Soc Indic Res (2014) 117:367–385
DOI 10.1007/s11205-013-0351-6

# Validity of Domain Satisfaction Across Cohorts in the US

**Anthony R. Bardo · Takashi Yamashita**

Accepted: 13 May 2013 / Published online: 18 May 2013


**Abstract** Domain satisfaction, a relatively under-researched topic in subjective well-being research, is designed to capture satisfaction in multiple aspects of life (e.g., family, health). In view of the life course perspective, perceptions toward such different domains of life are most likely influenced by the historical and social climate that individuals uniquely experience over their life span. However, little is known about whether domain satisfaction is a valid measure across cohorts, which reflect differing life experiences at each life stage. This study examines the psychometric properties (e.g., validity and reliability) of a domain satisfaction measure across seven theoretically meaningful cohorts (e.g., Baby Boomers) using a nationally representative sample of American adults from multiple waves of the General Social Survey (n = 15,302). Results from confirmatory factor analysis showed that the validity of the domain satisfaction measure was not consistent across cohorts; unlike when all samples (e.g., cohorts were not considered) were analyzed together. A series of follow-up analyses also revealed that temporally proximate cohorts that were born around the same time were more likely to be psychometrically comparable, while temporally distant cohorts were not. In summary, this study provides empirical evidence suggesting that the validity of domain satisfaction is sensitive to cohort effects, and researchers need careful consideration when comparing cohorts chronologically further apart.

**Keywords** Domain satisfaction · Life course · Cohort effects · Confirmatory factor analysis · Subjective well-being

A. R. Bardo (✉)
Department of Sociology and Gerontology, Miami University, 396 Upham Hall, Oxford, OH 45056, USA
e-mail: bardoar@miamioh.edu

T. Yamashita
Department of Sociology, University of Nevada, Las Vegas, 4505 S. Maryland Parkway, Box 455033, Las Vegas, NV 89154, USA
e-mail: takashi.yamashita@unlv.edu

## 1 Introduction

Subjective well-being (SWB) is one of the most widely used quality of life indicators in social science research (for examples, see: Krause 2003; Thomas 2010; Westerhof and Barrett 2005). A variety of SWB concepts such as happiness and life satisfaction, and measures such as single item happiness and domain satisfaction (e.g., a composite measure of multiple life domains such as residence, health, hobby, income, job, family and friend satisfaction), are employed to capture overall quality of life. However, relatively little is known about the validity of SWB measures across cohorts. Each cohort uniquely experiences important historical events and social movements at different stages of life. As such, cohort differences represent a major source of social variation, which strongly influences individuals' perceptions toward quality of life (Ryder 1965; Settersten 2002; Yang 2007). Therefore, the qualitative nature of SWB constructs is likely to vary across cohorts.

Among many existing SWB indicators, domain satisfaction, which captures an individual's satisfaction with specific domains of life, is a relatively under-researched topic in SWB research (Cummins 1996; Oishi and Diener 2001; Rojas 2006). Domain satisfaction is a function of life satisfaction. Different measures may reflect different types of life satisfaction, such that global measures are closely associated with a person's disposition, and domain based measures might more precisely reflect actual life experiences (Diener et al. 2000). Life experiences are often regulated to the individual level, but also include social experiences that may be similarly shared among members of a specific birth cohort. For instance, Elder (1974) suggested that the Great Depression may have negatively impacted its younger cohort's life-long trajectories of general well-being due to difficult early life experiences. Despite a steady growing interest in SWB and aging, cohort variation in domain satisfaction remains understudied. This study examines the validity of a domain satisfaction measure across cohorts in the US adult population to better understand how formative life experiences can shape perceptions of domain satisfaction.

### 1.1 Domain Satisfaction

Domain satisfaction can be understood as the result of satisfaction in specific domains that are pertinent to the way in which an individual evaluates their own life (Pragg and Ferrer-i-Carbonell 2007). Domain satisfaction has been found to be a valid and reliable measure of SWB (Andrews and Withey 1976; Krueger and Schkade 2008; Schimmack et al. 2010; Michalos 1980), and in some cases more reliable than measures of satisfaction with life overall (Kristensen and Westergaard-Nielsen 2006; Lucas and Donnellan 2012). However, there are many possible partitions of domain satisfaction to consider. For example, Cummins (1996) suggests that health, safety, emotional well-being, material well-being, productivity, community, and intimacy are the seven most important life domains. Day (1987) argues for thirteen different domains, and Flanagan (1978) suggests that researchers should consider fifteen specific domains. Moreover, there is a body of literature that examines domain satisfactions in isolation (see, for example Table I in Cummins 1996; Wannous et al. 1997).

Although there is substantial variation in domain satisfaction measures, specific domains usually include some variation of the following; place of residence, leisure, family life, friendships, health, work, and income (Andrews and Withey 1976; Argyle 2001; Heady and Wearing 1992). Schimmack et al.'s (2010) study examined domain satisfaction (household income, health, housing, leisure), and found that household income has a relatively high reliability compared to housing and leisure. Regardless of domain satisfaction partitioning, any enumeration or demarcation of domains of life should share at least two common

concerns; (1) they must include a manageable number of domains, and (2) the selection of domains must relate to the way people think about their lives (Rojas 2006). For example, some aging based research may not want to include job or income related domains because a large proportion of their sample is likely to be retired or no longer participating in the formal labor market. Furthermore, other life domains, such as health and marital quality, have been shown to be more important in later years (Crosnoe and Elder 2002). Additionally, there are methodological reasons to partition domain satisfaction. For example, certain domains of life (e.g., health) are often excluded to avoid issues of collinearity when other health measures are controlled for in a statistical model (Diener et al. 2000).

The relationship between domain satisfaction and more global measures of SWB (e.g., life satisfaction) is controversial. Most previous studies assume that the relationship between domain satisfaction and life satisfaction is additive (Rojas 2006); while others stress the use of ordinal techniques (e.g., ordered-probit models) in order to recognize the ordinality of life satisfaction (Praag et al. 2003). Moreover, some researchers suggest that weighted domain satisfaction scores is the best approach (Hsieh 2004), while still others argue against such practices (Trauer and Mackinnon 2001). Weighted domain satisfaction, or the practice of multiplying satisfaction and importance ratings, takes peoples' preferences into account. The argument for this multiplicative approach is that it should produce a more valid domain satisfaction measure by taking into account the importance of specific domains. There is some evidence that supports the use of importance ratings (Schimmack et al. 2002; Schneider and Schimmack 2010), but studies have found that both the multiplicative and additive approaches are just as highly correlated with global life satisfaction measures (Andrews and Withey 1976; Campbell et al. 1976; Trauer and Mackinnon 2001; Wu and Yao 2006; Wu et al. 2009; see also Zou 2010). Regardless of partitioning (e.g., 7 item, 13 item, 15 item, etc.), and approach (e.g., additive or multiplicative), it is evident that domain satisfaction is an important facet of life satisfaction specifically, and SWB more generally.

