

Examining the Longitudinal Stability of a Dual-Factor Model of Mental Health in Early  
Elementary School Students

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A dissertation submitted in partial fulfillment  
of the requirements for the degree of

Doctor of Philosophy

University of Washington

2016

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Program Authorized to Offer Degree:

College of Education

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Abstract

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Educational Psychology

The field of psychology has historically defined mental health as the absence of psychopathology, but emerging research has suggested that wellness and illness are not opposite ends of a single continuum, yet rather two distinct, interrelated constructs of a dual-factor model measured by indicators of well-being and distress (Herron & Trent, 2000; Keyes, 2002). The current study examined the longitudinal stability and change of mental health status according to a dual-factor model in early elementary-aged children. Group-based trajectory modeling (Nagin, 2005) was used to identify clusters of individuals following similar mental health trajectories over an 18-month time period. Findings suggested that clusters of children tend to follow one of five different developmental trajectories when measured according to both illness and wellness, and these distinct pathways varied in patterns of stability and change. The majority of students belonged to stable trajectories of either moderate or complete mental health, however, three less favorable trajectories characterized by a combination of high psychopathology and low well-being emerged.

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## Chapter 1: Introduction

Presently, one out of every five children in the United States experiences mental health problems significant enough to impair their functioning and warrant diagnosis (Costello et al., 2003; Duchnowski, Kutash, & Friedman, 2002; U.S. Department of Health & Human Services, 1999). Studies indicate that these mental, emotional, and behavioral (MEB) problems are associated with a host of adverse outcomes for children (Fazel, Hoagwood, Stephan & Ford, 2014), including educational failure (Riglin, Frederickson, Shelton, & Rice, 2013), poor social relationships (Hamre & Pianta, 2001; Risi, Gerhardstein, & Kistner, 2003), and increased risk-taking behavior (Collishaw, Maughan, Goodman, & Pickles, 2004).

Despite the prevalence and risks associated with mental illness in childhood and adolescence, only 20%-25% of youth are receiving interventions (U.S. Department of Health & Human Services, 1999). Of the few youth receiving interventions, approximately 70% are getting these services in schools (Burns et al., 1995). For this reason, substantial advocacy and federal attention has been directed toward providing students with access to school-based mental health (SBMH) services (NIMH, 2001; USPHS, 2000). Unfortunately, the type and quality of services being offered in school settings is often poorly understood (Rones & Hoagwood, 2000). Furthermore, SBMH services are often approached from a problem-based perspective, with minimal focus on the idea of developing student strengths that will serve as protective factors. It is important that a more comprehensive view of mental health is considered in schools so that service delivery includes a focus on building social-emotional competencies that promote optimal levels of well-being across entire student populations.

## **Statement of the Problem**

Historically, the field of psychology has defined mental health as the absence of psychopathology (Herron & Trent, 2000; Keyes, 2007). Within this framework, an individual who does not meet criteria for a certain disorder is deemed subclinical, and no treatment or intervention is likely to follow. Among traditional assessments of psychopathology, mental health is assumed in the absence of mental illness. Over the past two decades, emerging research has suggested that wellness and illness are not opposite ends of a single continuum, but rather two distinct, interrelated constructs measured by indicators of well-being and distress (Herron & Trent, 2000; Keyes, 2002). Ultimately, the narrow focus of the traditional disease-based perspective falls short to cultivate and promote optimal human well-being and a complete state of mental health. The field of psychology has begun to address this short-coming through a paradigm shift towards a more comprehensive approach to mental health that includes measures of well-being (Diener, 2000; Seligman & Csikszentmihalyi, 2000).

Research examining both positive and negative indicators of mental health suggests that not all youth with high psychopathology report low levels of happiness, nor do all those with low levels of psychopathology report high levels of happiness (Greenspoon & Saklofske, 2001). Studies have indicated that optimal functioning in youth is related to both an absence of psychopathology and a presence of happiness (Suldo & Shaffer, 2008). For this reason, experts in the field have proposed an integration of indicators of psychopathology (i.e. MEB problems) and indicators of happiness (i.e. subjective well-being; SWB) into one model of mental health. In this approach, it is presumed that four different mental health statuses exist: Flourishing, or Complete Mental Health (high SWB, low psychopathology), Troubled (low SWB, high psychopathology), Symptomatic but Content (high SWB, high psychopathology), and

Vulnerable (low SWB, low psychopathology). This dual-factor model identifies two groups (Vulnerable and Symptomatic but Content) typically overlooked within the traditional model of mental health. All four groups are summarized in Figure 1.

The presence and utility of a dual-factor model of mental health in youth was first examined in a sample of Canadian elementary school children (Greenspoon & Saklofske, 2001). The study integrated measures of SWB and psychopathology into a single model, and as predicted, four distinct mental health groups emerged. Results supported the validity of using the dual-factor model to assess mental health in an integrated fashion, as a few notable group similarities and differences emerged. Children with high SWB and high psychopathology (i.e. Symptomatic but Content) were more sociable and had greater academic self-competence than children with similarly high levels of psychopathology and with low SWB (i.e. Troubled). Children with high SWB and low psychopathology (i.e. Flourishing) reported better interpersonal relations and more scholastic self-competence than youth with similarly low levels of psychopathology and low SWB (i.e. Vulnerable). Taken together, these data suggest that high SWB is associated with positive outcomes for youth, regardless of psychopathology status.

Research on a dual-factor model of mental health has been replicated and extended to students in early adolescence (e.g. Antaramian, Huebner, Hills, & Valois, 2010), late adolescence (e.g. McMahan, 2012), and even young adulthood (e.g. Eklund, Dowdy, Jones, & Furlong, 2011). Among these studies, four distinct mental health groups have emerged, two of which are overlooked within the historical framework of mental health assessment. A range of 8.1 to 13% of youth across samples were found to have low SWB and low psychopathology, which provides support for the argument that the absence of psychopathology does not equate with the presence of mental wellness. Multiple studies have demonstrated a link between

complete mental health (high SWB, low psychopathology), and positive academic, social, and physical health outcomes, even when participants are compared to peers with similar low levels of psychopathology but low SWB. This indicates that average/high levels of SWB might serve as a protective factor integral to optimal functioning.

### **Purpose of the Current Study**

The purpose of the current study is to examine the longitudinal stability and change of mental health status according to a dual-factor model in early elementary-aged children. The following will present a summary of the gaps in the research that the current study is intended to address. Next, an overview of the current study is provided before a brief discussion of implications for the field of school psychology.

**Gaps in the research.** To date, no known studies have examined the presence and utility of a dual-factor model of mental health in early elementary school students. Existing research has extended the dual-factor model to middle school, high school, and college samples. Only one study has even explored the dual-factor model in elementary school students (Greenspoon & Saklofske, 2001), albeit an older sample ( $M$  age = 10.5 years,  $SD = .70$ ). Further research is needed to delineate a more comprehensive approach to mental health that includes indicators of both wellness and illness in young children.

Only two known studies have examined the stability and change of students' group membership according to the dual-factor model of mental health. Kelly, Hills, Huebner, and McQuillin (2012) explored the longitudinal stability and dynamics of group membership in a sample of 730 seventh- and eighth-grade U.S. middle school students. They reported greatest stability over a five month time period for the Flourishing group (high SWB, low psychopathology). Conversely, the Vulnerable group (low SWB, low psychopathology) showed

the least stability. Multiple logistic regression analyses were used to look at predictors of social support and their impact on patterns of change and stability. Youth initially identified as Vulnerable were most likely to move into the Flourishing group, demonstrating an increase in SWB over time while psychopathology remained low. Finally, the majority of students originally identified as Symptomatic but Content (high SWB, high psychopathology) either maintained group status or moved into the Flourishing group. This means that these students were more likely to maintain their high levels of happiness and experience a decrease in psychopathology than they were to experience a decrease in happiness and subsequent move to the Troubled group (low SWB, high psychopathology).

McMahan (2012) examined the longitudinal stability and dynamics of group membership in a sample of 425 U.S. high school students over a one-year period. Consistent with Kelly and colleagues (2012), this study found greatest stability among students in the Flourishing (or Complete Mental Health) group. Conversely, the least stable group was found to be the students identified as Symptomatic but Content in the high school sample. As in the study with middle school students, those identified in the moderate mental health groups (Vulnerable or Symptomatic but Content) were more likely to move to Flourishing than remain in their groups or to move to another group with either high psychopathology or low subjective well-being. Finally, multiple logistic regression analyses identified significant demographic, intrapersonal, and environmental predictors of stability and change.

Despite providing the groundwork for understanding the longitudinal stability and dynamics of group membership according to the dual-factor model, the aforementioned studies are not without certain limitations. Specifically, both studies relied on group assignment rules based on theoretical categorization criteria. Although such assignment rules are typically

reasonable, a major pitfall related to their use is the inability to take advantage of the continuous nature of the data and the interaction between psychological problems and well-being. Moreover, the literature has examined stability from a rather simple perspective by examining the percentage of individuals who maintain membership in a group or change membership to another group over time. What is needed are more sophisticated analyses that test for the presence of specific pathways or trajectories that individuals follow according to the dual-factor model. Given that group-based theory is so relevant to the dual-factor model of mental health, it is important that methods for examining patterns of longitudinal stability and change consider the distinct developmental trajectories that particular groups of children may follow over time. There are numerous examples from other areas of research that have examined individual developmental trajectories as a way of examining stability and change over time and determining whether there are common pathways underlying children's development (Nagin, 2005).

**Overview of the current study.** This study seeks to expand the extant literature on the stability of the dual-factor model by examining different developmental patterns or trajectories of stability and change according to the dual-factor model of mental health in early elementary students. In order to accomplish this, group-based trajectory modeling (Nagin, 2005) will be used to identify clusters of individuals following similar mental health trajectories over an 18-month time period. The study will also distinguish the groups on individual-level factors hypothesized to characterize different developmental pathways. The specific research questions that will be addressed are as follows:

- 1) For early elementary students, to what extent is mental health (defined by categories yielded in the dual-factor model), stable across one school year?

- 2) For early elementary students, what latent developmental trajectories represent children's stability and change in mental health according to the dual-factor model of mental health?
- 3) To what extent do individual-level factors (i.e. gender, SES, ethnicity) predict membership in the identified developmental pathways?

**School psychology implications.** School psychologists are members of educational teams that support students' ability to learn and succeed and teachers' ability to teach and serve students. This profession, which bridges the gap between education and psychology, requires expertise in the areas of mental health, learning, and behavior in order to help students children succeed academically, socially, emotionally, and behaviorally (National Association of School Psychologists, 2014). Given that the majority of students with MEB problems are being treated within schools, it is important for practitioners to approach SBMH services from a framework of mental health that integrates indicators of wellness and illness.

The focus of this dissertation is exploring the existence and utility of a dual-factor model of mental health in early elementary school students, as the traditional approach to SBMH is lacking a comprehensive lens through which to view optimal student functioning. Emerging work suggests that indicators of well-being cannot be ignored, as the traditional approach to assessing mental health completely overlooks individuals that are classified as Symptomatic but Content or Vulnerable according to a dual-factor model. Demonstrating that high levels of SWB can co-occur with high psychopathology and that low levels of SWB can co-occur with low psychopathology in early childhood will strengthen the rationale for measuring SWB in concert with psychopathology. Further, research on the stability of mental health provides a great foundation for informing prevention and intervention work. A better understanding of factors

that predict both wellness and illness can be used to help develop interventions that effectively promote optimal student functioning.

## **Chapter 2: Literature Review**

The review of the literature that follows is intended to provide adequate coverage of the background research that builds the case for and significance of this dissertation study. The chapter is organized according to the following. First, a general discussion about SBMH and the use of multi-tiered systems of support (MTSS) as a framework to facilitate school mental services is provided. Second, limitations of the traditional and modern frameworks of mental health are delineated before exploring applications of dual-factor model of mental health throughout childhood and adolescence. Third, predictors of both positive and negative indicators of youth mental health are offered. Finally, a review of the literature on the longitudinal change and stability of mental health in youth is provided. Throughout this literature review specific gaps in the extant research and practice will be highlighted to identify needs for further research to better understand how to approach the promotion of a comprehensive view of mental health in schools. The end goal is to build the significance for the present work examining patterns of change and stability according to the dual-factor model in order to ultimately support optimal mental health in early elementary school students.

### **School-Based Mental Health**

As mentioned previously, one out of every five children in the United States experiences mental health problems significant enough to impair their functioning (Duchnowski et al., 2002; U.S. Department of Health & Human Services, 1999) and warrant diagnosis (Costello et al., 2003). Studies indicate that these mental, emotional, and behavioral (MEB) problems are associated with educational failure (Riglin et al., 2013), which is in turn associated with a host of other adverse outcomes for children (Fazel et al., 2014). In the short term, MEB problems negatively impact children's social relationships with peers (Risi et al., 2003) and teachers

(Hamre & Pianta, 2001). In the long term, MEB problems place adolescents at risk for school dropout (Suh, Suh, & Houston, 2011), increased risk-taking behavior, and greater likelihood of entering the criminal justice system (Collishaw et al., 2004). Despite the prevalence and risks associated with mental illness in childhood and adolescence, approximately 75% to 80% of those affected children are not receiving appropriate interventions (U.S. Department of Health & Human Services, 1999). Of the 20-25% of youth receiving interventions, approximately 70% are getting these services in schools (Burns et al., 1995).

For these reasons, substantial advocacy and federal attention has been directed toward providing students with access to school-based mental health, or SBMH (NIMH, 2001; USPHS, 2000). Indeed, it is widely agreed upon that there is an urgent need for mental health programs and services in schools (Fazel et al., 2014; Hansen, Litzelman, Marsh, & Milspaw, 2004; Payton et al., 2008; U.S. Department of Health and Human Services, 2000). A report issued by the President's New Freedom Commission (Hogan, 2003) emphasized the need for quality screening in schools, as well as an improvement and expansion of SBMH programs.

Despite this federal attention, the type and quality of services being offered in school settings is often poorly understood (Rones & Hoagwood, 2000). In a broad sense, SBMH services can be defined as "any program, intervention, or strategy applied in a school setting that is specifically designed to influence students' emotional, behavioral, or social functioning" (Rones & Hoagwood, 2000; p. 224). Services run the gamut from prevention (e.g. a universally delivered social emotional learning curriculum) to intervention (e.g. social skills groups for at-risk students; individual cognitive behavior therapy for a student with a serious emotional disturbance). Historically, the expansion of broader general health services for students in schools gave rise to the introduction of mental health services (Flaherty, Weist, & Warner,

1996). Based on the principle that students in poor health cannot learn, nurses were placed in schools to focus on services including hearing/vision screening, ensuring that immunization records were complete, and referring students with more severe problems for appropriate medical services (Lear, Gleicher, St. Germaine, & Porter, 1991).

Throughout the 1980s, the rise of school-based health clinics gave way to the delivery of more comprehensive services based on a number of factors, including increased rates of problems associated with risk-taking behaviors, rising levels of adolescent suicide and homicide, and greater incidence of school dropout (Flaherty et al., 1996). Additionally, the introduction of legal mandates served to extend the responsibility of schools to provide suitable educational services to students with emotional problems. For instance, in 1975, Congress enacted the Education for All Handicapped Children Act (subsequently revised and renamed as Individuals with Disabilities Education Act in 1990), which required schools to provide appropriate educational programming for all handicapped children in the least restrictive setting possible. More recently, the Individuals with Disabilities Education Improvement Act left much of the responsibility for student mental health to the education system (US Department of Education, IDEA, 2004), insomuch as mental health problems impede a child's educational progress and success.

Indeed, it is well-documented that schools represent the primary setting in which the majority of impacted children, particularly those coming from economically disadvantaged environments, can access mental health interventions (Burns et al., 1995; Hoagwood, Burns, Kiser, Ringeisen, & Schoenwald, 2001). As mentioned previously, the type and quality of services being offered in school settings is often poorly understood (Rones & Hoagwood, 2000).

A number of seminal works reviewing the SBMH literature have attempted to bridge these gaps in understanding.

A review of the published literature from 1985-1999 identified 47 empirical studies of SBMH services, defined as “any program, intervention, or strategy applied in a school setting that is specifically designed to influence students’ emotional, behavioral, or social functioning” (p. 224; Rones & Hoagwood, 2000). Results from the analysis showed evidence for a number of effective SBMH programs that can be implemented to address both emotional and behavioral problems. Findings from this study further revealed five important implementation features for effective programming: 1) consistent program implementation, 2) inclusion of parents, teachers or peers, 3) the use of multiple modalities (e.g. informational presentation combined with skills training), 4) integration of program content into the general education curriculum, and 5) developmentally appropriate intervention components. These features were all associated with an increased probability of long-term service sustainability and maintenance.

Another review sought to examine the types of interventions that yield positive mental health and educational outcomes, as well as document the types of assessments most commonly used to measure both academic and mental health functioning (Hoagwood et al., 2007). The search identified 64 out of over 2000 articles published (1990-2006) that met methodologically rigorous inclusion criteria, and only 24 (37.5%) included both mental health and educational outcomes. Of those that examined both mental health outcomes and educational outcomes, 15 studies (62.5%) found positive effects on both outcomes, 8 studies (33.3%) found positive effects on mental health outcomes only, and 1 study (4.2%) found no significant positive effect on either domains. Mental health outcomes were most often assessed by self-, peer-, parent-, or teacher-rated measures of social competence, aggression, or problem behaviors and educational

outcomes were most often measured by academic scores and school attendance. The programs that found positive impact on both mental health and educational outcomes were highly intensive and involved multiple components across contexts (e.g. school and home) and program targets (e.g. students, parents, and teachers). Still, the positive effects were often quite modest, which raises some concern about the overall cost-effectiveness of these programs. Results also showed that these modest effects on academics often do not hold over time. Researchers suggested that part of the difficulty demonstrating the educational impact of mental health interventions is related to the fact that the majority of studies did not address academics as part of the intervention. Additionally, part of this difficulty could be related to the limited variety of academic measures used.

A third review focused specifically on SBMH programs for low-income, urban youth, given the combination of risk factors for developing psychological problems this population of children are likely to experience (Farahmand, Grant, Polo, Duffy, & Dubois, 2011). Results revealed different patterns for low-income, urban youth in comparison with those reported for the broader population by Rones & Hoagwood (2000). Specifically, there were substantially fewer effective programs for low-income, urban youth. The most effective programs included those that were delivered universally across all youth and those that focused on either internalizing problems or a broader social-emotional learning context. Further inconsistencies were revealed through an examination of the five implementation features identified by Rones & Hoagwood (2000). Specifically, no significant differences were found for implementation consistency, inclusion of parents, teachers, or peers, use of multiple modalities, or integration of program content into classroom curricula. With regard to the extent to which program elements were developmentally appropriate, the authors indicated that insufficient information was

available to viably compare groups on this variable. Overall, these different patterns for low-income, urban youth suggest that current models of change may not be appropriate for serving all populations.

All three of these meta-analyses highlight the potential for SBMH services to impact both educational and mental health outcomes for students, as well as the importance of integrating mental health services into the broader mission of schools. Each review found an evidence base for a number of effective SBMH programs that show promise for addressing both emotional and behavioral problems among youth. However, future research efforts must target several gaps identified by these reviews. First, evaluations of SBMH services must include more educationally-relevant outcomes. Efforts to further define these outcomes and to clarify the construct of academic success would help future research efforts identify variables that are both sensitive to short-term change and mediate long-term academic outcomes. Additionally, unanswered questions remain about the key components that lead to successful program implementation and dissemination. Further efforts must focus on identifying barriers to successful implementation so that these challenges can be mitigated. Finally, findings revealed limited evidence for effective SBMH interventions for low-income, urban youth, especially among those already displaying externalizing problems. This suggests that additional research is needed to better understand current models of change with underserved populations.

**Multi-tiered systems of support.** SBMH service delivery in the United States exists within a variety of models and contexts. Some schools have adopted the school-based clinic model in which mental health services occur in the context of a range of other health services. Often these clinics staff a master's level clinician to address the mental health needs of students (Flaherty et al., 1996). Lately, many school systems are moving away from the traditional

“Refer-Test-Place” model (Cash & Nealis, 2004) in which only those children who struggle in mainstream educational settings are referred for an assessment for special education or other individualized services. Instead, schools are moving toward the adoption of multi-tiered frameworks that provide a continuum of services to all children, including services to address MEB problems that are impacting academic success. Several advantages are inherent to offering a continuum of services across a multi-tiered system of support (MTSS), namely circumventing the “wait-to-fail” phenomenon that occurs with the “Refer-Test-Place” model. This phenomenon occurs when students who struggle academically, socially, and emotionally have unmet needs and subsequently fail for extended periods of time until reaching a threshold of problems that cannot be ignored (Walker, Severson, & Seeley, 2010). Indeed, the traditional “Refer-Test-Place” approach often produces a substantial gap in services for students with serious needs, as approximately only 1% of all students are designated for special education and related services due to emotional and behavioral disorders (Aron & Loprest, 2012). This is surprising given estimates that suggest between 12% and 22% of America’s youth under age 18 are in need of mental health services (National Advisory Mental Health Council, 1990), and numbers estimating that 70% of children who receive services for MEB problems do so in schools (Burns et al., 1995).

