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Psychometric Properties of the Daily Spiritual Experiences Scale: Support for a Two-Factor Solution, Concurrent Validity, and Its Relationship with Clinical Psychological Distress in University Students

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Abstract: This study examined the dimensionality and concurrent validity of the 16-item Daily Spiritual Experiences Scale (DSES) in a sample of 649 university students (448 females) from a private, Catholic university in the Midwestern United States. Present literature predominantly supported a single factor solution. From results of the present study from exploratory principal component analyses (PCAs), a two-component solution (*Closeness to the Divine* and *Selflessness*) accounted for 68% of the variance and was preferred to a single component solution. Confirmatory factor analyses provided support for this two-factor solution over two different single factor solutions. Convergent validity for the DSES was supported through positive correlations between its total score and emerging components and other commonly utilized measures of spirituality and religion. Discriminant validity was supported through negligible correlations with sociodemographic data. Females reported significantly higher DSES scores. Females with low reported spirituality had significantly higher (and clinically significant) symptoms of psychological distress than moderately and highly spiritual females. The findings of the present study provide contrasting conclusions from previous work supporting a single factor solution for the DSES, encourage further investigation into its dimensionality in varying populations, and suggest a unique relationship between spirituality and psychological distress in university students.

Keywords: daily spiritual experiences scale; factor analysis; psychometric properties; university students; sex differences

1. Introduction

Religion and spirituality have received increased interest and attention from researchers over the past decades. While they are closely related topics (Koenig 2012), they represent unique constructs deserving of individual treatment and empirical understanding (Zinnbauer et al. 1997). As the definition of spirituality itself is often up for debate and controversial (Koenig 2008), its measurement is often a difficult task in light of its heterogeneous nature. A concise operational definition of spirituality may include the “aspects of personal life that include the transcendent, divine or holy, ‘more than’ what we can see or touch or hear” (Underwood 2011, p. 30). Regardless, defining such an ethereal concept as spirituality proves difficult and multifaceted for religious scholars and psychologists.

An instrument that has been utilized in the measurement of spirituality as defined above is the Daily Spiritual Experiences Scale (DSES), (Underwood and Teresi 2002). The DSES was designed to measure ordinary spiritual experiences, not experiences that occur rarely or have an exceptional mystic quality (Underwood 2011). It is a self-reporting measure of 16 items assessing one’s inner peace,

connectedness to others and life itself, and perception of God's love within their daily lives. While first created to be utilized in health research, it has received considerable attention within the social sciences and humanities (Underwood 2011).

1.1. Psychometrics of the DSES

The DSES includes items that incorporate both theistic content and items assessing experiences of spirituality that some may not perceive in the context of theistic religion (Underwood 2011, Underwood and Teresi 2002). Underwood (2011) noted that the DSES intentionally provides an "overlapping circles concept" (p. 30) of religion and spirituality. As such, it follows that researchers may conceptualize the DSES as either a unidimensional or multidimensional instrument (Underwood and Teresi 2002; Zemore and Kaskutas 2004). Of note, investigations of the factor structure of the DSES in various populations have yielded variable results.

Many factor analytic studies of the DSES routinely produce a single factor, or unidimensional, structure. In the original validation study, Underwood and Teresi (2002) performed several exploratory principal components analyses. Their first analysis suggested that DSES items tended to cluster as a single dimension. A second analysis using an oblique rotation revealed two factors, with 14 items strongly loading onto one factor and the remaining two (Items 13 and 14) loading onto the other. However, they reported that a "two-item scale is generally undesirable," (Underwood and Teresi 2002, p. 28) although the factor with these two items accounted for an additional 8% of the variance. In all, they concluded that the DSES scale is "unidimensional" (Underwood and Teresi 2002, p. 30).

Continued research on the DSES has supported single factor solutions. In a sample of adults recovering from alcohol abuse, Robinson et al. (2007) corroborated the conclusion of Underwood and Teresi (2002) and suggested the DSES possessed a one-factor solution. Regarding various translations of the DSES, several studies have suggested a similar, single factor solution to the English DSES in German, Chinese, and Spanish samples (Mayoral et al. 2013; Ng et al. 2009; Schmidt 2010).

Studies on the short-form (6 items) of the DSES have provided further support for a single factor solution. Research on variants of the short-form (6-item) of the DSES have purported it to be unidimensional in populations from French-speaking, Canadian older adults (Bailly and Roussiau 2010) to community-dwelling, African-American Mississippians (Loustalot et al. 2011). However, the psychometric properties of the short-form DSES may not be generalizable to those of the long (16-item) form due to fewer items and limited content.

On the other hand, a limited number investigations have supported a multidimensional, two-factor solution for the DSES. Ellison and Fan (2007) understood the DSES as comprised of an eight-item "theistic" and eight-item "non-theistic (self-transcendent)" subscales that differentially related to participants' ratings of happiness. Kalkstein and Tower (2008) found evidence for a two-factor solution of the DSES in a sample of older, primarily Jewish, adults and a community-based sample of adults. They reported one factor with items 1 through 12, 15, and 16 and a second factor including items 13 and 14. Kalkstein and Tower (2008) suggested that the first DSES factor tapped into a fundamental institutional component associated with spirituality. They offered support for the two-item second factor within both populations and cited Underwood (2005) research purporting it as a dimension measuring "compassionate love" (Kalkstein and Tower 2008, p. 408). While the second factor only had two items loading onto it, they considered it meaningfully contributing to the model and measuring unique content.

Zemore and Kaskutas (2004) also found evidence for a two-factor model of the DSES. Their work comes from investigations with adults recovering from alcohol abuse. Their two-factor solution accounted for 70% of the variance, and items were shown to group into meaningful sets. The first factor included every item referring to "God" or "religion" (*Theism*) and the other factor included items assessing connectedness with others and the universe (*Self-Transcendence*). Confirmatory factor analyses by Zemore and Kaskutas (2004) revealed a significantly better fit for the two-factor solution in a notable departure from previous psychometric work (Underwood and Teresi 2002).