### 1.2 Cohort Effects on SWB

Only a few cohort analyses of SWB indicators have been done in the US (e.g., Yang 2008), and even fewer in regards to domain satisfaction. Therefore, this section discusses previous findings in regards to various measures of SWB over the life cycle. The previous studies discussed below should only be interpreted as a proxy for the lack of life course research on domain satisfaction. Most SWB concepts are highly correlated, and are often used interchangeably (Lu 1999), but this should be avoided when possible. SWB trends (e.g., happiness and life satisfaction) observed in the past have been hypothesized to reflect cohort differences (Easterlin 2001; Rodgers 1982; Yang 2008). Trend studies on happiness have found that older adults (65+) were less happy than younger adults (18–64 years old) prior to 1970, but the older population has become happier in more recent years (Rodgers 1982). Some scholars contend that cohort changes and historical events cannot affect the association of SWB with age (Diener and Suh 1997; Shmotkin 1990); yet further empirical research is warranted in this area (Easterlin 1987; Elder 1974; George 2010; Yang 2008).

Yang (2008) examined several hypotheses to explain cohort variation in SWB trends. For example, the "post-materialism" hypothesis is associated with smaller increases in happiness among more recent cohorts due to a shift in values in the 1960s (Rodgers 1982; Yang 2008). The Easterlin hypothesis associates birth cohort size with SWB trajectories, as larger cohorts are expected to have a greater level of competition for schooling and jobs, which act as pathways toward increased levels of SWB (Easterlin 1987; Yang 2008). The Easterlin hypothesis may explain lower levels of happiness among the Baby Boomers

(Yang 2008). Ryder's (1965) proposition emphasizes that individuals are most impressionable during their formative years (e.g., childhood and young adulthood). The Great Depression cohort's overall lower levels of well-being might be directly related to their difficult childhood and/or difficult young adulthood during WWII (Elder 1974).

Cohort effects are also associated with various components of SWB (e.g., positive and negative affect). Possible cohort effects were observed for the Great Depression cohort on positive and negative affect in the Longitudinal Study of Generations. Specifically, negative affect declined at a slower pace, and positive affect declined slightly among those who experienced the Great Depression compared to more recent cohorts (Charles et al. 2001). At the same time, a study of 2,727 participants in the Midlife in the United States Survey suggested that positive affect increased and negative affect decreased across age groups, though they were unable to distinguish between age and cohort effects (Mroczek and Kolarz 1998). In spite of somewhat mixed findings, these cohort effects suggest that time-specific macro-level factors reflected in cohort variations most likely play a significant role in shaping individual SWB trajectories (George 2010).

### 1.3 Cohort Construction

Other research has found that levels of SWB are often stable across different cohorts (Baird et al. 2010). For example, Hamarat et al. (2002), and Blanchflower and Oswald (2008), found no significant differences in life satisfaction across cohorts. However, such studies often defined cohorts based on somewhat arbitrary age groups (e.g., middle-aged = 45–64, young-old = 65–74, oldest-old = 75–89) without clear theoretical underpinnings. In this respect, theoretically identified birth cohorts that capture effects of specific experiences at similar life stages on SWB also need to be examined (George 2010; Ryder 1965). The need for theoretically sound cohort analysis is based on at least three assumptions; (1) individuals are particularly impressionable early in their life span, (2) these youthful impressions carry over into adulthood and later life, and (3) cohort members experience similar historical events in similar ways (Hughes and O'Rand 2004).

Hughes and O'Rand (2004) propose that at least six twentieth-century cohorts can be meaningfully constructed based on historical events and their shared life experiences. (1) The *Young Progressives* (1905–1914) experienced WWI at a relatively young age, and were well into their adulthood during the Great Depression and WWII. (2) The *Jazz Age Babies* (1915–1924) are considered the "children of the Depression" (Elder 1974), and were young adults during WWII. (3) The *Depression Kids* (1925–1934) were babies and young children during the Depression and WWII, and reached middle-adulthood by the 1960s. (4) The *War Babies* (1935–1944) were born during WWII, experienced the cultural shifts of the 1960s and 1970s as young and middle aged adults, and were often the older siblings of "Baby Boomers". (5) The *Early Boomers* (1945–1954) likely remember the assassinations of John F. Kennedy and Martin Luther King Jr., Woodstock, and were at risk of draft into the Vietnam War. (6) The *Late Boomers* (1955–1964) shared common experiences of the Cold War, Watergate, and the oil embargo. These meaningfully constructed cohorts are employed to examine the variability of domain satisfaction in this study.

### 1.4 Synthesizing the Inconsistent Findings of Cohort Effects on SWB

The inconsistent findings of cohort effects on various measures of SWB throughout previous literature suggest that there are at least three major issues in aging research on SWB. First, there are conceptual issues related to the common interchangeability of SWB terms. For example,

Yang (2008) found no evidence in her age-period-cohort analysis of happiness, which utilized the General Social Survey (GSS) (1972–2004), to support long standing claims that the Great Depression was detrimental to the overall well-being of those who experienced it during a formative age (e.g., Elder 1974). However, it is quite possible that such macro-economic historical events could have negative impacts on other factions of SWB (e.g., life satisfaction) despite their relatively high correlation. The frequent interchangeable use of SWB terms (e.g., happiness and life satisfaction) has made it difficult for previous research to fully understand the effects of aging on particular SWB constructs. Additionally, there are no previous studies that examine cohort variation in the distinct areas of life that typically come together to form domain satisfaction (e.g., family, friends, hobbies, place of residence, and health).

Second, there are methodological issues related to the construction of birth cohorts. Many previous studies employed single-wave cross-sectional data, typically with the use of somewhat arbitrary age groups (George 2010). In turn, studies that have used multiple waves of cross-sectional data tend to construct cohorts based on birth years that are convenient in their data. Another issue with cohort construction, beyond across-study comparability, is that the use of arbitrary birth cohorts compromises the very theoretical nature of cohort effects, or their power to explain social variation through shared life experiences (Hughes and O'Rand 2004). That is, if the birth years selected to represent a particular cohort do not span a theoretically meaningful time period, they are not likely to effectively explain social variation due to shared life experiences during similar life stages.

Third, there are theoretical issues related to the cohort/SWB relationship. Indeed, several sets of hypotheses—the post-materialism hypothesis (Rodgers 1982; Yang 2008) and the Easterlin hypothesis (Easterlin 1987)—have been explored in regards to cohort effects on SWB. However, to date, a more general approach to fundamental life course assumptions (e.g., formative life experiences) has yet to be used to explain the mechanisms associated with cohort effects on SWB outcomes.

## 2 Towards a Life Course Model for Cohort Effects on Domain Satisfaction

Individuals who experience a particular historical event at a certain point in time during a similar life stage are collectively referred to as a cohort. For example, the *Jazz Age Babies* (1915–1924) were born around the end of WWI, were children during the Great Depression, were young adults during WWII, and were reaching old age during the cultural revolution of the 1960s and 1970s. The fundamental mechanism behind cohort effects is demographic in nature, such that it is shaped by fertility and mortality, and is sensitive to the social and cultural landscape of the times (Ryder 1965). Basic life course assumptions hold that cohort's experiences during childhood and young adulthood (e.g., formative years) leave a lasting impression on the perspectives and beliefs of that cohort (Hughes and O'Rand 2004). Therefore, we should expect that the Great Depression and WWII had a greater impact on *Jazz Age Babies'* perceptions and beliefs than the cultural revolution of the 60s and 70s. In contrast, the *Early Boomers* (1945–1954) were adolescents and young adults during 1960s and 1970s, which greatly influenced their life-long beliefs and behaviors. In turn, times of economic deprivation and world war most likely have a significantly different influence on individual perceptions than times signified by racial and sexual revolution, so it could be expected that the *Jazz Age Babies* and the *Early Boomers* hold significantly different perceptions toward life overall.