As an alternative to the traditional approach, many schools are adopting three-tiered frameworks that provide a continuum of services to all children. Based on the public health model, which emphasizes the prevention of health problems that affect an entire population, these frameworks have taken multiple forms within schools. Response to Intervention (RtI) is an approach that focuses primarily on academic achievement through a school-wide, multi-level instructional and behavioral system (National Center on Response to Intervention, 2010). Core

components of RtI include: delivery of research-based curricula and evidence-based interventions, implementation of a two stage screening process to identify students at-risk for poor learning outcomes, progress monitoring of students' performance over time, adjustment of intensity and nature of interventions based on students' responsiveness (data-based decision making), and employing a multi-level prevention system (primary prevention, secondary prevention, and tertiary prevention). Alternatively, Positive Behavioral Interventions and Supports (PBIS) is an MTSS approach focused on reducing students' externalizing behaviors (Lewis & Sugai, 1999). When implemented school-wide, it employs many of the same core components of RtI, including a multi-level prevention system, theoretically sound and evidence-based practices, and data-based decision making.

Despite differences in terminology, MTSS models (including RtI and PBIS) share certain hallmarks of the public health model on which they are based. Namely, these models place substantial emphasis on primary, universal, or Tier 1 prevention efforts. Delivered to all students, Tier 1 interventions include research-based core academic and social-emotional curricula, culturally responsive instructional practices, differentiated learning activities to address individual needs, delivery of clear behavioral expectations, and universal screening to assess present levels of performance and identify students in need of more intense intervention (National Center on Response to Intervention, 2010; Lewis & Sugai, 1999). Those students who are identified as at-risk for academic or MEB problems receive targeted support at the Tier 2 level, typically through small-group instruction (National Center on Response to Intervention, 2010). Finally, as student progress is monitored, Tier 3 supports are offered to the select few students who still do not respond to secondary interventions. Tier 3 interventions often take the form of intensive, individualized plans in order to meet the increasingly complex needs of

students at this level (National Center on Response to Intervention, 2010). Inherent to every level of support are systematic surveillance, progress-monitoring, and data-based decision making strategies (National Center on Response to Intervention, 2010). This data collection guides the intensity and types of interventions selected and is necessary to inform where a student is situated within the MTSS framework.

**Challenges and barriers to effective SBMH service delivery.** Although significant progress has been made in the growing field of SBMH, the research base has significant limitations (Hoagwood et al., 2007) and schools continue to struggle to garner the necessary support for the delivery of quality, evidence-based services (Evans & Weist, 2004). Despite the aforementioned benefits (e.g. opportunities to reach a wide range of youth, a universal prevention approach, services for at-risk students before functioning is severely impacted, etc.), several challenges to effective SBMH service delivery exist. Additionally, a substantial gap between “what works” and what is actually being implemented in schools exists (Forman et al., 2013). Ultimately, effective school-based interventions will not result in positive outcomes for students unless they are being used appropriately.

***Challenges to the MTSS approach.*** Several systemic challenges exist within the continuum of service delivery through multiple tiers. For instance, universal Tier 1 approaches often face implementation challenges. Since these prevention strategies are so comprehensive, implementation requires a concerted effort by administrative leadership and staff school-wide (Fazel et al., 2014). This requires a lot of “buy-in” and commitment from staff to implement interventions with fidelity. An increased understanding about classroom factors that impact social-emotional functioning and academic success has recently emerged, elucidating potential implementation challenges for certain classroom climates. Evidence suggests that an integrative

approach to improving contextual factors within schools (e.g. setting up positive behavioral norms that strengthen student-teacher interactions) can improve intervention implementation across all tiers of service delivery (Fazel et al., 2014). Further challenges arise with regard to the systematic screening process, including the over-identification of students at-risk (false positives) and the failure to detect students with developing MEB problems (Goodman, Ford, Simmons, Gatward, & Meltzer, 2000). False positives in particular could lead to unnecessary labeling and stigma within the school community. Also, concerns have been expressed about the ethical implications of identifying more youth than can readily be treated (Levitt, Saka, Romanelli, & Hoagwood, 2007). Given these limitations, it may be helpful to consider universal screening for MEB problems as simply one strategy in a continuum of early identification methods. Future research should continue to explore more effective methods of detecting students who need additional mental health supports.

***Workforce and resource limitations.*** Given that the education system is largely under local control, there are many schools that do not have the infrastructure to support basic school health and mental health services, including nurses or adequate time from school counselors (Evans & Weist, 2004). Even when this infrastructure is sound, these key individuals are often constrained by other duties. Coupled with a lack of external resources, these workforce limitations considerably impact a school's ability to focus on a comprehensive approach to mental health. Even if a school is moving toward this goal, those involved in the effort often receive too little support, training, and other resources to effectively implement evidence-based practices (Graczyk, Domitrovich, & Zins, 2003). Additionally, allocating resources to mental health services is a difficult choice when basic education remains underfunded (Prodente,

Sander, & Weist, 2002). As a result, school staff often have few mental health training resources available to them (Evans & Weist, 2004).

**Broader systemic barriers.** There are many additional contextual barriers to providing appropriate mental health services in the schools. In order to benefit from care, students must be actively attending school, and student absences among those with the greatest mental health needs can be a major barrier to timely and effective service delivery (Lyon et al., 2013). Some students and families also indicate a preference to receive services outside of the school context, particularly if they have experienced a sense of estrangement from the school community (Fazel et al., 2014). Additionally, students who drop out of school are unlikely to continue receiving services. Given these issues, SBMH services need to include reaching out to children and families in the community to facilitate access to care.

**Disease-based perspective.** Another challenge to SBMH service delivery comes with the pervasive disease-based approach, in which mental health is defined as the absence of psychopathology or mental illness. According to this perspective, mental health exists at the opposite end of the same continuum as mental illness (Herron & Trent, 2000, Keyes, 2005) and individuals can be classified on one dimension: sick or not sick (Greenspoon & Saklofske, 2001; Keyes 2005). Indeed, much of the way SBMH services are approached is based on intervention and treatment of emerging MEB problems, and little attention is given to the idea of developing strengths that will serve as protective factors for all students. It is important that a more comprehensive view of mental health is considered in schools so that service delivery includes a focus on building social-emotional competencies that promote optimal levels of well-being across entire student populations.

### **A Traditional Approach to Mental Health**

In its current state, much of the field of psychology holds a general acceptance of the medical model of mental health (Herron & Trent, 2000; Greenspoon & Saklofske, 2001; Keyes, 2002). The medical model suggests that when something is wrong with an individual, a clinician is tasked with trying to eliminate the symptoms, injury, or illness in order to cure the person. When applying this model to the construct of mental illness, the psychologist's job is to help the client reduce psychological distress or a set of problematic behaviors that are interfering with his or her ability to function "normally." When this goal is accomplished, the therapist's work is complete; the client is no longer mentally ill, and is considered to be "okay" (Keyes, 2002).

Stemming from the medical model, mental health is largely viewed from a disease-based perspective, defined as the absence of psychopathology or mental illness (Herron & Trent, 2000; Greenspoon & Saklofske, 2001; Keyes, 2007). This view has traditionally held that individuals can be classified on one dimension: sick or not sick (Greenspoon & Saklofske, 2001; Keyes 2005). Certainly, the National Institute of Health (NIH) has often focused on cure-oriented therapeutics and the strategic prevention of mental illness (Insel & Scolnick, 2006). The assumption behind this research is that by reducing the number of cases of mental illness, the American public will be mentally healthier. However, as Keyes (2007) stated, "This is truly an assumption, because it rests on one of the most simple and inexplicably untested empirical hypotheses: The absence of mental illness is the presence of mental health" (p. 95). Keyes (2007) goes on to argue that this hypothesis wrongfully assumes that "measures of mental illness and measures of mental health belong to a single, bipolar latent continuum" (p. 95).

According to the bipolar, single continuum model, mental health exists at the opposite end of the same continuum as mental illness (Figure 2; Herron & Trent, 2000; Keyes, 2005). As

Herron and Trent (2000) describe the basic features of the bipolar model, “Mental health and mental illness, although appearing at opposite ends of the continuum, are correlative terms.

There is a dependency relationship between the two. The existence or degree of one is dependent on the existence/absence or degree of the other” (p. 30). Some argue that placing mental health and mental illness at separate poles on one continuum implies that promoting mental health requires an individual to “move” along the continuum from the point of mental illness towards mental health (Herron & Trent, 2000). As Trent (1992) denotes, there are multiple problems with viewing mental health and mental illness as opposite ends of the same continuum. First, it is impossible for an individual to be in two places on the continuum simultaneously, and therefore cannot be considered mentally healthy and ill at the same time. Likewise, it is difficult to have the potential for mental health when an individual has an identified mental illness. Further, an individual would have to be at the extreme mental health pole before considered “mentally healthy” and it is arguably an arbitrary point along the continuum at which point mental health becomes mental illness.

Despite its limitations, the disease-based focus has resulted in many benefits, including a greater understanding of therapy for mental illness and a variety of effective treatments for many debilitating disorders (Keyes, 2007; Seligman & Csikszentmihalyi, 2000). Indeed, psychology’s empirical emphasis is predominately the assessment and treatment of individual suffering. A wealth of research has focused on psychopathology and the negative effects of environmental stressors, including exposure to violence, parental divorce, and physical and sexual abuse. This research has given rise to the knowledge about how people survive and endure conditions of adversity, yet little is understood about what makes a life worth living (Seligman & Csikszentmihalyi, 2000). This research has also led to substantial strides in the prevention efforts

of mental illness. Although mental illness prevention efforts have demonstrated good efficacy, the target of such efforts is reducing cases of mental illness, with little emphasis on whether these interventions also serve to promote well-being (Keyes, 2007). Ultimately, the narrow focus of the disease-based perspective falls short to cultivate and promote optimal human well-being and a complete state of mental health.

### **A Modern Approach to Mental Health**

**History of positive psychology.** Despite the general acceptance of this medical model of mental health, some psychologists have given thought to the idea of positive psychology and what it means to be functioning better than “okay” (Keyes, 2002). In an article on positive psychology, Seligman and Csikszentmihalyi (2000) discuss a radical paradigm shift in the science and profession of psychology after World War II. They suggest that prior to World War II, the field had three different missions: to cure mental illness, to make the lives of all people more productive and fulfilling, and to identify and nurture high talent. They illustrate the focus of positive psychology by emphasizing Terman’s early work on giftedness (Terman, 1939) and marital happiness (Terman, Bittenwieser, Ferguson, & Wilson, 1938); Watson’s work on effective parenting (1928); and Jung’s work on the search for and discovery of meaning in life (Jung, 1933). Further, they suggest that two economic events shortly after the war were responsible for changing the focus of psychology: the founding of the Veterans Administration, which led psychologists to discover they could make a living treating mental illness and the founding of the National Institute of Mental Health, which led academics to discover that they could get grants for research in pathology (Seligman & Csikszentmihalyi, 2000). Although some extraordinary benefits resulted from this shift, the other two missions of psychology (making people’s lives more productive and fulfilling; identifying and nurturing high talent) experienced

a dramatic decrease in attention with the increased empirical focus on assessing and curing individual suffering.

In spite of this paradigm shift, there were a few psychologists that continued to focus on aspects of positive psychology post World War II. In her book *Current Concepts of Positive Mental Health*, Jahoda (1958) identified six concepts associated with positive mental health: accurate perception of reality, integration of psychological functions, autonomy, attitudes toward the self, environmental mastery, and development of self-actualization. Abraham Maslow was another psychologist who devoted his career to the argument that the field of psychology was lacking attention to the potential for optimizing human experience. His theory of motivation postulates that human needs are organized into a hierarchy of relative importance, and that a person must achieve satisfaction at each level before advancing to the next (Maslow, 1954). According to Maslow's hierarchy, physiological needs, including hunger and thirst, are the primary needs that must be fulfilled. Once satisfied, subsequent higher order needs can be met: safety, love and belonging, esteem, and self-actualization. Maslow described the first four levels, or basic needs, as needs that motivate humans to fulfill a deficit state. In other words, when unmet, the basic needs are said to motivate people and the need to fulfill them will become increasingly stronger the longer duration in which they are denied. For example, the longer a person goes without water, the thirstier he or she will become. Conversely, Maslow theorized that self-actualization was not based on deficiency, but rather a positive desire to fulfill one's potential (1954). The traits associated with meeting this potential (including an accurate perception of reality, acceptance of self, autonomy, humor, mystic experiences) are consistent with Jahoda's (1958) concepts associated with positive mental health.

Modern day positive psychology represents a branch of psychology that focuses on how to make seemingly normal life more meaningful, satisfying and fulfilling (Csikszentmihalyi, Rathunde, & Whalen, 1993; Masten & Reed, 2002). Positive psychology focuses on teaching individuals skills, strengths, and routines to promote effective management of emotions, maintain a positive outlook on life, and establish and maintain positive relationships with others (Seligman, Ernst, Gillham, Reivich, & Linkins, 2009). Ultimately, these positive life skills, habits, and routines serve protective factors that contribute to life success (e.g., happiness, gratitude; Seligman, 1998) and there is a growing body of evidence supporting it as an approach to enhance well-being and life satisfaction (Seligman, 2002; Sin & Lyubomirsky, 2009).

**A comprehensive approach to mental health.** Psychologists interested in the study of positive mental health have long contended that assuming that mental health and mental illness occupy the poles of a singular continuum impedes progress in mental health research and promotion (Korner, 1958). Korner (1958) argued that mental health and mental illness represent two separate and distinct entities existing along two different continua. The two continua model of mental illness and mental health holds that both constructs are related, yet distinct dimensions, one of which indicates the presence or absence of mental health, the other the presence or absence of mental illness (Westerhof & Keyes, 2010). Despite a wide variety of proposed theories on what constitutes mental health, there is a common support for the need to incorporate mental health and mental illness (Compton, Smith, Cornish & Qualls, 1996).

Social scientists have measured mental health through the investigation of subjective well-being (SWB), which is defined as individuals' perceptions and or evaluations of their own lives with respect to their mood states and psychological and social functioning (Keyes & Waterman, 2003). Keyes (2002) introduced an operationalization of mental health as a syndrome

of symptoms of positive thinking, positive feelings and overall positive life-functioning. Keyes (2002) argues that mental health is best viewed as a complete state consisting of low levels of mental illness and high levels of SWB. He defines the opposite ends of the mental health continuum as complete and incomplete mental health and categorizes adults with complete mental health as flourishing in life with high levels of well-being. Conversely, adults with incomplete mental health are categorized as languishing in life with low well-being.

Keyes (2005) later proposed a model for the cluster of symptoms (or measures) that comprise the diagnostic criteria for mental health. The model was based on SWB research that yielded clusters of mental health symptoms that closely parallel symptoms used to diagnose major depressive episode in the *Diagnostic and Statistical Manual of Mental Disorders* (4<sup>th</sup> ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000). For instance, a diagnosis of depression requires symptoms of anhedonia and malfunctioning, whereas a diagnosis of flourishing requires symptoms of both hedonia (i.e. positive feelings towards one's life) and positive functioning. Altogether, mental health is defined as the presence of emotional well-being in conjunction with high levels of social and psychological functioning (Westerhof & Keyes, 2012). When considering this, a person's complete mental health falls along two separate yet inter-related dimensions: illness and well-being.

**Support for a comprehensive approach to mental health.** Proponents of a more comprehensive approach to mental health have long promoted a definition of mental health that extends beyond the absence of mental illness (Jahoda, 1958). Data from the National Institute of Mental Health estimated that in 2012, 18.6 percent of adults in the United States experienced mental illness, with 4.1 percent impacted by a serious mental illness (U.S. Department of Health and Human Services, 2013). Despite the serious reasons for concern about the prevalence and

etiology of mental illness, the majority of the adult population will remain free of serious mental illnesses across its lifespan. Arguably, the 81.4 percent of adults living free of any mental illness in 2012 were not leading equally productive and mentally healthy lives. Many individuals without mental disorders do not feel healthy or function well, which is also true in the realm of public health, where many individuals are free from injury or disease but are not experiencing optimal physical well-being. All clinicians are familiar with those patients that are significantly impacted functionally yet do not meet criteria for diagnosis. In fact, data suggests that nearly half of the adults receiving mental health services annually have no diagnosable disorder (Regier et al., 1993).

In order to determine the prevalence of flourishing, languishing, and moderate mental health in the United States, Keyes (2002) examined data gathered in 1995 from the MacArthur Foundation's Midlife in the United States (MIDUS) Survey ( $N = 3,032$ ). The Composite International Diagnostic Interview Short Form (CIDI-SF; Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998) scale was used to measure mental illness, which was limited in this study to a major depressive episode (MDE). Mental health was measured by a total of 13 scales examining emotional, psychological, and social well-being. Results indicated that 85.9 percent of adults did not experience an MDE in the past twelve months. Of the adults who did not experience an MDE, only 20.0 percent were classified as flourishing in life, 14.1 percent were languishing, and 65.9 percent were moderately mentally healthy. Interestingly, 28.0 percent of languishing adults experienced an MDE, whereas 13.1 percent of moderately mentally healthy and 4.9 percent of flourishing adults met criteria for an MDE. Thus, moderately well adults were over twice as likely to experience depression as flourishing adults, and languishing adults were over five times more likely to have had an MDE (Keyes, 2002). Taken together, these data suggest that the

majority of adults are not impacted by the mental illness of depression. More importantly, among those who were not classified as mentally ill, there were varying levels of mental health according to emotional, psychological, and social well-being measures. This would indicate that there are in fact individuals without mental illness who could benefit from supports to promote or cultivate their mental health and overall well-being. These data also support the notion that mental illness and mental health exist as separate, distinct constructs and that mental health cannot simply be defined as a lack of mental illness.

Further research has empirically confirmed that the constructs of mental health and mental illness are distinct, yet correlated axes, best viewed together as a complete state. In 2005, Keyes published another study using the MIDUS survey data that extended the definition of mental illness beyond an MDE to include generalized anxiety disorder, panic disorder, and alcohol dependence. Mental health was again measured by self-report scales of emotional, psychological, and social well-being. Confirmatory factor analyses were run to test the fit of various theories of the latent structure of the measures of mental health and mental illness. Results demonstrated that a correlated two-factor model was the most tenable for the structure of mental health and mental illness. The latent factors of mental health and mental illness correlated at  $-.53$ , indicating that 25% of variance between measures of mental illness and mental health was shared variance, with the remaining 75% being unshared (Keyes, 2005). This study also found that adults with moderate or languishing mental health experienced greater difficulty functioning in terms of work reductions, health limitations, and psychosocial functioning compared with flourishing adults. Additionally, languishing adults (without mental illness) functioned worse than adults with pure mental illness in all areas of functioning except work problems (Keyes, 2005). Altogether, mounting evidence supports the conceptualization of

mental health as a complete state that consists of both the absence of illness and the presence of positive functioning and well-being.

Keyes (2006) extended this conceptualization of a complete state of mental health to a sample of 1,234 adolescents aged 12 to 18 years old through a 12-item, self-report measure adapted from a similar tool used with adults to measure emotional, psychological, and social well-being (Keyes & Magyar-Moe, 2003). Adolescents also completed a global self-concept scale (Marsh, 1990), the Children's Depression Inventory (CDI; Kovacs, 1992), and a scale developed by the author to gauge how often participants felt safe, included, and happy at school. Conduct problems (e.g. truancy, delinquency, substance use) were also measured via student self-report. Similar to the mental health diagnostic criteria Keyes previously applied to adults (2002), youth were classified as flourishing if they reported experiencing at least one of the three symptoms of emotional well-being and at least five of the nine symptoms of positive functioning almost every day or every day. Adolescents were classified as languishing if they experienced at least one symptom of emotional wellbeing and at least five symptoms of positive functioning once or twice or never. Finally, adolescents who did not meet criteria for flourishing or languishing were categorized as moderately mentally healthy.