In all, work on the DSES' factor structure has yielded differing results, as many researchers support its unidimensional structure while others argue that it is multidimensional and assesses unique but related aspects pertaining to spirituality. Beyond its psychometric structure, other work has focused on the DSES in relation to health- and mental health-related outcomes.

1.2. Religion, Spirituality, and Health

Extensive research has linked increased religiosity to better mental health outcomes and greater emotional wellbeing (Bergin 1983; Koenig 2012). Moreover, methodologically sound literature has investigated differentially religious groups (i.e., those of low, moderate, and high religiosity). Such research supports that those with high religiosity tend to report significantly lower psychological distress than those with low religiosity (Mosher and Handal 1997). Mosher and Handal (1997) further reported that those of low religiosity reported clinically significant psychological distress, that is, scores above a clinically validated cutoff score denoting need for treatment. Similar research has shown a sex difference, with females of differing levels of religiosity reporting varying levels of psychological distress, but no differences among males (Crawford et al. 1989). They (Crawford et al. 1989) also reported that the elevated report of psychological distress among females with low and moderate religiosity was clinically significant. Similarly, Handal et al. (1989) reported that African-American females of low religiosity tended to report clinically significant psychological distress, as well.

Investigations into the DSES have argued that it is related significantly to improved health outcomes through its relationship to better overall physical health (Koenig et al. 2004a), shorter hospital stays (Koenig et al. 2004b), and healthy lifestyle behaviors (Loustalot et al. 2011). Within adult survivors of myocardial infarctions, the DSES has been weakly, but significantly, related to decreased ratings of depressive symptoms (Blumenthal et al. 2007). Still more literature links the DSES to positive *mental health* functioning in various populations (Ciarrocchi and Deneke 2005a; Ciarrocchi and Deneke 2005b, p. 161).

Of note, Desrosiers and Miller (2007) reported a unique finding in regard to sex differences, spirituality, and their relationship to mental health outcomes in adolescents and young adults, which was similar to noted research on religion (Crawford et al. 1989). First, Desrosiers and Miller (2007) reported that girls tended to report greater levels of depressive symptoms and higher daily spiritual experiences as measured by a 6-item short form of the DSES. Secondly, they found that increased daily spiritual experiences significantly predicted decreased depressive symptoms only in girls, perhaps as related to greater emphasis on emotional and personal elements of religion in women (Ozorak 1996; Desrosiers and Miller 2007). Research such as that by Desrosiers and Miller (2007) suggest that spiritual experiences may, in fact, play a protective role against negative psychological and perhaps some physical health outcomes, and the effect may be moderated by gender. This study is limited by its use of a short-form of the DSES, and its emphasis on adolescents.

More thorough research supporting this pattern of spirituality, as measured by the DSES, and mental health is needed in university students, as this group may be at particularly higher risk of developing psychopathology compared to adults and younger adolescents (Arnett 2000; Schulenberg and Zarrett 2006). Emerging adulthood, the age between approximately 18 and 25 (Arnett 2000), is when most mental health problems have their first onset (Kessler et al. 2005). Notably, results from a recent survey of 763 college students showed that over half of these participants suffered from at least one mental health problem at baseline and after two years (Zivin et al. 2009). Moreover, more thorough investigations ought to borrow the methodology of previous studies (Crawford et al. 1989; Handal et al. 1989; Mosher and Handal 1997) that have investigated individuals of varying levels of spirituality (i.e., low, moderate, and high) and clinically significant psychological distress.

1.3. The Present Study

To date, no published study has investigated the factor structure and concurrent validity of the 16-item DSES in a sample of solely university students. While Underwood and Teresi (2002) incorporated undergraduates into their normative study, they included them into a combined sample

(age range 18–88). Further, research has noted that spirituality is a relevant construct of interest for investigation in university students (Creech et al. 2013; Handal and Lace 2017), and literature regarding the relationship between spirituality and mental health may demonstrate unique patterns associated with gender (Desrosiers and Miller 2007). As such, the purpose of the present study was to investigate the psychometric properties of the DSES in the aforementioned specified sample through exploratory principal component analyses, confirmatory factor analyses, assessments of concurrent validity with sociodemographic characteristics and other measures of spirituality and religion, and analysis of the relationship between spirituality and psychological distress.

2. Materials and Methods

2.1. Participants

Participants were recruited from undergraduate courses at a private, Catholic university in the Midwestern United States and participated as part of a larger study. Of the original 670 participants, the final sample of the present study consisted of 649 individuals (M age = 19.37, SD = 1.31), with 201 males (M age = 19.51, SD = 1.39) and 448 females (M age = 19.31, SD = 1.26) who had complete data for the DSES. Ages ranged from 18 to 25 with no significant difference in age between males and females. Most participants were freshmen (53.9%), 21.6% were sophomores, 16.5% were juniors, 7.4% were seniors, and 0.6% were fifth year undergraduates or beyond.

Participants were predominantly Caucasian (74.9%), 9.9% identified as Asian or Asian-American, 4.0% identified as South Asian or Indian-American, 3.7% identified as Multi-racial or Multi-ethnic, 2.8% identified as Black or African-American, 2.6% identified as Hispanic or Latina/Latino, and 1.5% identified as Middle Eastern or Arab-American. One participant each identified as Native American or Native Alaskan, Hawaiian or Pacific Islander, and “Greek.”

Participants were from a variety of religious backgrounds, though a majority identified as Catholic (56.2%). Others identified as Protestant (10%), Non-denominational Christian (8.9%), Agnostic (6.3%), Hindu (3.9%), Muslim (3.2%), Buddhist (0.5%) and Jewish (0.2%). The remaining participants (7.2%) identified as “Other.” Participants reported a range of family annual income from less than \$40,000 (6.3%) to greater than \$160,000 (23.7%), with the median reported annual family income being between \$100,000 and \$120,000.

