011)

Overview: Ecomap data collection occurs in three phases:

**Phase A: Small Group Administration**
Students will meet in small groups (approximately 4-5 students per group) to complete their ecomaps, with one-on-one assistance provided as needed. *It is expected that most children will need one-on-one assistance, and that although each child will begin his or her individual ecomap in the group setting, that the researcher may help the child to complete his or her ecomap in the beginning of the individual interview period.*

**Phase B: Individual Interview**
Each student meets one-on-one with a clinician/researcher (leader of Small Group) to complete and explain his or her ecomap. This should occur as soon after the Small Group session as possible (preferably the same day, or the next day if necessary).

The clinician/researcher is responsible for ensuring that
- Each relationship is clearly coded
- Each relationship is clearly labeled with relationship type (e.g., brother, aunt, teacher, etc.)

**Phase C: Record & Submit**
Clinician/researcher completes data recording sheet and submits all materials. This should occur on the same day as the Individual Interview.

**Materials:**
- Drawing paper (11x17 or other large-sized paper) (need 1 per student & extras)
- Index cards (5x7) (need 1 per student & extras)
- Colored markers (plenty)
- Glue sticks (several)
- Sample Ecomaps (A & A1; B & B1) (one of each)
- Good Feelings Key, Bad Feelings Key, Both Kinds of Feelings Key (one of each)
- Small cookies/crackers (e.g., Teddy Grahams) (given at strategic points throughout session)
- Small incentive/rewards (e.g., stickers) (for end of session)
- Interview Protocols (1 per student)

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1 Researcher needs four sample ecomaps; Ecomaps A and B are uncoded (just have people drawn), while Ecomaps A1 and B1 are coded versions of A and B. Two sets of samples are intended to promote participants’ understanding that variation is expected, and that they should not attempt to copy the sample.
• Recording Sheet (1 per student)

Phase A: Small Group Administration

1) INTRODUCTION (Small group)

“Today you are going to draw a special kind of picture. You will draw yourself and people who are important to you. We will help you with your drawings.”

“While you are with us in this group, it is important that you understand that this is a safe place. You do not have to worry about anyone else having mad or sad feelings. If you let us know that you are having a hard time, or if you share that something happened or might happen that sounds like it might not be safe, either for you or somebody else, then we will help you. It is our job to help make sure that kids and other people are safe.

“Thank you for helping us today. We are trying to learn about how kids your age think and feel. We hope today will be fun for everyone.”

2) CHILD DRAWS SELF-PORTRAIT (Small group):

“For the first part of our activity, draw a picture of yourself on this index card.”

(After pictures are complete, the researcher assists each student in gluing his or her picture in the center of drawing paper. Typically paper will be in landscape orientation. Having the self-portrait on the index card ensures proper sizing and placement of the child’s picture.)

3) CHILD DRAWS OTHERS ON ECOMAP (Small group):

Researcher shows and explains Sample Ecomap A and Sample Ecomap B (without lines or other codes) and explains the task of drawing important people from different areas of life on the ecomap:

“For the next part of our activity, you will be drawing other important people in your life. I have two different examples here, because everybody is different. The examples will help you understand what to do, but you can do it in your own way.”

For both Sample A and B:

“The picture of the child who made it is in the middle, like yours. Then, the kid drew a bunch of pictures of other important people around the outside.”

(The researcher should go around and point out the different people on each sample ecomap.)

“Are the two drawings the same? Tell me some differences you see.”

“Now you will do the same thing for the important people in YOUR life. You can put people on it from home (like your family), from your neighborhood or things you do outside of school, and from in school. Adults and kids can both be in the drawing.
You can have a few people or many people. It is up to you. What kinds of people do you think can be in the drawing?" (Elicit 4-5 verbal responses from the group, emphasizing that everyone has different people who are important to them.)

“It is okay if you get an idea from your friend. For example, you might notice that your friend has a dog in her picture. You might think, “Oh yeah! I love my dog! I’m going to put my dog on there!” But if you don’t have a dog, should you draw a dog? Just make sure everyone who is on your drawing is important to YOU.”

“Another REALLY important thing: The people do not have to be people that you like—they just have to be important people—you can have good or bad feelings about them. I know that this child (reference Sample Ecomap A) gets mad at her friend from school, but she is still on the drawing because she spends time with her. And this child (reference Sample Ecomap B) thinks his uncle says mean things sometimes, but the uncle is still on the drawing because he sees him a lot or thinks about him a lot.”