Less than half of adolescents were diagnosed as flourishing, and significant differences were found between different ages (Keyes, 2006). Specifically, 48.8% of youth aged 12 to 14 years old were flourishing and 45.2% were considered moderately mentally healthy, while 6.0% were diagnosed as languishing. In youth between the ages of 15 and 18 years-old, only 39.9% were diagnosed as flourishing, while the majority (54.5%) were moderately mentally healthy and 5.6% were considered languishing. Adolescents in the flourishing group had significantly fewer depressive symptoms and conduct problems, had higher levels of global self-concept and

feelings of closeness with people than those who were considered moderately mentally healthy or languishing. The best outcomes were associated with a flourishing status, and conversely, languishing adolescents had the worst functioning across all measures. Interestingly, adolescents with moderate mental health had more depressive symptoms and conduct problems than flourishing youth. Moderately mentally healthy adolescents also reported fewer feelings of school integrations, fewer close relationships, and lower levels of self-concept than their flourishing peers. Taken together, these findings serve to strengthen the argument that mental health is not simply the absence of mental illness, as adolescents who lacked symptoms of pathology were not necessarily flourishing or experiencing optimal functioning.

### **A Dual-Factor Model of Mental Health in Youth**

With the aforementioned research the field of psychology has begun to acknowledge the shift from a binary distinction towards a dual-factor or two continua model that integrates both measures of psychopathology and SWB into one model of mental health (Doll, Spies, & Champion, 2012). Several different terms have been used when referring to this model of mental health; such as the two-continuum model, the dual-factor model, or the dual continua model. For the purpose of this paper, the concept will be referred to as the dual-factor model of mental health. In this approach, it is presumed that four different mental health statuses exist; these groups are summarized in Figure 1. This model identifies two groups (one with high SWB and high psychopathology, and one with low SWB and low psychopathology) typically overlooked within the traditional model of mental health.

**A dual-factor model in late childhood.** Greenspoon and Saklofske (2001) classified a set of 407 Canadian students (grades 3-6) according to a dual-factor model of mental health assessment by integrating measures of SWB and psychopathology. Students were classified as

high or low on each construct, thus comprising four different groups (high SWB & low psychopathology; low SWB & high psychopathology; low SWB & low psychopathology; high SWB & high pathology). A series of discriminant function analyses were performed to classify students among the four groups, using predictors known to be independently associated with both SWB and psychopathology (e.g. measures of temperament, personality, self-concept, interpersonal relations, and locus of control). Results supported the validity of using the dual-factor model to assess mental health in an integrated fashion. Children with high SWB and low psychopathology reported better interpersonal relations and more scholastic self-competence than youth with similar levels of psychopathology but with low SWB. Children with high psychopathology and high SWB were more sociable and more confident in their academic competence than children with similarly high levels of psychopathology but with low SWB.

Of particular interest to the researchers was the group of children exhibiting low levels of pathology and low levels of SWB (Group 3). This group challenges the one-dimensional model of mental health and was comprised of students who present in the “normal range” on tests of psychological illness yet experienced diminished levels of well-being. In keeping with the dual-factor model, results suggested two directions for intervention/prevention research. The first came from a similarity on the dispositional variables of neuroticism and locus of control between children in Groups 3 (low SWB and low psychopathology) and 1 (high SWB and low psychopathology). Specifically, children in Groups 1 and 3 tended to have lower levels of neuroticism and increased levels of internal locus of control. This suggests that low levels of neuroticism and high levels of internal locus of control may offer protection from developing pathology in the face of adverse situations. Thus, strategies aimed at decreasing neurotic personality tendencies and developing an internal locus of control might increase and foster

resilience against mental illness. The second direction for intervention/prevention work came from a similarity on situational variables (interpersonal relations and scholastic competence) between children in Groups 2 (low SWB and high psychopathology) and 3 (low SWB and low psychopathology). The similarities in situational variables across Groups 2 and 3 suggest that low self-concept of scholastic competence and poor interpersonal relations are related to decreased SWB and/or increased psychopathology. Strategies aimed at strengthening social relationships and increasing academic support would likely play an integral role to increasing SWB.

**A dual-factor model in early adolescence.** As an extension of the work published by Greenspoon and Saklofske (2001), Suldo and Shaffer (2008) set out to determine the proportion of students in each group among a sample of U.S. adolescents (grades 6-8) and compare groups on measures of educational functioning, social relationships, and physical health. Results furthered the existence of a four-group classification system as a more comprehensive view of mental health. Group 1 (termed Complete Mental Health, comprised of students with high SWB and low psychopathology) contained 57% of the total sample; Group 2 (termed Vulnerable, comprised of students with low SWB and low psychopathology) contained 13% of the total sample; Group 3 (termed Symptomatic but Content, comprised of students with high SWB and high psychopathology) contained 13% of the total sample; Group 4 (termed Troubled, comprised of students with low SWB and high psychopathology) contained 17% of the total sample. Interestingly, not all students who exhibited high psychopathology (30% of the total sample) reported low levels of SWB. In fact, almost half of the students with high psychopathology reported average to high levels of SWB. Conversely, not all students without symptoms of mental illness reported average to high levels of SWB. Taken together, these findings suggest

that positive and negative indicators of mental do not exist at opposite ends of a single continuum.

Besides supporting the existence of a dual-factor model of mental health in adolescence, Suldo and Shaffer (2008) provided support for the utility of such model by identifying differences in functioning among each mental health group, controlling for SES and parent marital status. With regard to the majority of educational functioning indicators, students in the Complete Mental Health group were more academically successful than their Vulnerable (low SWB, low psychopathology) peers. Youth in the Vulnerable group exhibited lower levels of academic self-concept, reduced motivation to self-regulate behaviors necessary for learning, and viewed school as less important for achieving long-term goals. Vulnerable youth performed lower on an objective measure of reading achievement and were absent from school more often than students in the Complete Mental Health group. In terms of social functioning, students in the Complete Mental Health group reported fewer social problems with peers (e.g. loneliness, difficulty getting along with others, etc.) and greater social support from classmates and parents than students in the Vulnerable group. Lastly, on the majority of physical health variables, students with average to high SWB were healthier than their peers with low SWB and comparable levels of psychopathology. Specifically, Vulnerable students reported lower levels of general health and greater limitations in family activities because of health or behavior problems than students with Complete Mental Health.

**Longitudinal outcomes predicted by a dual-factor model.** Suldo, Thalji, and Ferron (2011) were the first to examine longitudinal outcomes predicted by mental health group membership according to the dual-factor model of mental health. Researchers followed up with a sample of 300 middle school students that originally participated in Suldo and Shaffer's (2008)

study on a dual-factor model to determine how Time 1 mental health status predicted a number of academic achievement and in-school behaviors in the following school year. Forty-one students were lost to attrition between Time 1 (spring of 2006) and Time 2 (2006-2007 school year), and those students were no more likely than students in the longitudinal sample to have a unique mental health profile or to be part of a specific demographic group. At Time 1, students completed self-report measures of mental health, including the Students' Life Satisfaction Scale (SLSS; Huebner, 1991), the Positive and Negative Affect Scale for Children (PANAS-C; Laurent et al., 1999), and the youth self-report from the child behavior checklist (CBCL; Achenbach & Rescorla, 2001). As a measure of externalizing behavior, the externalizing symptoms composite was used from the teacher report form of the CBCL (Achenbach & Rescorla, 2001). Several indicators of academic achievement and in-school behaviors were gathered for both waves of data collection, including: standardized test scores from a statewide achievement test; school attendance; office discipline referrals; and GPA.

Consistent with previous research (e.g. Suldo & Shaffer, 2008), Complete mental health was associated with more positive outcomes for youth. Specifically, adolescents in the Complete Mental Health group at Time 1 had the best standardized test scores in math, grades, and attendance at Time 2, even compared to the Vulnerable students with similar low levels of psychopathology. This suggests that SWB may serve as a protective factor, as students with higher levels of SWB were more likely to experience favorable student outcomes. The worst outcomes at Time 2 were among those students originally classified as Troubled. Specifically, adolescents in the Troubled group experienced steeper declines in GPAs than youth without psychopathology. Interestingly, Symptomatic but Content adolescents did not experience greater declines in GPA than their peers with low psychopathology. Taken together, findings indicate

that both high levels of SWB and low levels of psychopathology are associated with the most positive academic and behavioral outcomes for adolescents.

### **Predictors of Negative and Positive Indicators of Youth Mental Health**

Individual differences on mental health status between youth stem from a complex interplay of personal characteristics and environmental experiences. In the following section, the literature that suggests which factors are associated with youth mental health is briefly summarized. In keeping with the dual-factor approach, this includes both correlates and predictors of psychopathology as well as subjective well-being. First, individual-level predictors and their relationships with psychopathology and well-being are delineated. Second, school-based contextual-level predictors their relationships with student mental health are discussed.

**Individual-level predictors of youth mental health.** Individual-level predictors are student specific characteristics including such information as gender, ethnicity, socioeconomic status, and age. A number of individual-level variables have demonstrated links with mental health, including indicators of psychopathology and subjective well-being.

***Gender and psychopathology.*** Research examining gender differences with regard to early childhood mental health has yielded mixed results. Some studies have found significant effects of child gender on trajectories of externalizing problems in early childhood (e.g. Tremblay et al., 2004), yet others have not (e.g. Mesman et al., 2009; Spieker, Larson, Lewis, Keller, & Gilchrist, 1999). In those studies that have found significant differences, boys have displayed significantly higher externalizing problems (Appleyard, Egeland, & Sroufe, 2007) and more stable high aggression trajectories (Tremblay et al., 2004) than girls. In terms of internalizing trajectories, community-based samples have found that girls show higher mean levels and experience greater increases in internalizing symptoms from childhood to adolescence

than boys (Angold, Erkanli, Silberg, Eaves, & Costello, 2002; Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003). Alternatively, a meta-analysis of 310 studies using the Children's Depression Inventory (CDI; Kovacs, 1992) showed that girls had slightly less depressive symptoms in childhood, yet surpassed boys after age 13 (Twenge & Nolen-Hoeksema, 2002).

***Socioeconomic status and psychopathology.*** Studies have demonstrated higher rates of psychopathology among individuals with lower socioeconomic status (SES) than those with higher SES (Fryers, Melzer, & Jenkins, 2003). Similar longitudinal findings have been reported among children and adolescents in the United States. One longitudinal study following children ages 8-16 years-old over a period of nine years found that low SES significantly predicted a variety of internalizing and externalizing behaviors (van Oort, van der Ende, Wadsworth, Verhulst, & Achenbach, 2011). Specifically, low SES predicted significantly greater symptoms of withdrawal, aggressive behaviors, thought problems, and attention problems. Other research has found disproportionate accumulations of clinically elevated scores on various scales of internalizing and externalizing psychopathologies among low SES groups (Wadsworth & Achenbach, 2005).

***Ethnicity and psychopathology.*** Given the robust relationship between ethnicity and SES, difference rates in psychopathology by student ethnicity are difficult to uniquely explain. Indeed, studies have reported that ethnic differences disappear after controlling for SES (e.g. Doi Roberts, Takeuchi, & Suzuki, 2001). Despite this, some research has demonstrated that Caucasian students have higher prevalence rates of internalizing disorders, including depressive, mood, and anxiety disorders than their African American peers (Angold et al., 2002). Minsky and colleagues (2006) reviewed data from two behavioral health service environments to determine whether ethnicity differences existed by clinical diagnosis of children and adolescents.

From their samples of over 15,000 youths in the United States, they found a main effect for ethnicity. Specifically, African American youth were given more externalizing diagnoses and fewer internalizing diagnoses than European American youth.

***Age and psychopathology.*** In last few decades, increasing work has given rise to an understanding about the developmental interplay between age and psychopathology. Before this, internalizing disorders in particular were viewed as predominately adult disorders, but developmental studies have been critical to the process of modifying that perspective (Maughan, Collishaw, & Stringaris, 2013). Still, early childhood rates of internalizing disorders such as unipolar depression and anxiety are relatively low (Egger & Angold, 2006). Unipolar depression levels tend to rise in the early teenage years (Maughan et al., 2013), whereas specific anxiety disorders follow varying patterns of change with age (Egger & Angold, 2006). Age is also relevant to the development of externalizing psychopathology, in that rates of certain disruptive behavioral disorders, including oppositional defiant disorder (ODD) and conduct disorder (CD) tend to decrease with age (Egger & Angold, 2006). Attention deficit hyperactivity disorder (ADHD) is more prevalent in younger children (APA, 2000), yet some research indicates that the pure inattentive type of the disorder is rare in preschool children (Pineda et al., 1999).

***Individual-level variables and subjective well-being.*** There is not much evidence for strong relationships between most individual-level variables (e.g. age, ethnicity, gender) and measures of SWB, including life satisfaction (Gilman & Huebner, 2003; Lent 2004). In Lent's (2004) review of the literature on well-being, he noted, "no single demographic group has a monopoly on happiness" (p.490). Lent (2004) posits that the influence of individual-level variables on SWB is likely moderated by other factors, rather than directly related to happiness. Indeed, Ash and Huebner (2001) found the following correlations between individual-level

variables and SWB: age ( $r = -.05$ ), gender ( $r = .00$ ), and grade ( $r = -.03$ ). Conversely, they demonstrated that extremely low SES was associated with lower rates of life satisfaction. Other research provides further support for the fact that once basic needs are met, extra financial resources do not predict higher levels of SWB (Gilman & Huebner, 2003).

**School-based contextual-level predictors of youth mental health.** Contextual-level predictors are aspects of the school setting and classroom environment that influence student adjustment and performance, including factors such as proactive classroom management, classroom climate, and teacher self-efficacy. For elementary students, considering the time spent in a single classroom in the presence of a teacher, the classroom context is likely to provide the most proximal influences of child adjustment and performance. A number of contextual-level variables have demonstrated links with mental health, including indicators of psychopathology and subjective well-being.

***Proactive classroom management.*** From a behavioral perspective, a child's behavior and functioning is fundamentally related to the environment in which it occurs. For this reason, it makes sense that research has demonstrated a link between student behavior and classroom organization/management practices. Specifically, disruptive behavior occurs more frequently in the absence of clearly defined and structured classroom activities (Doyle, 1986). Research has also demonstrated that disorderly environments characterized by harsh discipline are associated with greater problem behavior and conflict than more orderly and positive environments (e.g. Lewis, 2001; Miller, Ferguson, & Byrne, 2000). On the other hand, orderly environments that emphasize proactive, positive behavioral supports have been linked with improved prosocial behavior and attachment between students and teachers (e.g. Abbott et al., 1998; Jennings & Greenberg, 2009).

If proactive classroom management strategies have the potential to strengthen student-teacher relationships and increase school attachment (i.e. positive feelings about one's school), it follows that proactive classroom management is a contextual factor that could impact student mental health status and stability over time. Indeed, delinquency in adolescence has been predicted by poor school attachment and poor school commitment (Liljeberg, Eklund, Fritz, & Klinteberg, 2011). Alternatively, positive schooling experiences are among primary contextual factors correlated with youth SWB (Gilman & Huebner, 2003; Suldo, Huebner, Savage, & Thalji, 2011). Greater perceptions of teacher support, and positive relations with teachers and classmates also co-occur with elevated subjective well-being (Gilman & Huebner, 2006; Suldo et al., 2009). Taken together, these factors suggest that proactive classroom management may be a contextual-level factor that impacts student mental health.

*Classroom climate.* School climate has received considerable attention in the educational and psychological literature bases as a construct that influences student social, emotional, and academic well-being. School climate refers to the amalgamation of people's experiences of school life as reflected by perceptions of norms, values, interpersonal relationships, teaching and learning practices, and organizational structures. Ultimately, climate is about 'something in the air' in the school which creates a general feeling about the school setting (Mitchell, Bradshaw, & Leaf, 2010). School climate has been shown to predict a variety of outcomes, including student adjustment and student achievement (Haynes, Emmons, & Ben-Avie, 1997). Suldo and colleagues (2012) explored the relationship between school climate and the dual-factor model of mental health in high school students (Suldo, McMahan, Chappel, & Loker, 2012). Bivariate links emerged among six dimensions of positive perceptions of school climate and better mental health. Interestingly, teacher-student relations were particularly associated with wellness.

For elementary students who spend the majority of their time in a single classroom, classroom climate likely reflects a more proximal environmental factor on school performance and well-being. A positive classroom climate consists of high perceptions of teacher support, positive peer relationships, and positive student-teacher relationships, all of which are factors co-occur with elevated SWB (Gilman & Huebner, 2006; Suldo et al., 2009). Given the association between teacher-student relationships and SWB (e.g. Suldo et al., 2012), classroom climate variables might impact student mental health status according to a dual-factor model.

***Teacher self-efficacy.*** Another school-based contextual factor that may be linked to child mental health status is teacher competence. Socially and emotionally competent teachers help establish supportive relationships with their students, design lessons that build on student strengths and abilities, handle situations of conflict productively, and act as a role model for respectful and appropriate communication (Jennings & Greenberg, 2009). One proxy of teacher competence is self-efficacy. Self-efficacy is defined as a belief in one's own abilities to perform an action or activity necessary to achieve a goal or task (Bandura, 1997). Studies have demonstrated a link between high levels of teacher self-efficacy and increased student achievement (Cannon & Scharmann, 1996; Ross, Hogaboam-Gray, & Hannay, 2001). Teachers who believe they can implement certain practices to best support the needs of have been shown to be more effective as educators (Ashton, 1984). Teacher self-efficacy has also been shown as a protective factor from the experience of job strain, thus decreasing the risk of burnout (Schwarzer & Hallum, 2008). Ultimately, teacher stress has the potential to greatly impact student-teacher relationships, thereby impacting student mental health.

### **Longitudinal Stability and Change of Mental Health**

Research on the continuity of psychopathology from early childhood is scarce, particularly longitudinal designs with large community samples. Some research has demonstrated links between early childhood MEB problems and psychiatric problems in adulthood (Pihlakoski et al., 2006). Even fewer studies have examined the stability of SWB throughout childhood and adolescence. Finally, only two known studies have examined the stability of youths' mental health according to the dual-factor model classification system. Each of these studies measured the stability of mental health group membership in adolescence, with a population of middle school students (Kelly et al., 2012) and high school students (McMahan, 2012). Results across both studies demonstrated moderate stability of group membership over time, as 69% of middle school and 61% of high school students maintained group status. Additionally, youth in the Complete Mental Health group demonstrated the greatest stability over time across both studies. In the following section, studies of childhood psychopathology are first discussed, followed by a brief review of longitudinal studies of SWB, and ending with a summary of longitudinal studies examining both psychopathology and SWB.

**Stability of psychopathology in youth.** Early childhood behavior problems have been linked to psychiatric problems in adulthood through various prospective studies (Pihlakoski et al., 2006). Despite these links between early childhood behaviors and psychiatric problems in adulthood, research on the continuity of psychopathology from early childhood is scarce. A review of the studies that have examined both child and adolescent psychiatric disorders demonstrated that between 23% and 61% of children with a diagnosis at one time point had a diagnosis at a subsequent time point (Costello et al., 2003). However, not all of these studies distinguishes between homotypic continuity, which refers to the same diagnosis at different

assessments, and heterotypic continuity, which is continuity of disorder but a different diagnosis. Still, longitudinal community-based studies that cover both childhood and adolescent psychiatric disorders are rare (Bittner et al., 2007). Among the research that does exist, considerable stability has been demonstrated for both internalizing and externalizing behavior problems from early childhood to late childhood (Pihlakoski et al., 2006), adolescence (Bittner et al., 2007), and even adulthood (Fergusson, Horwood, & Ritter, 2005).

*Continuity through early childhood.* A number of recent studies have focused on the continuity or stability of preschool psychopathology for both externalizing and internalizing behavior disorders (Lavigne, LeBailly, Hopkins, Gouze, & Binns, 2009). Tandon, Si, and Luby (2011) examined the course of ADHD in a preschool population over a two-year period. As part of a larger community sample of preschool children aged 3.0-5.11 years, those with ADHD (N=46) were assessed at 3 annual time points in a prospective longitudinal study design. DSM-IV diagnostic criteria were met using the Preschool Age Psychiatric Assessment (PAPA, Egger, Ascher, & Angold, 1999). ADHD showed relatively high homotypic continuity, as 46.9% (n=13) of preschoolers diagnosed with ADHD at baseline maintained the diagnosis at later data collection waves. The diagnosis also showed relatively high heterotypic continuity, as 37.5% (n=12) of preschoolers diagnosed with ADHD at baseline had a different psychiatric diagnosis at follow-up waves. After controlling for key demographic variables, a diagnosis of ADHD significantly predicted later ADHD diagnosis in older children. Other significant risk factors included a baseline diagnosis of ODD, family history of disruptive behavior disorders, and stressful life events.