2.2. Measures

2.2.1. Spirituality

The DSES, as noted above, is a 16-item scale that asks respondents to report the frequency with which they have certain spiritual experiences. It allows responses to range from “never” (1) to “many a day” (6). Item 16 (“In general, how close do you feel to God?”) is scored on a 4-point metric from (1) “not at all close” to (4) “as close as possible.” To maintain consistent directionality among items and to allow the most logical interpretation of scores, all items are coded in the direction such that higher scores reflect greater numbers of daily spiritual experiences with the total DSES score equaling the raw sum of all 16 items. Because many items include the word “God,” participants are instructed that they may substitute the word “God” with another word or concept denoting their personal term for the divine, holy, or supernatural. To maintain item consistency within the present paper’s inferential statistical analyses (e.g., principal components and factor analyses), the raw score of Item 16 was adjusted to match the 6-point spectrum of the other items, but its 4-point spectrum was maintained for descriptive statistical reporting (e.g., means and standard deviations).

The DSES has good reported internal consistency and test-retest reliability in adults (Underwood and Teresi 2002; Ellison and Fan 2007), and variants of the instrument in other languages also have good reported psychometric properties (Ng et al. 2009). The internal consistency of all DSES items in

the present study ($\alpha = 0.95$) was high. Underwood (2011) provided extensive, detailed information about the DSES's development, history, and current use.

2.2.2. Additional Spirituality and Religion Measures

Other instruments utilized in the present study to investigate convergent validity of the DSES included the Spiritual Transcendence Scale (STS) (Piedmont 1999) and the Spiritual Involvement and Beliefs Scale (SIBS) (Hatch et al. 1998). The STS contains 24 items answered on a Likert scale from "strongly agree" to "strongly disagree," and is directionally coded so that higher raw scores capture greater levels of spirituality. Its items include, "I believe that there is a larger meaning to life," and "I meditate and/or pray so that I can reach a higher spiritual plane of consciousness." The STS measures the belief in unity and purpose in life (universality), one's feeling of joy resulting from prayer or meditation (prayer fulfillment), and personal responsibility and connection to others (connectedness). Piedmont (1999) and Piedmont et al. (2009) reported extensive psychometric properties of the STS and acceptable-to-good reliabilities for its subscales (α s ranging from 0.64 to 0.87). Piedmont and Leach (2002) suggest the STS may generalize well across cultures as evidence from samples of Indian Christians, Hindus, and Muslims.

The SIBS (Hatch et al. 1998) is a 26-item instrument designed to measure spiritual beliefs of respondents. Twenty-three items have a 5-point Likert scale from "Strongly Disagree" to "Strongly Agree," or "Always" to "Never," and the other 3 items about frequency of spiritual activity with 5-point Likert scales from "10 or more times" to "0 times." SIBS items are coded so that higher ratings reflect higher levels of spirituality. Its internal consistency has been reportedly high ($\alpha = 0.92$), its test-retest reliability has been demonstrated to be high ($r = 0.92$), and its concurrent validity has been supported (Hatch et al. 1998). The SIBS may avoid cultural-religious bias in the investigation of spiritual beliefs and actions (Maltby and Day 2001). Its items include, "My spiritual life fulfills me in ways that material possessions do not," and "Spiritual activities help me draw closer to a power greater than myself." Factor analysis has supported the SIBS' four-factor structure (Hatch et al. 1998), including dimensions of external/ritual ($\alpha = 0.98$), internal/fluid ($\alpha = 0.74$), existential/meditative ($\alpha = 0.70$), and humility/personal application ($\alpha = 0.50$).

The Duke University Religion Index (DUREL) (Koenig and Büssing 2010) is a five-item measure of religious involvement that is incorporated in epidemiological surveys investigating the relationship between religion and health outcomes. It measures three primary dimensions of religion: organizational religious activity; non-organizational activity; and intrinsic/subjective religion. The DUREL has demonstrated excellent test-retest reliability (intraclass correlation coefficient = 0.91), good to excellent internal consistency with Cronbach's α s ranging from 0.78 to 0.91, and high convergent validity with other measures of religion and religiosity. Extensive reliability and validity data are provided by Koenig and Büssing (2010).

2.2.3. Psychological Distress

The Langner Symptom Survey (LSS) (Langner 1962) is a widely used epidemiological measure of nonspecific psychological distress (Dooley and Catalano 1979; Handal and Lace 2017) that contains 22 items. It assesses sleep difficulties, somatic symptoms, feelings of loneliness and low spirit, cognitive problems, and anxious and depressive symptomatology. Examples of items on the LSS include: "I have personal worries that get me down physically (make me physically ill)," "Do you feel somewhat apart even among friends (apart, isolated, alone)?" and "I have periods of such great restlessness that I cannot sit long in a chair (cannot sit still very long)." Items are coded dichotomously to denote either the endorsement (1) or absence (0) of a symptom. Higher LSS scores represent greater psychological distress and need for treatment. The LSS has robust psychometric properties (Cochrane 1980), with reportedly good internal consistency (Ross et al. 2009). It has demonstrated discriminant validity in identifying psychologically distressed adults and adolescents with a cutoff score of 4 (Handal et al. 1993; Langner 1962).

Recent psychometric analysis of the LSS provided validity for a cutoff score of 5 denoting psychological distress and need for treatment in emerging adult populations (Handal et al. 2015). In this study, college students currently in psychological treatment had a mean LSS score of 7.35 ($SD = 2.75$), which was significantly higher than students previously in treatment who reported a mean LSS score of 4.86 ($SD = 3.60$) and students who had never received psychological care reported a mean LSS score of 3.49 ($SD = 3.98$). Each group was significantly different from one another, and use of the cutoff score of 5 resulted in a 70% percent accuracy rate in university students.

