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Reliability of Subjective Well-Being Measures in Middle School Students

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RELIABILITY OF SUBJECTIVE WELL-BEING MEASURES IN MIDDLE SCHOOL
STUDENTS

by

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ABSTRACT

A rise in the emphasis of positive aspects of functioning has led to increased attention paid to the field of positive psychology. Encompassed in this field is the recognition of subjective well-being (SWB) as an important factor in developing a holistic understanding of students. Established significant positive relations between SWB and academic engagement suggest that incorporating positive psychology variables, such as SWB, into assessment may be a useful and feasible tool to develop a comprehensive understanding of student strengths and difficulties. In this study, we investigated the reliability of three promising SWB measures for use within the school context. Results provided support for the internal consistency and test-retest reliability of the Students' Life Satisfaction Scale (SLSS), an 30-item version of the Multidimensional Students' Life Satisfaction Scale (MSLSS), and a school-based version of the Positive and Negative Affect Schedule for Children (PANAS-C) across 5-month, 7-month, and 1-year periods of time. Future research should focus on clarifying the sensitivity of the measures to planned and unplanned situational changes across varying time periods.

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CHAPTER 1

INTRODUCTION

Since 1948, The World Health Organization (WHO) has defined health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (World Health Organization, 1948, p. 100). The field of positive psychology reflects this concept by promoting the presence of positive qualities within individuals’ lives rather than solely removing negative ones. These qualities are further addressed in the field of positive psychology, which is defined as the study of positive emotions, positive character traits, and the institutional features that facilitate optimal functioning in individuals and groups (Seligman & Csikzentmihalyi, 2000). To monitor the presence of these qualities, measures have been developed to detect differences in levels of constructs related to positive psychology, such as subjective well-being measures, hope measures, gratitude measures, etc. The development of such measures has enhanced the growth of positive psychological science (Lopez & Snyder, 2003). Within the realm of positive psychology lies the construct of well-being. Traditionally, well-being has been defined as an absence of problems, but the shift of focus to positive psychology has inspired a new definition of well-being that focuses on assets (i.e., focusing on individual strengths, rather than an absence of weaknesses; Terjesen, Jacofsky, Froh, & DiGuiseppe, 2004).

Societal trends have continually moved toward recognition of the importance of both the individual and individuals’ subjective evaluations of life. Individuals’

perceptions of subjective well-being have begun to outweigh their health, access to resources, and education status when defining “the good life” (Diener, Suh, Lucas, & Smith, 1999). While an increasing emphasis on positive aspects of human functioning may be occurring presently, psychology has not historically reflected this mindset. In the mid-1990s, psychological articles featured a ratio of 17 to 1 in addressing issues related to the presence of negative states and positive states, respectively (Myers & Diener, 1995). This ratio would change with the growing popularity of positive psychology. Most discussions of positive psychology topics include the concept of subjective well-being (SWB; Lopez & Snyder, 2003), the reliable measurement of which is the key concept of interest in this study.

Defining SWB

As the notion of SWB has become increasingly accepted and the definition has become more refined, SWB has evolved from being comprised of the single factor of “subjective well-being” to the more extensive and refined conceptualization reflected in Diener, Suh, Lucas, and Smith’s (1999) work. Their definition is a tripartite conceptualization, consisting of three components: life satisfaction (LS), positive affect (PA), and negative affect (NA; Diener, 1984, 2000). Measured as either a global or domain-specific quality, LS represents a cognitive judgment by an individual about his or her general quality of life. This quality is construed as an overall evaluation of contentment or derived from an aggregation of judgments regarding specific domains, such as satisfaction with relationships with friends or experiences at school. Self-reported frequencies of feeling positive emotions (e.g., joy and interest) and negative emotions (e.g., anger and anxiety) constitute measures of PA and NA, respectively (Diener, 2000).

Specifically, Diener suggests that high SWB is represented by individuals who experience higher levels of LS and PA, accompanied by lower levels of NA.

Research has supported the distinctiveness of the three constructs among adults and children (Busseri & Sadava, 2011; Diener, 2000; Huebner, 1991a; Huebner & Hills, 2013). In fact, the three SWB components have been shown to be differentiable as early as third grade (Huebner, 1991a).

Measuring SWB

As the clarifying and refining work to define and explore the concept of SWB continues to occur, there is a need for reliable instrumentation that accurately measures the evolving phenomenon over time. Research on the measurement of SWB in children and adolescents has been summarized by several authors (Huebner & Hills, 2013; Proctor, Linley, & Maltby, 2009). Such reviews have identified several promising measures of SWB that are appropriate for youth. In order to defend conclusions resulting from the combination of multiple measures, which is necessary in the aggregate measures of LS, PA, and NA that make up SWB, it is important to identify and track the internal consistency of each of the contributing instruments. Similarly, in order to track changes in subjects' SWB and to defend conclusions about trends in data over time, it is important to know the limits of test-retest reliability for instruments used to provide such data longitudinally. Two underlying questions are addressed herein: to what degree are the results of test-retest administrations consistent and to what degree does their reliability degrade as time periods between test and retest increase? Applicable measures include those used in this study: The Students' Life Satisfaction Scale (SLSS; Huebner, 1991b),

an abbreviated version of the Multidimensional Students' Life Satisfaction Scale (MSLSS; Huebner, 1994), and a school-based version of the Positive and Negative Affect Schedule for Children (PANAS-C; Laurent, Potter, & Catanzaro, 1994). Descriptions of these measures are below, and information summarizing previous reliability studies is provided in Tables 1, 2.1, 2.2, and 3.

Life Satisfaction. As indicated above, LS is defined as an individual's cognitive evaluation of the quality of his or her life either as a whole (on a global level) or with specific domains (Diener et al., 1999). In addition to understanding individual differences in LS as determined partly by the accumulation of various positive individual experiences, we can also view LS as a determinant of positive outcomes or benefits. These positive outcomes include increased quality in intrapersonal relationships, interpersonal relationships, health outcomes, vocational outcomes, and educational success (Lyubormirsky, King, & Diener, 2005). That is, high levels of LS may positively affect individuals' perceptions of themselves, their relationships with others, outcomes in the workplace, and success with schooling. Conversely, mental and physical health problems are connected to lower levels of LS (Frisch, 2000).

Across time, LS is generally stable in adults (Baird, Lucas, & Donnellan, 2010). Support has been shown across time intervals of two weeks ($r = .83$) and one month ($r = .84$) using a widely accepted adult measure of LS (Pavot & Diener, 1993). A separate study of Taiwanese adults supported LS measurement across two time intervals between one-month and two-month intervals (Wu, Chen, & Tsai, 2009). Across longer periods of time (seven and eleven years in separate samples), LS judgments appear to be moderately stable but sensitive to situational changes (Lucas & Donnellan, 2007).

Global LS. Current research also supports the importance of global LS in children's, as well as adults', adaptation (Siddall, Huebner, & Jiang, 2013). As such, global LS represents an overall rating of satisfaction, reflecting satisfaction with life as a whole. The Students' Life Satisfaction Scale (SLSS) is one measure for which evidence of evidence of validity and reliability has been provided. It has been frequently used in previous studies to measure global LS (see below for a full description of the measure and Table 1.1 for reliability measurements).

Measurement of Global LS. To measure global LS in students, the SLSS was created and serves as a useful tool to facilitate the study of SWB in children who are in grades 3 through 12 (Huebner, 1991a; Huebner, Suldo, & Valois, 2003). The current SLSS was revised from the original form by reducing from 10 to 7 items and adjusting the response format from a 4-point Likert scale (1 = never, 2 = sometimes, 3 = often, and 4 = always) to a 6-point Likert scale (1 = strongly disagree, 2 = moderately disagree, 3 = mildly disagree, 4 = mildly agree, 5 = moderately agree, and 6 = strongly agree) (Huebner et al., 2003). The following is an example item from the SLSS: "My life is going well." The SLSS has been employed in a number of studies with various samples including elementary (e.g., Huebner 1991c) and secondary school children (e.g., Dew & Huebner, 1994; McKnight, Huebner, & Suldo, 2002) from various areas of the United States and elsewhere.