As children draw, the researcher moves around to assist them, offering the following prompts:

a. If a child is struggling to think of people to include, try to encourage him or her to draw at least six people (preferably more)by using the following prompts:
   i. “How about people in your family or at home?”
   ii. “How about people from school?”
   iii. “How about people from outside school?”
   iv. For each location, the researcher can ask, “How about kids?” or “How about adults?” as needed.

b. If children express a desire to put non-humans (like pets or toys) or persons unknown to them (such as athletes) on their ecomaps, this is acceptable. Occasionally, a child will try to put a number of toys or movie stars or athletes on the ecomap. In this case, the researcher should encourage the child to “just pick one or two” and move on to “people that you know.” More leeway should be given if a child wants to put several pets on the ecomap.

c. If a child indicates that he or she does not want to put someone on the ecomap because he or she dislikes that person or is angry at them, encourage child to put ANY important people down, even if they might feel bad feelings.

d. If they put places, ask, “Are there any people who are important to you in this place?”

4) CHILD CODES RELATIONSHIPS AS SUPPORTIVE, STRESSFUL, OR AMBITIANCE (“BOTH”) (Small group and/or one-on-one, depending on need):

After children have been given a few minutes to draw, the researcher can decide whether to introduce ecomap coding in the group or transition to individual interviews to explain and help children complete coding one-on-one. In general, we have found that the slightly older children are quite able to at least begin the process
in the large group, and might only need minimal one-on-one assistance, while many kindergartners and first graders might benefit more from working more closely with a group leader, either one-on-one or in pairs. moving immediately to the one-on-one setting.

“Now we will take a break from drawing. If you’re not completely done, that’s okay. You will be able to add more people later if you need to. Now I will show you what to do next.”

“Some relationships we have with people give us good feelings. What kinds of feelings are good feelings?” Engage student(s) in listing “good feelings” (happy, excited, loving, friendly, proud, safe, calm, etc.). “Sometimes those people help or support us.” Engage student(s) in listing helpful things people do and ways they make us feel good. “This drawing shows a line of circles to show good that the child has when she or he thinks about or is with an important person.” Show Good Feelings Key. Give specific examples: “Sister shares her toys with me, so I feel happy; Daddy gives me big hugs, so I feel love.”

“Sometimes relationships give us bad feelings. What kinds of feelings are bad feelings?” Engage student(s) in listing “bad feelings” (angry, sad, scared, worried, lonely, embarrassed, etc.). “Sometimes those people seem to make things hard for us, or they don’t help, so we don’t feel good. Sometimes we can call that ‘stressed.’” Engage student(s) in listing unhelpful or stressful things people do or ways they cause bad feelings. “The child who made this drawing used a line of Xs to show bad and stressful feelings she or he has about a person.” Show Bad Feelings Key. Give specific examples: “Uncle teases me about my hair, which makes me feel angry; Cousin hits me a lot, and I’m sad because I want her to be nice to me.”

“Some relationships have BOTH kinds of feelings. We feel happy sometimes, and angry or sad other times.” Show Both Kinds of Feelings Key. “The child who made this drawing used a line of circles AND Xs to show that he/she felt BOTH good feelings and bad feelings about this person.” Give specific examples: “Teacher tells me I did a good job on my math test, which makes me feel happy and proud, but he also yells at the kids, which makes me scared and mad; My mom isn’t around a lot, so I miss her and I’m sad, but when she is around, we play together and talk and I am happy.”

Show Sample Ecomaps A1 and B1 (coded versions of Samples A and B). Go through several examples from each sample, making sure that the children understand how the ecomap codes work and that they see a variety of different codes.

“Notice that this child also put Xs and Os around herself. Why do you think she did that?” Elicit ideas and explain that people have feelings about themselves, too. Encourage the children to think about how they feel about themselves—good feelings, bad feelings, or both kinds of feelings. “You can put Xs, Os, or both around the picture of yourself, too.”
“Remember, if you think of people you want to add to your drawing, you can do that.”

“No one will be mad at you if you say that someone gives you bad feelings. You can be very honest. We are trying to learn about how kids think and feel.”

Assist children in coding their ecomaps. (Using different symbols and codes, including different shapes or colors, is acceptable; however, it is critical for the researcher to draw a key explaining any code changes.)

5) CLOSING THE SESSION

Thank all the children for helping you understand how kids think and feel, and for doing such a good job on their drawings and in the interviews. Allow each child to select a small prize, such as a sticker or safe school supply item (pencil, eraser), and accompany children back to their classes.

Phase B: Individual Interview

Again, it is important that child is interviewed by one of the clinicians/researchers who led his/her Small Group Administration, and that the interview take place the same day, or the next day if necessary.