2.2.4. Demographic Questionnaire

A 22-item demographic questionnaire was included that asked participants' age, sex, race/ethnicity, religious or faith identify, year in school, grade point average, parent's marital status, approximate familial income, current living arrangement, employment history, and psychological service utilization history.

2.3. Procedure

Approval from the university's Institutional Review Board was obtained before data collection began. Participants were recruited from undergraduate psychology classes and participated as part of a larger study. Some classes (approximately 66%) offered class credit for participation, while other classes did not offer incentives for participation. Participants accessed the study via SONA, a university-approved research recruitment program, or through a link provided to them by professors who helped with recruitment. After accessing the study, they were directed to a link to the Qualtrics site hosting the survey. Demographic questions were answered first, followed by the DSES, DUREL, STS, SIBS, and LSS. Participants were allowed to skip items or discontinue as desired. Only participants with complete data for the DSES were included for the factor analysis, and those with missing items for other measures were excluded in a pairwise fashion as appropriate.

2.4. Statistical Analyses

All analyses were performed with SPSS 24.0 and AMOS 24.0 for Microsoft Windows. First, as Underwood (2011) reported that "the single factor solution (of the DSES) is the dominant one at present" (p. 34), a principal components analysis (PCA, Table 1, PCA 1) was performed. Criterion of number of factors extracted was set equal to one. Second, exploratory principal components analysis (PCA) with promax (oblique) rotation to allow for correlation(s) among any extracted components using the Kaiser stopping criterion (i.e., retain eigenvalues ≥ 1) were used (Table 1, PCA 2). PCA was preferred to principal axis factoring as the goal was to reduce data into meaningful components, and due to the possible over-extraction of factors from principal axis factoring (De Winter and Dodou 2012). For each PCA, item loadings equal to or greater than 0.40 were considered statistically meaningful and contributory to a component to be consistent with other research on the DSES (Ng et al. 2009). Internal consistencies for each relevant set of variables were assessed using Cronbach's alpha and are reported. Of note, as males and females reported statistically significantly different levels of spirituality (see below), PCAs were conducted on samples of only males and only females. Notably, the component solutions extracted by each of these sex-separated analyses were identical to the component solution extracted on the combined sample; thus, only PCAs and confirmatory factor analyses (CFAs) on the combined sample of males and females are described and discussed.

Thirdly, to test the fits of specified solutions, three CFAs (Table 2) were conducted. The CFAs utilized unweighted least squares (ULS) as their estimation methods, as the DSES item data were ordinal in nature (i.e., Likert scale) (Forero et al. 2009; Li 2014). Next, Pearson's correlation coefficients were computed for each pair of dependent variables to assess the strength of the bivariate relationships and concurrent validity. These correlation coefficients are displayed in Table 3.

Table 1. Results from principle components analysis (PCA) 1 and PCA 2 and Item Correlations with Langner Symptom Survey (LSS) Total.

Item # and Abbreviated Content	PCA 1		PCA 2			Item-Total Corr.	LSS Corr.
	Comp Loading	h ²	Comp 1 Loading	Comp 2 Loading	h ²		
1. God's Presence	0.88	0.78	0.88	-	0.79	0.85	-0.18 *
2. Connection to all Life	0.65	0.42	-	0.46	0.51	0.62	-0.10 *
3. During Worship, Feel Joy	0.87	0.75	0.89	-	0.78	0.83	-0.13 *
4. Strength in Rel/Spir	0.88	0.77	0.88	-	0.79	0.85	-0.12 *
5. Comfort in Rel/Spir	0.86	0.75	0.86	-	0.76	0.83	-0.15 *
6. Inner Peace	0.64	0.41	-	0.43	0.49	0.61	-0.24 *
7. Ask God's Help	0.84	0.70	0.92	-	0.75	0.79	-0.06
8. Guided by God	0.88	0.78	0.92	-	0.81	0.85	-0.11 *
9. Feel God's Love Directly	0.89	0.78	0.92	-	0.81	0.85	-0.17 *
10. Feel God's Love Through Others	0.83	0.68	0.79	-	0.69	0.79	-0.16 *
11. Beauty of Creation	0.67	0.44	0.44	-	0.48	0.63	-0.05
12. Thankful	0.60	0.36	-	0.63	0.56	0.58	-0.14 *
13. Selfless Caring	0.45	0.20	-	0.87	0.67	0.43	-0.08 *
14. Accept Others	-	0.13	-	0.88	0.62	0.34	-0.05
15. Desire Close to God	0.85	0.71	0.88	-	0.74	0.81	-0.11 *
16. How Close to God?	0.83	0.68	0.87	-	0.72	0.79	-0.20 *
Cronbach's Alpha	0.95	-	0.96	0.78	-	-	-

Note: Coefficients not meaningfully loading onto a component (i.e., <|0.40|) are suppressed. See Underwood and Teresi (2002) for full item content and wording. All item-total correlations significant at $p < 0.001$, * $p < 0.05$.

Table 2. Results from CFAs.

Model	GFI	AGFI	NFI	RFI	SRMR
1. One Factor—All 16 Items	0.86	0.84	0.83	0.83	0.25
2. One Factor—Item 14 Excluded	0.89	0.88	0.87	0.87	0.22
3. Two Factors (Closeness to the Divine and Selflessness)	0.95	0.94	0.94	0.93	0.16
Selected interpretive guideline value for good fit	>0.90 †	>0.90 *	>0.90 †	>0.90 ‡	<0.08 *

Note: ‡ Bentler and Bonett (1980); † Byrne (1994); * Tabachnik and Fidell (2001). GFI = Goodness of fit index; AGFI = Adjusted goodness of fit index; NFI = Normed fit index; RFI = Relative fit index; SRMR = Standardized root mean square residual.