The internal consistency of the SLSS has been investigated in numerous studies. For example, Dew and Huebner (1994) found an alpha of .86 in their sample of students in grades 9 through 12. Huebner (1991a) found an alpha of .82 in a sample of students in grades 4 through 8. The SLSS has also been investigated with students in South Korea

(Park & Huebner, 2005) and Spain (Casas, Alsinet, Rosich, Huebner, & Laughlin, 2001), and these studies showed high internal consistencies as well. In addition, a German version of the SLSS (German SLSS) has supported internal consistency for use with German-speaking youth between ages 12 and 17. In this study, Weber, Ruch, and Huebner (2012) reported a coefficient alpha of .88. McDougall, Wright, Nicols, & Miller (2013) also reported internal consistencies of .79 (youth) and .73 (parents), supporting the use of the SLSS in youth (ages 11 to 17 years) with chronic conditions, including cerebral palsy, spina bifida, autism spectrum disorder, acquired brain injury, developmental delay, cleft lip, cleft palate, Down syndrome, arthritis, communication disorder, amputation, or any other non-progressive muscular or central nervous system disorder. The available research on the internal consistency of the SLSS is summarized in Table 1.1.

Studies of test-retest reliability of the SLSS have also been conducted, but these have not been as extensive as the studies of internal consistency. In the extant literature, Huebner (1991b) has reported a test-retest coefficient of .74 across a 1- to 2-week interval with students in grades 4 through 6. Employing a sample of students in grades 3 through 5, Terry and Huebner (1995) reported a test-retest coefficient of .76, also across a 1- to 2-week time interval. In the aggregate, these results suggest that elementary-aged respondents who complete the SLSS at one point in time are likely to produce similar results when retested with the instrument within one to two weeks. Another report of the SLSS stability coefficients employing a one-month span of time yielded a stability coefficient of .64 (Gilman & Huebner, 1997). With a transition of two weeks to one month, the reliability thus dropped slightly. Furthermore, Weber, Ruch, and Huebner (2012) reported a stability coefficient of .55 for a German version of the SLSS over a 4-

month period of time with a sample of German-speaking Swiss students of ages 12 through 17. Finally, Huebner, Funk, and Gilman (2000) examined the test-retest performance of the SLSS with a group of high school students with one year between administrations. The resulting test-retest reliability coefficient was .53. A summary of test-retest reliability studies for the SLSS can also be found in Table 1.1.

The extant literature has shown support for both convergent validity and discriminant validity of the SLSS. The SLSS has been correlated with other SWB self-report measures, including the Perceived Life Satisfaction Scale ($r = .58$; Adleman, Taylor, & Nelson, 1989), the Happiness subscale of the Piers-Harris Children's Self-Concept Scale ($r = .53$; Piers & Harris, 1969), Andrews and Withey one-item scale ($r = .62$; Andrews and Withey, 1976), and Revised Dimensions of Temperament Survey mood scale ($r = .34$; Windle & Lerner, 1986; Huebner, 1991a). The SLSS has also been supported in both convergent and discriminant validity when compared to responses on the Self-Description Questionnaire-II (SDQ-II). Validity was supported via relatively high correlations between parent and child responses on the SLSS ($r = .54$), and discriminant validity was supported via relatively low correlations between ratings of academic self-concept and LS ($r = .31$ in self report and $r = .47$ in parent report; Gilman & Huebner, 1997).

Patterns of associations between personality characteristics, maladaptive psychosocial conditions, and environmental experiences also support the validity of the SLSS (see Huebner, Suldo, Smith, & McKnight, 2004, for a review). For example, the SLSS has been significantly correlated with measures of self esteem ($r = .65$) and extraversion ($r = .23$), and it has been significantly negatively correlated with measures

of anxiety ($r = -.48$), external locus of control ($r = -.48$), neuroticism ($r = -.57$; see Huebner, 1991b), depression ($r = -.57$), loneliness ($r = -.38$), and teacher ratings of classroom behavior ($r = -.35$; see Huebner & Alderman, 1993). One substantial finding in the study of discriminant validity of SWB factors is the discriminant validity found among the SLSS and measures of PA and NA. Multiple studies indicate that scores on the SLSS and scores on measures of PA and NA are related, but differentiable from one another (Huebner, 1991a; Huebner & Dew, 1996).

Domain-Based LS. Multidimensional scales, when utilized in addition to the SLSS, are useful for gaining a more thorough understanding of domain-specific LS in children grades 3 through 12 (Huebner et al., 2003). Multidimensional LS scales use context-specific questions to specifically address LS in domains such as school, family, friends, self, and living environment. The Multidimensional Students' Life Satisfaction Scale (MSLSS) addresses each of these areas and has garnered some support for validity and reliability (Gilman & Huebner, 2000). A summary of these studies can be found in Tables 1.2 and 1.3.

Measurement of Domain-Based LS. The MSLSS addresses five domains of LS thought to be important across the ages of 8 through 18: family, friends, self, school, and living environment. The original scale consisted of 40 items on the scale with responses on a 6-point Likert scale (1 = strongly disagree, 2 = moderately disagree, 3 = mildly disagree, 4 = mildly agree, 5 = moderately agree, and 6 = strongly agree; Gilman & Huebner, 2000). The collection of a child's responses is averaged to produce an aggregate measure of that respondent's general LS (Huebner, 1994).

The internal consistency of the MSLSS scores has been reported on in multiple studies (Funk, 2001; Greenspoon & Saklofske, 1997; Haranin, Huebner, & Suldo, 2007; Huebner & Gilman, 2002). In each of these studies, alpha coefficients showed acceptable levels of consistency for the MSLSS. For example, Haranin, Huebner, and Suldo (2007) provided support for the use of the MSLSS with children grades 6 through 12, reporting a range of alpha coefficients from .77 to .87 across MSLSS subscales. Also, Antaramian and Huebner (2009) reported alphas ranging from .76 to .95 for a sample of middle school students. Additionally, Brantley, Huebner, and Nagle (2002) showed internal consistency alpha coefficients ranging from .63 to .83 with a sample of adolescents with mild mental disabilities and showed alpha coefficients ranging from .73 to .92 with a sample of typically achieving adolescents.

Fewer studies in the extant literature have explored test-retest reliability of the MSLSS. Two studies have provided support related to the test-retest reliability of the MSLSS over a period of four weeks. Greenspoon and Saklofske (1997) investigated the use of the MSLSS with Canadian students in grades 3 through 8, yielding test-retest correlations ranging from .59 (School) to .78 (Self and Total). Huebner, Laughlin, Ash, and Gilman (1998) reported similar results with a group of students in grades 6 through 8, with coefficients ranging from .53 (Self) to .81 (Living Environment and Total). Furthermore, Antaramian and Huebner (2009) reported test-retest reliability coefficients for time spans of both one year and two years with students in grades 8 through 10. The one-year time span resulted in test-retest reliability coefficients ranging from .27 (Friends) to .59 (School), with a median coefficient of $r = .49$. The 2-year time span resulted in test-retest reliability coefficients ranging from .41 (Environment) to .53 (Self)

with a median coefficient of $r = .46$. Summaries of test-retest reliability and internal consistency studies for the MSLSS are presented in Tables 2.1 and 2.2, respectively.