Using the same community sample of preschool children, Luby and colleagues examined the stability and course of preschool depression over the same 24-month period (Luby, Si,

Belden, Tandon, & Spitznagel, 2009). Again, participants were assessed at three time points, and depression was diagnosed by parent interview using the PAPA (Egger et al., 1999). Preschoolers with depression at baseline ( $n= 75$ ) had four times greater likelihood of homotypic continuity 12 and/or 24 months later, even after controlling for comorbid disorders and other demographic variables and risk factors. Both a diagnosis of major depressive disorder in early childhood and family history of affective disorders were the most robust predictors of later depression. These findings demonstrated that a two-year course of preschool depression is similar with regard to longitudinal stability and homotypic continuity of depression in school-age children.

*Continuity from early to late childhood.* Pihlakoski et al. (2006) assessed the continuity of a variety of psychopathologies from early to late childhood. Using a Finnish population-based birth cohort, children's emotional and behavioral problems were measured using the Child Behavior Checklist (CBCL; Achenbach, 1991a) at age 3 ( $N= 1,086$ ) and then again at age 12 ( $N= 908$ ). They found that externalizing problems at 3 years-old predicted both externalizing and internalizing problems in preadolescence for boys and girls. Specifically, aggressive and destructive behavior among boys at age 3 predicted later clinically significant scores on the following syndrome scales: anxious-depressive, delinquent behavior, aggressive behavior, social problems, and attention problems. Aggressive and destructive behaviors among girls at age 3 predicted thought problems, aggression, withdrawal, anxious-depressive symptoms, social problems, attention problems, and delinquency at the age of 12.

Another study focused on the longitudinal outcomes of a variety of early childhood risk factors for internalizing problems in late childhood (Ashford, Smit, van Lier, Cuijpers, & Koot, 2008). At Time 1, a random age and sex stratified sample of children (mean age = 2.6 years) and

their parents were recruited to participate from the Dutch Province of South Holland (N= 420). Parents completed the CBCL (Achenbach, 1991a) and were approached two years later for participation in a follow-up study. Ninety-five percent of parents that participated at Time 1 (N= 397) completed another CBCL and consented for data collection of the CBCL teacher report (Achenbach, 1991b) as well (mean child age = 5.3 years). Finally, parents were approached again 6 years later for a second follow-up, at which point 85% of the original sample (N= 358; mean age = 10.9 years) completed a final CBCL and consented for another CBCL teacher report. Complete data was available for 294 children, and final models of the analyses were based upon this sample, which did not differ from the complete sample with respect to sex, SES, or probability of being classified as high internalizing at Time 3. As hypothesized, child internalizing problems the age of 4–5 (as reported by their parents) predicted persistence of such problems at age 11 years. This finding supports those of Lavigne et al. (1998), who followed children aged 2 to 5 years over a 2-year period and found a considerable stability of emotional disorders and internalizing psychopathology among these children. Other significant predictors of internalizing problems at age 11 included: low SES, family psychopathology at child age 2-3 (assessed through parent interview), and parenting stress at child age 4-5 (as measured by the Parenting Stress Index; Abidin, 1983).

*Continuity from childhood to adolescence.* One longitudinal community study examined the homotypic and heterotypic continuity of a number of psychiatric disorders in children from age 9 through 16 years-old (Costello et al., 2003). Data were collected as part of the Great Smoky Mountains Study in which three cohorts of children (aged 9, 11, and 13 years at the first assessment) were recruited from 11 counties in western North Carolina. This representative population sample of children (N= 1420) were assessed annually for DSM-IV disorders, using

the Child and Adolescent Psychiatric Assessment (CAPA; Angold & Fisher, 1999; Angold et al., 1995) until age 16 years. Results showed that children with a history of psychopathology were three times more likely than those with no previous psychopathology to have a diagnosis at any subsequent wave of data collection. Homotypic continuity was significant for all disorders (generalized anxiety disorder, separation anxiety disorder, panic disorder, PTSD, any depressive disorder, ADHD, conduct disorder, oppositional defiant disorder, enuresis, encopresis, motor tics, verbal tics, psychosis, and substance use disorder) except specific phobias. The disorders showing the greatest level of continuity included panic disorders, psychosis, verbal tics, encopresis, enuresis, and substance use disorders. Heterotypic continuity was significant from depression to anxiety and vice versa, from ADHD to oppositional defiant disorder, and from anxiety and conduct disorder to substance use disorders. Separate analyses by sex showed that heterotypic continuity of disorder was significantly more common in girls.

Another longitudinal study focused explicitly on the relationship between childhood anxiety disorders and subsequent adolescent psychopathology (Bittner et al., 2007). Data were collected as part of the previously described Great Smoky Mountains Study. Diagnoses of both childhood (before age 13) and adolescent (13-19 years) psychiatric disorders were available from 906 study participants. Diagnostic assessment was performed annually using participant interview with the CAPA (Angold & Fisher, 1999; Angold et al., 1995) and each psychiatric disorder was defined as being present if a child met diagnostic criteria for that disorder at one or more observations before age 13. Adolescent psychiatric disorders were defined as present if a child met diagnostic criteria at any interview point between 13 and 19 years old. Logistic regression models indicated that childhood anxiety disorders predicted a variety of later disorders in adolescence, including both anxiety and other disorders. Specifically, childhood separation

anxiety disorder predicted adolescent separation anxiety disorder, whereas childhood overanxious disorder predicted adolescent overanxious disorder, depression, conduct disorder, and panic attacks. Generalized anxiety disorder in childhood was only related to conduct disorder in adolescence, and finally, childhood social phobia was associated with adolescent social phobia, overanxious disorder, and attention-deficit/hyperactivity disorder (ADHD). Taken together, these results demonstrated both homotypic and heterotypic continuity through adolescence for a number of specific types of childhood anxiety disorders.

*Continuity from childhood to adulthood.* One study examining the continuity of psychopathology from middle childhood to adulthood found statistically significant connections between childhood conduct problems and a wide range of adverse outcomes (Fergusson et al., 2005). Data were gathered from a longitudinal study of a birth cohort of 1,265 children from an urban region in New Zealand. Seventy-seven percent of the initial cohort was included in the study analyses (N= 973), as these participants had complete information on childhood conduct problems and adult psychosocial outcomes. Childhood conduct was measured at 7, 8, and 9 years of age for each child through parent and teacher report on the Rutter (Rutter, Tizard, & Whitmore, 1970) and Conners (1969; 1970) questionnaires. Scale scores representing the extent of disruptive, oppositional, or conduct-disordered behavior at each time point were created by summing parent and teacher ratings, then averaged over the 3-year period to provide an overall score for conduct problems in middle childhood. Regression models were fitted to estimate associations between childhood conduct problems and adult outcomes while controlling for various potentially confounding psychosocial risk factors (e.g. gender, ethnicity, SES, family conflict, parental adjustment, child abuse, childhood anxiety/withdrawal, childhood attentional problems, and child IQ). Even when controlling for these potential confounds, significant

associations were found between early conduct problems and several domains of adult functioning, including: crime, substance abuse, mental health, and sexual/partner relationships.

Other studies have found stability for both externalizing and internalizing psychopathology from childhood to adulthood. Caspi, Moffitt, Newman, and Silva (1996) found that behavioral observations of children at 3 years-old were predictive of certain adult psychiatric disorders. Specifically, children who displayed particular externalizing characteristics (e.g. impulsivity, restlessness, and distractibility) were more likely to meet diagnostic criteria for antisocial personality disorder and involvement with crime by age 21. Additionally, children who displayed various internalizing characteristics (e.g. shyness, fearfulness, emotional sensitivity) were more likely to meet diagnostic criteria for depression at age 21. Roza and colleagues (2003) found that mood disorders in adults were significantly predicted by high scores on the anxious/depressed scale and on the internalizing composite (withdrawn, somatic complaints, and anxious/depressed) on the CBCL in childhood and adolescence. They also demonstrated a link between anxiety disorders in adults and elevated CBCL scores on the social problems scale and the externalizing composite (delinquent behavior and aggressive behavior) in childhood and adolescence.

**Stability of subjective well-being in youth.** Compared to the research on psychopathology, even fewer longitudinal studies of SWB in childhood exist. One construct commonly included in the broader context of SWB is life satisfaction, defined as individuals' perceptions of the quality of their lives (Diener, Suh, Lucas, & Smith, 1999). In a review of the literature on life satisfaction in youth, Huebner (2004) indicated that longitudinal studies with children and adolescents have demonstrated moderate stability with regard to life satisfaction reports over time and yield more than just temporary affective state. Considerable research with

adults has demonstrated that life satisfaction reports comprise both state and trait components (e.g. Diener, 1994), and initial studies investigating the stability of life satisfaction in children and adolescents has yielded similar results. The Students' Life Satisfaction Scale (SLSS; Huebner, 1991) is a measure of life satisfaction developed for use with children and adolescents. Research with the SLSS has demonstrated a test-retest reliability coefficient of  $r = .74$  in a sample of 4<sup>th</sup> through 8<sup>th</sup> grade students over a period of two weeks (Huebner, 1991), and a four-week coefficient of  $r = .64$  in a sample of middle school students (Gilman & Huebner, 1997). Further, a one year test-retest reliability coefficient of  $r = .53$  was found with a sample of high school students (Huebner, Funk, & Gilman, 2000). Although this coefficient is lower than those based on shorter intervals, it still reflects moderate stability for global life satisfaction reports in adolescence.

In a study measuring life satisfaction in childhood and early adolescence, Greenspoon and Saklofske (1997) set out to assess the psychometric properties of the Multidimensional Students' Life Satisfaction Scale (MLSS; Huebner, 1994). The MLSS was administered to 314 students, grades 3-8 ( $M$  age = 11.00,  $SD = 1.70$  years), in three separate towns in suburban/rural central Canada. Results from a principal-axis factor analysis supported a five-factor structure, which included family, friends, school, self, and living environment. A subsample comprised of 21% of the original students ( $n = 85$ ;  $M$  age = 11.00,  $SD = 1.70$  years) were re-tested four weeks later. The following Pearson correlation coefficients were obtained between Time 1 and Time 2: Family ( $r = .77$ ); Friends ( $r = .59$ ); School ( $r = .78$ ); Self ( $r = .64$ ); Living Environment ( $r = .77$ ); and Total Score ( $r = .78$ ). Taken together, these results suggest moderate stability of the five factor domains and total life satisfaction score over a one-month period.

Although life satisfaction is a commonly studied indicator of SWB in late childhood and adolescence, there is not much research that measures life satisfaction in early childhood. Other indicators of SWB commonly measured in early child are based more on affect and emotions. Certainly, many theorists contend that SWB is comprised of three different, but related constructs: life satisfaction, positive affect, and negative affect (Diener, 2000). Affect refers to the moods and emotions people feel in response to events in their lives (Diener et al., 1999). Positive affect involves experiencing pleasant emotions or moods, such as joy, excitement, and pride. Conversely, negative affect involves experiencing unpleasant emotions and moods, such as sadness, loneliness, and fear. Multiple studies have examined the longitudinal stability of positive and negative affect in youth (Cole, Peeke, Dolezal, Murray, & Canzoniero, 1999; Larson, Moneta, Richards, & Wilson, 2002; Lonigan, Phillips, & Hooe, 2003). Findings from these studies indicate that both positive and negative affect ranged from moderately stable to highly stable over a periods ranging from 6 months to 4 years.

Other research has consistently found reliable relationships between the construct of emotional intelligence and well-being (Burrus et al., 2012). Defined as the ability to effectively process, use, and manage emotional information, the theoretical model emotional intelligence is comprised of four different hierarchical branches of abilities (Mayer, Roberts, & Barsade, 2008). The most rudimentary branch is simply the ability to perceive emotions, and the most complex branch is the ability to manage emotions, such that negative emotional responses to events are diminished and positive emotional responses to events are enhanced. It has been suggested that individuals with high emotional intelligence skills may be more equipped to handle the stress of everyday life, to cultivate more meaningful close relationships, and have increased social competence (Zeidner, Matthews, & Roberts, 2009). As a consequence, these individuals may

also be more likely to experience high well-being. Indeed, multiple studies have demonstrated a link between emotional intelligence and a variety of well-being indices, including life-satisfaction and positive affect (Austin, Saklofske, & Egan, 2005; Brackett & Mayer, 2003; Brackett, Mayer, & Warner, 2004; Martins, Ramalho, & Morin, 2010). In a study of 131 college students, Burrus and colleagues (2012) found that people with higher emotional intelligence experienced positive affect more frequently and negative affect less frequently than individuals with lower emotional intelligence. Additionally, they found that those with high emotion management tended to have higher levels of psychological well-being.

Various research has demonstrated the stability of emotion regulation, or emotion management skills in early childhood (e.g. Halligan et al., 2013) and late childhood/adolescence (e.g. Gullone & Taffe, 2012). One study examined the longitudinal stability of trait emotional intelligence in a sample of 773 Canadian children from ages 10 to 18 years old (Keefer, Holden, & Parker, 2013). As hypothesized, test-retest correlations on the youth version of the Emotional Quotient Inventory (EQI; Bar-on, 2004) tended to decrease at longer time intervals, and to increase with older age. These patterns are consistent with the development of personality structures (Roberts & DelVecchio, 2000) which suggest that individuals' relative standing on various traits shift gradually over time, and inter-individual differences become increasingly stable with age.

Overall, longitudinal studies with children and adolescents have demonstrated moderate stability with regard to various indicators of well-being over time, including measures of life satisfaction, positive and negative affect, and emotional intelligence. Evidence suggests that despite moderate stability there is still room for individual change over time. Further research is

needed to explore gender differences in longitudinal patterns of change and stability of well-being.

**Stability of the dual-factor model of mental health in youth.** Few studies have simultaneously examined the longitudinal stability of psychopathology and SWB, likely as a consequence of the traditional model of mental health in which mental health is defined by the absence of psychopathology. The limited studies that have included measures of wellness as well as measures of psychopathology have found moderate stability for mental health over time (Huebner et al., 2000; Marques, Pais-Ribeiro, & Lopez, 2011; Suldo & Huebner, 2004). These studies have all found correlations between externalizing and internalizing symptoms to yield similar stability as SWB indicators over time. With regard to a dual-factor model of mental health, only two known studies have explored the stability and movement of youths' mental health status as classified by group membership. Each of these studies examined group membership stability in adolescence: one with a sample of middle school students (Kelly et al., 2012) and the other with a sample of high school students (McMahan, 2012).

**Stability of the dual-factor model in middle school.** Kelly and colleagues (2012) assessed the stability of group membership with a sample of 730 7<sup>th</sup> and 8<sup>th</sup> grade students from one middle school in the Southeastern United States. SWB was measured via composite score from two measures: The Students' Life Satisfaction Scale (SLSS; Huebner, 1991) and The Positive and Negative Affect Scale for Children (PANAS-C; Laurent et al., 1999). Internalizing and externalizing symptoms of psychopathology were measured by the Self-Reported Coping Scale (SRCS; Causey & Dubow, 1992). Students were classified at two time points, 5 months apart, according to the four groups denoted as follows: Flourishing (high SWB and low psychopathology), Vulnerable (low SWB and low psychopathology), Symptomatic but Content

(high SWB and high psychopathology), and Troubled (low SWB and high psychopathology). At Time 1, 64% of students were classified as Flourishing, 8% Vulnerable, 20% Symptomatic but Content, and 8% Troubled.

Of the youth originally classified as Flourishing, at Time 2: 85% were still Flourishing, 6% became Vulnerable, 9% Symptomatic but Content, and 1% Troubled. Of the youth originally classified as Vulnerable, at Time 2: 29% were still Vulnerable, 46% became Flourishing, 14% Symptomatic but Content, and 12% Troubled. Of the youth originally classified as Symptomatic but Content, at Time 2: 42% were still Symptomatic but Content, 43% became Flourishing, 7% Vulnerable, and 7% Troubled. Finally, of the youth originally classified as Troubled, at Time 2: 47% were still Troubled, 18% became Flourishing, 23% Vulnerable, and 12% Symptomatic but Content. Overall, students originally classified in the Flourishing group (high SWB and low psychopathology) demonstrated the greatest stability, as 85% of students maintained their group status at Time 2. The group that demonstrated the least stability over time were those originally identified as Vulnerable (low SWB and low psychopathology), as only 29% remained. Interestingly, students originally identified as Vulnerable were most likely to be classified as Flourishing at Time 2, which means that well-being increased while psychopathology remained constant for these students. Further, among the students with high psychopathology (both Troubled and Symptomatic but Content), those with high SWB (Symptomatic but Content) were more likely to improve to Flourishing than those with low SWB (Troubled). This finding supports other research that suggests SWB can serve as a resiliency factor (Suldo & Huebner, 2004).

*Stability of the dual-factor model in high school.* McMahan (2012) assessed the stability of group membership with a sample of 425 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> grade students from 2 high schools

in the Southeastern United States. SWB was measured by a composite score from the SLSS and PANAS-C. Internalizing psychopathology was measured via self-report using the Behavior Assessment System for Children, 2nd Edition (BASC-2; Reynolds & Kamphaus, 2004). Externalizing psychopathology was measured via teacher-report using the BASC-2. Students were classified at two time points, 1 year apart, according to the four groups denoted as follows: Complete Mental Health (high SWB and low psychopathology), Vulnerable (low SWB and low psychopathology), Symptomatic but Content (high SWB and high psychopathology), and Troubled (low SWB and high psychopathology). At Time 1, 63.53% of students were classified as having Complete Mental Health, 11.06% Vulnerable, 11.06% Symptomatic but Content, and 14.35% Troubled.

Of the students originally classified with Complete Mental Health, at Time 2: 79.63% still had Complete Mental Health, 6.67% became Vulnerable, 10.00% Symptomatic but Content, and 3.71% Troubled. Of the students originally classified as Vulnerable, at Time 2: 29.79% remained Vulnerable, 44.68% moved to Complete Mental Health, 10.63% moved to Symptomatic but Content, and 14.98% moved to Troubled. Of the students originally classified as Symptomatic but Content, at Time 2: 17.02% remained Symptomatic but Content, 46.81% moved to Complete Mental Health, 17.02% moved to Vulnerable, and 19.15% moved to Troubled. Finally, of the students originally classified as Troubled, at Time 2: 36.07% remained Troubled, 24.59% moved to Complete Mental Health, 19.67% moved to Vulnerable, and 19.67% moved to Symptomatic but Content.

Overall, the Complete Mental Health (or Flourishing) group demonstrated greatest stability, followed by the Troubled group. These results are consistent with group membership stability found in middle school students (Kelly et al., 2012). Conversely, the least stable groups

differed with respect to each study. As mentioned previously, the least stable group classification among middle school students was Vulnerable (Kelly et al., 2012). In the study with high school students, students originally classified as Symptomatic but Content demonstrated the least stability, with only 17% remaining. Interestingly, of the students originally classified with moderate mental health, those with high SWB (Symptomatic but Content) were most likely to move to the Complete Mental Health group at Time 2. Specifically, 47% of high school students with both high SWB and high psychopathology (Symptomatic but Content) at Time 1 moved to Complete Mental Health at Time 2, while only 25% of high school students also with high psychopathology but with low levels of SWB (Troubled) had Complete Mental Health at Time 2. As in the study by Kelly and colleagues (2012), this finding supports the notion of SWB serving as a resilience factor in adolescence.

### **Limitations of the Current Research Base**

Although providing an important foundation of understanding of the longitudinal stability and dynamics of group membership according to the dual-factor model, the aforementioned studies are not without certain limitations. For instance, both studies relied on group assignment rules based on theoretical categorization criteria, which results in the inability to take advantage of the continuous nature of the data and the interaction between psychological problems and well-being. Furthermore, the current literature has examined stability from a rather simple, descriptive perspective by examining the percentage of individuals who maintain membership in a group or change membership to another group over time. In order to fill this gap, it will be important to test for the presence of specific pathways or trajectories that individuals follow according to the dual-factor model. Given that group-based theory is so relevant to the dual-factor model of mental health, it is important that methods for examining latent patterns of

longitudinal stability and change consider the underlying developmental trajectories that particular groups of children may follow over time.

Group-based trajectory modeling may provide an effective method for summarizing longitudinal patterns of mental health group membership. Group-based trajectory models estimate change over time in a repeated measures outcome, and they are designed to identify groups of individuals with similar developmental trajectories (Nagin & Odgers, 2010).