Table 3. Correlation coefficients among Daily Spiritual Experiences Scale (DSES) Components and other included measures.

	1	2	3	4	5	6	7	8	9
1. Closeness to God †	-								
2. Selflessness †	0.52 **	-							
3. DSES Total	0.98 **	0.69 **	-						
4. STS	0.68 **	0.52 **	0.71 **	-					
5. SIBS	0.81 **	0.45 **	0.80 **	0.79 **	-				
6. DUREL	0.82 **	0.36 **	0.79 **	0.61 **	0.79 **	-			
7. LSS	-0.17 **	-0.14 **	-0.17 **	-0.09 *	-0.15 **	-0.15 **	-		
8. Age	-0.11 **	-0.07	-0.11 **	-0.02	-0.05	-0.09 *	-0.02	-	
9. Year in College	-0.10 **	-0.07	-0.10 *	-0.05	-0.07	-0.09 *	-0.09 *	0.83 **	-
10. GPA	0.15 **	0.09 **	0.15 **	0.12 **	0.19 **	0.17 **	-0.14 **	-0.01	0.06

Note: * $p < 0.05$, ** $p < 0.01$. † Standardized regression estimates; ns range from 642 to 649. GPA = Grade Point Average.

Next, as females reported significantly higher DSES scores than males, $t(647) = -3.72, p < 0.001$, the sample was separated by sex. Five individuals (three females and two males) had incomplete data for the LSS and were subsequently excluded from only these analyses. Participants were categorized into groups of low, moderate, or high spirituality based on their DSES scores. Those whose DSES scores fell at or below one standard deviation below the mean within their respective comparative sample

(i.e., females or males) were placed in the “low” spiritual group. Those whose DSES scores fell at or above one standard deviation above the mean within their respective comparative sample were placed in the “high” spiritual group. All other respondents whose scores fell between one standard deviation below and one standard deviation above their group’s mean were placed in the “moderate” spiritual group. Visual inspection of the LSS revealed nonnormal distribution. However, given the exceptional robustness against violations of normality (Norman 2010; Schmider et al. 2010), an analysis of variance (ANOVA) was performed in each sample of males and females with the LSS as the dependent variables and spirituality group as independent variables. Tukey’s post-hoc follow-up tests with homogenous subsets were conducted to compare means of unequal sample sizes. Mean LSS scores for each group were compared to a clinically validated cutoff score denoting psychological distress and need for treatment in this population (Handal et al. 2015).

3. Results

3.1. Exploratory PCAs

Inter-item correlations ranged from 0.20 to 0.86, suggesting an adequate range of shared variance among items. Item-total correlations ranged from 0.34 to 0.85, suggesting that each item was related to the overall DSES score (Bernstein and Nunnally 1994). Evidence of high sampling adequacy was found (Kaiser-Meyer-Olkin, KMO = 0.95) (Dziuban and Shirkey 1974), and Bartlett’s test of sphericity ($\chi^2 = 8692.20$, $p < 0.01$) suggested that the correlation matrix was not an identity matrix, and that items could be efficiently analyzed.

Abbreviated item content and their respective loadings for each PCA are presented in Table 1. In the first PCA, two items demonstrated communalities below .30, suggesting that they did not share adequate variance with other items. The one extracted component ($\alpha = 0.95$) contained all but one (Item 14) of the 16 items with loadings ranging from 0.45 to 0.89 (see Table 1, PCA 1), that accounted for 58.41% of the variance.

In the second PCA, communalities of all items fell above .40, confirming adequate shared variance among items. Results from this exploratory PCA (Table 1, PCA 2) revealed that two components were extracted from the 16 DSES items. The two extracted components accounted for 58.41% and 10.05% of the variance, respectively, accounting for a total of 68.46% of the variance. The two components were moderately correlated at $r = 0.52$. Items significantly loading onto the first component (Items 1, 3–5, 7–11, 15, 16; $\alpha = 0.96$) had loadings ranging from 0.44 to 0.92, and those loading onto the second component (items 2, 6, 12–14; $\alpha = 0.78$) had loadings ranging from 0.43 to 0.88. No items loaded onto both components at 0.40 or greater. Each component demonstrated good-to-excellent internal consistency.

The items loading meaningfully onto the first component included all the items with a reference to “God,” and all those with reference to “religion.” Only one item (Item 11) loading onto the first component did not directly reference religion or God. Overall, this component appeared to capture the relationship one has with God and as such, was named *Closeness to the Divine*.

The items loading meaningfully onto the second component seemed to capture a higher-level connection to other people, life, and creation, while also iterating a sense of gratitude. Additionally, four of these five items on the second component matched items on a five-item factor identified by Zemore and Kaskutas (2004) as capturing self-transcendence. In borrowing slightly from previously used nomenclature (Ellison and Fan 2007; Zemore and Kaskutas 2004) and in an attempt to capture the nuanced qualities of the items loading onto it, the second component identified in this analysis was named *Selflessness*.

While Item 14 did not load onto the single extracted component in the first PCA, it loaded the most strongly of any other item onto the second extracted component in the second PCA detailed above. Also, the two-component solution accounted for greater variance and demonstrated higher communalities among items. Overall, the two components extracted from the second PCA appeared to

account for more variance and demonstrate a stronger solution for the DSES than the single component extracted from the first PCA.