MSLSS subscales demonstrated support related to convergent and discriminant validity with various measures, including, but not limited to the Behavior Assessment System for Children (BASC; Reynolds and Kamphaus, 1992), the Children's Loneliness and Social Dissatisfaction Scale (Asher, Hymel, & Renshaw, 1984), and the Self-Description Questionnaire-I (SDQ-I; Marsh, 1990). Construct validity for the MSLSS has been supported by Huebner (1994) by assessing patterns of correlations between the MSLSS and relevant scales, and confirmatory factor analyses have been conducted by Gilman, Huebner, and Laughlin (2000) and Huebner, Laughlin, Ash, & Gilman (1998). Additionally, a convergent and discriminant validity study conducted by Huebner, Brantley, Nagle, and Valois (2002) supported the validity of the MSLSS when comparing parent and student reports on the MSLSS.

Harainin et al. (2007) used the MSLSS and the SLSS to determine predictive validity by comparing the measures to children's self-reported internalizing and externalizing behaviors across one- and two-year time periods, indicating that the total score for global LS on the SLSS was a robust predictor of internalizing and externalizing behaviors (Harainin et al., 2007). Furthermore, various domain-based scores demonstrated incremental validity in relation to the prediction of internalizing and externalizing behaviors as well.

In a study with Canadian youth, Sawatzky, Ratner, Johnson, Kopec, and Zumbo, (2009) found interpretability problems with the 10 reverse-key items of the MSLSS. Given that previous research has suggested that some children and pre-adolescents have

difficulty responding to reverse-key items (Marsh, 1986), a modified version of the MSLSS was developed in which the 10 reverse-keyed items were excluded (Huebner, Zullig, and Saha, 2012). Preliminary support was found for this abbreviated version of the MSLSS. Coefficient alphas were similar to those reported in 40-item scale studies (summarized in Table 1.3), and fit indices suggested that a five-factor conceptual model of life satisfaction (e.g., Huebner, 1994) was supported with the abbreviated MSLSS (Huebner et al., 2012; Zappulla, Pace, Cascio, & Huebner, 2013).

Positive and Negative Affect. PA and NA refer to the frequencies of positive and negative emotions experienced by an individual over some period of time (e.g., Diener & Emmons, 1984; Watson & Tellegen, 1985). Watson, Clark, and Tellegen (1988) characterized PA as an experience of pleasurable engagement with one's environment and NA as unpleasant engagement with one's environment. Even so, these constructs correlate modestly with one another, though they can also be differentiated from one another. For example, they correlate with different variables. They are not opposites on one continuum; rather they are differing constructs that should be measured independently of one another (Lucas, Diener, & Suh, 1996).

Both PA and NA are conceptualized by some as trait-like in nature, reflecting relatively stable individual differences in the experience of feelings of positive or negative emotions (Watson, Clark, & Carey, 1988; Laurent et al., 1999). However, a body of research supports the notion that PA and NA can be characterized as either states or traits. These differing definitions (i.e., state affect and trait affect) relate to differing measurement approaches (Frederikson 2001; Kanfer and Ackerman 1989; Seo, Barrett, & Bartunek, 2004). The distinction is generally operationalized through the specific

directions for the measure. On one hand, measures of state emotions asks for reports of the frequency of specific emotions during a brief time span (e.g., in the past hour, in the past few days) or in relation to specific life events. On the other hand, measures of trait emotions request report of the experience of specific emotions over a longer time period (e.g., one month or one year).

Measuring different types of affect in children has become important since the discovery of the role of affect in relation to mental and physical health variables (Beck, Novy, Diefenbach, Stanley, Averill, & Swann, 2003; Watson et al., 1988), physical illness (Hu & Gruber, 2008), quality of life, and self-esteem (Caprara et al., 2012; Zeigler-Hill & Abraham, 2006). Additionally, positive school outcomes have been observed in relation to higher frequencies of positive emotions in school, such as emotional preparedness to solve problems and succeed at new learning tasks (Reschly, Huebner, Appleton, & Antaramian, 2008). Thus, measuring affect in children has become a topic of interest in the field.

Measurement of Positive and Negative Affect. The original Positive and Negative Affective Schedule (PANAS) was created to measure adults' experiences of PA and NA in a brief, easily administered format (Watson et al., 1988). The measure was subsequently revised for use with children to become the Positive and Negative Affective Schedule for Children (PANAS-C), which is a widely used measure of emotional experiences applicable to children grades 4 through 8 (Laurent et al., 1994). When responding to this measure, children indicate how often they experience specific feelings related to their overall life, rather than for a specific context, such as school or home (Huebner, Gilman, & Suldo, 2006). The PANAS-C has been supported in its utility for

children with anxiety disorders (Hughes & Kendall, 2009), and a parent scale has also been developed for use to understand children's PA and NA (Ebesutani, Okamura, Higa-McMillan, & Chorpita, 2011). The investigation of both of these scales together indicate that the expansion of the PANAS-C to more specific areas of investigation may be useful in broadening the measure's application to research in positive psychology.

In a preliminary study examining psychometric properties of the PANAS-C, internal consistency was examined using Cronbach's alpha across three time samples. The first administration yielded alphas for NA and PA of .86 and .86, respectively. The second administration yielded alphas for NA and PA of .89 and .89, respectively, and the third administration yielded alphas for NA and PA of .92 and .89, respectively. Extant literature regarding its internal consistency and specific measurements are displayed in Table 1.4. Alpha coefficients reported range from .87 to .93 for the PA subscale and from .81 to .95 for the NA subscale (Laurent et al., 1999; Damásio, Pacico, Poletto, & Koller, 2013; Estubani et al., 2011).

Test-retest reliability has only marginally been explored with regard to the PANAS-C. Cook et al. (1998) conducted a study with students in grades 3 through 5 using three time points, two weeks apart, totaling four weeks in length. The study totaled four weeks in length, including administrations of the PANAS-C at the beginning, middle, and end. Test-retest reliability coefficients were reported for Time 1 compared to Time 2, Time 2 compared to Time 3, and Time 1 compared to Time 3 for both PA and NA. Across all of these comparisons, ranges of $r = .72$ to $r = .79$ existed for PA while ranges of $r = .66$ to $r = .82$ existed for NA. Overall, the reliability of the PANAS-C with students in elementary school was supported over a time span of 4 weeks. Summaries of

test-retest reliability and internal consistency studies for the PANAS-C are presented in Table 1.4.

Evidence for the convergent validity of the PANAS-C has been offered through associations between PA and measures of General Life Satisfaction Scale for Children (GLSS-C; Damasio et al., 2013) and between NA and measures of the Children's Depression Inventory (CDI; Laurent et al., 1999), the Multidimensional Anxiety Scale for Children (MASC; March, Parker, Sullivan, Stallings, & Conners, 1997), and the Revised Children's Manifest Anxiety Scale (RCMAS; Hughes & Kendall, 2009). Discriminant validity is also supported for the PANAS-C. The PA subscale was modestly negatively correlated with the State-Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973) and strongly negatively correlated with the CDI (Kovacs, 1985). A two-factor model of affect has been supported during both scale development and replication studies using the PANAS-C (Laurent et al., 1999). Psychometric properties of the PANAS-C indicate support for both reliability and validity for the scale.

Long, Huebner, Weddell, and Hills (2012) developed a context-specific version of the PANAS-C. Rather than asking for children to report PA and NA in reference to their lives as a whole, directions on their measure requested that children respond based on how they have felt during the past few weeks "at school." This modification assumed that children may experience different emotions when they are at school versus other settings in their lives (e.g., home, neighborhood). Using confirmatory factor analysis procedures, they identified a three-factor structure, but concluded that further research needed to be done to formulate conclusions about the dimensionality of the measure.