In regards to life experiences shaping perceptions toward life satisfaction, Strack et al. (1985) suggest that easily accessible life experiences have a strong influence on individual

life satisfaction judgments. In a later development of their work, Schwarz and Strack (1991) state if accessible information pertains to previous living conditions (as opposed to present living conditions) it will act as a standard of comparison. These claims, coupled with a life course theoretical approach, suggest that cohort effects could shape perceptions toward different areas of life in such a way that domain satisfaction is not psychometrically valid across different cohorts. Thus, not knowing the psychometric properties of domain satisfaction measures, it would make little sense to compare mean scores across cohorts.

### 2.1 A Life Course Model

A basic life course model (Fig. 1) demonstrates how formative life events can have a lasting impact on present perceptions toward domain satisfaction. Life course theoretical approaches coupled with life satisfaction judgment recall theory are the basis of this fundamental model (Schwarz and Strack 1991). The "Historical Events and Social Conditions" at the top of the model represent possible sources of cohort effects, and the progression of the three boxes (from left to right) signifies temporal sequence. The bold arrow at the bottom represents the direction of the entire life span, from birth until death. The bold arrows going across the model represent the life span of particular cohorts, their right alignment indicates later birth years across time, and the dashes represent their formative years (e.g., childhood and young adulthood). The thin arrows coming out of the "Historical Events and Social Conditions" boxes represent possible cohort effects during formative years for particular cohorts. Although depending on intensity and length, a single historical event or social condition could impact multiple cohorts during their respective formative years. Additionally, historical events and social conditions can occur before a particular cohort is born, or well after their "formative" years. Therefore, temporally proximate cohorts are more likely to share similar beliefs and attitudes toward life compared to temporally distant cohorts (Hughes and O'Rand 2004; Ryder 1965).

The factor analytic model, within the larger model (Fig. 1), depicts several different hypotheses for how cohort effects can moderate the relationship between aging and domain satisfaction. "Domain Satisfaction" represents a common five factor composite measure of domain satisfaction, which includes level of satisfaction with place of residence, family life, friendships, health, and hobbies. Hypothesis (H)1 through H3 represent three hypotheses about the role of cohort effects on the validity of domain satisfaction. H1 identifies possible cohort effects on the overall measure of domain satisfaction across all cohorts. Previous studies indicate that cohort is unlikely to affect the validity of the overall domain satisfaction construct for the entire sample (Andrews and Withey 1976; Michalos 1980). H2 accounts for the relative importance of the 5 domains reflective of the overall concept of domain satisfaction across all cohorts. To our best knowledge, no previous studies examined the relative importance of individual domains of life across cohorts. Although there are little theoretical indications for such variation, empirical analysis is still warranted. H3 accounts for the baseline difference for each of the 5 domains across all cohorts. As described earlier, we expect that temporally proximate cohorts are more likely to be psychometrically comparable.

## 3 Research Questions

1. Is the overall validity of the domain satisfaction measure sensitive to cohort effects?
2. Does the relative importance of each of the 5 respective life domains vary by cohort?
3. Are birth cohorts psychometrically (e.g., validity) comparable for domain satisfaction?

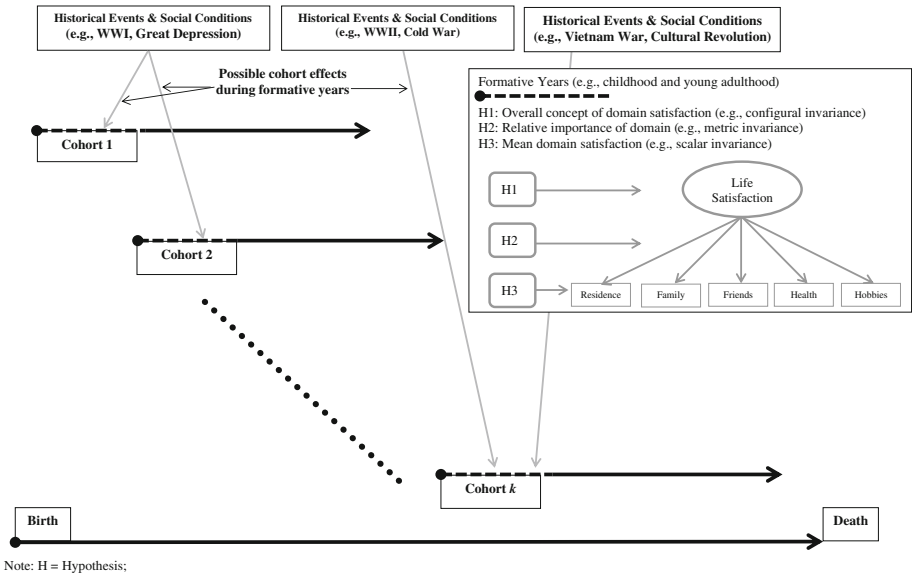


**Fig. 1** Simplified life course model of possible cohort effects on domain satisfaction through life experiences during formative years

Examining psychometric properties of domain satisfaction across theoretically defined birth cohorts provides new insights about the comparability of domain satisfaction depending on when individuals were born and their subsequent life experiences at given life stages; a fundamental life course assumption that links micro level outcomes with macro level experiences (Elder 1975, 1994; Elder et al. 2003). The life course model for possible cohort effects on domain satisfaction (See Fig. 1) suggests that historical events and social conditions experienced during a formative life stage could influence life-long perceptions toward domain satisfaction. Additionally, a series of comparisons between birth cohorts may generate further hypotheses explaining the process of how individuals form their perceptions toward and evaluate their lives. However, this study is not specifically designed to separate age and cohort effects; partially because such methods have not been established (Yang 2008). Difficulty separating age and cohort effects in SWB research has also been acknowledged in previous studies (Cheng 2004; Kunzmann et al. 2000). The main purpose of the current study is to test if the psychometric properties of domain satisfaction differ across theoretically sound cohorts.

## 4 Methods

### 4.1 Data

The data were obtained from the GSS, which began in 1972 as a project for collecting nationally representative data regarding demographic characteristics, socio-economic information, and opinions/attitudes toward community and society. The GSS waves between 1973 and 1984 (except 1979 and 1981) were used in analysis given the availability of specific birth years for constructing birth cohorts (described below). The final

sample size is 15,302 after excluding cases with no domain satisfaction data and those who did not belong to any cohorts considered in this study. GSS data after 1984 are not included in analyses due to a large amount of missing data (about 30 % of all cases) on domain satisfaction.

