Personality and Individual Differences 99 (2016) 217–224

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Validating a measure of life satisfaction in older adolescents and testing invariance across time and gender

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ARTICLE INFO

Article history:
Received 22 March 2016
Received in revised form 3 May 2016
Accepted 6 May 2016
Available online 20 May 2016

Keywords:
Subjective well-being
Life domains
Measure invariance
Confirmatory factor analysis

ABSTRACT

The general purpose of this study was to explore the measurement of life satisfaction in older adolescents over time using a nationally representative sample. One specific aim was to capitalize on a pre-existing dataset that included a measure of life satisfaction yet to be validated. Another specific aim was to examine the measurement invariance of the best fitting model for this scale across gender, time, and the interaction of these two variables. Participants ($N = 7643$) completed a 12-item scale designed as part of the Longitudinal Surveys of Australian Youth (LSAY) project. Participants of the 2003 Cohort completed this scale across three waves. Single-group confirmatory factor analyses supported the superiority of a two-factor model (i.e., current life satisfaction; satisfaction with future prospects) of life satisfaction in the overall sample and across gender and time. Results from a series of multi-group confirmatory factor analyses indicated that the two-factor model exhibited strong measurement invariance (i.e., configural, metric, scalar, invariant factor co/variances and uniqueness) across gender, time, and gender × time. Collectively, these findings support the LSAY scale as a stable measure of perceived life satisfaction in older Australian adolescents.

1. Introduction

Researchers have demonstrated that life satisfaction in adolescents predicts important psychological (e.g., rates of psychopathologies), social (e.g., strength of relationships with parents) and behavioral (e.g., rates of delinquency) outcomes (Huebner, 2004). Drawing on Diener and colleague's works (Diener, 2009; Diener, Scollon, & Lucas, 2003), life satisfaction forms part of a larger concept known as subjective well-being. In line with this conceptualization, life satisfaction – or the cognitive components of subjective well-being – comprises the general (e.g., happiness with life in general) and specific (e.g., happiness at work, happiness with peers) evaluations individuals make about their lives. Subjective well-being also comprises affective components such as pleasant (e.g., happiness, love) and unpleasant (e.g., anger, worry) emotions. The key focus of this study was life satisfaction. We chose to focus on this topic alone as confidence in some of the findings concerning life satisfaction is restricted by the use of measures that focus mainly on general and not specific aspects of individuals' lives (Diener, Emmons, Larsen, & Griffin, 1985; Huebner, 2004). Additionally, previous measures of life satisfaction have not been empirically validated with large, representative samples (Huebner, 2004). In this study, we capitalized on a pre-existing, nationally representative dataset to examine the reliability and validity of an established tool that was designed to capture general and specific dimensions of life satisfaction among older adolescents. It is important that the structural make-up of this measure is clarified, as this tool has the potential to inform substantive investigations of life satisfaction among adolescents (e.g., Parker, Jerrim, & Anders, 2016).

Although individuals' general evaluations of their lives are omnipotent, the influence of specific life domains on life satisfaction is likely to change across key development stages (Diener et al., 2003). For example, young professionals may place greater value on the satisfaction derived from their work, compared to older adults who may be more likely to base their sense of satisfaction on their perceived levels of safety and health (Daig, Herschbach, Lehmann, Knoll, & Decker, 2009). Adolescents may also weigh specific life domains differently to other age groups. During adolescence – a time of physical, emotional, and social change – individuals experience heightened levels of uncertainty about their future and often search for opportunities to quell such anxieties (Montemayor, Adams, & Gullotta, 1990; Susman & Rogol, 2004; Tatar, 1998). Researchers have demonstrated that adolescents, particularly those in the later stages of this development period, who hold positive perceptions about their future prospects are likely to transition successfully into adulthood (Roisman, Masten, Coatsworth, & Tellegen, 2004). However, the majority of valid assessment tools available for exploring life satisfaction in older adolescence (i.e., 17–19 years) that include items related specific life domains relevant to this age group is

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http://dx.doi.org/10.1016/j.paid.2016.05.015
0191-8869/

scarce. Such scarcity promotes the need to validate robust measures of life satisfaction for this group (Huebner, 2004).

In light of the knowledge above, life satisfaction can be viewed as a multidimensional concept. That is, life satisfaction comprises a general facet, as well specific facets (Diener et al., 2003; Huebner, 2004). As such, measures of life satisfaction should reflect the multidimensional nature of the concept. However, Diener and colleagues (Diener et al., 1985; Pavot & Diener, 1993) found support for a single factor model of life satisfaction, a measure that has since been widely used in the field. On closer inspection, this measure may only reflect general evaluations of life satisfaction, but not specific life domains as well. Other researchers have demonstrated support for a two-factor model that includes general and specific aspects of life satisfaction (see, Zautra & Reich, 1983). Further still, other researchers (Huebner, 1991) have supported a three-factor model of life satisfaction, again advocating a general component of life satisfaction, as well as more specific factors. Taking into consideration these previous findings, it is fruitful to test single, two-, and three-factor models when validating measures of life-satisfaction.