Trajectory models have been used often in sociological and medical research including studies on childhood development (e.g. Brame, Nagin, & Tremblay, 2001; Castellanos et al., 2002) and disease trajectories (e.g. Verkleij et al., 2012; Walsh et al., 2012). Ultimately, identifying clusters of children that follow similar patterns of change and stability according to dual-factor model group membership will help to inform intervention and prevention strategies for school-based service delivery. Moreover, it is important to understand the individual-level predictors that are associated with different developmental trajectory groups in order to inform the development of specific strategies for the prevention of problems and the promotion of well-being in students to ensure that children are likely to follow the optimal developmental trajectory.

### **Purpose of this Dissertation**

As stated above, 20% of children in the United States experience a mental health problem significant enough to impair functioning (Costello et al., 2003). Given that these problems are associated with a host of adverse outcomes (Fazel et al., 2014), and that most youth are receiving interventions in schools (Burns et al., 1995), substantial advocacy and federal attention has been directed toward providing students with access to SBMH services. SBMH services are often approached from a problem-based perspective, with minimal focus on the idea of developing student strengths that will serve as protective factors. Emerging research is demonstrating the

importance of integrating indicators of both wellness and illness into a dual-factor model of mental health (Greenspoon & Saklofske, 2001; Suldo & Shaffer, 2008), as the most favorable student outcomes are associated with both an absence of psychopathology and presence of happiness (Antaramian et al., 2010; Kelly et al., 2012; Suldo & Shaffer, 2008; Suldo et al., 2011).

To date, no known studies have examined the presence and utility of a dual-factor model of mental health in early elementary school students. Perhaps given the challenges inherent to longitudinal study designs, only two known studies have examined the stability and change of students' group membership according to the dual-factor model of mental health (Kelly et al., 2012; McMahan, 2012). These studies have each employed short-term longitudinal designs, with two time points spanning 5 months to 1 year. Further, the current literature has examined stability from a rather simple perspective by examining the percentage of individuals who maintain membership in a group or change membership to another group over time.

This study seeks to expand the existing literature on the stability of the dual-factor model by examining different developmental patterns or trajectories of stability and change according to the dual-factor model of mental health in early elementary students. In order to accomplish this, group-based trajectory modeling will be used to identify clusters of individuals following similar mental health trajectories over an 18-month time period. Finally, it will distinguish the groups on individual-level factors hypothesized to characterize different developmental pathways. The specific research questions that will be addressed are as follows:

Research Question #1- For early elementary students, to what extent is mental health (defined by categories yielded in the dual-factor model), stable across one school year?

Hypothesis #1 – It was hypothesized that patterns of stability and change in our sample of early elementary school students would be similar to rates seen in middle school (Kelly et al., 2012) and high school students (McMahan, 2012). Specifically, students with complete mental health (those in the Flourishing group) would demonstrate the greatest longitudinal stability, whereas students with moderate mental health (those in the Symptomatic but Content or Vulnerable groups) would be more likely to change group membership. Additionally, among students with high psychopathology at Time 1 (Troubled and Symptomatic but Content), those who also have high well-being (Symptomatic but Content) would be more likely to improve to Flourishing.

Research Question #2 – For early elementary students, what latent developmental trajectories represent children’s stability and change in mental health according to the dual-factor model of mental health?

Hypothesis #2 - Given that psychopathology and subjective well-being have demonstrated moderate stability over time, it was hypothesized that four developmental trajectories will capture the data: Persistently Flourishing, Persistently Troubled, Declining (decrease in well-being or increase in problems), and Improving (increase in well-being or decrease in problems).

Research Question #3 – To what extent do individual-level factors (i.e. gender, SES, ethnicity) predict membership in the identified developmental trajectories?

Hypothesis #3 - It was hypothesized that gender would be evenly represented across each developmental pathway, since gender differences in psychopathology typically emerge

when externalizing and internalizing behaviors are considered separately, which is not the case in this study. With regard to SES, it was hypothesized that the Persistently Troubled pathway would be characterized by students with lower SES. Similar to gender differences, ethnic differences in psychopathology have emerged when considering externalizing and internalizing disorders as distinct categories. However, given the robust relationship between SES and ethnicity, it was hypothesized that the Persistently Troubled group would be characterized by greater proportions of minority students.

### **Chapter 3: Methodology**

The purpose of the current study was to expand the extant literature on the stability and change of the dual-factor model by examining different developmental pathways or trajectories of mental health in early elementary students. This chapter describes the larger study and dataset from which this study was derived and the specific methods used to address this study's research questions. Participants, procedures, and measures are discussed before an overview of the data analytic procedures used to address the foregoing research questions delineated in Chapter 2.

#### **Participants**

Participants were part of a larger study that included students in kindergarten through second grade and enrolled in five school districts across the Puget Sound area of Washington and in one district in Mesa Arizona. School districts ranged from rural to urban settings and were recruited in the spring of 2012 after approval from the Institutional Review Boards (IRB). School districts, teachers, students, and parents of the students all consented to participate in accordance with IRB procedures. The Washington site was able to secure and maintain the participation of 41 schools across five school districts. On average, 6 randomly selected classrooms participated in data collection from each early and delayed start school. A total of 224 teachers agreed to participate and passive parental permission was obtained for 4,868 students. The Arizona site was able to secure and maintain participation from 20 schools from the Mesa School District. An average of 5 classrooms participated in data collection, with a total of 97 teachers. Passive parental permission was obtained for 2879 students. Approximately 1% of parents declined.

With regard to socioeconomic status, 50% and 78% of participating students in Washington and Arizona, respectively, received free and reduced lunch. The racial and ethnicity

breakdown of the students was as follows: 43.5% Caucasian, 11.4% Asian, 7.2% African American, 27.1% Latino, 1.2% Native American or Pacific Islander, 6.2% reported more than one race, and 17.1% were unknown. This sample of students was relatively representative of the ethnicity distribution of school-age children in the United States (US Census, 2013). Teachers' average age and years teaching experience were 43.78 ( $SD = 12.33$ ) and 15.24 ( $SD = 9.97$ ), respectively, and 88% were Caucasian, 0.6% Black or African American, 2.8% Asian, 0.9% Native Hawaiian or Pacific Islander, 0.6% American Indian or Alaska Native, 4.3% more than one race, and 2.2% other. In addition, 6% of teachers reported they were "Hispanic or Latino/a."

### **Recruitment and Retention**

All schools continued in the study from baseline (Fall of 2012) through Spring of 2013, and only two teachers had to suspend participation (health or personal reasons). Specifically, the Washington site was able to maintain the participation of 223 teachers and 4232 students from Fall 2012 to Spring 2013 data collection across the 41 participating schools, for an overall attrition rate of 13%. The Arizona site was able to maintain the participation of 96 teachers and 2326 students across 20 schools by end of Year 1, for an average attrition rate of 19%. Attrition primarily encompassed students who moved out of district or to a non-participating school.

All schools continued in the study from Year 1 to Year 2, except one school that was closed due to district budget cuts. The Washington site was able to maintain the participation of 298 teachers and 4534 students from Fall 2013 to Spring 2014 data collection, for an overall attrition rate of 9%. The Arizona site was able to maintain the participation of 150 teachers and 2365 students from Fall 2013 to Spring 2014 data collection, for an overall attrition rate of 16%. Again, attrition primarily included students who moved out of district or to a non-participating school.

## Research Design

This study represents part of a larger collaborative effort between the Committee for Children (CfC), University of Washington (UW), and Arizona State University (ASU) to evaluate the impact of two years of implementation of the newly revised and released 4<sup>th</sup> Edition of the *Second Step*<sup>®</sup> program (2012) in early elementary school classrooms. *Second Step*<sup>®</sup> is a social-emotional learning curriculum designed to teach students nonacademic skills that are important for school success, such as empathy, emotion management, problem solving, self-regulation, and executive functioning skills. A large-scale matched randomized control trial design was used in which 61 elementary schools from two sites (UW – 41 and ASU – 20) were randomly assigned within their district to either the early start (n= 31) or delayed start (n = 30) conditions. Schools were matched on free and reduced lunch and percent of non-White students. Data were collected across six waves (e.g., baseline-Fall year 1, post1-Winter year 1, post2-Spring year 1, post3-Fall year 2, post4-Winter year 2, and post5-Spring year 2) on a variety of measures assessing student outcomes (e.g., behavior ratings, direct observations, academic performance) and classroom environment.

The current study utilized a longitudinal non-experimental design to examine the stability and change of mental health groups, as well as developmental trajectories yielded from a dual-factor model of mental health. A non-experimental study is designed to collect evidence to support relationships between naturally occurring variables. In this study, there was not any random assignment to groups, or manipulation of the independent variables of interest. Instead, the present study sought to examine the naturally occurring relationships between individual-level factors (i.e. ethnicity, gender, SES) and mental health trajectory group membership. The dataset from the current study ( $N = 2,604$ ) consists of four waves of data collection; Time 1 and

Time 2 occurred within the same school year (Fall 2012 and Spring 2013, respectively) while Time 3 and Time 4 occurred within the subsequent school year (Fall 2013 and Spring 2014, respectively). In order to remove treatment effects, the present dataset includes only students assigned to delayed start schools. Among students in the delayed start condition, 2,604 had data available from four waves of data collection. Those missing survey data were determined to be missing at random, so multiple imputations of missing values were performed using the Expectation-Maximization (EM) algorithm (Dempster, Laird, & Rubin, 1977). The final dataset consisted of 2,604 students.

With regard to socioeconomic status, 49.17% of participating students in the current study received free and reduced lunch. The racial and ethnicity breakdown of the students was as follows: 38.37% Caucasian, 13.21% Asian, 7.26% African American, 30.93% Latino, 3.47% Native American or Pacific Islander, and 6.76% reported more than one race. This sample of students was relatively representative of the ethnicity distribution of school-age children in the United States (US Census, 2013). Finally, the sample was comprised of 49.10% female students.

### **Measures**

Teachers completed online surveys of student behavior. Reports from Year 1 (Time 1 and Time 2) indicated that roughly 93% of all teachers across sites completed the online surveys within the allotted time frame. Reports from Year 2 (Time 3 and Time 4) indicated that roughly 89% of all teachers across sites completed the online surveys within the allotted time frame. Teacher surveys included the following standardized, norm-referenced behavior rating scales.

**Devereux Student Strengths Assessment – Second Step® Edition (DESSA-SSE).** The DESSA-SSE (LeBuffe, Naglieri, & Shapiro, 2011) is a 36-item, standardized, norm-referenced behavior rating scale that assesses the social-emotional competencies that serve as protective

factors for children in kindergarten through the eighth grade and map onto the *Second Step*<sup>®</sup> program. The DESSA-SSE is organized into four conceptually derived scales that provide information about different social–emotional competencies: skills for learning (e.g. a child’s ability to use the skills of listening, focusing attention, self-talk, and assertiveness), empathy (e.g. a child’s ability to identify and label emotions in his/herself and others and take on others’ perspectives), emotion management (a child’s ability to cope with strong emotions and express them in socially acceptable ways), and problem-solving (a child’s ability to effectively handle personal challenges and interpersonal challenges in prosocial ways). Standard scores are used to measure each student’s competency on all four dimensions, each of which includes nine items on which the rater is asked to indicate on a five-point scale how often the student engaged in each behavior over the past four weeks. The DESSA-SSE also yields an overall Social-Emotional Composite score, which is a combination of the four scales, to provide an overall indication of the strength of a student’s social-emotional competence.

The DESSA-SSE has demonstrated excellent internal consistency across all scales according to Cronbach’s alpha (LeBuffe et al., 2011). Specifically, the internal reliability coefficients for the four social–emotional competence scales range from a low of .82 (Emotion Management—Parent Raters) to a high of .93 (Skills for Learning—Teacher Raters). All of these reliability coefficients exceed the .80 minimum suggested by Bracken (1987). Findings from test-retest reliability measures over 4 to 8 day intervals yielded significant correlations ( $p < .01$ ) across all scales, ranging from  $r = .84$  (Skills for Learning and Empathy—Parent Raters) to  $r = .94$  (Skills for Learning and Problem Solving—Teacher Raters). The correlation coefficients for the Social–Emotional Composite were  $r = .87$  for Parent Raters and  $r = .95$  for Teacher Raters. Taken together, these findings indicate that the DESSA-SSE scales have good test-retest

reliability. Finally, with regard to criterion validity, the DESSA-SSE has demonstrated an ability to differentiate between groups of students identified as seriously emotionally disturbed and their regular education peers (LeBuffe et al., 2011).

The Emotion Management scale, which measures a child's ability to cope with strong emotions and express them in socially acceptable ways, was used as a proxy for well-being in the current study. As mentioned previously, emotion management is a feature of emotional intelligence that is correlated positively with psychological well-being (e.g. Burrus et al., 2012). Further, multiple studies have demonstrated a link between emotional intelligence and a variety of well-being indices, including life-satisfaction and positive affect (Austin et al., 2005; Brackett & Mayer, 2003; Brackett et al., 2004; Martins et al., 2010). For the purposes of this study, the Emotion Management scale demonstrated acceptable internal consistency reliability ( $\alpha = .82$ ).

**Strengths and Difficulties Questionnaire (SDQ).** The SDQ (Goodman, 1997) is a brief behavioral screening questionnaire for 3-16 year olds that measures areas of problems and strengths by assessing functioning across five domains: Peer Problems, Inattention-Hyperactivity, Conduct Problems, Emotional Symptoms, and Prosocial Behavior. The questionnaire consists of 25 total questions rated on a 3-point Likert scale (0 = not true; 1 = somewhat true; 2 = certainly true). In a comparison study, mothers of children 4 through 7 years old (N = 132) completed the SDQ and Child Behavior Checklist (CBCL; Achenbach, 1991a) based on their child's behaviors throughout a four week period (Goodman & Scott, 1999). Scores from the SDQ and CBCL were highly correlated and equally able to discriminate between participants drawn from psychiatric versus dental clinics, despite the SDQ being approximately one fifth the length of the CBCL. The internal consistency of parent-completed SDQ scales were investigated in a Swedish general population sample (N = 900), with Cronbach's alpha being .76

for Total score, .75 for Inattention-Hyperactivity, .70 for Prosocial Behavior, .61 for Emotional Symptoms, .54 for Conduct Problems, and .51 for Peer Problems (Smedje, Broman, Hetta, & Von Knorring, 1999). Finally, test-retest reliability was examined in a British general population sample in which parents ( $N = 34$ ) completed SDQs on two occasions between 3 and 4 weeks apart. The intraclass correlations were .85 for Total score, .75 for Inattention-Hyperactivity, .81 for Prosocial Behavior, .70 for Emotional Symptoms, .74 for Conduct Problems, and .83 for Peer Problems (Goodman, 1999).

For the present study, the Total Difficulties score was used to represent psychopathology. The Total Difficulties score is created by summing all four problem subscales (Peer Problems, Inattention-Hyperactivity, Conduct Problems, and Emotional Symptoms). In low-risk samples, both theoretical and empirical support exist for combining the emotional and peer subscales into an ‘internalizing’ subscale and the conduct and hyperactivity subscales into an ‘externalizing’ subscale (Goodman, Lamping, & Ploubidis, 2010). For this reason, the Total Difficulties score was selected to represent both internalizing and externalizing psychopathology in this study.

### **Data Analytic Procedures**

A combination of descriptive and inferential statistics were used to answer the following research questions:

- 1) For early elementary students, to what extent is mental health (defined by categories yielded in the dual-factor model), stable across one school year?

To answer this research question, individual students were classified as either high or low psychopathology as well as high or low subjective well-being. High psychopathology was defined according to published norms for the SDQ (Goodman, 1997), with cut-points selected as whole numbers closest to the 70<sup>th</sup> percentile. Average to high well-being was defined according

to published norms for the DESSA-SSE (LeBuffe et al., 2011), with cut-points selected as whole numbers closest to the 30<sup>th</sup> percentile. Finally, a new variable representing mental health group was created based on individuals' dichotomized psychopathology and SWB scores at each time point (Time 1 and Time 2). After students were assigned to one of the four mental health groups at each time point, descriptive analyses were employed to summarize the proportion of students who remained in the same group and the sample proportions that changed groups.

- 2) For early elementary students, what latent developmental trajectories represent children's stability and change in mental health according to the dual-factor model of mental health?

To answer this research question, group-based trajectory modeling was used to classify students by patterns of trajectory-group membership over time. A developmental pathway or trajectory describes the course of an outcome over age or time. Numerous studies have examined developmental trajectories in psychology, medicine, and criminology that apply a method alternatively called group-based trajectory modeling (GBTM) by Nagin (2005, 1999) or growth mixture modeling (GMM) by Muthén (2001). For the purposes of this research, GBTM was used because the underlying assumption is that the population of interest is composed of a mixture of distinct groups defined by their developmental trajectories. With GBTM, differences in the form of the outcome variable necessitate technical differences in the statistical model used for analysis (Nagin, 1999). In keeping with the dual-factor model, a single variable that captures both psychopathology and well-being was computed. Specifically, scores from the Emotion Management scale of the DESSA-SSE were converted into z-scores and used as a proxy for well-being. Scores from the Total Difficulties Scale of the SDQ were converted into z-scores, and then reverse scored so that negative values are representative of greater psychopathology.

Finally, the two z-scores were added together to create a mental health variable whereby high positive scores indicate flourishing mental health and lower scores indicate troubled mental health.

One of the key decision points in GBTM is a determination of the number of groups or latent classes that best represents the heterogeneity in developmental trajectories. Developmental trajectories have been extensively examined in prior work (McLachlan & Peel 2004, Muthén, 2004, Nagin 2005, Nylund, Asparouhov, & Muthén, 2007). The most frequently employed criteria to evaluate model fit include the Bayesian information criteria (BIC; Raftery 1995), Akaike information criterion (AIC; Akaike 1974), and Lo-Mendell-Rubin likelihood ratio test (LMR-LRT; Lo, Mendell, & Rubin, 2001). A combination of these were used to determine the number of developmental trajectories underlying the data. Once determined, the developmental trajectories were named according their patterns of stability or change over time.

- 3) To what extent do individual-level factors (i.e. gender, SES, and ethnicity) predict membership in the identified developmental pathways?

To answer this research question, participants were assigned to trajectory groups based on posterior probabilities of group membership. Next, multinomial logistic regression analyses were used to examine which individual-level variables predict trajectory group membership. Logistic regression allows for the prediction of a discrete outcome (e.g. group membership) from a set of variables (Tabachnick & Fidell, 2006). Although related to discriminant analysis and multiple logistic regression with a dichotomous dependent variable, logistic regression is more flexible in that it makes no assumptions about the distributions of the predictor variables. For example, the predictors do not need to be normally distributed, linearly related to the outcome variable (e.g. group membership), or of equal variance within each group (Tabachnick & Fidell,

2006). Logistic regression has been used as an extension of the basic group-based trajectory model in order to identify risk and protective factors associated with membership in a given trajectory group (Nagin & Odgers, 2010).

## Chapter 4: Results

This chapter presents the results of the data analyses conducted to answer each of the research questions. First, preliminary analyses, including descriptive statistics are provided in order to summarize and describe the variables of interest. To address the first research question, patterns of stability and change according to group membership associated with the dual-factor model of mental health are calculated, portrayed, and interpreted. To address the second research question, findings from the group-based trajectory modeling are presented and interpreted. To address the third research question, results from the multinomial logistic regression analyses are presented, and the individual-level factors that significantly predict group membership according to the trajectories uncovered in the second research question are discussed.

### Preliminary Analyses

**Handling of missing data.** Missing data was determined to be missing at random (MAR), which assumes that missing values do not depend on themselves, but may depend on other variables. Multiple imputations of missing values were performed using the Expectation-Maximization (EM) algorithm with SAS PROC MI, and a priori normal distribution was assumed. With the EM algorithm, the missing value is first drawn from the distribution conditional to the observed data (*E-step*; Dempster, Laird, & Rubin, 1977). Then, the new estimate of the parameters for the distribution are generated using maximum likelihood (*M-step*). The two steps are iterative until convergence; 5 imputations were performed and the dataset derived from the 5<sup>th</sup> imputation was used for the data analyses.

**Descriptive statistics.** Descriptive statistics for the mental health variables are reported in Tables 1 and 2. Mean scores on the subjective well-being variable (i.e. the Emotion Management scale from the DESSA-SSE; Table 1) were comparable across all time points to

those found in previous studies (e.g. LeBuffe et al., 2012). Emotion management scores were lowest at Time 1 ( $M = 23.72$ ) and highest at Time 2 ( $M = 25.35$ ). As for variability, there was notable variability in participating students Emotion Management scores across all four time points (Table 1). Mean scores on the psychopathology variable (i.e. the Total Difficulties score from the SDQ; Table 2) were consistent with those found in prior research across all time points (e.g. Essau et al., 2012). Total Difficulties scores were lowest at Time 2 ( $M = 6.46$ ) and highest at Time 4 ( $M = 7.36$ ). There was also notable variability in Total Difficulties scores across all four time points (Table 2).