### 4.2 Measures

For building a latent construct, domain satisfaction, the five domain satisfaction indicators available in the GSS (1973–1984) were utilized; (1) satisfaction with place of residence, (2) family, (3) friends, (4) health and (5) hobbies. The participants were asked "How much satisfaction you get from…" with a 7-point Likert scale from (1) *A very great deal*; (2) *A great deal*; (3) *Quite a bit*; (4) *A fair amount*; (5) *Some*; (6) *A little*, and (7) *None*, which were reverse-coded so that the higher scores indicate greater satisfaction. It would have been optimal to include satisfaction with income, but this measure is not part of the domain satisfaction inventory in the GSS. Additionally, job satisfaction is a common domain satisfaction measure, but this measure is not included in the domain satisfaction inventory, nor is it appropriate to include in our sample that includes older adults (Crosnoe and Elder 2002). The utilization of this 5 item domain satisfaction measure is comparable to previous studies that have used the GSS (see, for example Barak and Greenwood 1997; Beatty and Tuch 1997; Blanchflower and Oswald 2000).

### 4.3 Birth Cohorts

Qualitatively and theoretically meaningful birth cohorts were constructed using the framework suggested by Hughes and O'Rand (2004), and Yang (2007). In our study, seven cohorts were defined: (1) *the oldest cohort* [born before 1904 (n = 1,036)]; (2) *Young Progressives* [1905–1914 (n = 1,696)]; (3) *Jazz Age Babies* [1915–1924 (n = 2,214)]; (4) *Depression Kids* [1925–1934 (n = 2,193)]; (5) *War Babies* [1935–1944 (n = 2,680)]; (6) *Early Baby Boomers* [1945–1954 (n = 3,606)] and (7) *Late Baby Boomers* [1955–1964 (n = 1,847)]. The youngest cohort (e.g., *Generation X*) in the data was excluded from analyses due to its small sample size (n = 104). Also, the respondents who did not belong to the suggested cohorts were excluded as well. Each cohort includes respondents from multiple waves of the GSS to capture wider ranges of their experiences as cohort members and perceptions toward domain satisfaction.

## 5 Analysis

Descriptive summaries were computed for each life domain and age by cohorts. A series of confirmatory factor analyses and measurement invariance tests (e.g., multiple group analysis) were used to address the research questions (Brown 2006). At each stage of analysis, psychometric property (e.g., validity and reliability) was examined. All models were evaluated with consideration of the Chi square statistic, Tucker-Lewis Index (TLI), Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA) (Browne and Cudek 1993; Hu and Bentler 1999). Examining multiple model fit indices and their consistency is the recommended practice in CFA due to advantages and disadvantages of each index. For this reason, different types of indices including absolute fit (Chi square), model parsimony (RMSEA) and comparative fit (CFI & TLI) were evaluated. On a related note, another commonly used absolute fit index, the Standardized Root Mean

Square Residual (SRMR) was not used because of incompatibility with categorical data (Yu 2002). Specifically, non-significant Chi square statistic, TLI and CFA greater than 0.95 (0.90), and RMSEA less than 0.06 (0.10) are considered good (adequate/acceptable) model fit (Hu and Bentler 1999). However, given the relatively large sample size, the significance of the Chi square statistic was not used as one of the main criteria for model fit decision making. One factor model was identified as the data points (n = 15) were greater than the number of parameters to be estimated (n = 10) (Bollen 1989). Also, the required sample size for desired power ($1 - \beta = 0.80$) of measurement model was met (DF = 5, n = 832) as the smallest cohort in this study had over 1,000 respondents (MacCallum et al. 1996).

Domain satisfaction was modeled using confirmatory factor analysis (Brown 2006; Vandenberg and Lance 2000). Specifically, measurement relationship (Eq. 1) and one factor measurement model (Eq. 2) are expressed as follows:

$$x = \tau_x^{(g)} + \lambda_x \xi^{(g)} + \delta_x^{(g)} \tag{1}$$

Let $x$ be each of five domain satisfaction indicators and $\tau$ be an intercept of each $x$. $\lambda$ is a regression weight (e.g., factor loading) and $\xi$ is the latent domain satisfaction construct. $\delta$ is a measurement error of $x_i$. $g$ indicates each birth cohort (for multiple group analysis described below).

$$\sum_{xx}^{(g)} = \Lambda_x^{(g)} \Phi^{(g)} \Lambda_x^{(g')} + \Theta_\delta \tag{2}$$

Let $\Sigma$ be the variance/covariance matrix among the five domain satisfaction indicators $x$ for cohort $g$. $\Lambda$ is the matrix of regression coefficients, $\Phi$ is the variance of the domain satisfaction construct for cohort $g$. $\Theta$ is the matrix of measurement error ($\delta$) variances. This model is also expressed in a diagram (see Fig. 2).

The validation of domain satisfaction was done in four steps: (1) baseline model, (2) test of configural (weak factorial) invariance; (3) test of metric (weak) invariance and (4) test of scalar (strong) invariance test (Vandenberg and Lance 2000). The invariance test needs to be done step by step starting from the baseline model (Vandenberg and Lance 2000). That is, the good baseline model fit is the requirement for satisfying the configural invariance (Wang and Wang 2012). The same applies for subsequent invariance tests. As such, subsequent test is no longer necessary in case any previous test does not achieve invariance. In the first step, the one factor model was specified (see Fig. 2) both for all respondents together and each cohort separately. In the second step, multiple group analyses with no constraints imposed were conducted for examining appropriateness of the model specification across cohorts [e.g., $\Sigma g = \Sigma g'$ ($g = 1, 2, 3, 4, 5$)]. In the third step, multiple group analyses with constraints imposed on factor loadings [e.g., $\Lambda g = \Lambda g'$] were conducted. In the fourth step, multiple group analyses with constraints imposed on factor loadings and intercepts [$\tau g = \tau g'$] were conducted. The maximum likelihood with robust standard errors was employed given possible non-normality of data (Satorra and Bentler 2001). The cases with partially missing (e.g., 1, 2, 3 or 4 out of 5 domains) domain satisfaction indicators were incorporated into the parameter estimation using MLR function in Mplus (Muthén and Muthén 1998–2011). The model of each step was compared using the Satorra-Bentler scaled Chi square difference test (Satorra and Bentler 2010).

Based on the preliminary analyses, 21 sets (all possible combinations of 2 cohorts) of invariance tests were conducted for identifying comparable and incomparable pairs of cohorts. Each cohort pair was examined using the scalar invariance test. The model

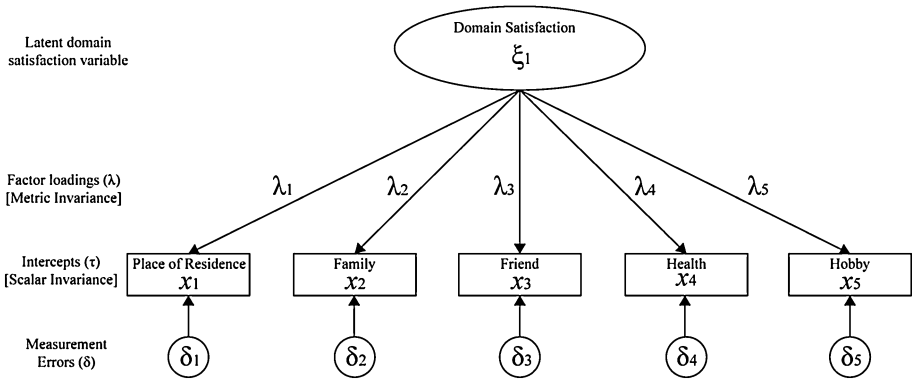


**Fig. 2** One factor measurement model of domain satisfaction with five quality of life domain indicators

evaluation criteria are the same as the series of invariance tests described above. All analyses were done using Mplus version 6 (Muthén and Muthén 1998–2011).