Current Study

With regard to psychological measures, good measures are considered to have adequate content sampling of items from the construct of interest. Content sampling indicates a random sampling of all possible items that could have been on the measure, and it is assumed that these items will be interrelated because they assess the same construct of interest. When test items are correlated with each other, this interrelationship is often called internal consistency (see Anastasi & Urbina, 1997; Henson, 2001; and Nunnally, 1994). Test-retest reliability indicates whether or not respondents' positions in the rank ordering of scores are preserved across time. The current study targets the utilization of the foundational support described above and offers another resource for the reliability of measurements of SWB in adolescents. The SLSS, MSLSS, and PANAS-C have all generally shown adequate internal consistency and meaningful test-retest reliability across specific lengths of time and across various populations. Even so, additional research is warranted to elucidate the properties of these and similar measures fully, especially with respect to the assessment of stability with children and adolescents. Across the various instruments used to measure SWB, although some studies of test-retest reliability have been conducted, most have focused on relatively short periods of time. Investigations of stability of responses across lengthier time periods would further illuminate the nature of the constructs of global- and domain-based LS and school-based PA and NA and their measures in youth.

Research Questions. Thus, as part of a larger study (Kelly, Hills, Huebner, & McQuillin, 2012), the present study aimed to address several questions, specifically regarding the internal consistency reliability and test-retest reliability of three measures of SWB

appropriate for use with children and adolescents (i.e., the SLSS, MSLSS, and PANAS-C) when assessed on three occasions over a one-year time period.

Specifically, the present study investigated the reliability of the three measures of SWB in a sample of middle school students. Six research questions were proposed for the current study:

1. What are the internal consistency estimates of the SLSS in middle school students?
2. What are the test-retest reliability estimates for the SLSS over a time span of five months, seven months, and 12 months in middle school students?
3. What are the internal consistency estimates for the abbreviated version of the MSLSS in middle school students?
4. What are the test-retest reliability estimates for the MSLSS over a time span of five months, seven months, and 12 months in middle school students?
5. What are the internal consistency estimates for the school-based version of the PANAS-C in middle school students (i.e., when students are asked to report their feelings at school for the past few weeks)?
6. What are the test-retest reliability estimates for the school-based version of the PANAS-C over a time span of five, seven, and 12 months in middle school students (i.e., when students are asked to report their feelings at school for the past few weeks)?

Measures of global LS, such as the SLSS, reflect both trait and state components. In literature regarding the SLSS, a test-retest reliability coefficient of .75 was observed over a four-month time interval in a sample of German-speaking Swiss adolescents (ages

12 to 17; Weber et al., 2013), while a test-retest reliability coefficient of .53 was observed over a one-year time interval in a sample of high school students (grades 9 to 12; Huebner et al., 2000). Thus, it was expected that test-retest reliability coefficients in the current study would be higher in the five-month and seven-month time intervals than in the one-year time interval. Furthermore, correlation coefficients were expected to exceed $r = .50$ for all three time interval comparisons.

Similarly to global LS measurement via the SLSS, measurement of domain-specific LS using the MSLSS is also likely influenced by both the state and trait components. One-month test-retest reliability coefficients reported in the extant literature range from .59 to .78 across domains in a sample of students in grades 3 through 8 (Greenspoon & Saklofske, 1997) and range from .53 to .81 in a sample of students in grades 6 through 8 (Huebner et al., 1998). Scholars have reported test-retest coefficients within a range of .27 to .59 in a sample of students in grades 8 through 10 over a one-year time interval (Antaramian & Huebner, 2009). Considering that these coefficients are reflective of the 40-item MSLSS, it was expected that internal consistency and test-retest reliability estimates would be lower than those in previous studies. There are no previous studies that reflect test-retest reliability estimates between a one-month and one-year time interval. Therefore, the five- and seven-month time intervals investigated in the current study were predicted to lie between the one-month and one-year estimates provided in previous studies.

PA and NA also reflect both states and trait components. The test-retest reliability of the PANAS-C has been investigated only in two subsequent two-week time intervals. Regarding PA, this study reported a correlation coefficient of .74 across a one-month

time interval. The correlation coefficient reported for NA across a one-month time interval was .66 (Crook, Beaver, & Bell, 1998). However, the current study is contextualizing PA and NA within a specific domain (i.e., school setting), which will likely influence the test-retest reliability. As such, it was expected that the five-month, seven-month and one-year test-retest reliability estimates regarding PA and NA at school would be lower than those based on studies of the more global, PANAS-C measure.

This study expands on previous research that has supported the use of the SLSS, abbreviated version of the MSLSS, and school-based version of the PANAS-C in children. SWB measures are well studied in adults, but SWB measures in general, and these measures in particular, have received little attention among adolescents. Specifically, this study will add to the existing body of information related to the internal consistency of the measures as well address the stability of the measures over somewhat lengthier periods of time compared to previous studies.

Table 1.1 Students' Life Satisfaction Scale Internal Consistencies and Test-Retest Reliabilities

Author(s)	Year	Participants	Internal Consistency Coefficient Alphas	Test-Retest Coefficients	Time Between Administrations
Huebner ^a (Study 1)	1991a	254 students, grades 3-8	.84	--	--
Huebner (Study 2)	1991a	Sample A: 72 students, grade 4 Sample C: 89 students, grades 5-6	.82	.74	1-2 weeks
Dew & Huebner	1994	222 students, grades 8-12	.86	--	--
Terry & Huebner	1995	183 students, grades 3-5	.73	.76	1-2 weeks
Gilman & Huebner	1997	84 students, grades 6-8	6 point extent scale: .84 4 point frequency scale: .82	6 point extent scale: .64	1 month
Huebner, Funk, & Gilman	2000	Time 1: 321 students, grades 9-12 Time 2: 99 students, grades 10-12	Time 1: .84 Time 2: .79	.53	1 year
Park & Huebner	2005	488 Korean students, grades 7-11	.83	--	--
		571 American students, grades 7-11	.84	--	--
Marques, Pais-Ribeiro, & Lopeç	2011	367 Portuguese students, grades 6-8	Time 1: .89 Time 2: .85 Time 3: .86	T1-T2: .56 T2-T3: .53 T1-T3: .51	2 1-year time period; 1 2-year time period
Weber, Ruch, & Huebner	2012	286 German-speaking Swiss, ages 12-17	.88	.55	4 months
McDougall, Wright, Nichols, & Miller	2013	439 youth with chronic conditions, ages 11-17 years; parents also included	Youth: .79 Parent: .73	--	--

^aThe original measure had ten items, rather than seven, but the final data were reported based on seven items.