The entire dataset was also described according to gender, ethnicity, SES, and grade (Table 3). At Time 1, the grade-level composition was as follows: 39.17% kindergarten students, 55.18% first grade students, and 5.65% second grade students. With regard to socioeconomic status, 49.17% of participating students in the current study received free and reduced lunch. The racial and ethnicity breakdown of the students was as follows: 38.37% Caucasian/White, 13.21% Asian, 7.26% African American, 30.93% Hispanic/Latino, 0.86% Native Hawaiian or other Pacific Islander, 2.61% American Indian or Alaska Native, and 6.76% reported more than one race. This sample of students was relatively representative of the ethnicity distribution of school-age children in the United States (US Census, 2013). Finally, the sample was comprised of 49.10% female students.

### **Research Question 1**

To explore the stability and change of group membership according to the dual-factor model, students were classified into mental health groups at two different time points (Time 1 = Fall of 2012; Time 2 = Spring of 2013). Procedures to construct groups were modeled after methods used in previous studies to categorize individuals according to the dual factor model of

mental health (e.g. Suldo & Shaffer, 2008; Kelly et al., 2012). First, students were categorized according to mental health problems. High psychopathology was defined according to published norms for the SDQ (Goodman, 1997). Whole numbers closest to the 70<sup>th</sup> percentile were chosen as cut-points. Specifically, females with scores of 8 or more and males with scores of 9 or more on the Total Difficulties Scale were grouped as high psychopathology. The remaining students were classified as low psychopathology. Using these criteria, 872 of the 2604 participants (33.49%) were classified as high psychopathology at Time 1 and the remaining 66.51% of participants were classified as low psychopathology. At Time 2, 861 of the 2604 participants (33.06%) were classified as high psychopathology whereas the remaining 66.94% of participants were classified as low psychopathology.

Next, students were categorized according to their status on the well-being measure. High to average well-being was defined according to published norms for the DESSA-SSE (LeBuffe et al., 2011). The whole number closest to the 30<sup>th</sup> percentile was chosen as a cut-point, and students with scores of 20 or higher on the Emotion Management scale were grouped as moderate to high SWB. The remaining students were classified as low SWB. Using these criteria, 1963 of the 2604 participants (75.38%) were classified as average to high SWB at Time 1 and the remaining 24.62% were classified as low SWB. Using the same criteria, at Time 2, 2100 of the 2604 participants (80.65%) were classified as average to high SWB and the remaining 504 participants (19.35%) were classified as low SWB. Finally, a new variable representing mental health group was created based on a cross-tabulation between individuals' status on the psychopathology and SWB measures at each time point (i.e. Symptomatic but Content: high psychopathology, high SWB; Troubled: high psychopathology, low SWB; Vulnerable: low psychopathology, low SWB; Flourishing: low psychopathology, high SWB).

Figures 3 and 4 describe the proportion of students in each group at Time 1 and Time 2, respectively. Demographic characteristics for each of the four mental health groups are presented in Table 4.

After students were assigned to mental health groups at each time point, descriptive analyses were used to summarize the proportion of students for which group membership remained stable and the proportion of students that changed groups. Figure 5 illustrates the different possible combinations of stability and mobility, including the proportion of students that constructed each subgroup. Out of the entire sample, 70.51% of students ( $n = 1,836$ ) remained in the same mental health group across time points. Three-hundred and forty-nine (13.40%) students showed changes in their psychopathology status only, 297 (11.41%) students showed changes in their SWB status only, and 122 (4.69%) showed changes in both psychopathology and SWB. Of the total sample, 278 students (10.68%) moved to a higher SWB group (e.g. Vulnerable to Flourishing or Troubled to Symptomatic but Content), while 141 (5.41%) moved to a lower SWB group (e.g. Flourishing to Vulnerable or Symptomatic but Content to Troubled). Furthermore, 230 students (8.83%) moved to a higher psychopathology group (e.g. Flourishing to Symptomatic but Content or Vulnerable to Troubled), while 241 (9.25%) moved to a lower psychopathology group (e.g. Symptomatic but Content to Flourishing, or Troubled to Vulnerable).

Students in the Flourishing group showed the greatest stability over time. Specifically, 85.90% ( $n = 1,328$ ) of the 1,546 students in the Flourishing group at Time 1 maintained membership status at Time 2. Only 36 students (2.33%) originally in the Flourishing group moved to the Troubled group (i.e. experienced a decrease in SWB and an increase in psychopathology). Thirty-three students (2.13%) originally classified as Flourishing moved to

Vulnerable (i.e. experienced a decrease in SWB but no change in psychopathology), and 149 (9.64%) moved to the Symptomatic but Content group (i.e. experienced an increase in psychopathology and no change in SWB). In sum, the Flourishing group as a whole remained largely stable across time points. If individuals in the Flourishing group changed over time, it was most often exhibiting increased psychopathology and moving to the Symptomatic but Content group.

Although less stable than the Flourishing group, the majority of students in the Troubled group also maintained group membership status across time points. Specifically, 61.10% ( $n = 278$ ) of the 455 students in the Troubled group at Time 1 remained at Time 2. Sixty-one (13.41%) moved from Troubled to Flourishing (i.e. experienced an increase in SWB and a decrease in psychopathology). One hundred and one students (22.20%) moved from Troubled to Symptomatic but Content (i.e. experienced an increase in SWB but no change in psychopathology), whereas 15 students (3.30%) moved from Troubled to Vulnerable (i.e. experienced a decrease in psychopathology and no change in SWB). Overall, students in the Troubled group remained largely stable over time. If individuals changed across time points, it was most often exhibiting an increase in SWB and moving to the Symptomatic but Content group.

Findings indicated that there was less stability in group membership for those students initially classified as Symptomatic but Content. Only 185 (44.36%) of the 417 students in the Symptomatic but Content group at Time 1 remained at Time 2. Over one-third (38.37%;  $n = 160$ ) of students in the Symptomatic but Content group at Time 1 moved to the Flourishing group at Time 2 (i.e. experienced a decrease in psychopathology). Sixty-seven students (16.07%) moved from the Symptomatic but Content group to the Troubled group (i.e. experienced a decrease in

SWB) and only 5 students (1.20%) moved from Symptomatic but Content to Vulnerable (i.e. experienced a decrease in both SWB and psychopathology). In sum, less than half of the individuals initially in the Symptomatic but Content group remained at Time 2. Overall, the majority of individuals who changed membership experienced a decrease in psychopathology across time points, thus moving to the Flourishing group.

Finally, the least stable group over time were those students originally classified as Vulnerable. Only 45 (24.19%) of the 186 students initially classified as Vulnerable maintained group membership status at Time 2. Over half (51.61%,  $n = 96$ ) of the students in the Vulnerable group at Time 1 moved to the Flourishing group at Time 2 (i.e. experienced an increase in SWB). Twenty-five students (13.44%) moved from Vulnerable to Troubled (i.e. experienced an increase in psychopathology), while 20 students (10.75%) moved from Vulnerable to Symptomatic but Content (i.e. experienced an increase in both SWB and psychopathology). Overall, less than a quarter of students initially classified as Vulnerable maintained group membership status over time. The majority of individuals who changed groups exhibited increased SWB, thus moving to the Flourishing group.

### **Research Question 2**

Group-based trajectory modeling (GBTM; Nagin, 2005) was used to answer the second research question and identify subgroups of individuals who followed similar patterns of mental health status over time. In keeping with the dual-factor model and meeting the requirements of GBTM, a single variable was created to capture both psychopathology and well-being. Specifically, scores from the Emotion Management scale of the DESSA-SSE were converted into z-scores and used as a proxy for well-being. Scores from the Total Difficulties Scale of the SDQ were also converted into z-scores, and then reverse scored so that negative values were

representative of greater psychopathology. Finally, the two z-scores were summed to create a mental health variable whereby high positive scores indicated flourishing mental health and lower scores indicated troubled mental health. One advantage of GBTM is the way it integrates the continuous nature of the data and the interaction between psychological problems and well-being, yet one of the limitations the difficulty differentiating the moderate or middle mental health groups (i.e. Vulnerable and Symptomatic but Content). This makes it hard to distinguish whether changes in mental health were due to changes in psychopathology versus well-being. Nonetheless, the single continuous dependent variable still served to account for participants' status across psychopathology and SWB.

Because analyses were based on psychometric scale data the censored normal distribution was used to account for clustering at the scale minimum and maximum. Posterior probabilities, which estimated the likelihood of an individual's being a member in each of the groups, were calculated. Individuals were subsequently assigned to their most likely trajectory group on the basis of posterior probabilities. Data were tested for different numbers of latent classes, and the fit of different models was compared with the Bayesian information criterion (BIC; Raftery, 1995) and the Akaike information criterion (AIC; Akaike, 1974). Models with up to seven latent classes were considered, and the best trajectory solution was determined by three criteria: the BIC values across all models, a model in which the posterior probability of group membership for each trajectory was above .80, and a conceptually clear model. First, a visual inspection of the data according to BIC and AIC values was performed. The scree plot indicated that a model with at least three trajectory groups was likely to provide the best fit (Figure 6).

Next, the BIC values were examined across all models. When prior information on the correct model is limited, selection of the model with the maximum BIC is recommended (Nagin,

2005; Raftery, 1995). BIC and AIC values continued to increase as the number of groups increased, but the degree of increase began to taper off after the 5-group model (see Table 5). Since BIC and AIC scores continued to increase with the addition of parameters to the model, posterior probabilities were examined to guide model selection. Posterior probabilities are an index of how well individuals are matched to their assigned groups. Ideally, each individual in a group should have a high probability of belonging to the group in which assigned and a low probability of belonging to other groups. Average posterior probabilities provide an assessment of how individuals have been matched to their prospective groups, and values above .80 indicate that individuals are well matched to groups and that an adequate group solution has been identified (Nagin, 2005). Results from this analysis (see Table 6) indicated that within the six-group model, mean posterior probabilities drop below .80 for two groups, which points to selection of a four- or five-group model.

Thus, final model selection was done on the basis of conceptual clarity between the four and five-group solution. When comparing the four-group (Figure 7) and five-group (Figure 8) mental health trajectory solutions, it is evident that the additional subgroup in the five-group model adds to the understanding of different group patterns. Both models include a persistently high group, a persistently low group, a group that starts low and improves over time, and a group that starts moderate and declines over time. The five-group solution also includes a trajectory group that is distinctly different in shape and level, showing a persistently moderate pattern of mental health over time. Furthermore, each group in the five-group solution includes over 5% of the sample. Taken together, the five-group solution was selected based on the BIC values, posterior probabilities, and conceptual clarity.

Figure 9 shows the final five-group dual-factor mental health trajectory solution. Group 1 (the Persistently Troubled trajectory) consisted of 6.61% of the sample. Individuals in this trajectory were associated with low mental health scores, indicating high psychopathology and low SWB across all time points. Group 2 (the Improving trajectory) consisted of 10.56% of the sample. Individuals in this group started with relatively low mental health scores that increased over time, either due to an increase in SWB or decrease in psychopathology. Individuals in Group 3 (the Declining trajectory; 9.37% of the sample) began with moderately low mental health scores that decreased over time, either due to a decrease in SWB or an increase in psychopathology. Those in Group 4 (the Persistently Moderate trajectory; 39.02% of the sample) demonstrated considerably stable moderate mental health scores over time. Finally, members of Group 5 (the Persistently Flourishing trajectory; 34.45% of the sample) had high mental health scores across all time points, indicating low psychopathology and high SWB. Overall, results indicated that individuals are likely to follow distinct trajectories over time with regard to their status on psychopathology and SWB. The majority of individuals are likely to fall into the Persistently Flourishing trajectory, or the Persistently Moderate trajectory; whereas not many individuals are likely to follow the Persistently Troubled trajectory.

### **Research Question 3**

A multinomial logistic regression analysis was performed using SAS LOGISTIC to assess prediction of membership in one of the five mental health trajectory groups (Persistently Troubled, Improving, Declining, Persistently Moderate, Persistently Flourishing) on the basis of three individual-level predictors, including gender (male or female), ethnicity (Caucasian or Non-Caucasian), and SES (low or average/high; as measured by free or reduced lunch status). Of the larger sample of student participants ( $N = 2,604$ ), 40 were missing gender data, 386 were

missing ethnicity data, and 1217 were missing SES data. Any student with missing data was removed from the dataset in order to perform the logistic regression analysis, resulting in a subsample of 1144 students.

A test of the full model with all three predictors against a constant-only model was statistically significant,  $\chi^2(4, N = 1144) = 134.79, p < .01$ , indicating that as a set, the predictors significantly distinguished between mental health trajectory groups. According to the Wald criterion, ethnicity,  $\chi^2(4, N = 1144) = 15.60, p < .01$ ; gender,  $\chi^2(4, N = 1144) = 83.43, p < .01$ ; and SES,  $\chi^2(4, N = 1144) = 23.59, p < .01$ , all significantly predicted trajectory group membership when holding constant the variance accounted for by the other variables. While there was no significant difference between the Persistently Troubled and Improving groups on the basis of ethnicity or SES, the odds of being female were significantly higher for students in the Improving group ( $OR = 2.30, p < .05, 95\% CI [1.17, 4.52]$ ). Conversely, there were no significant differences between the Persistently Troubled and Declining groups on the basis of ethnicity, gender, or SES. When comparing the Persistently Troubled and Persistently Moderate groups, significant differences emerged on the basis of gender and SES. Specifically, the odds of being female were significantly greater for students in the Persistently Moderate group ( $OR = 2.44, p < .01, 95\% CI [1.35, 4.42]$ ), and the odds of having low SES were significantly lower for students in the Persistently Moderate group as compared with the Persistently Troubled group ( $OR = .42, p < .01, 95\% CI [.24, .74]$ ). Similarly, there were significant differences between the Persistently Troubled and Persistently Flourishing groups on the basis of gender and SES. The odds of being female were significantly greater for students in the Persistently Flourishing group ( $OR = 6.64, p < .05, 95\% CI [3.64, 12.11]$ ), and the odds of having low SES were significantly

lower for students in the Persistently Flourishing group as compared with the Persistently Troubled group ( $OR = .31, p < .01, 95\% CI [.17, .55]$ ).

While the global model statistic indicated that ethnicity was associated with trajectory group membership, none of the individual likelihood ratio tests indicated a significant odds ratio, but one group comparison did approach statistical significance. Specifically, the odds of being a non-Caucasian student in the Persistently Flourishing group were lower as compared with the Persistently Troubled Group ( $OR = .53, p = .089, 95\% CI [.26, 1.01]$ ), indicating that Caucasian were slightly more likely to be represented in the Persistently Flourishing group than non-Caucasians. Overall, the results of the multinomial logistic regression indicated that individual-level demographic variables significantly relate to membership in different trajectories. In sum, it appears that being female and not receiving free and reduced lunch were associated with increased odds of being in one of the more favorable trajectories (Persistently Flourishing, Improving, or Persistently Moderate). On the other hand, being male and receiving free and reduced lunch were associated with increased odds of being in one of the less favorable trajectories (Persistently Troubled or Declining).

## **Chapter 5: Discussion**

The dual-factor model has been advanced as a modern conceptualization of mental health that captures the distinct yet inter-connected constructs of psychopathology and subjective well-being. However, no research to date has examined the dual-factor model in the context of young children and few studies have investigated the stability of child mental health according to the dual-factor model. As a result, the purpose of this study was to examine developmental patterns or trajectories of stability and change according to the dual-factor model of mental health in early elementary-aged children. Specifically, this study employed traditional descriptive approaches to constructing mental health groups to assess stability and change of group membership over time, as well as advanced statistical procedures in the form of group-based trajectory modeling to identify clusters of students following similar mental health trajectories over 18 months. The following discussion seeks to first expand on the present study's findings and integrate them within the context of the relevant literature. Next, the study's contributions to the literature and implications of the findings for school psychological practice are delineated. Finally, the study's limitations are discussed along with recommendations for future research.

### **Stability of Mental Health Group Status According to a Dual-Factor Model**

To explore the stability of mental health status according to the four categories yielded by the dual-factor model (see Figure 1), students were assigned to one of the four groups at two different time points. This approach was taken in part because the process is consistent with previously published research (e.g. Kelly et al., 2012; McMahan, 2012), thus maintaining consistency with established procedures and providing a basis for comparison across studies. Although one of the advantages to the group-based trajectory modeling approach is the way it integrates the continuous nature of the data and the interaction between psychological problems

and well-being, a resulting downfall is the difficulty attributing patterns of change to specific changes in either psychopathology or well-being. Indeed, the commonly used categorical approach was taken in order to take an initial descriptive look at the patterns of stability and change within the data.

As previously discussed, the dual-factor model of mental health lends itself to four groups that emerge when using dichotomized levels of psychopathology (low to average versus high) in combination with dichotomized levels of SWB (low versus average to high). Two of the groups are consistent with the traditional, bipolar model of mental health (see Figure 2): Flourishing (low psychopathology and average to high SWB) and Troubled (high psychopathology and low SWB). The two additional groups (Vulnerable: low psychopathology and low SWB; Symptomatic but Content: high psychopathology and high SWB) are those that are traditionally overlooked. The stability of this dual-factor categorical group membership has been examined in two known studies, one with a sample of middle school students (Kelly et al., 2012) and one with a sample of high school students (McMahan, 2012). When comparing these findings with those of the current study, several similarities emerge. First, the majority of participants in all three studies remained in the same mental health group over time. Specifically, 71% of elementary school students (current study), 69% of middle school students (Kelly et al., 2012), and 61% of high school students (McMahan, 2012) maintained group membership status across two time points (separated by 7 months, 5 months, and 1 year, respectively). In both the current and previous studies, the Flourishing (or Complete Mental Health) groups demonstrated the greatest stability, followed by the Troubled groups. This means that across all three studies, the two groups traditionally overlooked by a bipolar model of mental health (i.e. Symptomatic

but Content and Vulnerable) were less stable overall than the two traditional mental health classifications (i.e. Flourishing or Troubled).

The current study found that the Symptomatic but Content group was moderately stable, as almost half (44%) of students maintained group status. This profile is consistent with findings from Kelly and colleagues (2012) that show 42% of middle school students remained in the Symptomatic but Content group over time. This differs from the findings with high school students, which show considerably less stability within the Symptomatic but Content group (17%; McMahan, 2012). Also similar to findings with middle school students, the current study found that the Vulnerable group demonstrated the least stability. It is noteworthy to mention that students across all three studies indicated a trend towards Flourishing mental health from both of the moderate or middle mental health groups over time. In other words, students that were initially classified as Vulnerable or Symptomatic but Content were more likely to move to Flourishing or remain the same than to experience a worsening in psychopathology or SWB.

Furthermore, students originally in the Troubled group were more likely to maintain group status than move to any other group, which is consistent with the findings from the other two stability studies. This consistent finding highlights the chronic nature of mental health problems in conjunction with low SWB. Findings from all three studies indicate that among all students with high psychopathology (i.e. Troubled and Symptomatic but Content), those with low SWB were less likely to improve compared to those with average to high SWB. Specifically, 38% of elementary school students initially classified Symptomatic but Content moved to Flourishing at Time 2, while only 13% of those with similarly high psychopathology but low SWB at Time 1 (i.e. Troubled) moved to Flourishing mental health at Time 2. This finding is also consistent with previous research that has demonstrated that SWB can serve as a buffer

against psychopathological behavior (Frederickson, 2013; Suldo & Huebner, 2004). Taken together, these findings suggest that SWB might be used as a marker of a better prognosis among clinically symptomatic children and adolescents.

### **Developmental Trajectories of Mental Health According to a Dual-Factor Model**

To date, no known studies have tested for the presence of specific pathways or developmental trajectories that individuals follow over time with regard to a dual-factor model of mental health. The current study used group-based trajectory modeling in order to summarize longitudinal patterns of mental health according to a dual-factor model and ultimately, five trajectories of mental health were identified in this sample of early elementary school students: 1) individuals with low mental health scores across all four time points (Persistently Troubled); 2) individuals who started out with low mental health scores that increased over time (Improving); 3) individuals who began with moderately low mental health scores that decreased over time (Declining); 4) individuals with moderate mental health scores across all four time points (Persistently Moderate); 5) individuals with high stable mental health scores over time (Persistently Flourishing).