1.1. Scale validation

An important feature of scale validation concerns the assessment of the robustness of the measurement model. One means for assessing the robustness of the measurement model is to evaluate measurement invariance (Pitts, West, & Tein, 1996). Measurement invariance refers to the stationarity and stability of the theoretical structure of the assessment instrument. Strong stationarity (i.e., the stability of factor loadings for each item on their respective construct over time) demonstrates that the same construct is being measured across time and is based on the longitudinal invariance of the factor structure and structure coefficients (Pitts et al., 1996). Strong stability demonstrates that the relative rank order of participants on the construct remains constant across time and is based on the longitudinal invariance of the factor covariances (Pitts et al., 1996). The evaluation of measurement invariance to assess the robustness of assessment instruments has increased in popularity among researchers within the development literature in particular, a field in which the availability of measures is growing (Little, Preacher, Selig, & Card, 2007). Two variables that are useful for measuring the stationarity and stability of assessment instruments, as well as being worthy of consideration because of their contested and evidenced associations with life satisfaction, are gender and time.

1.1.1. Gender invariance

Whereas some investigators have reported gender differences in perceived life satisfaction in adolescents (Levin, Currie, & Muldoon, 2009), a greater number of researchers have found no significant differences between males and females (Diener et al., 2003; Huebner, 2004; Rask, Åstedt-Kurki, & Laippala, 2002). Evidence suggests gender differences in life satisfaction in adolescents is modest and has been explained as a result of mediating psychological processes such as coping style and goal orientations (Huebner, 2004). These conclusions are well supported (Lucas, Clark, Georgellis, & Diener, 2003; Mahon, Yarcheski, & Yarcheski, 2005) and justify the testing of gender invariance to validate the psychometric properties of the measure among older adolescents. As such, a measurement model that is invariant between genders would support utility and universality of the measure. It is important that measurement equivalence across gender groups is assessed to enhance confidence that any differences in findings are due to real quantitative variations as opposed to differences in measurement properties of the construct (Millsap, 2010).

1.1.2. Longitudinal invariance

Longitudinal designs are considered one of the most reliable and rigorous means of assessing developmental changes in psycho-social constructs because data are collected in situ, as opposed to requesting individuals to recall events that may have occurred some time ago (Menard, 2002; Ruspini, 2008). Measurement invariance over time is an important assumption that should generally be tested in longitudinal investigations to ascertain whether the associations between the observed variables and their underlying latent construct remain stable (Meredith & Horn, 2001; Vandenberg & Lance, 2000). Concerns arise when a scale used to assess a particular construct does not exhibit evidence of longitudinal invariance because of the ambiguity in interpreting changes in mean scores and correlations between time points (Horn & McArdle, 1992). In other words, changes in item functioning or in the factorial structure of the construct can confound an understanding of true developmental changes in the attribute itself. Researchers have previously indicated that, regardless of age, life satisfaction remains stable over time (Diener et al., 2003; Huebner, 2004). However, life satisfaction can be influenced by meaningful life circumstances (e.g., graduating from high school, parental divorce)(Lucas et al., 2003). These changes are typically temporary and individuals often return to previous levels of life satisfaction (Lucas, Clark, Georgellis, & Diener, 2004). Such patterns are consistent with definitions and conceptualizations of life satisfaction, namely that individuals' evaluations of their lives reflect their life as a whole and not just single events. As such, invariance across time would indicate a robust measure of life satisfaction in older adolescence.

The general purpose of this study was to explore the measurement of life satisfaction in older adolescents over time using a nationally representative sample. One specific aim was to capitalize on a pre-existing dataset that included a measure of life satisfaction yet to be validated. Another specific aim was to examine the measurement invariance of the best fitting model (either single, two-, or three-factor) for this scale across gender, time, and the interaction of these two variables. It was expected that the factor structure of life satisfaction would be replicable and invariant across gender and time, as well as the interaction of these two variables.

2. Methods

2.1. Sample

The three-wave data set used for the present study comes from the 2003 Cohort of the Longitudinal Survey of Australian Youth (LSAY) project. The LSAY entails a series of panel surveys of nationally representative young Australians with the aim of collecting information on the transition from school into further study, work, and elsewhere. Detailed background and technical information on these surveys can be obtained on the website (http://www.lsay.edu.au/cohort/2003/101.html). The sample used herein comes from the 2003 Cohort and employs data collected at Waves 2 (i.e., 2004), 3 (i.e., 2005), and 4 (i.e., 2006). At Wave 2, a total of 9378 young people ($M_{age} = 15.25$; $SD_{age} = 0.29$) provided responses to the primary measure of the current study. Due to study attrition, the total sample reduced to 8649 (8% attrition) and 7643 (12% attrition) young people at Waves 3 and 4, respectively. An overview of the demographic details of participants at each wave is detailed in Table 1.

2.2. Procedure

The 2003 Cohort of the LSAY project was constructed by randomly selecting 50 students aged 15 years from a sample of schools designed to represent all states. At Wave 1, various assessments (e.g., mathematical literacy, reading literacy) were administered and demographic questionnaires were completed in the school setting. Young people also participated in a follow-up telephone interview to provide further school and work information. From 2004 (i.e., Wave 2), young people participated in an annual telephone interview in which they responded to questions on various issues (e.g., school, transitions from school, post-school education and training, work, job history, health). Ethical approval to access the LSAY dataset was provided by [name and approval number blinded for peer-review].