Table 1.2 Multidimensional Students' Life Satisfaction Scale Test-Retest Reliabilities

Author(s)	Year	Participants	Family	School	Friends	Self	Living	Total	Retest Interval
Greenspoon & Saklofske	1997	314 Canadian students; grades 3-8	.77	.78	.59	.64	.77	.78	4 weeks
Huebner, Laughlin, Ash, & Gilman	1998	291 students, grades 6-8	.75	.70	.70	.53	.81	.81	4 weeks
Antaramian & Huebner	2009	84 students; grades 8-10	1	1	1	1	1	1	1 year; 2 years
			year: .48	year: .59	year: .27	year: .29	year: .50	year: .50	
			2	2	2	2	2	2	
			year: .44	year: .48	year: .42	year: .53	year: .41	year: .59	

Table 1.3 Multidimensional Students' Life Satisfaction Scale Internal Consistencies

Author(s)	Year	Participants	Family	School	Friends	Self	Living	Total
Huebner	1994	312 students, grades 3-8	.82	.85	.85	.82	.83	.92
Huebner	1994	413 students, grades 3-5	.79	.83	.81	.78	.82	.92
Greenspoon & Saklofske	1997	314 Canadian students; grades 3-8	.84	.83	.84	.72	.83	.90
Huebner, Laughlin, Ash, & Gilman	1998	291 students, grades 6-8	Time 1: .84 Time 2: .81	Time 1: .85 Time 2: .88	Time 1: .85 Time 2: .81	Time 1: .77 Time 2: .78	Time 1: .78 Time 2: .86	Time 1: .91 Time 2: .93
Huebner	1998	725 students, grades 3-8; split by race	Black: .83 White: .81	Black: .77 White: .87	Black: .82 White: .83	Black: .64 White: .61	Black: .77 White: .83	Black: .91 White: .93
Gilman, Huebner, & Laughlin	2000	515 students, grades 9-12	.86	.84	.82	.84	.79	.91
Griffin & Huebner ^a	2000	49 students with a Severe Emotional Disability (SED)	.88	.82	.80	.83	.65	.75
		49 students matched without a Severe Emotional Disability (SED)	.66	.85	.85	.74	.76	.79
Brantley, Huebner, & Nagle	2002	160 students, grades 9-12, with a mild mental disability;	.76	.71	.76	.65	.63	.83
		80 typically achieving students, grades 9-12	.84	.85	.83	.73	.82	.92

Author(s)	Year	Participants	Family	School	Friends	Self	Living	Total
Park, Huebner, Laughlin, Valois, & Gilman ^a	2004	835 Korean students; All elementary, middle, and high school students	All levels >.70	All levels >.70	All levels >.70	E: .71 M: .82 H: .79	All levels >.70	All levels >.90
Gilman, Ashby, Sverko, Florell, & Varjas	2005	341 American students, grades 6-12	.91	.84	.86	.83	.83	.88
		291 Croatian students, grades 8-12	.87	.82	.88	.70	.72	.87
		224 Irish adolescents	.90	.87	.90	.80	.85	.93
Gilman, Huebner, Tian, Park, O'Byrne, Schiff, Sverko, & Langknecht	2008	308 American adolescents	.91	.87	.86	.82	.82	.93
		369 Chinese adolescents	.87	.78	.74	.69	.67	.89
		437 South Korean adolescents	.86	.86	.86	.79	.81	.92
Antaramian & Huebner	2009	84 students; grades 8-10	Time 1: .85 Time 2: .92 Time 3: .92	Time 1: .86 Time 2: .87 Time 3: .86	Time 1: .84 Time 2: .89 Time 3: .86	Time 1: .76 Time 2: .84 Time 3: .83	Time 1: .82 Time 2: .82 Time 3: .83	Time 1: .91 Time 2: .95 Time 3: .94
Hatami, Motamed, & Ashrafzadeh	2010	430 Persian students, grades 6-12	.84	.82	.81	.78	.70	.83
Jovanovic & Zuljevic	2011	408 Serbian students, ages 15-19 years	.88	.84	.88	.78	.78	.90
Huebner, Zullig, & Saha	2012	844 students, grades 7-8	.91	.88	.90	.71	.83	--

Author(s)	Year	Participants	Family	School	Friends	Self	Living	Total
Zappulla, Pace, Cascio, Guzzo, & Huebner ^b	2013	Study 1: 996 Italian adolescents, ages 14-18 years	.86	.81	.94	.85	.71	--
		Study 2: 380 Italian adolescents; ages 14-19 years	.85	.81	.93	.86	.70	.91

^aOne item removed from the Self domain in the Park et al. (2004) and Griffin and Huebner (2000) studies

^bStudy 2 in the Huebner et al. (2012) study used the 30-item abbreviated MSLSS used in the present study

Table 1.4 Positive and Negative Affect Schedule for Children Internal Consistencies and Test-Retest Reliabilities

Authors	Year	Participants	Internal Consistency Coefficients: PA	Internal Consistency Coefficients: NA	Test-Retest Coefficients: PA	Test-Retest Coefficients: NA	Retest Interval
Crook, Beaver, & Bell	1998	110 students; grades 3-5	Time 1: .86 Time 2: .89 Time 3: .89	Time 1: .86 Time 2: .89 Time 3: .92	T1-T2: .67 T2-T3: .82 T1-T3: .66	T1-T2: .72 T2-T3: .79 T1-T3: .74	2 subsequent 2-week intervals
Laurent et al.	1999	349 students; grades 4-8	.87	.92	--	--	
Chorpita & Daleiden	2002	226 students; grades 1-12	.90	.86	--	--	
Ebesutan i, Okamura, Higa-McMillan, & Chorpita	2011	606 children and adolescents; grades 3-12	.89	.92	--	--	
		606 children and adolescents; grades 3-12; divided into age groups	3-4: .93 5-6: .93 7-8: .90 9-10: .90 11-12: .92	3-4: .92 5-6: .93 7-8: .89 9-10: .92 11-12: .95	--	--	
Damásio, Pacio, Poletto, & Koller ^a	2013	Study 1: 370 Brazillian students; ages 7-16 years Study 2: 450 Brazillian students; ages 7-16 years	Study 1: .84 Study 2: .82	Study 1: .90 Study 2: .81	--	--	

^aEight-Item Brazilian Positive and Negative Schedule for Children

CHAPTER 2

METHOD

Participants

The data analyzed in the current study were collected at a large middle school in a suburban school district in the Southeastern United States as part of a multi-semester, school-wide monitoring of school climate, student engagement, and well-being conducted by the school administration. School teachers administered the surveys in homerooms during the Fall of 2008 (Time 1), the Spring of 2009 (Time 2) and the Fall of 2009 (Time 3). Data analysis excluded participants who were absent on one or more of the three surveys. The final sample consisted of 248 students. The participants (53% male and 47% female) included students who were in seventh grade during the first two data collection points (Fall 2008 and Spring 2009) and were in eighth grade during the final data collection point (Fall 2009). The mean ages were 12.14 years ($SD = .38$), 12.53 years ($SD = .55$), and 13.18 years ($SD = .43$) at Times 1, 2, and 3, respectively. In the sample of students, 61% were Caucasian, 30% were African American, 2% were Asian American or Pacific Islander, and 7% were of other racial heritage. As a rough estimate of socioeconomic status (SES), students were asked to indicate whether they paid for lunch or received free or reduced price lunches. A total of 20% of the students in the sample reported free or reduced lunch status (i.e., lower SES).

Measures

Global LS. Global LS was assessed using the SLSS (Huebner, 1991a). This scale is a self-report measure designed to assess LS in children and adolescents in grades 3 through 12. The scale includes seven statements about one's life (e.g. "My life is going well," "I wish I had a different kind of life"). Participants respond to these statements by rating their agreement for each item on a 6-point Likert scale, ranging from "strongly disagree" to "strongly agree." Total LS scores were calculated by summing the scores on the seven items and dividing by seven. Two items were reverse scored.

Domain-Based LS. Domain-based LS was assessed using a shortened version of the MSLSS (Huebner, 1994). This scale is a self-report measure designed to assess LS in specific domains in children and adolescents in grades 3 through 12. The scale includes statements regarding five domains of life (friends, school, living environment, self, and family). Example items are "My friends are great" and "I enjoy school activities." Participants responded to these statements by rating their agreement for each item on a 6-point Likert scale, ranging from "strongly disagree" to "strongly agree."