Interestingly, the final five-group solution included the four that were originally hypothesized (Persistently Flourishing, Persistently Troubled, Improving, and Declining) with an additional group that emerged: the Persistently Moderate trajectory. Students on the Persistently Moderate trajectory (39.02% of the current sample) are likely represented by those students who are in the two moderate mental health groups as defined by the traditional dual-factor model of mental health (i.e. Vulnerable and Symptomatic but Content). Indeed, students with low psychopathology and low SWB (i.e. Vulnerable) and those with high psychopathology and high SWB (i.e. Symptomatic but Content) would both have moderate mental health scores according

to the continuous dual-factor variable of mental health used for the group-based trajectory model, so it makes sense that this Persistently Moderate trajectory would emerge to represent those students in subgroups 3 and 4 (see Figure 5).

Results from group-based trajectory modeling indicated that the Persistently Moderate and Persistently Flourishing groups comprised the majority of the sample (39.02% and 34.45%, respectively). This is important because it captures the fact that the majority of students (73.47%) are indeed relatively mentally healthy when considering both psychopathology and well-being. Additionally, the majority of students (80.08%) belonged to one of the Persistent trajectories, which speaks to the stability of both psychopathology and SWB. It appears that both dual-factor dimensions remain relatively consistent over time, especially when no purposeful intervention is implemented. Despite the fact that the majority of students were captured by the Persistently Moderate and Persistently Flourishing groups, it is noteworthy that three of the trajectory groups that emerged represent low mental health scores for over one quarter of the sample (26.54% of students). This is particularly concerning given that these low scores are likely reflective of a combination of both high psychopathology and low SWB. The most concerning trajectory captured young children falling within the Persistently Troubled category. These children demonstrated some combination of low SWB and high psychopathology, indicating mental health needs on two fronts. Overall, these findings highlight the relative stability of a dual-factor model of mental health in early childhood and further support the integration of both psychopathology and SWB to provide a more comprehensive view of student functioning.

### **Individual-Level Predictors of Mental Health Trajectory Groups**

Findings from the multinomial logistic regression analysis indicated that ethnicity, gender, and SES significantly predicted membership in the developmental trajectories described

above. Specifically, females were more likely than males to be categorized in the Improving, Persistently Moderate, and Persistently Flourishing trajectory groups. Looking at the gender composition by trajectory groups (Table 6), it is clear that males are over-represented in the Persistently Troubled trajectory (72.02%), and the Declining Trajectory (64.02%) as compared with the entire sample (50.90%; Table 3). Conversely, females are over-represented in the Persistently Flourishing trajectory (63.28%) as compared with the entire sample (49.10%). As a whole, these findings related to gender indicate that female students exhibited higher mental health scores according to the dual-factor variable, which is characteristic of lower psychopathology and higher SWB. Given that emotion management was used as a proxy for SWB in this study, this finding is consistent with previous research that has shown girls of this age to have higher emotional competence (Rose & Rudolph, 2006). Moreover, previous research has demonstrated that girls are more likely to exhibit internalizing psychopathology whereas boys are more likely to exhibit externalizing behaviors in early childhood (Angold et al., 2002; Broidy, Cauffman, Espelage, Mazerolle, & Piquero, 2003; Keiley et al., 2003). Since both types of psychopathology were measured by teacher report, it makes sense that boys might have higher psychopathology scores, as externalizing behaviors (e.g. aggression, peer conflict) are much more readily observed than internalizing behaviors (e.g. somatization, withdrawal). Indeed, other research has found that children are much more accurate reporters of their own internal states than either their parents or teachers (Stanger & Lewis, 1993); however, this may not be true for young children such as those included in the sample from this study.

The findings for SES indicated that students who received free or reduced price lunch were less likely to be categorized in the Persistently Moderate or Persistently Flourishing trajectory groups as compared with the Persistently Troubled trajectory. Looking at the SES

composition by trajectory groups (Table 6), it is clear that students with lower SES are over-represented in the Persistently Troubled trajectory (77.78%) and the Improving trajectory (61.31%) in relation to the entire sample (49.17%; Table 3). Altogether, these findings are consistent with the hypothesis that students who qualified for free or reduced lunch would be more likely to comprise the less favorable trajectory groups. Although it could be argued that the Improving group is more favorable than the Declining group, low mental health scores are characteristic of both groups. These low mental health scores are likely a combination of low SWB and high psychopathology, and other research has demonstrated a link between low SES and elevated psychopathology levels (Fryers et al., 2003; van Oort et al., 2011; Wadsworth & Achenbach, 2005).

Finally, ethnicity was also a significant predictor of trajectory group membership while holding SES and gender constant. Although individual group comparisons did not yield any statistically significant findings, there was a trend towards significance when comparing the Persistently Flourishing and Persistently Troubled groups in that non-Caucasian students appeared less likely to be in the Persistently Flourishing group. When examining the composition of ethnicities by trajectory group (Table 6), it appears that African American students in particular are over-represented in the Persistently Troubled (15.11%) and Declining (12.98%) trajectories as compared with the entire sample (7.26%; Table 3). Given previous research that has linked increased externalizing behaviors with African American youth compared to their European American peers (e.g. Angold et al., 2002; Minsky et al., 2006), these ethnicity differences might be explained by measurement since the current study relied on teacher reports for internalizing psychopathology. On the other hand, it appears that Asian students in particular are over-represented in the Persistently Flourishing trajectory group compared to the other

groups (see Table 6). The current study collapsed the ethnicity variable into a dichotomous variable (Caucasian/non-Caucasian), but the large percentage of Hispanic participants (30.93%) might have also impacted the individual likelihood ratio tests. Further research is necessary in order to better understand how student ethnicity is related to mental health trajectory.

Overall, the results of the multinomial logistic regression indicated that individual-level demographic variables significantly relate to membership in different trajectories. In sum, it appears that being male and receiving free and reduced lunch were associated with increased odds of being in one the less favorable trajectories (Persistently Troubled or Declining), whereas being female and not receiving free and reduced lunch were associated with increased odds of being in one of the more favorable trajectories (Persistently Flourishing, Improving, or Persistently Moderate).

### **Implications for School Psychological Practice**

Given that 20% of children in the United States experience mental health problems significant enough to impair their functioning (Costello et al., 2003; Duchnowski et al., 2002; U.S. Department of Health & Human Services, 1999), and the majority of those students receiving services are being treated in schools (Burns et al., 1995), considerable advocacy and federal attention has been directed toward providing students with access to school-based mental health (SBMH) services (NIMH, 2001; USPHS, 2000). With the emerging research examining both positive and negative indicators of mental health suggesting that high psychopathology is not synonymous with low subjective well-being and vice versa (Greenspoon & Saklofske, 2001), experts in the field have proposed the integration of indicators of psychopathology and indicators of SWB into a dual-factor model of mental health. Indeed, studies have indicated that optimal

functioning in youth is related to both low levels of psychopathology and the presence of SWB (Suldo & Shaffer, 2008).

In order to better conceptualize how a dual-factor approach might impact SBMH service delivery, it is also important to understand the stability and change of both psychopathology and SWB in youth. Before the present study, only two known studies (Kelly et al., 2012; McMahan; 2012) have examined the stability and change of students' group membership according to the dual-factor model of mental health, using a rather simple perspective that examined the percentage of individuals who maintained membership in a group or changed membership to another group over time. The current study found support for five distinct developmental trajectories that children follow over time with regard to a dual-factor model of mental health. Understanding the individual-level factors that contribute to these pathways underlying children's development might serve to inform decisions about specific preventative and promotional supports for students. For instance, knowing that being male and having low SES places a student at higher likelihood for following a less favorable mental health trajectory, might influence school psychologists' decision-making for these students who are particularly at-risk for poor outcomes.

By extending this dual-factor model of mental health to a sample of early elementary school students, the present study highlights the need for practitioners to approach SBMH services from a framework of mental health that integrates indicators of wellness and illness, even in early childhood. Currently, much of the way SBMH services are approached is based on intervention and treatment of emerging MEB problems, and little attention is given to the idea of developing strengths that will serve as protective factors for all students. It is important that a more comprehensive view of mental health is considered in schools so that service delivery

includes a focus on building social-emotional competencies that promote optimal levels of well-being across entire student populations. In fact, the dual-factor model can help school psychologists and other SBMH service providers better understand students' mental health needs and inform specific programming for those students who are struggling. Thus, the dual factor model can serve as a conceptual framework to inform both assessment and intervention practices for students within a multi-tiered system of supports (MTSS).

Within an MTSS, school-wide programs that universally target mental health promotion through competence development have the potential to positively influence the functioning of all students, regardless of pathology or mental health status. Certainly, programs that are designed for prevention commonly target skills that enhance emotional, social, and psychological well-being. In keeping with the dual-factor model, universal Tier 1 supports should be implemented to help all students cultivate positive functioning and ameliorate distress. These school-wide interventions would include the delivery of evidence-based classroom curricula designed to diminish problem behaviors (e.g. aggression, anti-social behaviors, disruptive behaviors, conduct problems, negative affect) and improve skills to foster positive functioning (e.g. pro-social behaviors, effective conflict resolution, basic skills for learning) and well-being (e.g. life satisfaction, school connectedness, optimism, positive affect, emotion regulation). Given the relationship between well-being and school environmental factors (Suldo, Riley, & Shaffer, 2008), Tier 1 supports should also include use of evidence-based classroom management strategies to promote student-teacher relationships and a sense of belonging.

Another fundamental component of the MTSS framework is the use of universal screeners to determine the types of supports needed across a school population and to identify students who are not responding to Tier 1 interventions. The integration of brief, reliable

measures of positive mental health indicators (e.g. SWB) to school-wide screening efforts would be an effective way to identify students at-risk for low levels of well-being and further guide promotion efforts. Measures for different areas of functioning could help to determine needs among students in order to develop small groups for targeted Tier 2 interventions to promote well-being. By identifying groups of Vulnerable students (low SWB, low psychopathology), screening data could help to inform intervention selection by identifying specific skills to target. For instance, students with low levels of life satisfaction might receive an intervention designed to help them accumulate positives, build mastery towards goals, and engage in some cognitive restructuring for negative thought patterns. Moreover, screening might help to identify groups of students who are at risk for a Persistently Troubled trajectory (low SWB, high psychopathology). Early detection and intervention with these students with the highest needs could require more intensive (i.e. Tier 3) supports given the chronic nature of mental health problems in conjunction with low SWB. Consistent with the dual-factor model, specific programming would need to include strategies to diminish the problems and distress for these students as well as promote their well-being. Overall, integrating measures of well-being with traditional problem-based screeners could serve as a complementary strategy to enhance service delivery based on a dual-factor approach to mental health that includes the promotion of well-being as well as the prevention of emotional and behavioral problems.

The dual-factor model of mental health also has the potential to help inform policy and funding for SBMH services. Currently, the Individuals with Disabilities Education Improvement Act provides much of the impetus for student mental health to the education system (US Department of Education, IDEA, 2004), insomuch as mental health problems impede a child's educational progress and success. However, recent research has demonstrated significant

differences in academic functioning among children without mental health problems (i.e. low psychopathology or distress). For instance, Suldo and Shaffer (2008) found that students with Complete Mental Health had better reading skills, school attendance, academic self-perceptions, and academic related goals, when compared to their Vulnerable peers with low psychopathology and low well-being. Other studies have demonstrated similar findings (e.g. Antaramian et al., 2012; Suldo et al., 2011), and ideally this research can serve to inform a shift in policy as the field continues to acknowledge a dual-factor model of mental health. Specifically, more comprehensive policy would extend beyond the prevention and treatment of MEB problems to consider positive indicators of educational success such as student well-being. Ultimately, it will be important for evidence-informed policy to call for the integration of practices that promote well-being in order to equip students with the necessary skills to minimize psychological distress and maximize their well-being.

### **Limitations and Future Directions**

Despite its contributions to the literature, the current study is not without certain noteworthy limitations. For instance, when considering the results of the current study, it is important to take into account the problem of missing data. While missing data is common among such large-scale research projects, it is important to note that imputation procedures are not perfect and introduce a certain amount of bias into statistical tests. Additionally, the participating sample only included early elementary students from Washington and Arizona, so it would be inaccurate to assume that these findings apply to populations outside of this developmental level or geographic area. Further replication of results is needed before findings can be generalized to other age groups and locations.

A number of limitations pertain to both study measures and design. First, the psychopathology measure was based exclusively on teacher-report. While teachers are typically accurate reporters of child externalizing behaviors, future research might benefit from gathering internalizing behavior reports directly from students, as it is difficult to observe behaviors related to others' internal states. Additionally, this study relied on emotion management/competence as a proxy for early childhood well-being. While these constructs have been empirically linked (e.g. Burrus et al., 2012), it will be important for future research to develop better tools to measure subjective well-being in young children. Furthermore, in order to conduct the group-based trajectory analysis, it was necessary to create a single, continuous mental health variable that represented both psychopathology and subjective well-being. As a result, the middle trajectories are indistinguishable on these two constructs. Another limitation of the study design was the relatively short time frame of 18-months across data collection waves. Further research with the use of large longitudinal data sets would help to further the understanding of these developmental trajectories over longer periods of time. Finally, the present study relied on a limited number of individual-level variables to understand which factors predict trajectory group membership. Future research is necessary to better understand the more complicated contextual factors that are influencing these mental health trajectories in order to ultimately inform optimal development through school-based service delivery.

## **Conclusion**

In summary, results from the current study provide additional empirical support for the dual-factor model of mental health by extending its application to early childhood. Findings suggest that clusters of children tend to follow five different developmental trajectories when measured according to both illness and wellness, and these distinct pathways vary with regard to

patterns of stability and change. The majority of students belonged to stable trajectories of either moderate or complete mental health, however, three less favorable trajectories characterized by a combination of high psychopathology and low well-being emerged. Hopefully this work will serve as a starting point to stimulate additional research to further the validity and utility of the dual-factor model of mental health as it relates to early childhood development.

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Table 1

*DESSA-SSE Descriptives*

DESSA-SSE Scale	Emotion Management			
	<i>M</i>	( <i>SD</i> )	Min	Max
Time 1	23.72	(6.48)	0.00	41.00
Time 2	25.35	(6.63)	0.00	43.00
Time 3	24.66	(6.33)	5.00	41.00
Time 4	25.25	(6.61)	1.00	46.00

*Note.* (N = 2603). DESSA-SSE = Devereux Student Strengths Assessment – Second Step® Edition.

Table 2.

*SDQ Descriptives*

SDQ Scale	Total Difficulties Score			
	<i>M</i>	( <i>SD</i> )	Min	Max
Time 1	6.47	(6.08)	0.00	34.00
Time 2	6.46	(6.15)	0.00	34.00
Time 3	6.91	(6.39)	0.00	37.00
Time 4	7.36	(6.59)	0.00	33.00

*Note.* (N = 2603). SDQ = Strengths and Difficulties Questionnaire.

Table 3

*Demographic Characteristics of Participating Students*

<b>Demographic Variable</b>	<b>%</b>
Gender <sup>a</sup>	
Male	50.90
Female	49.10
Ethnicity <sup>b</sup>	
Asian	13.21
Native Hawaiian or other Asian/Pacific Islander	0.86
Black or African American	7.26
American Indian or Alaska Native	2.61
Caucasian/White	38.37
Multi-racial	6.76
Hispanic	30.93
Socioeconomic Status <sup>c</sup>	
Low	49.17
Average or High	50.83
Grade	
Kindergarten	39.17
First Grade	55.18
Second Grade	5.65

*Note.*  $N = 2,604$ ; a = 40 students were missing gender data; b = 386 students were missing ethnicity data; c = 1217 students were missing SES data.

Table 4

*Demographic Characteristics of Participants in Mental Health Groups*

Demographic Variable	Time 1 Mental Health Group				Time 2 Mental Health Group			
	Troubled ( <i>n</i> = 455) %	Vulnerable ( <i>n</i> = 186) %	Symptomatic		Troubled ( <i>n</i> = 406) %	Vulnerable ( <i>n</i> = 98) %	Symptomatic	
			but Content ( <i>n</i> = 417) %	Flourishing ( <i>n</i> = 1,546) %			but Content ( <i>n</i> = 455) %	Flourishing ( <i>n</i> = 1,645) %
Gender <sub>a</sub>								
Male	61.57	57.92	56.31	45.47	62.88	59.79	55.06	46.31
Female	38.42	42.07	43.69	54.53	37.12	40.21	44.94	53.69
Ethnicity <sub>b</sub>								
Asian	7.86	11.83	14.84	14.46	6.31	6.25	9.56	16.13
Native Hawaiian or other Asian/Pacific Islander	1.08	1.18	1.48	0.60	0.90	–	1.36	0.76
Black or African American	11.11	9.47	8.01	5.74	13.21	6.25	8.47	5.63
American Indian or Alaska Native	3.79	1.18	3.86	2.16	3.60	7.50	2.19	2.22
Caucasian/White	42.28	34.91	39.17	37.56	43.54	48.75	41.80	35.74
Multi-racial	6.78	9.47	6.23	6.56	6.61	8.75	6.56	6.75
Hispanic	27.10	31.95	26.41	30.87	25.83	22.50	30.10	32.75
Socioeconomic Status <sub>c</sub>								
Low	63.64	46.51	50.85	44.96	60.96	51.52	55.34	44.97
Average or High	36.36	53.49	49.15	55.04	39.04	48.48	44.66	55.03

*Note.* *N* = 2,604; a = 40 students were missing gender data; b = 386 students were missing ethnicity data; c = 1216 students were missing SES data.

Table 5.

*Information Criteria*

Number of Groups	BIC	AIC
2	-19268.6	-19243.2
3	-18764.2	-18720.7
4	-18548.4	-18486.7
5	-18344.8	-18265
6	-18214.4	-18116.5
7	-18151.2	-18035.2

*Note.* BIC = Bayesian information criterion.

AIC = Akaike information criterion.

Table 6.