## 6 Results

Table 1 shows the means and standard deviations of the five domain satisfaction indicators and age by cohorts. While all cohorts report relatively high satisfaction (range from 5.10 to 5.93 out of 7 point Likert-scale), satisfaction with place of residence and health have notable trends. For place of residence, the earlier cohorts (e.g., *The Oldest* = 5.60; *Young Progressive* = 5.60) are more likely to have greater satisfaction than the later cohorts (e.g., *Early Baby Boomers* = 4.73; *Late Baby Boomers* = 4.58). On the other hand, the earlier cohorts (e.g., *The Oldest* = 4.79; *Young Progressive* = 4.96) are more likely to have lower health satisfaction than the later cohorts (e.g., *Early Baby Boomers* = 5.73; *Late Baby Boomers* = 5.76). Due to the aggregation of multiple GSS waves, the age range of some cohorts partially overlapped (e.g., *The Oldest cohort*, *Young Progressives*, and *Jazz Age Babies*).

The baseline models examined all cohorts together and separately. The single group models for all cohorts showed adequate to good fit. In the multiple group analyses, the seven cohorts were simultaneously examined (see Table 2 for all model fit indices). Table 3 shows a series of invariance test results. The configural invariance was achieved as indicated by good model fit. Subsequently, the metric invariance (e.g., all factor loadings were constrained to be equal across all seven cohorts) was also achieved. The evaluation of metric invariance is done based on the non-significant Sattora-Benlter scaled Chi square difference test ($\Delta\, x^2 = 20.91$; DF = 28; $p = 0.83$) and virtually no difference in CFIs for the multiple group model 1 (configural invariance) and model 2 (metric invariance). The scalar invariance was not achieved ($\Delta\ x^2 = 1{,}977.15$; DF = 30; $p < 0.001$). After reviewing the theoretical explanations (e.g., aging and health), descriptive statistics and modification indices, an attempt was made to achieve partial scalar invariance (e.g., factor loadings for place of residence and health are freed) (Byrne 2011; Byrne et al. 1989). Although the overall model fit of partial scalar invariance was improved compared to that of the full scalar invariance, the partial scalar invariance was still not achieved ($\Delta\, x^2 = 169.94.15$; DF = 18; $p < 0.001$). On a related note, the partial invariance test was

**Table 1** Descriptive summary of quality of life indicators by cohorts

| Satisfaction with | All (n = 15,302) Mean (SD) | Cohort 1 *The Oldest* (n = 1,036) Mean (SD) | Cohort 2 *Young Progressives* (n = 1,696) Mean (SD) | Cohort 3 *Jazz Age Babies* (n = 2,214) Mean (SD) | Cohort 4 *Depression Kids* (n = 2,193) Mean (SD) | Cohort 5 *War Babies* (n = 2,680) Mean (SD) | Cohort 6 *Early Baby Boomer* (n = 3,606) Mean (SD) | Cohort 7 *Late Baby Boomer* (n = 1,847) Mean (SD) |
|---|---|---|---|---|---|---|---|---|
| Place of residence | 5.10 (1.52) | 5.60 (1.38) | 5.60 (1.41) | 5.43 (1.40) | 5.23 (1.47) | 5.06 (1.50) | 4.73 (1.53) | 4.58 (1.59) |
| Family | 5.93 (1.35) | 5.66 (1.58) | 5.83 (1.49) | 5.93 (1.38) | 5.97 (1.30) | 6.06 (1.21) | 5.97 (1.36) | 5.84 (1.35) |
| Friend | 5.77 (1.22) | 5.77 (1.31) | 5.82 (1.25) | 5.86 (1.19) | 5.75 (1.19) | 5.74 (1.20) | 5.71 (1.25) | 5.75 (1.22) |
| Health | 5.45 (1.50) | 4.79 (1.72) | 4.96 (1.70) | 5.21 (1.53) | 5.42 (1.53) | 5.65 (1.36) | 5.73 (1.25) | 5.76 (1.50) |
| Hobby | 5.28 (1.58) | 5.02 (1.91) | 5.29 (1.66) | 5.29 (1.56) | 5.27 (1.56) | 5.30 (1.52) | 5.33 (1.52) | 5.33 (1.58) |
| Age | – | 78.33 (5.15) | 67.81 (4.38) | 58.27 (4.60) | 48.64 (4.78) | 38.19 (4.58) | 28.72 (4.51) | 22.85 (2.93) |
| Age range | – | 69–89 | 59–79 | 49–69 | 39–59 | 29–49 | 19–39 | 18–29 |

Data Source: General Social Survey data from 1973 to 1984 (except 1979 and 1981)

Domain Satisfaction measures are recorded in 7 point Likert-scale

The total sample size and the sum of cohort sample sizes do not match due to the cases with missing values (n = 30 or 0.2 % of the entire sample)

**Table 2** Model fit indices from confirmatory factor analyses

| Model | Model fit | $x^{2a}$ | DF | TLI | CFI | RMSEA | Alpha[c] |
|---|---|---|---|---|---|---|---|
| *Single group* | | | | | | | |
| All cohorts | Good | 117.60*** | 5 | 0.968 | 0.984 | 0.038 | .672 |
| The Oldest | Adequate | 19.91** | 5 | 0.934 | 0.967 | 0.054 | .667 |
| Young Progressives | Adequate | 30.95*** | 5 | 0.941 | 0.970 | 0.055 | .703 |
| Jazz Age Babies | Good | 28.34*** | 5 | 0.953 | 0.977 | 0.046 | .667 |
| Depression Kids | Good | 29.48*** | 5 | 0.952 | 0.976 | 0.047 | .685 |
| War Babies | Good | 6.54 | 5 | 0.998 | 0.999 | 0.011 | .699 |
| Early Baby Boomer | Good | 27.46*** | 5 | 0.975 | 0.988 | 0.035 | .691 |
| Late Baby Boomer | Good | 17.09** | 5 | 0.972 | 0.986 | 0.036 | .667 |

| Multiple group | Model fit | $x^{2a, b}$ | DF | TLI | CFI | RMSEA |
|---|---|---|---|---|---|---|
| 1 Configural Invariance | Good | 178.63*** | 36 | 0.963 | 0.981 | 0.043 |
| 2 Metric Invariance | Good | 202.62*** | 64 | 0.980 | 0.981 | 0.031 |
| 3 Scaler Invariance | Poor | 1,853.85*** | 94 | 0.823 | 0.762 | 0.093 |
| 4 Partial Scaler Invariance | Good | 348.26*** | 82 | 0.969 | 0.964 | 0.039 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