Positive and Negative Affect. PA and NA were assessed using a modified version of the PANAS-C (Laurent et al., 1999). This measure is the version of the PANAS specifically tailored for use with children (Watson et al., 1988). The scale consists of 27 items that comprise two subscales: PA and NA. Each of these items consists of an emotionally charged word on which respondents rate the extent to which they have felt each emotion in the past few weeks on a 5-point Likert scale ranging from "very little or not at all" to "extremely or all of the time." Twelve items are positively charged (e.g. energetic, excited, cheerful, and proud), comprising the PA subscale, and 15 items are negatively

charged (e.g. sad, ashamed, lonely, and nervous), comprising the NA subscale. To assess school-related emotions, modified instructions were provided in the current study, requesting that students report on their emotions experienced specifically *in the school setting* (Long et al., 2012).

Data Analysis

The study involved analysis of the de-identified archival data set collected as part of an in-house survey of students' well-being and school climate in a middle school in the southeastern United States. Ethical permission was obtained from the Institutional Review Board at the University of South Carolina. Portions of this dataset have been used in other studies (e.g., Jiang, Huebner, & Siddall, 2013; Kelly et al., 2012); however the present analyses are unique to this study.

Varying amounts of missing data existed in all three waves of data, accounting for a total of 3.88% of the final sample. Missing data were managed using multiple imputation in R 3.0.3, which predicts and replaces any missing values using existing values within the dataset (Rose & Fraser, 2008). Analyses were conducted using SPSS Version 22.0 to calculate test-retest reliability (Pearson's r) and internal consistency (Cronbach's α) for each data set. To investigate the test-retest reliability and internal consistency of the SLSS, the PANAS-C school version, and the 30-item version of the MSLSS, each of 40 imputed data sets was considered. To evaluate test-retest reliability, Pearson's r was calculated between Times 1 and 2, between Times 2 and 3, and between Times 1 and 3 using the imputed data sets, and the average of these results was calculated to obtain a final result. To evaluate internal consistency, Cronbach's α was calculated for each of the components for each measure across all three occasions.

CHAPTER 3

RESULTS

Internal consistency reliability and test-retest reliability were analyzed for the archival dataset. Though specific universal guidelines have not been agreed upon in interpreting Pearson's r for research purposes, an alpha of .70 has been widely used to determine an "adequate" level of internal consistency for research purposes, with higher values expected for clinical purposes (Nunnally, 1994).

Internal Consistency Reliability. To analyze internal consistency, Cronbach's α was calculated using SPSS Version 22.0. The total score on SLSS was analyzed for all three data collection points. Domain-based LS was investigated for the five domains mentioned above and was analyzed for all three data collection points. All alphas were above .80 for the SLSS and the MSLSS scores. The highest internal consistency estimates were found for Family Satisfaction at Time 2 ($M = 4.76$, $SD = 0.11$; 7 items; $\alpha = 0.92$) and for Time 3 ($M = 4.79$, $SD = 0.16$; 7 items; $\alpha = 0.93$). Also, internal consistency for Friend Satisfaction at Time 2 ($M = 5.30$, $SD = 0.14$; 6 items; $\alpha = 0.90$) and for School Satisfaction at Time 2 ($M = 4.37$, $SD = 0.32$; 5 items; $\alpha = 0.90$) were relatively high.

School-based PA and NA were also investigated and analyzed for all three data collection points. All coefficients exceeded .85. Internal consistency for PA at Time 2 ($M = 3.87$, $SD = 0.23$; 12 items; $\alpha = 0.91$) was the highest. Results from analyses revealed internal consistency to be persistently high for all groups and within all measures

indicating that these instruments, used with this population, provided reliable information regarding the various components of SWB. These results are presented in Table 3.1.

Test-Retest Reliability. To analyze test-retest reliability in the SLSS, abbreviated MSLSS, and school-based version of the PANAS-C, correlation coefficients were calculated for the following scores: SLSS Total, MSLSS Family Satisfaction, MSLSS Friend Satisfaction, MSLSS Living Satisfaction, MSLSS School Satisfaction, MSLSS Self Satisfaction, school-based PA, and school-based NA. For each group, Time 1 and Time 2 were compared, Time 2 and Time 3 were compared, and Time 1 and Time 3 were compared (see Table 3.2 for a summary).

Results from analyses revealed statistically significant test-retest reliability estimates for all measures across all three occasions. Correlation coefficients for the T1-T2 (five months) comparison ranged from .43 to .67 (median $r = .64$) across all measures. The scores on the SLSS for this time range resulted in a test-retest coefficient of .66. On the MSLSS, the test-retest coefficient for the Family domain was .67, for the Friend domain was .43, for the School domain was .62, for the Self domain was .66, and for the Living domain was .66. The median coefficient across domains was calculated as .66. The PANAS-C school version yielded test-retest coefficients of .59 and .54 for the PA and NA scales, respectively, when considering the five-month, T1-T2, comparison.

An examination of the T2-T3 (seven months) correlations revealed a range of coefficients from .49 to .71 (median $r = .65$) across all measures. The scores on the SLSS for this time interval resulted in a test-retest coefficient of .69. On the MSLSS, the test-retest coefficient for the Family domain was .69, for the Friend domain was .49, for the School domain was .66, for the Self domain was .63, and for the Living domain was .72.

The median coefficient across domains was calculated as .66. The PANAS-C school version yielded test-retest coefficients of .58 and .56 for the PA and NA scales, respectively, when considering the T2-T3 (seven-month) comparison.

An examination of the T1-T3 (one year) correlation coefficients revealed a range of .32 to .62 (median $r = .56$) across all measures. The scores on the SLSS for this range resulted in a test-retest coefficient of .57. On the MSLSS, the test-retest coefficient for the Family domain was .62, for the Friend domain was .32, for the School domain was .57, for the Self domain was .54, and for the Living domain was .59. The median coefficient across domains was calculated as .57. The school-based version of the PANAS-C school yielded one-year test-retest coefficients of .50 and .41 for the PA and NA scales, respectively.

Differences between one-year and five-month test-retest reliability coefficients and also differences between one-year and seven-month test-retest reliability coefficients were analyzed. Across all levels and domains of measurement instruments, an average decrease in test-retest reliability coefficient of .02 resulted in comparisons of five-month and seven-month coefficients, and a difference of .11 was found comparing seven-month to one-year coefficients. When comparing five month to one-year coefficients, an average decrease of .09 was found across all levels and domains of measurement instruments. These differences represent a decrease in test-retest reliability coefficients across time. In considering only SLSS test-retest reliability, coefficients decreased by .12 when comparing seven months to one year and by .09 when comparing five months to one year coefficients. Both of these changes across time are relatively average decreases compared to the average of all instruments used in the study.

On the MSLSS, test-retest reliability decreased across the seven month to one-year time span by a reliability coefficient of .07 on the Family domain, by .17 on the Friend domain, by .09 on the School domain, by .09 on the Self domain, and by .13 on the Living Environment domain. Test-retest reliability decreased when comparing the five month and one year administrations on all domains, resulting in changes of .05 on the Family domain, .11 on the Friend domain, .05 on the School domain, .12 on the Self domain, and .07 on the Living Environment domain.

The relative magnitudes of the stability coefficients of the MSLSS revealed that all of them (except the Friend domain) were above .60, for the five- and seven-month time periods. For the one-year time period, all of the MSLSS test-retest reliability coefficients remained above .50, except for the Friend domain. The coefficient for the Friend domain was the lowest coefficient across all three time intervals, demonstrating relatively low stability.

On the school-based version of the PANAS-C, test-retest reliability decreased by .09 and .08 on the PA domain and by .13 and .15 on the NA domain when comparing five months to one year and when comparing seven months to one year, respectively. It was anticipated that these types of decreases in test-retest reliability across time would be found, so this result was consistent with expected results. Test-retest comparisons on the five-month and seven-month administrations of the PANAS-C resulted in little differences between PA and NA. However, greater differences were observed between seven-month and one-year comparisons of test-retest reliability. PA test-retest reliability was slightly more consistent across time than was NA, which dropped in consistency (by $r = .15$) at a one-year retest administration.