3.2. Confirmatory Factor Analyses

Table 2 summarizes available fit indices from each analyzed model and reports interpretive guideline values for indication of good fit suggested in the literature (Bentler and Bonett 1980; Byrne 1994; Tabachnik and Fidell 2001) and utilized in other factor analytic studies of measures of religion and spirituality (Fisher 2013). The first CFA (see Model 1, Table 2) tested the fit of a one-factor solution with all 16 DSES Items. Its goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), and relative fit index (RFI) all fell below 0.90, and its standardized root mean square residual (SRMR) was 0.25. In all, this model appeared to have marginal-to-poor fit as the indices examined did not meet generally acceptable cutoffs denoting good fit. The second CFA (Model 2, Table 2) tested the fit of the one-factor solution with Item 14 excluded, as it did not significantly load onto the single extracted component in the forced one-component PCA as detailed above (PCA 2). Model 2 demonstrated better fit than the one-factor model with all items. However, it still appeared to have overall poor fit with a GFI, AGFI, NFI, and RFI all below 0.90, and an SRMR above 0.20.

The third CFA (Model 3, Table 2) tested the fit of the two-factor solution as proposed by the initial PCA as explained above, with Items 1, 3–5, 7–11, and 15–16 loading onto Factor 1 (*Closeness to the Divine*) and Items 2, 6, and 12–14 loading onto Factor 2 (*Selflessness*). These factors could correlate with each other in the construction of this CFA's model. The fit index values suggested an overall acceptable-to-good fit based on generally accepted criteria for these values. Its GFI fell at 0.95, and its AGFI, NFI, and RFI all fell above 0.90. However, the SRMR suggested less than good fit. Of interest, the SRMR demonstrated a notable decrease from Model 1 (0.25) to Model 3 (0.16). This suggests that, while its SRMR does not meet a commonly accepted cutoff point, the two-factor model (Model 3) provides *relatively better* overall fit than either single factor model for the DSES items investigated in the present study.

3.3. Convergent and Discriminant Validity

Table 3 displays Pearson's correlation coefficients of each bivariate pair of variables. Standardized regression estimate of the *Closeness to the Divine* component highly correlated the DUREL and the SIBS, and moderately correlated with the STS. Standardized regression estimate of the *Selflessness* factor correlated moderately with the STS and SIBS. The DSES Total score correlated strongly with the DUREL, STS, and SIBS. The standardized regression estimate of *Closeness to the Divine* and the DSES total score demonstrated negligible, albeit statistically significant, correlations with LSS score, age, year in college, and grade point average. The standardized regression estimate of *Selflessness* demonstrated negligible correlations with LSS score and grade point average, and nonsignificant correlations with age and year in college (Mukaka 2012).

3.4. DSES and Psychological Distress

As shown above in Table 1, Pearson's correlation coefficients were calculated between each DSES item and the LSS total score. These results revealed that 13 of the 16 items significantly correlated to the LSS total score, but that 3 items did not. The items not significantly correlating with the LSS total score assessed the frequency with which respondents asked for God's help, reflected on the beauty of creation, and the strength of their desire to be close to God. These results reveal that different daily spiritual experiences may relate to nonspecific psychological distress in different ways.

The ANOVA examining differences among low, moderate, and high spiritual males was significant, $F(2, 196) = 3.393$, $p = 0.036$, partial $\eta^2 = 0.033$, as low spiritual males reported significantly greater LSS scores than high spiritual males. Males in the moderate spiritual group did not differ significantly from those in low and high spiritual groups on LSS. Additionally, the ANOVA examining differences among low, moderate, and high spiritual females was significant, $F(2, 442) = 7.444$, $p = 0.001$,

partial $\eta^2 = 0.033$, as females in the low spiritual group had significantly higher LSS scores than females in the moderate and high spiritual groups ($p < 0.05$). The moderate and high spiritual groups of females did not demonstrate significantly different LSS scores.

Notably, the mean LSS score for females within the low spiritual group ($M = 5.23$, $SD = 4.02$) fell above a clinically validated cutoff score of 5 denoting psychological distress and need for treatment in this population (Handal et al. 2015). Of the 87 females in the low spiritual group, 46 (50.6%) reported LSS scores at or above 5, suggesting that more than half of the females in this group were psychologically distressed and in need of treatment. Of the 71 females in the high spiritual group, only 21 (29.6%) reported LSS scores at or above 5. None of the mean LSS score for males in the high, moderate, and low spirituality groups fell above this clinically validated cutoff score. See Table 4.

Table 4. Differences among differentially spiritual groups of males and females

Spirituality Group	Males		Females	
	n	LSS Mean (SD)	n	LSS Mean (SD)
Low (L)	38	4.76 (4.14)	87	5.23 ^a (4.02)
Moderate (M)	130	3.39 (3.16)	287	3.77 (2.92)
High (H)	31	2.81 (3.07)	71	3.79 (2.85)
Group Significance		L > H *		L > M, H *

Note: * $p < 0.05$. LSS = Langner Symptom Survey; ^a Clinically Significant Distress (Handal et al. 2015).

4. Discussion

The results of the present study offer three primary conclusions. The first conclusion supports the use of the DSES as a multidimensional measure of spirituality in university students. Results from principal components analyses and confirmatory factor analyses generally supported a two-factor structure for the DSES over several one-factor structures. This conclusion is in contrast to the presently dominant position of the DSES as a single-factor instrument (Underwood 2011; Underwood and Teresi 2002). Exploratory analyses demonstrated a two-component solution that accounted for over 68% of the variance. Conceptually, the items appeared to group into components assessing *Closeness to the Divine* and *Selflessness*. This conclusion is similar to that of Kalkstein and Tower (2008), who noted that their first factor extracted from DSES items reflects a “strong institutional component” (p. 411) captured by traditional religious words, and their second factor may reflect “compassionate love” (Kalkstein and Tower 2008, p. 408) in its item content reflecting accepting and caring for others. The items assessing acceptance of others (item 14) and selfless caring (item 13) may be manifestations of selflessness or “compassionate love” (Kalkstein and Tower 2008, p. 408) on a daily, experiential level. Notably, while it is possible that the exclusion of these two items may result in a cleaner, unidimensional emergent factor structure, the intent of the present study was to investigate the full breadth of content as measured by the published DSES.