Before beginning the interview, make sure that the child has completed his or her ecomap, and that the codes are clearly understandable. Go through each relationship on the ecomap and make sure that you know whether the child intended to label the relationship as supportive (good feelings), stressful (bad feelings), or ambivalent (both kinds of feelings). Make sure all individuals are labeled by type of relationship (e.g., sister, mother, father, friend from school; names can also be used, but type of relationship is necessary). Assist the child if needed.

Using the Interview Protocol as a guide and to take notes, ask the child to describe up to six of his or her relationships. Try to get a balance of settings, types of feelings/codes, and kids/adults. Almost all children should have six or more relationships on their ecomaps, because they will be encouraged to pick kids and adults from different settings. However, this is not absolutely required if a child does not respond to those prompts or cannot think of important people.

For each relationship selected, double-check child’s categorization (good feelings/supportive, bad feelings/stressful, both/ambivalent), ask the following questions, and record the child’s answers on the Interview Protocol:

a. “Tell me what feeling(s) you have about this person or when you are with them.”

b. “Tell me about feeling ______________ about (with) this person.” Make sure to ask about all feelings that the child identifies. Write child’s answers verbatim.
Thank the child for talking with you. If needed, remind the child that no one will be angry with him or her for his or her answers.

Return child to class.

**Phase C: Record & Submit**

1) Complete recording sheet while you and the child are still at the school (child should be back in class). This ensures that you will remember key information and that you can ask the child for clarification if needed.

2) Submit all materials
### Appendix B

**Correlation Matrix for Tier 1 Data**

<table>
<thead>
<tr>
<th>Variable</th>
<th>BessTRP</th>
<th>Academic Scores</th>
<th>#TOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>BessTRP</td>
<td>—</td>
<td>-.387**&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.492**&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Academic Scores</td>
<td>-.387**&lt;sup&gt;a&lt;/sup&gt;</td>
<td>—</td>
<td>-.074&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>#TOR</td>
<td>.492**&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.074&lt;sup&gt;c&lt;/sup&gt;</td>
<td>—</td>
</tr>
</tbody>
</table>

*Note. BESSTRP = BASC-2 BESS Teacher Report Form (Kamphaus & Reynolds, 2007). 
#TOR=Time-Out Referrals.

<sup>a</sup>n=220, <sup>b</sup>n=239, <sup>c</sup>n=241

*<sup>p</sup><.05, **<sup>p</sup><.01, ***<sup>p</sup><.001
**Appendix C**

*Correlation Matrix for Ecomap SSI with Tier 1 Data*

<table>
<thead>
<tr>
<th></th>
<th>BESS-TRP</th>
<th>Academic Scores</th>
<th>#TOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>EcomapSSI</td>
<td>-.061(^a)</td>
<td>.093(^b)</td>
<td>.064(^c)</td>
</tr>
</tbody>
</table>

*Note.* EcomSSI = Ecomap Stress Support Index = \(\sum\) (coded stress and supportive relationships)/\(n\) where \(n\)=total relationships in participant’s network. BESSTRP= BASC-2 BESS Teacher Report Form (Kamphaus & Reynolds, 2007). #TOR=Time-Out Referrals.

\(^{a}\) \(n=86\), \(^{b}\) \(n=67\), \(^{c}\) \(n=70\).

No significant correlations found.
Appendix D

Correlation Matrix for Tier 1 Data with Relevant Domains of BASC-2 SRP

<table>
<thead>
<tr>
<th></th>
<th>Attitude Toward School</th>
<th>Attitude Toward Teacher</th>
<th>Atypicality</th>
<th>Social Stress</th>
<th>Anxiety</th>
<th>Depression</th>
<th>Emotional Symptoms</th>
<th>Interpersonal Relations</th>
<th>Attention Problems</th>
<th>Hyperactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>BESS-TRP^a</td>
<td>-.077</td>
<td>.01</td>
<td>-.012</td>
<td>-.053</td>
<td>.000</td>
<td>.032</td>
<td>.069</td>
<td>-.14</td>
<td>.085^d</td>
<td>.051^d</td>
</tr>
<tr>
<td>Academic Scores^b</td>
<td>.034</td>
<td>.036</td>
<td>.000</td>
<td>-.126</td>
<td>-.101</td>
<td>-.171</td>
<td>-.112</td>
<td>.002</td>
<td>-.118^e</td>
<td>-.27^e</td>
</tr>
<tr>
<td>#TOR^c</td>
<td>.052</td>
<td>-.036</td>
<td>-.164</td>
<td>-.171</td>
<td>-.196</td>
<td>-.176</td>
<td>-.141</td>
<td>.146</td>
<td>.124^f</td>
<td>-.018^f</td>
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</tbody>
</table>