*Posterior Probabilities*

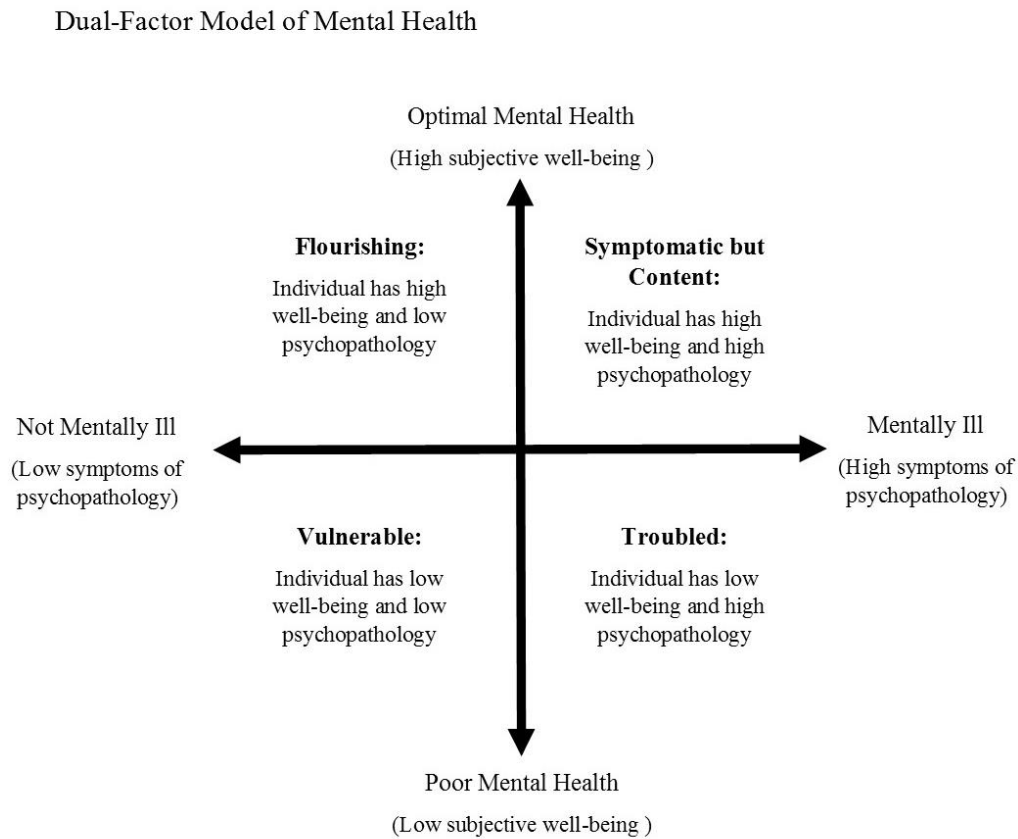
Number of Groups	Mean Posterior Probability of Group Membership					
	1	2	3	4	5	6
3	0.93	0.87	0.92	–	–	–
4	0.93	0.80	0.81	0.93	–	–
5	0.94	0.85	0.86	0.83	0.89	–
6	0.94	0.84	0.84	0.75	0.79	0.89

Table 7

*Demographic Characteristics of Participants in Trajectory Groups*

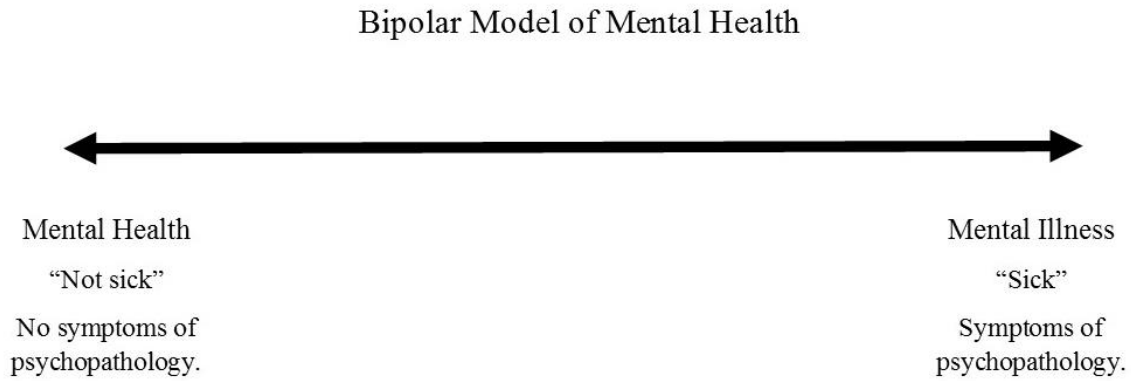
Demographic Variable	Mental Health Trajectory Group				
	Persistently Troubled ( <i>n</i> = 172)	Improving ( <i>n</i> = 275)	Declining ( <i>n</i> = 244)	Persistently Moderate ( <i>n</i> = 1016)	Persistently Flourishing ( <i>n</i> = 897)
	%	%	%	%	%
Gender <sup>a</sup>					
Male	72.02	59.63	64.02	54.39	36.72
Female	27.98	40.37	35.98	45.61	63.28
Ethnicity <sup>b</sup>					
Asian	7.91	6.79	5.29	12.93	18.27
Native Hawaiian or other Asian/Pacific Islander	1.44	0.90	1.44	0.59	0.88
Black or African American	15.11	8.14	12.98	7.05	4.38
American Indian or Alaska Native	2.88	2.71	5.77	2.70	1.63
Caucasian/White	43.88	44.80	41.35	39.13	34.04
Multi-racial	4.32	9.95	3.85	6.93	6.88
Hispanic	24.46	26.70	29.33	30.67	33.92
Socioeconomic Status <sup>c</sup>					
Low	77.78	61.31	53.98	48.02	42.54
Average or High	23.33	38.69	46.02	51.97	57.46

*Note.* *N* = 2,604; a = 40 students were missing gender data; b = 386 students were missing ethnicity data; c = 1217 students were missing SES data.



*Figure 1.* Location of mental health groups according to the dual-factor model of mental health.

Model design, group names, and descriptions adapted from Suldo & Shaffer (2008).



*Figure 2.* Defining mental health by the traditional medical model, or disease-based perspective.

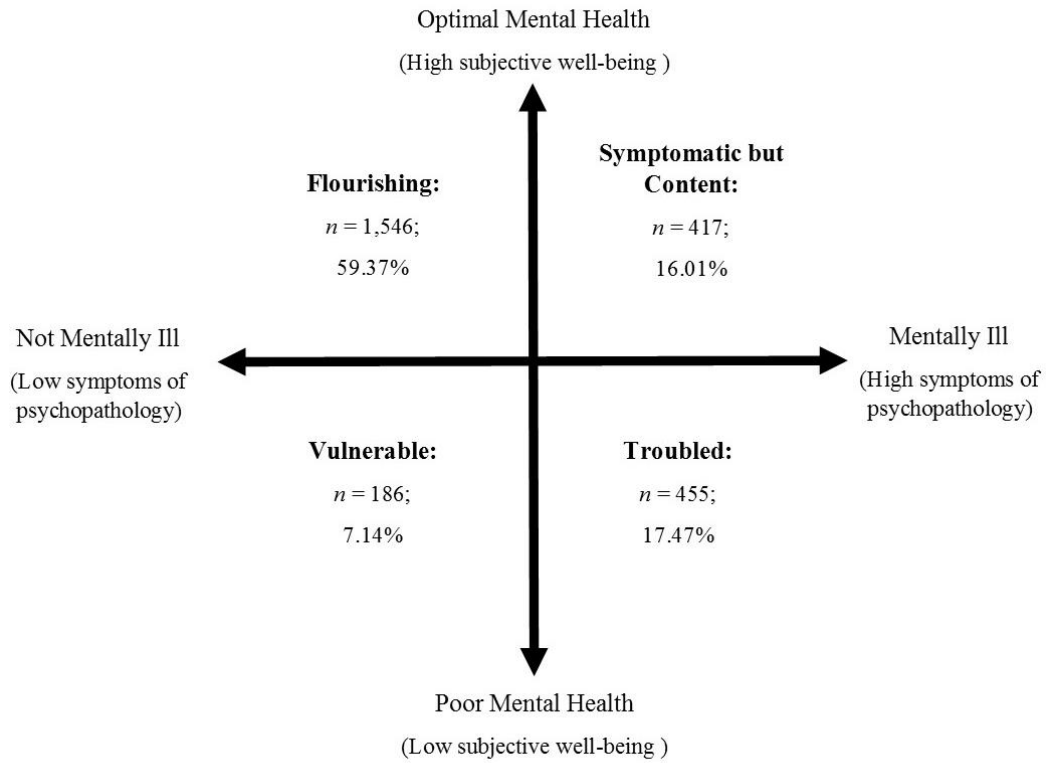


Figure 3. Proportions of students in each dual-factor mental health group at Time 1.

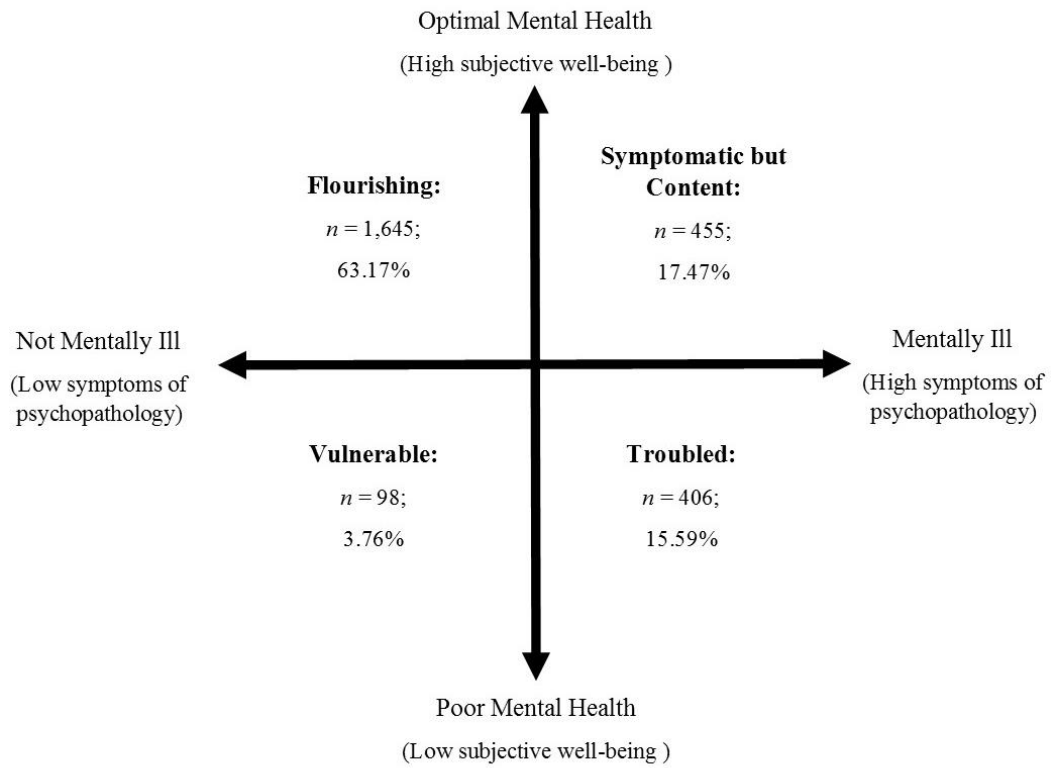


Figure 4. Proportions of students in each dual-factor mental health group at Time 2.

		<b>Time 1 Mental Health</b>			
		Flourishing ( <i>n</i> = 1,546; 59.37%)	Troubled ( <i>n</i> = 455; 17.47%)	Vulnerable ( <i>n</i> = 186; 7.14%)	Symptomatic but Content ( <i>n</i> = 417; 16.01%)
<b>Time 2 Mental Health</b>	Flourishing ( <i>n</i> = 1,645; 63.17%)	Stable <i>Subgroup 1</i> <i>n</i> = 1,328; 85.90%	SWB Increases, PTH Decreases <i>Subgroup 8</i> <i>n</i> = 61; 13.41%	SWB Increases <i>Subgroup 11</i> <i>n</i> = 96; 51.61%	PTH Decreases <i>Subgroup 14</i> <i>n</i> = 160; 38.37%
	Troubled ( <i>n</i> = 406; 15.59%)	SWB Decreases, PTH Increases <i>Subgroup 5</i> <i>n</i> = 36; 2.33%	Stable <i>Subgroup 2</i> <i>n</i> = 278; 61.10%	PTH Increases <i>Subgroup 12</i> <i>n</i> = 25; 13.44%	SWB Decreases <i>Subgroup 15</i> <i>n</i> = 67; 16.07%
	Vulnerable ( <i>n</i> = 98; 3.76%)	SWB Decreases <i>Subgroup 6</i> <i>n</i> = 33; 2.13%	PTH Decreases <i>Subgroup 9</i> <i>n</i> = 15; 3.30%	Stable <i>Subgroup 3</i> <i>n</i> = 45; 24.19%	SWB Decreases, PTH Decreases <i>Subgroup 16</i> <i>n</i> = 5; 1.20%
	Symptomatic but Content ( <i>n</i> = 455; 17.47%)	PTH Increases <i>Subgroup 7</i> <i>n</i> = 149; 9.64%	SWB Increases <i>Subgroup 10</i> <i>n</i> = 101; 22.20%	SWB Increases, PTH Increases <i>Subgroup 13</i> <i>n</i> = 20; 10.75%	Stable <i>Subgroup 4</i> <i>n</i> = 185; 44.36%

Figure 5. Patterns of stability and movement of mental health group membership across time (N = 2604. Note. SWB = Subjective Well-being; PTH = Psychopathology. Shaded boxes represent stable groups.

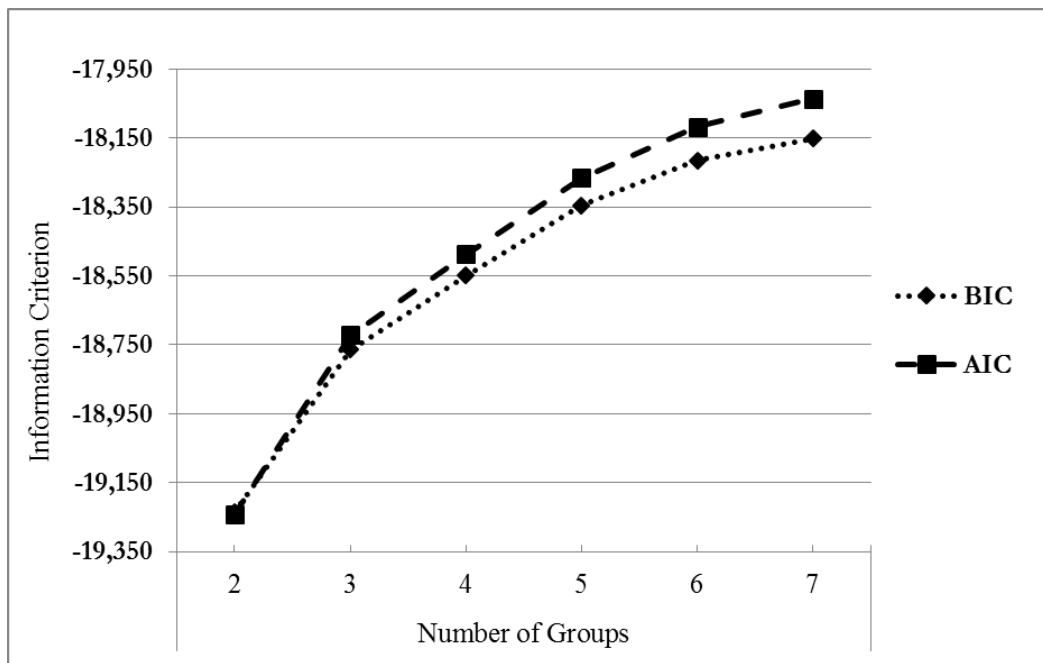


Figure 6. Model selection based on BIC and AIC information criteria.

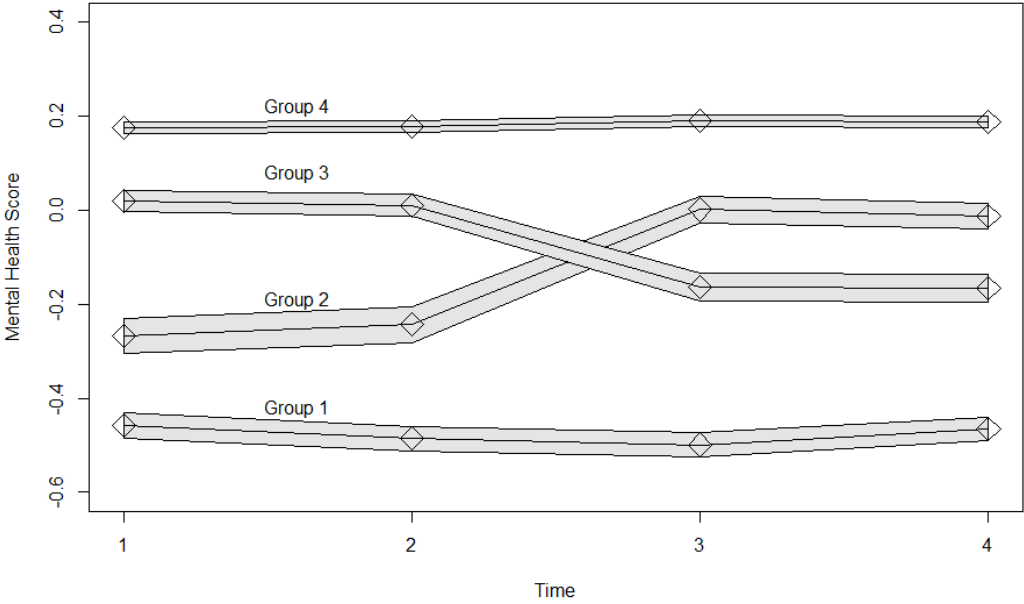


Figure 7. Four-group model solution.

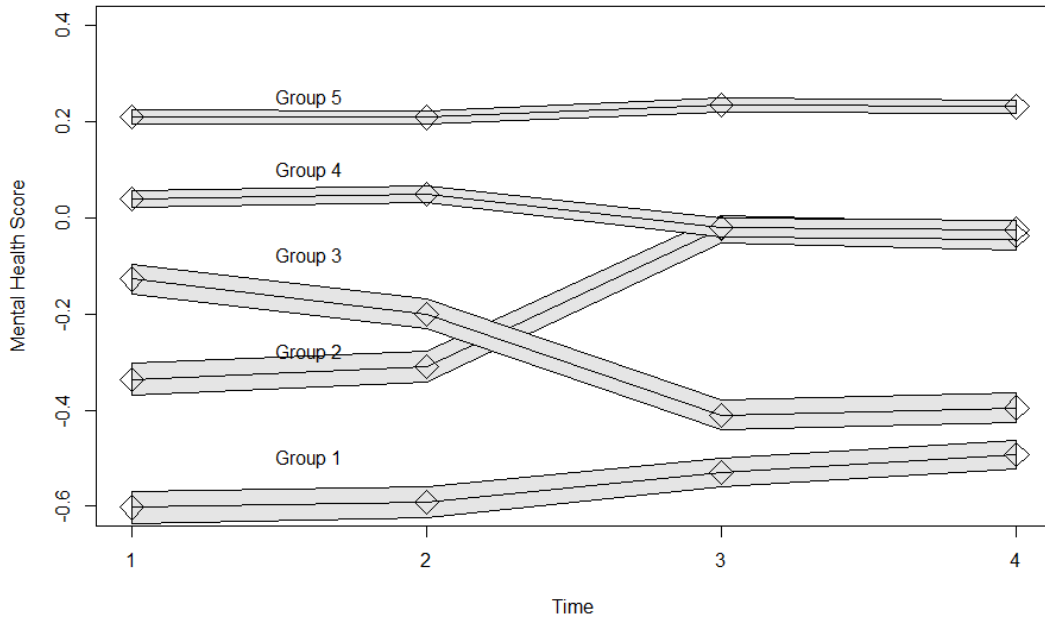


Figure 8. Five-group model solution.

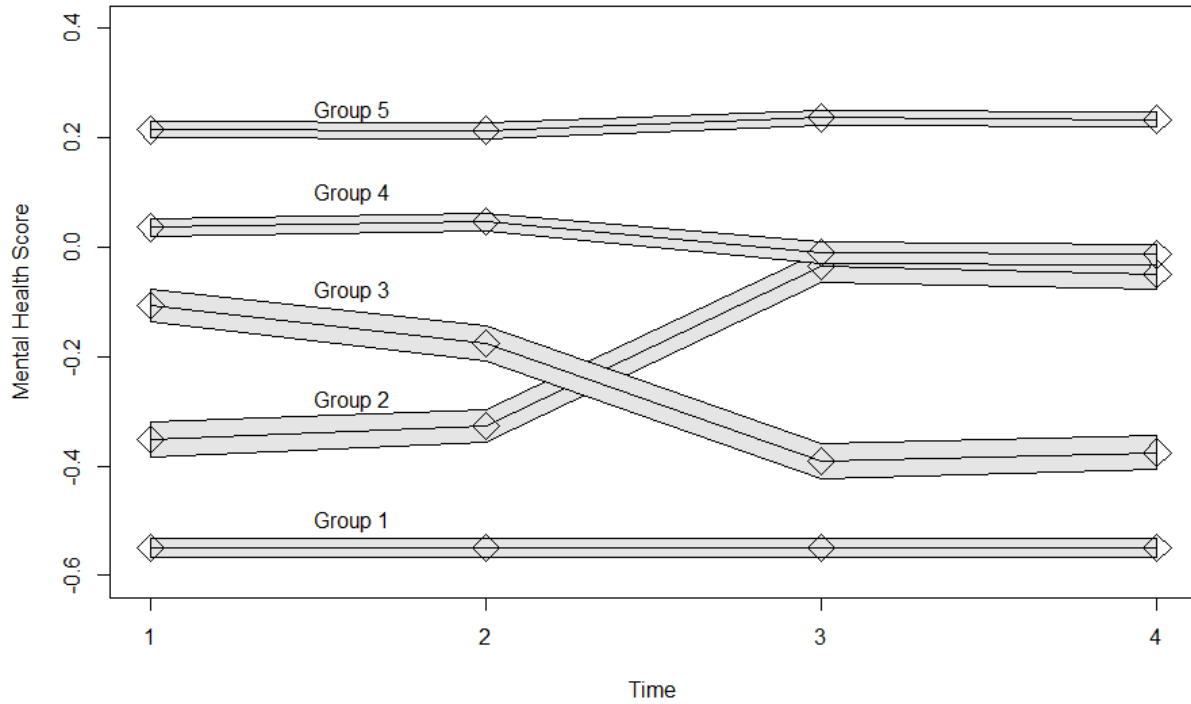


Figure 9. Final five-group solution. Group 1 = Persistently Troubled (6.61%); Group 2 = Improving (10.56%); Group 3 = Declining (9.37%); Group 4 = Persistently Moderate (39.02%); Group 5 = Persistently Flourishing (34.45%).