[a] Robust standard errors and Chi square statistic (MLR command in Mplus 6.0)

[b] Satorra-Bentler scaled Chi square difference test

[c] Cronbach's alpha coefficient

**Table 3** Summary of measurement invariance test

| Step | Invariance test | Model comparison | $x^{2a}$ | DF | $\Delta x^{2b, c}$ | $\Delta$ DF | $p$ value | CFI | $\Delta$CFI |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Configural Invariance | – | 178.63 | 36 | – | – | – | 0.981 | – |
| 2 | Metric Invariance | Non-significant difference | 202.62 | 64 | 20.91 | 28 | 0.829 | 0.981 | 0 |
| 3 | Scaler Invariance | Significant difference | 1,853.85 | 94 | 1,977.15 | 30 | <0.001 | 0.762 | 0.219 |
| 4 | Partial Scaler Invariance | Significant difference | 348.26 | 82 | 169.94 | 18 | <0.001 | | |

[a] Robust standard errors and Chi square statistic (MLR command in Mplus 6.0)

[b] Satorra-Bentler scaled Chi square difference test

[c] Each comparison ($\Delta x^2$) reflects the following combinations: [step 1 and step 2]; [step 2 and step 3]; [step 2 and step 4]

evaluated as follow-up analysis to provide practical implications (e.g., not all the measurement tools can achieve invariance in practice; identifying specific items that may need caution in group comparisons) (Byrne 2011).

Results of the follow-up analyses for each pair of cohorts showed that temporally proximate cohorts were more likely to be comparable (the model fit indices not reported). In other words, further analyses (e.g., latent mean comparisons) are possible for cohorts that were born around the same time. For instance, the model for the *Oldest* cohort and

**Table 4** Summary of measurement compatibility for the quality of life measure for each combination of cohorts

| Comparability | Cohort 1 | Cohort 2 |
|---|---|---|
| 1 Comparable | Oldest Cohort | Young Progressives Cohort |
| 2 Comparable | Oldest Cohort | Jazz Age Babies Cohort |
| 3 Not comparable | Oldest Cohort | Depression Kids Cohort |
| 4 Not comparable | Oldest Cohort | War Babies Cohort |
| 5 Not comparable | Oldest Cohort | Early Baby Boomer Cohort |
| 6 Not comparable | Oldest Cohort | Late Baby Boomer Cohort |
| 7 Comparable | Young Progressives Cohort | Jazz Age Babies Cohort |
| 8 Not comparable | Young Progressives Cohort | Depression Kids Cohort |
| 9 Not comparable | Young Progressives Cohort | War Babies Cohort |
| 10 Not comparable | Young Progressives Cohort | Early Baby Boomer Cohort |
| 11 Not comparable | Young Progressives Cohort | Late Baby Boomer Cohort |
| 12 Comparable | Jazz Age Babies Cohort | Depression Kids Cohort |
| 13 Not comparable | Jazz Age Babies Cohort | War Babies Cohort |
| 14 Not comparable | Jazz Age Babies Cohort | Early Baby Boomer Cohort |
| 15 Not comparable | Jazz Age Babies Cohort | Late Baby Boomer Cohort |
| 16 Comparable | Depression Kids Cohort | War Babies Cohort |
| 17 Comparable | Depression Kids Cohort | Early Baby Boomer Cohort |
| 18 Not comparable | Depression Kids Cohort | Late Baby Boomer Cohort |
| 19 Comparable | War Babies Cohort | Early Baby Boomer Cohort |
| 20 Comparable | War Babies Cohort | Late Baby Boomer Cohort |
| 21 Comparable | Early Baby Boomer Cohort | Late Baby Boomer Cohort |

[a] The comparability is examined by the scalar invariance test (2 groups)

[b] "Not comparable" indicates that caution is required when comparing means of 2 groups

*Young Progressive* cohort achieved the scalar invariance. Yet, the *Oldest* cohort and *Jazz Age Babies* cohort (born after *Young Progressive*) are not comparable. Both *Early* and *Late Baby Boomer* cohorts are comparable to *War Babies* cohort. When all seven cohorts are examined, the scalar invariance was not achieved. However, when comparing all possible combinations of 2 cohorts, comparability varied. Results are summarized in Table 4.

## 7 Discussion

This study examined the validity of a domain satisfaction measure consisting of five items [(1) place of residence, (2) family, (3) friends, (4) health, and (5) hobbies] across theoretically defined birth cohorts. The invariance test results showed that the domain satisfaction measure achieved metric (e.g., weak) invariance. Namely, the overall model structure or conceptualization of domain satisfaction is consistent across cohorts. In other words, domain satisfaction can be measured on the same scale for all cohorts using the five indicators adopted in this study. However, the scalar (e.g., strong) invariance was not achieved and therefore, mean comparisons across cohorts warrants caution (Dimitrov 2006; Widman and Reise 1997). Based on the non-invariant item intercepts (e.g., scalars), at least one cohort seems to systematically score either higher or lower on specific items.

As freeing the place of residence and health intercepts improved model fit in partial scalar invariance test, paying closer attention to these two items is worth considering when domain satisfaction is compared across cohorts. Additionally, results of follow-up analyses implied that researchers need careful consideration when comparing cohorts chronologically further apart from each other. For instance, while *Early* and *Late Baby Boomer* cohorts (that were born around the same time) were more likely to be comparable, the baby boomer cohorts were not comparable with the *Young Progressive* cohort (that was born long before).

The findings from this study suggest that the validity of domain satisfaction is sensitive to cohort effects, and domain satisfaction across cohorts is not always comparable. For instance, simply comparing means of domain satisfaction for *the Oldest Cohort* and *Young Progressives* (e.g., young adults during the Great Depression) to those of more recent cohorts is conceptually questionable. Although relatively little is known about how early life experiences shape SWB trajectories over the life span, the findings from this study suggest more attention should be given to how specific cohorts uniquely experience historical events in relation to SWB pathways (e.g., schooling, careers, health care, housing). The earlier cohorts arguably were more likely to have a greater level of satisfaction with place of residence and lower satisfaction with health than more recent cohorts. For example, as suggested by Elder (1974), experiencing the Great Depression may have resulted in the development of an extraordinary work commitment, strong desire for security, and observed adverse health outcomes. Here, over time, the adverse health trajectories could lead to lower levels of satisfaction with health. Likewise, the extraordinary work commitment and strong desire for security might be related to achieving higher levels of satisfaction with place of residence—as these earlier Great Depression cohorts may have strived to establish a home with a greater sense of security.