^a n=51, ^b n=50, ^c n=52, ^d n=26, ^e n=25, ^f n=26.
No significant correlations found.
Appendix E

Correlation Matrix for Ecomap SSI with Relevant Domains of BASC-2 SRP

<table>
<thead>
<tr>
<th></th>
<th>Attitude Toward School</th>
<th>Attitude Toward Teacher</th>
<th>Atypicality</th>
<th>Social Stress</th>
<th>Anxiety</th>
<th>Depression</th>
<th>Emotional Symptoms</th>
<th>Interpersonal Relations</th>
<th>Attention Problems</th>
<th>Hyperactivity</th>
</tr>
</thead>
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<tr>
<td>EcoSSI(a)</td>
<td>.248</td>
<td>.162</td>
<td>.165</td>
<td>.073</td>
<td>.048</td>
<td>.109</td>
<td>.227</td>
<td>-.118</td>
<td>.480*(b)</td>
<td>0.231(b)</td>
</tr>
</tbody>
</table>

Note. EcoSSI = Ecomap Stress Support Index = \(\sum\) (coded stress and supportive relationships)/n where \(n\)=total relationships in participant’s network. BASC-2, SRP = Behavior Assessment System for Children-2\(^{nd}\) Edition; Self Report of Personality, child form for ages 8+ and interview form for ages 6 and 7 (Kamphaus & Reynolds, 2004, 2005).

\(^a\)\(n=50\), \(^b\)\(n=25\).

*\(p<.05\)
## Appendix F

Correlation Matrix for relevant domains of BASC-2 SRP

<table>
<thead>
<tr>
<th></th>
<th>Attitude Toward School</th>
<th>Attitude Toward Teacher</th>
<th>Atypicality</th>
<th>Social Stress</th>
<th>Anxiety</th>
<th>Depression</th>
<th>Emotional Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes Toward Teacher</td>
<td>.470**</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Atypicality</td>
<td>.312*</td>
<td>.445**</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Social Stress</td>
<td>.062</td>
<td>.217</td>
<td>.536**</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.314*</td>
<td>.417**</td>
<td>.732**</td>
<td>.541**</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Depression</td>
<td>.445**</td>
<td>.399**</td>
<td>.449**</td>
<td>.523**</td>
<td>.561**</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Emotional Symptoms</td>
<td>.483**</td>
<td>.631**</td>
<td>.695**</td>
<td>.648**</td>
<td>.744**</td>
<td>.790**</td>
<td>—</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>


* p<.05,  ** p<.01,  *** p<.001
Appendix G

Correlation Matrix for BASC-2 SRP-C domains of Attention and Hyperactivity with other BASC-2 SRP domains

<table>
<thead>
<tr>
<th></th>
<th>Attitude Toward School</th>
<th>Attitude Toward Teacher</th>
<th>Atypicality</th>
<th>Social Stress</th>
<th>Anxiety</th>
<th>Depression</th>
<th>Emotional Symptoms</th>
<th>Interpersonal Relationships</th>
</tr>
</thead>
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<tr>
<td>Attention Problems</td>
<td>.624**</td>
<td>.590**</td>
<td>.578**</td>
<td>.293</td>
<td>.604**</td>
<td>.547**</td>
<td>.653**</td>
<td>-.346</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td>.402*</td>
<td>.382</td>
<td>.483*</td>
<td>.311</td>
<td>.454*</td>
<td>.427*</td>
<td>.389*</td>
<td>-.116</td>
</tr>
</tbody>
</table>

*p<.05 , **p<.01, ***p<.001
References


approaches to promoting the competency and wellness of children (pp. 43-65).


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Biography

Jorge Verlenden received her Bachelor’s Degree from Louisiana State University in Baton Rouge and her Master’s Degree from Loyola University of New Orleans, specializing in Elementary Education and the Teaching of Reading. She is a certified teacher for grades K-8 and a certified reading specialist for grades K to 12. Ms. Verlenden is a former classroom teacher, academic interventionist, and teacher trainer for pre-service and in-service teachers. She has also worked as an outcomes-based researcher on an educational development project in Cairo, Egypt, which was funded by the United States Agency for International Development (USAID). Ms. Verlenden is currently a Developmental Psychology Doctoral student at Tulane University in New Orleans, Louisiana, working under the direction of Dr. Bonnie Nastasi in the International Psychological Well-Being lab.