Furthermore, *Closeness to the Divine* correlated more strongly with the DUREL ($r = 0.82$), one of the most robust measures of religion and religiosity (Koenig and Büssing 2010) than with either measure of spirituality in the present study, suggesting that it is likely to be measuring underlying religious components. Also, *Selflessness* correlated more strongly with the STS ($r = 0.52$), a measure of spiritual transcendence that assesses perceptions of universality among all people and connectedness to others (Piedmont 1999), than either the DUREL or SIBS, providing support for the emphasis on other-focused components of spirituality.

Additionally, the conclusion of two factors relates to that of Zemore and Kaskutas (2004) in an investigation of the DSES in a population of recovering alcohol abusers, as they reported items grouped into those assessing *Theism* and *Self-Transcendence*. While the patterns of item loadings onto distinct factors/components were slightly different in the present study, it nonetheless supported the DSES as a two-factor measure—one of which emphasizes respondents’ closeness to God or religion and the other capturing respondents’ relationship to their environment and society. In contrast, the present

study's exploratory analysis with one component extracted accounted for less than 59% of the variance, demonstrated lower relative communalities among items, and resulted in an item failing to significantly load onto the component.

Confirmatory factor analyses (CFAs) supported a two-factor solution over two different single-factor solutions. Single-factor CFAs with all items and all but one item (Item 14) contributing, demonstrated fit indices that were below generally accepted cutoffs cited in literature and in recent psychometric work on measures of religion and spirituality (Fisher 2013). In contrast, the two-factor solution resulted in fit indices that were generally at or above widely accepted cutoffs suggesting that the two-factor solution is better than either single factor solution examined in the present study.

However, importantly, the two-factor solution did not demonstrate perfect fit. In fact, the SRMR fell notably above a value denoting acceptable fit, and other fit indices fell below notably more stringent and conservative values for acceptable fit (e.g., >0.95 for GFI, AGFI, NFI, RFI) (Marsh et al. 2004). However, the cutoff values utilized in the present study were selected intentionally to minimize the possible rejection of a model that may, in fact, adequately fit the data (i.e., reduce Type II error). Regardless, the two-factor model provided *relatively* better fit than either single-factor model as its values met many more predetermined fit criteria than either single-factor model. Continued psychometric investigation should seek to refute and/or confirm the models proposed throughout the literature (see Underwood (2011)) and the two-factor model proposed above.

Why might the DSES demonstrate a clear two-factor solution, one of which strongly related to religiosity and the other of which strongly related to spiritual transcendence and connectedness, in the present sample of university students? Perhaps for university students, the dichotomy of institutionalized religion and individual spirituality remains salient. From a developmental lens, university students (most of whom were freshman in the present sample) may have not yet fully integrated religion and spirituality as united constructs (Koenig 2012). Importantly, literature supporting the DSES' *singular* dimensionality predominantly occurs in adults (Bailly and Roussiau 2010; Loustalot et al. 2011; Mayoral et al. 2013; Robinson et al. 2007). It may be that adults and older adults are more religiously and/or spiritually mature to recognize the "overlapping circles" (Underwood 2011, p. 30) conception of religion and spirituality whereas university students may hold fast to a more separated view of the two. Relatedly, it may be that university students do not integrate institutionalized religion and acceptance of others (item 14) and selfless caring (item 13), as these two items loaded most strongly onto *Selflessness*. University students may be prone to identify as "spiritual, but not religious," making the differentiation between religiosity and spirituality in this population difficult (Handal et al. 2014; Handal et al. 2016).

Spiritual development as an individual quest during university years may relate to one's institution (i.e., religiously affiliated or secular) (Bradley and Kauanui 2003), peer-involvement and available extracurricular opportunities (i.e., student ministries, outreach groups) (Ma 2003), and usually involves self-referential exploration and the consideration of one's faith, meaning, and other existential concerns (Parks 2000). Spiritual development may be even more important for those who of Judeo-Christian background (which is much of the present sample) who study at a religiously affiliated university. The interactions of these facets can ultimately impact the overall integration of one's identities, both religious and spiritual (Dalton et al. 2006). Creech et al. (2013) reported that levels of religiosity and spirituality tended to decrease throughout one's university years, the extent to which university students integrate spirituality in their daily lives may *increase* after their first year (Bryant et al. 2003). In all, one's ability to define his or her own spirituality and integrate it with other aspects of one's own beliefs may be more limited at the beginning of college than it is for those who are older. Continued research should study religiosity, spirituality and their integration as well as the dimensions of the DSES in university students at each year level.

The results support a secondary conclusion, in that the DSES demonstrated appropriate concurrent validity with other included measures in the present study. The DSES and standardized regression estimates of its extracted components (*Closeness to the Divine* and *Selflessness*) demonstrated convergent

validity through good relationships with other theoretically related measures of spirituality (STS, SIBS) and religion (DUREL). The total DSES correlated most strongly with the SIBS, suggesting that daily spiritual experiences may relate closely with internal spiritual beliefs. The total DSES correlated next most strongly with the DUREL, a psychometrically robust measure of religion used in epidemiological studies. Perhaps the influence of the language of institutional religion in the DSES' assessment of spirituality influenced this relationship. Additionally, the DSES was designed so as to allow for "overlapping circles" (Underwood 2011, p. 30) between the constructs of religiosity and spirituality.

Furthermore, the DSES and its components demonstrated weak or nonsignificant correlations with demographic characteristics. Notably, it may be that age and year in school are negatively associated with spirituality in emerging adulthood. Previous research in university students has suggested that college freshman report higher religiosity and greater numbers of daily spiritual experiences than college juniors and seniors (Creech et al. 2013). As such, such a relationship may be reflective of a decrease in spirituality over one's time in university. Continued scholarship in this area is warranted to fully determine the overall relationships between demographic variables and DSES scores. In summary, however, the DSES and its extracted components demonstrated meaningful correlations with scales of spirituality and religion, and weak correlations with other measures of psychological distress and demographic characteristics that may or may not be attributable to a decrease in spirituality over one's emerging adulthood years, or may simply be a statistical artifact of sample size (Altman and Krzywinski 2015).