Indeed, the fundamental mechanism behind cohort effects is demographic in nature. That is, new cohorts are socialized into society by the cohorts that came before them, and flow through dynamic age-graded social structures over their life span (Ryder 1965). Therefore, chronologically proximate cohorts most likely share similar experiences that are different from those who were born significantly earlier or later (Ryder 1965). This fundamental life course assumption, along with previous findings on how earlier life experiences can shape perceptions toward life satisfaction (Schwarz and Strack 1991; Strack et al. 1985) is consistent with the findings about the incomparability of domain satisfaction between chronologically distant cohorts in this study. For example, the findings from this study suggest that WWI and the Great Depression had a similar impact on the perceptions of domain satisfaction for the *Oldest Cohort* and the *Young Progressives*, while the shared experience of the Great Depression did not equate to comparable perceptions toward domain satisfaction between the *Oldest Cohort* and *Jazz Age Babies*. In turn, the additional experience of WWII during the formative years of the *Young Progressives*, *Jazz Age Babies*, and *Depression Kids* may have similarly shaped their perceptions toward domain satisfaction (See Fig. 3; also see Table 4). These findings are also consistent with previous age-period-cohort research on happiness (e.g., Yang 2008).

Domain satisfaction, however, is a fundamentally different facet of SWB than happiness. Indeed, Yang (2008) warned about generalizing her findings of cohort effects on happiness to different SWB measures. Yet, if domain satisfaction reflects actual life experiences more precisely than other SWB measures (Diener and Suh 2000), then it should not be surprising that temporally distant cohorts show greater variances across any life domains as shown in the current study. At the same time, a better understanding of specific pathways between various SWB measures (e.g., happiness, domain satisfaction) and predictors such as gender, race,

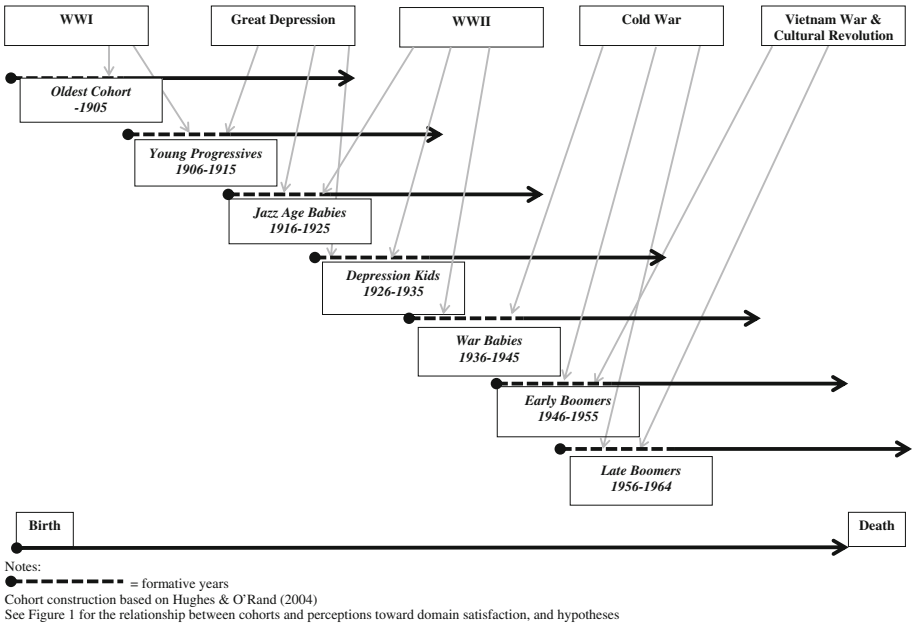


**Fig. 3** Operationalized Model of cohort effects on domain satisfaction through life experiences during formative years

educational attainment, marital status and health status still requires further empirical analysis (Yang 2008). Perhaps, more detailed analysis of individual cohorts will clarify the effects of earlier life experiences on various SWB measures.

Importantly, whereas age and cohort effects cannot be precisely distinguished in this study, we argue that our analysis sufficiently provided empirical evidence for possible cohort effects in the validity of domain satisfaction. Aggregate data from multiple waves of the GSS employed in this study partially adjusted for age effects (See Table 1). Indeed, the cohorts included a wide range of age distributions that overlapped across several cohorts. Additionally, our follow-up analysis [one-way analysis of variance, $F(6; 15{,}328) = 37{,}489.7$; $p < 0.05$] with Tukey's test ($p < 0.05$ for all pairs)] showed statistically significant differences in mean ages for all cohort pairs. Our life course model demonstrates how earlier life events and social conditions can impact perceptions toward domain satisfaction, in such a way that variation in domain satisfaction outcomes can be, in part, explained by cohort effects. In this regard, it is highly unlikely that the differences in domain satisfaction indicators, as well as psychometric properties, were purely due to age effects. However, this study can only begin to hint at the mechanisms behind these findings. The life course approach suggests that the main mechanism driving cohort variation in domain satisfaction is perceptions (e.g., attitudes, preferences, and values) that are shaped during a formative age in a unique historical landscape for each theoretically defined cohort (George 2010). Indeed, early life circumstances have been found to act as a standard of comparison in life assessments (Schwarz and Strack 1991). Analyzing other objective measures of domain satisfaction in relation to subjective measures is an important next step in future studies.

This study made several contributions to the existing SWB and aging literature. First, we conducted an in-depth analysis in an understudied area of cohort differences in the

validity of a domain satisfaction measure. In the US, as one of the societies where an increasing number of cohorts coexist, precisely measuring the domain satisfaction of each cohort is critical for promoting the well-being of an entire population as well as for reducing well-being disparities across cohorts. Second, the findings regarding the specific cohort pairs which are psychometrically comparable or incomparable suggests careful consideration of aggregate data analysis in future SWB studies. Particularly, for data with a wide range of age distributions, pooling members from multiple cohorts may offset unique effects of each cohort on SWB. Finally, generated hypotheses about why and how cohort effects may impact the validity of domain satisfaction in the US. These hypotheses are useful to guide future SWB research and policy directives, not only for the US but also for applications in other counties.

This study is not without limitations. Cross-sectional data analysis does not allow any inference of causal relationships between cohorts and domain satisfaction. Also, while this study provides justifications for theoretically sound cohort construction and practical guidelines for cross-cohort comparisons, the findings should not be generalized across different measures of SWB and different populations. Indeed, the data analyzed in this study are snapshots of cohorts in the US. Although not a purpose of this study, other covariates were not included in analyses. This study was designed specifically to examine the differences in the psychometric property of domain satisfaction across cohorts. Other possible stratifications such as gender, race and socio-economic status are beyond the scope of this study. Furthermore, future studies should consider examining different combinations of life domains (e.g., inclusion of work and income domains). Yet, the findings from this study provide a foundation for such multivariate analyses of SWB data. Finally, although theoretically sound cohorts were defined for an American population in this study, this is not to exclude other possible cohort constructions in SWB research. On a related note, the development of sound methods for distinguishing age and cohort effects would be useful for future SWB research.

In conclusion, analyses of nationally representative data of American adults provided empirical evidence for possible cohort differences in the validity of a domain satisfaction measure. Additionally, temporally distant cohorts were less likely to be comparable and were subject to practice of caution in data analysis. Further understanding about specific occurrence mechanisms of cohort differences in domain satisfaction as well as other SWB measures such as happiness, would lead to better design of culturally sensitive SWB promotion programs and in turn, reduce SWB disparities across cohorts. Careful consideration of theoretically sound cohort constructions and selection of SWB measures are recommended in future national and international study, and we hope this paper can lead to more theoretical development in regards to aging and domain satisfaction.