Comparisons of Means Across Time. A repeated measures ANOVA was conducted to identify significant differences between scores on the three measures across the three data collection points. Means and standard deviations for all measures across all three time periods are presented in Table 3.3. Regarding the SLSS, a significant difference was found, $F(2, 494) = 5.84, p = 0.004, \eta^2 = 0.005$ for students in grade 8 ($M = 4.68, SD = 0.98$) compared to students in grade 7 (fall semester; $M = 4.50, SD = 0.96$) and students in grade 7 (spring semester; $M = 4.56, SD = 1.06$). On average, responses for global LS were lower when students were in grade 8 (Fall 2009), though less than 1% of the variance in global LS was due to the difference in administration times. Regarding the MSLSS, a significant difference was found in the Living Environment domain, $F(2, 494) = 5.67, p = 0.004, \eta^2 = 0.005$ for Time 3 ($M = 4.75, SD = 1.20$) compared to Time 1 ($M = 4.92, SD = 1.11$) and Time 2 ($M = 4.93, SD = 1.20$). Less than 1% of the variance in satisfaction with the Living Environment was due to the difference in administration times. With respect to the school-based version of the PANAS-C, no significant differences were found for PA or NA across Time 1, Time 2, or Time 3.

Table 3.1 Cronbach's Alpha Values of Subjective Well-being Measures

Instrument	Subdomain	Time 1	Time 2	Time 3
SLSS	SLSSTotal (7)	.81*	.86*	.85*
PANAS-C	PosAffect (12)	.90*	.91*	.85*
	NegAffect (15)	.90*	.89*	.88*
MSLSS	FamilySat (7)	.90*	.92*	.93*
	FriendSat (6)	.88*	.90*	.89*
	SchoolSat (5)	.90*	.91*	.90*
	SelfSat (7)	.85*	.86*	.87*
	LivingSat (5)	.83*	.89*	.87*

Note. Number of items is in parentheses.

* $p < .05$.

Table 3.2 Test-retest Reliability Coefficients for Subjective Well-being Measures

Instrument	Subdomain	T1-T2 (5 months)	T2-T3 (7 months)	T1-T3 (1 year)
SLSS	SLSSTotal	.66*	.69*	.57*
PANAS-C	PosAffect	.59*	.58*	.50*
	NegAffect	.54*	.56*	.41*
MSLSS	FamilySat	.67*	.69*	.62*
	FriendSat	.43*	.49*	.32*
	SchoolSat	.62*	.66*	.57*
	SelfSat	.66*	.63*	.54*
	LivingSat	.66*	.72*	.59*

Note. T1 indicates Time 1 for data collection (Fall 2008), T2 indicates Time 2 for data collection (Spring 2009), and T3 indicates Time 3 for data collection (Fall 2009).

* $p < .05$.

Table 3.3 Means and Standard Deviations

Instrument		Time 1		Time 2		Time 3	
		(Grade 7 Fall)		(Grade 7 Spring)		(Grade 8 Fall)	
		M	SD	M	SD	M	SD
SLSS	SLSSTotal	4.50	.96	4.56	1.06	4.68	.98
PANAS-C	PosAffect	46.94	9.33	47.08	9.36	46.65	10.14
	NegAffect	27.85	10.56	27.60	10.14	26.91	9.65
MSLSS	FamilySat	4.84	1.02	4.80	1.11	4.74	1.13
	FriendSat	5.31	.82	5.30	.88	5.30	.84
	SchoolSat	4.30	1.26	4.42	1.21	4.45	1.15
	SelfSat	5.17	.79	5.18	.83	5.15	.82
	LivingSat	4.92	1.11	4.93	1.20	4.75	1.20

CHAPTER 4

DISCUSSION

The present study addressed the internal consistency and test-retest reliability of the SLSS, MSLSS, and a school-based version of the PANAS-C. The investigation of the internal consistency of the SLSS revealed Cronbach's alphas of at least .81 across all three administrations. These estimates are consistent with those found in previous studies, using a variety of youth samples (e.g., Dew and Huebner, 1994; Gilman & Huebner, 1997; Huebner, 1991a; McDougall et al., 2013; Park & Huebner, 2005; Weber, Ruch, & Huebner, 2012). The current findings regarding the internal consistency of the MSLSS were slightly higher than those reported in previous studies with similar samples (e.g., Antaramian & Huebner, 2009; Gilman, Ashby, Sverko, Florell, & Varjas, 2005; Gilman et al., 2000; Griffin & Huebner, 2000; Huebner, 1994; and Huebner et al., 1998). The present results indicated alphas for the domain-based scores with ranges slightly higher than those in previous studies ($\alpha = .83$ to $\alpha = .93$ for this study). Therefore, it is possible that the use of this shorter version of the MSLSS, without the reverse-keyed items, yields higher levels of internal consistency than does the use of the original version.

The internal consistency results of the school-based version of the PANAS-C were consistent with previous findings using the original version of the scale with a sample similar to that of the current study (e.g., Chorpita & Daleiden, 2002; Ebesutani et al., 2011). Internal consistency estimates of both PA and NA in the present study mirror those in the extant literature, ranging from $\alpha = .85$ to $\alpha = .91$ across the three

administrations. The use of the term “at school” in the instructions on this measure seems not to have adversely affected the internal consistency of the PANAS-C.

Taken together, as noted above, the internal consistency estimates for all three measures exceed .80 on all administration occasions. The magnitudes of these alpha coefficients thus suggest adequate internal consistency for research and clinical purposes within this age group (Nunnally, 1994).

The estimates of the stability of these early adolescents’ reports on the three measures also yield meaningful information. The investigation of test-retest reliability of the SLSS revealed coefficients of at least .50 across all three administrations, decreasing by almost .10 over a time span of one year compared five months data. Compared to a study reporting a four-month retest coefficient on the German SLSS ($r = .55$; Weber et al., 2012), the five-month coefficient reported in the present study was slightly higher ($r = .66$). Huebner and colleagues (2000) previously reported a retest coefficient of .53 after a one-year time span, which is comparable to that of the present study ($r = .57$).

On the MSLSS, the magnitudes of the test-retest coefficients across domains were variable. Though few previous studies have reported retest coefficients beyond a one-month interval, one study reported coefficients for a one-year retest time period (Antaramian & Huebner, 2009). Some results from the current study differed from those of the Antaramian and Huebner study. On the Family domain, the results of the current study revealed a higher test-retest coefficient ($r = .62$) compared to that of the Antaramian and Huebner study ($r = .48$). Furthermore, the largest difference in domain test-retest coefficients was seen in the Self domain. The present study yielded a higher retest coefficient on the Self scale by .25. Results of the previous study yielded a

coefficient of .29 after one year while the current study yielded a coefficient of .54 on the Self domain. Another domain exhibiting a degree of difference between studies was the Living Environment domain. In the Antaramian and Huebner study, this domain yielded a test-retest coefficient of .50, and the present study yielded a coefficient of .59. Finally, the one-year retest coefficients for the Friends and School domains across the two studies were similar, only differing by .05 and .02, respectively. The differences observed on the Family and Self domains may be affected by the age differences in the two samples. In the Antaramian and Huebner study, the students were in grades 8 through 10, while students in the present study were in grades 6 through 8. With only one year of overlap in grades, it is possible that levels of satisfaction in specific domains changed based on the grades in which students were assessed, which may suggest that middle school students show higher test-retest coefficients on similar measures than high school students. This finding is surprising given the generally increasing stability displayed in older adolescents with measures of similar constructs, such as self-concept (see Trzesniewski, Donnellan, & Robins, 2003). The differences in findings may relate to differing samples, nevertheless, developmental differences in the life satisfaction reports of children and adolescents warrant further investigation.