A third conclusion involves the significant difference between males and females on the DSES that was observed, as females reported significantly higher levels of daily spiritual experiences than males. This finding is similar to extant literature suggesting females tend to report more daily spiritual experiences than males, particularly in American samples (Underwood 2011). Further, these results suggest that significantly different patterns of psychological distress emerge between males and females of low, moderate, and high spirituality. Females who reported low levels of spirituality had significantly greater psychological distress than females in the moderate and high spirituality groups, and males demonstrated a similar pattern. Of greater importance, however, was that women of low spirituality tended to report symptoms at or above a clinically validated cutoff score denoting psychological distress and need for treatment for use in this population, while males did not tend to report clinically significant psychological distress.

This finding raises questions as to why the differential pattern between males and females is observed. Perhaps females who experience psychological distress distance themselves from spiritual experiences, become less aware of their connectedness to God or other divine beings and to others, and subsequently are more prone to develop psychological distress. Other work notes a link between self-reported religiosity and greater social desirability and impression management (Gillings and Joseph 1996; Leak and Fish 1989), which may in turn relate to reluctance to report psychologically distressing symptomatology.

Alternatively, in the same way that religion may serve as a protective factor in its provision of social support and collaborative coping mechanisms in light of negative events (Idler 1987), spiritual experiences and spirituality may function in a similar capacity. It may be that those who have more daily spiritual experiences are better able to self-regulate their emotions in the same way that those who are highly religious are (Watterson and Giesler 2012), and are thus able to monitor and downregulate psychopathological symptoms. Additionally, as some DSES items assessed for "comfort" received from one's religion and spirituality, it may be that more spiritual experiences allow one to contextualize experienced distress and be comforted in light of them, and this may be a more salient process for women. Further research investigating the reasons why this pattern is observed among females but not males in relation to spiritual experiences and spirituality with psychological distress and the influential mediation and moderating factors involved is duly needed.

Additionally, this finding carries more practical weight for mental health practitioners, members of the clergy or other religious leaders, and anyone who may work in a setting wherein mental

health and spirituality are relevant concerns. Clinicians should continue to be sensitive to clients' or patients' spirituality in the context of presentations of mental health, and be mindful of its use in a therapeutic context. Clinicians should approach spirituality in a holistic context and refrain from judgment of a client's or patient's individual beliefs or ideas as they relate to spirituality or mental health. Importantly, continued research on mental health outcomes and their relationships to spirituality in emerging adulthood is warranted.

5. Limitations and Future Directions

Limitations for the present study are several. Firstly, these results were found in a sample of university students and did not include individuals from a broad age range. Also, these results were reported in the context of a private, religiously affiliated, Midwestern university. Previous research has suggested that students from private and public universities may differ in their reports of religiosity (Low and Handal 1995), and this pattern may be consistent with spirituality, as well. Moreover, the predominance of Catholics in the present sample may notably limit the broad generalizability of these findings to other samples of university students or emerging adults.

Further, participants mostly identified as White with relatively fewer students of reported African or Latino descent. The sample appeared relatively affluent as compared to the general American population, as the median annual family income reported by participants in this sample was greater than \$100,000. As such, future research is needed to determine if the DSES holds similar factor structure in various samples of university students in public and private, non-religious affiliated universities with a variety of ethnoracial and socioeconomic backgrounds across diverse geographic locations. Additionally, future research should include other samples, including adults and older adults, individuals at high risk for developing psychopathology (e.g., emergency room nurses, social workers), or those with manifest psychopathology (e.g., those with clinical depression, psychiatric inpatients).

Secondly, this was a monomethod investigation that entailed only self-report of spirituality, religiosity, and psychological distress. Perhaps obtaining informant-reports (when ethically and feasibly available) would provide additional context surrounding the constructs of interest in this study. Finally, the present study did not include measures of physical or general overall health. Previous literature has suggested a link between spiritual experiences and physical health outcomes (see Underwood (2011)) in addition to psychological outcomes. Extending such research to an emerging adult population would be of merit.

Thirdly, the confirmatory value of a CFA may be limited if the model is based on exploratory analyses on the same data. Future investigations should maximize sample size (i.e., 1000+ participants) to ensure the ability to split datasets into those for exploratory and confirmatory analyses, respectively.

Finally, future research should more closely examine the relationships between individual daily spiritual experiences, or even other facets of spirituality (e.g., transcendence, spiritual practice), and psychological distress. The present study provided correlation coefficients between the LSS and DSES items, and seeks to bring forth future a starting point for continued discussion on mediating or moderating factors between these spiritual facets and psychopathological symptoms.

6. Conclusions

In conclusion, the present study supported a two-factor solution of the DSES (Closeness to the Divine and Selflessness). St. Teresa of Avila wrote, "The Lord asks only two things of us: love of His Majesty and love of our neighbor" (Avila et al. 2007, p. 146). Perhaps it is no mistake that the DSES items and its two-factor structure with the most support in the present study correspond relatively well with the divine mandates outlined by St. Teresa's writing. Furthermore, the present study supports appropriate convergent validity with other measures of spirituality and religiosity. Lastly, it demonstrates a unique link between daily spiritual experiences and clinically significant psychological distress in *only* emerging adult females, as females reporting low levels of daily spiritual experiences tended to report psychological distress at or above a clinically validated cutoff score

denoting need for treatment. The study opens new areas of continued scholarship, and provides meaningful conclusions for psychologists, mental health clinicians, and theologians alike.

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