The investigation of the test-retest reliability of the school-based version of the PANAS-C revealed coefficients of at least .50 for PA and at least .41 for NA across all three administrations. Given that this was the first study to observe test-retest reliability of the PANAS-C over time increments greater than one month, the extant literature did not provide a guideline for expected results. However, there has been one study that used two subsequent two-week intervals to report test-retest coefficients on the PANAS-C

(Crook et al., 1998). In their results, Crook and colleagues (1998) found test-retest coefficients to be no less than .66 for PA and .72 for NA across all three administrations. Current results of test-retest reliability for PA after a five-month retest interval is .07 less than the one-month retest interval found in Crook and colleagues' (1998) study. The difference between the present one-year coefficient and the previously found one-month coefficient is .16. A larger difference was found using the same time comparisons with the NA domain. Current results of test-retest reliability for NA after a five-month retest interval is .20 less than the one-month retest interval found in the previous study. Further, comparison of the retest coefficients from the present study's one-year interval and the previous study's one-month interval results in a difference of .33. Thus, as expected, the test-retest coefficients for the school-based version of the PANAS-C decreased as the retest time interval increased, though greater differences were found in retest reliability of NA when comparing the present study to that of Crook and colleagues (1998).

The stability coefficients for the global life satisfaction measure obtained with adolescents in the current study are comparable to those found with adults. For example, using the Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), studies have revealed average test-retest coefficients of .84 for one month and .50 for ten weeks (Pavot & Diener, 1993), as well as about .67 for periods of greater than seven years (Lucas & Donnellan, 2007). Similarly, the stability coefficients for the school-based version of the PANAS-C are similar to those obtained with adults using somewhat comparable measures. For example, average test-retest coefficients on the PANAS have been reported as .60 (for PA and NA) for intervals less than or equal to one month and .57 (PA) and .58 (NA) for intervals greater than one month (Leue & Lange, 2011).

Additionally, the lower test-retest reliability coefficients for the affect measures (i.e., school-based version of the PANAS-C) compared to the global life satisfaction measure are consistent with results among adults (Diener, 2000).

With respect to previous literature, current estimates of test-retest reliability appear slightly divergent within dimensions of LS. Previous reports of test-retest reliability over a span of four weeks showed lower coefficients in the Friends (Greenspoon & Saklofske, 1997) and Self (Huebner et al., 1998) domains. Another study in the extant literature reported test-retest coefficients following one- and two-year retest intervals. Antaramian and Huebner (2009) reported the lowest test-retest coefficient in the Self domain regarding the one-year retest and in the Friends and Living Environment domains regarding the two-year retest. In the present study, the largest decreases in test-retest reliability were found for the Friends and Self domains, demonstrating less stability over time, perhaps suggesting that adolescents may experience greater changes in their lives in these domains relative to others. In the Self domain, retest reliability decreased from .63 to .54 between seven months and one year. Nevertheless, the one-year stability coefficient found for the Self domain in the current study is consistent with the extant literature demonstrating that early adolescents' global self-esteem reports show test-retest correlations that are generally approximately .50 for time intervals of one year (Alsaker & Olweus, 1992; Hirsch & DuBois, 1991; Roeser & Eccles, 1998; Trzesniewski, Donnellan, & Robins, 2003).

Furthermore, the lowest coefficient of test-retest reliability reported in the current study was found for the Friends domain of the MSLSS, consistent with the findings of Antaramian and Huebner (2009). Across all three longitudinal comparisons for this study,

the stability coefficients for the satisfaction with friend scores were consistently lower than the coefficients for the other four domains of life satisfaction (range of $r = .32$ to $.49$). This difference is notable, especially given that test-retest coefficients for the other MSLSS domains ranged from $.54$ to $.62$. However, given that Barry and Wentzel (2006) and Bowker (2004) have demonstrated that the nature of friendships is typically unstable in early adolescence, the lower test-retest reliabilities for this domain may reflect the more transient nature of adolescent friendships.

Similarly, it is important to consider the decrease in test-retest reliability coefficients in the SLSS and the PANAS-C from Time 1 to Time 3. Though the comparisons of Time 1 to Time 2 and Time 2 to Time 3 were fairly consistent across all measures of interest, these comparisons each represented only time spans of about six months. When test-retest reliability across the entire year was reported, the coefficients dropped an average of $.10$. Consistent with expectations, these findings show that test-retest reliability slightly decreased over a year's span compared to a span of about six months in middle school students.

Statistically significant changes across time also occurred with respect to the mean levels of student responses on global life satisfaction (i.e., SLSS) and on the Living Environment domain on the MSLSS. On the one hand, the mean responses on the SLSS ranged from 4.50 (Time 1) to 4.68 (Time 3), with higher scores in eighth grade than seventh grade. Although statistically significant, the effect was small. Though the existing literature suggests small decreases in global LS as students transition from elementary school to middle school (Park, 2005; Weber et al., 2012), these findings may suggest a slight rebound effect during the middle school years. On the other hand,

adolescents' mean scores on the Living Environment domain decreased over time, yielding mean scores ranging from 4.75 (Time 3) to 4.92 (Time 1) and 4.93 (Time 2). The mean score when students were in eighth grade was significantly lower than the mean scores for the other two times, though the effect size for this analysis was also small. Even so, current observations support previous findings that have shown that satisfaction in the Living Environment domain may decrease during periods of adolescence (e.g., Antaramian & Huebner, 2009; Park, 2005). Park (2005) found significant differences in the MSLSS Living Environment domain when comparing elementary, middle, and high school students. As students increased in grade, scores on Living Environment satisfaction decreased. This pattern continued when Antaramian and Huebner (2009) investigated students' Living Environment satisfaction in grades 8 through 10. Mean reports in grade 10 were significantly lower than those reported in both eighth and ninth grades. Thus, further research is needed to clarify the precise nature of the declines in satisfaction regarding adolescents' neighborhood and/or community lives.

Strengths, Limitations, and Future Directions. Given the benefits of having high SWB mentioned earlier, interventions for middle school students with low SWB may be necessary in some situations. Psychometrically sound measures of the components of SWB in middle school students are essential in evaluating prevention and intervention efforts related to enhancing students' SWB in middle schools. Reliable measurement is a prerequisite to valid measurement, thus studies of reliability can provide greater understanding in relation to the ability of various psychological measures to detect the effects of interventions. This study thus provides useful, additional information regarding

the internal consistency reliability and stability of three relatively understudied self-report measures of SWB appropriate for adolescents.

Although the sample was relatively large, a major concern regarding the current study is the nature of the sample. The sample was not representative of US youth of this age. Though males and females were represented fairly evenly, it is likely that additional research would be helpful with samples reflecting greater diversity in age, ethnicity, socioeconomic status, and geographic locale.

Despite its limitations, the present study provides a significant contribution to the literature regarding measurement of SWB in adolescents. The results shed additional light on the stability of early adolescents' reports for several relatively newer measures of SWB. The results revealed adequate internal consistency estimates for all three measures for research and clinical purposes with students in grades 6 through 8. Furthermore, the findings demonstrated meaningful levels of stability of the scores on the SLSS, the abbreviated version of the MSLSS, and the school-based version of the PANAS-C over time intervals of five months, seven months, and one year. With the exception of the Friends domain on the abbreviated version of the MSLSS, the magnitude of the correlations suggested that, in general, the scores on the measures reflect moderate degrees of stability ($r > .50$), but are also likely sensitive to situational variability. Of course, future research is needed to clarify the sensitivity of the measures to unplanned and planned (e.g., systematic intervention programs) situational changes across varying time periods.

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