## References

Andrews, F. M., & Withey, S. B. (1976). *Social indicators of well-being*. New York: Plenum Press.

Argyle, M. (2001). *The psychology of happiness*. London: Routledge.

Baird, B., Lucas, R., & Donnellan, M. (2010). Life satisfaction across the lifespan: Findings from two nationally representative panel studies. *Social Indicators Research, 99*(2), 183–203. doi:10.1007/s11205-010-9584-9.

Barak, S. E., & Greenwood, S. F. (1997). Religious attendance and subjective well-being among older Americans: Evidence from the General Social Survey. *Review of religious Research, 45*(2), 116–129.

Beatty, P., & Tuch, S. A. (1997). Race and life satisfaction in the middle class. *Sociological Spectrum, 17*(1), 71–90.

Blanchflower, D. G., & Oswald, A. J. (2000). The rising well-being of the young. In D. Blanchflower & R. Freeman (Eds.), *Youth employment and joblessness in advanced countries* (pp. 289–328). Chicago: University of Chicago Press.

Blanchflower, D. G., & Oswald, A. J. (2008). Is well-being U-shaped over the life cycle? *Social Science and Medicine, 66*(8), 1733–1749. doi:10.1016/j.socscimed.2008.01.030.

Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York: The Guilford Press.

Browne, M. W., & Cudek, R. (1993). Alternate ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage Publication.

Byrne, B. M. (2011). *Structural equation modeling with Mplus*. New York: Routledge Academic.

Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin, 105*(3), 456–466. doi:10.1037/0033-2909.105.3.456.

Campbell, A., Converse, S. E., & Rodgers, W. L. (1976). *The quality of American life*. New York: Russell Sage.

Charles, S. T., Reynolds, C. A., & Gatz, M. (2001). Age-related differences and change in positive and negative affect over 23 years. *Journal of Personality and Social Psychology, 80*(1), 136–151. doi:10.1037/0022-3514.80.1.136.

Cheng, S.-T. (2004). Age and subjective well-being revisited: A discrepancy perspective. *Psychology and Aging, 19*(3), 409–415. doi:10.1037/0882-7974.19.3.409.

Crosnoe, R., & Elder, G. H., Jr. (2002). Successful adaptation in the later years: A life course approach to aging. *Social Psychology Quarterly, 65*(4), 309–328.

Cummins, R. A. (1996). The domains of life satisfaction: An attempt to order chaos. *Social Indicators Research, 38*, 303–328.

Day, R. L. (1987). Relationship between life satisfaction and consumer satisfaction. In A. C. Samil (Ed.), *Marketing and the quality of life interface*. New York: Quorum Books.

Diener, E., Napa-Scollon, C. K., Oishi, S., Dzokoto, V., & Suh, E. M. (2000). Positivity and the construction of life satisfaction judgments: Global happiness is not the sum of its parts. *Journal of Happiness Studies, 1*(2), 159–176. doi:10.1023/a:1010031813405.

Diener, E., & Suh, M. E. (1997). Subjective well-being and age: an international analysis. *Annual Review of Gerontology and Geriatrics, 17*, 304–324.

Diener, E., & Suh, E. M. (2000). *Culture and subjective well-being*. Cambridge, MA: The MIT press.

Dimitrov, D. M. (2006). Comparing groups on latent variables: A structural equation modeling approach. *Work: A Journal of Prevention, Assessment and Rehabilitation, 26*(4), 429–436.

Easterlin, R. A. (1987). *Birth and fortune: The impact of numbers on personal welfare*. Chicago: University of Chicago Press.

Easterlin, R. A. (2001). Life cycle welfare: trends and differences. *Journal of Happiness Studies, 2*(1), 1–12. doi:10.1023/a:1011504817292.

Elder, G. H. (1974). *Children of the great depression*. Chicago: University of Chicago Press.

Elder, G. H. (1975). Age differentiation and the life course. *Annual Review of Sociology, 1*, 165–190.

Elder, G. H. (1994). Time, human agency, and social change: Perspectives on the life course. *Social Psychology Quarterly, 57*(1), 4–15.

Elder, G. H., Karckpatrick, J. M., & Crosnoe, R. (2003). The emergence and development of life course theory. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the life course* (pp. 3–19). New York: Plenum Press.

Flanagan, J. C. (1978). A research approach to improving our quality of life. *American Psychologist, 33*(2), 138–147. doi:10.1037/0003-066X.33.2.138.

George, L. K. (2010). Still happy after all these years: Research frontiers on subjective well-being in later life. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 65B*(3), 331–339. doi:10.1093/geronb/gbq006.

Hamarat, E., Thompson, D., Steele, D., Matheny, K., & Simons, C. (2002). Age differences in coping resources and satisfaction with life among middle-aged, young-old, and oldest-old adults. *The Journal of Genetic Psychology, 163*(3), 360–367. doi:10.1080/00221320209598689.

Heady, B., & Wearing, A. (1992). *Understanding happiness: A theory of subjective well-being*. Melbourne: Longman Cheshire.

Hsieh, C.-M. (2004). To weight or not to weight: The role of domain importance in quality of life measurement. *Social Indicators Research, 68*, 163–174.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. doi:10.1080/10705519909540118.

Hughes, M. E., & O'Rand, A. M. (2004). *The American people census 2000: The lives and times of the baby boomers*. New York: Russell Sage Foundation.
Krause, N. (2003). Religious meaning and subjective well-being in late life. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 58*(3), S160–S170. doi:10.1093/geronb/58.3.S160.
Kristensen, N., & Westergaard-Nielsen, N. (2006). Reliability of job satisfaction measures. *Journal of Happiness Studies, 8*(2), 273–292.
Krueger, A. B., & Schkade, D. A. (2008). The reliability of subjective well-being measures. *Journal of Public Economics, 92*(8), 1833–1845.
Kunzmann, U., Little, T. D., & Smith, J. (2000). Is age-related stability of subjective well-being a paradox? Cross-sectional and longitudinal evidence from the Berlin aging study. *Psychology and Aging, 15*(3), 511–526. doi:10.1037/0882-7974.15.3.511.
Lu, L. (1999). Personal or environmental causes of happiness: A longitudinal analysis. *The Journal of Social Psychology, 139*(1), 79–90. doi:10.1080/00224549909598363.
Lucas, R. E., & Donnellan, M. B. (2012). Estimating the reliability of single-item life satisfaction measures: Results from four national panel studies. *Social Indicators Research, 105*, 323–331. doi:10.1007/s11205-011-9783-z.
MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*(2), 130–149. doi:10.1037/1082-989X.1.2.130.
Michalos, A. C. (1980). Satisfaction and happiness. *Social Indicators Research, 8*(4), 385–422. doi:10.1007/bf00461152.
Mroczek, D. K., & Kolarz, C. M. (1998). The effect of age on positive and negative affect: A developmental perspective on happiness. *Journal of Personality and Social Psychology, 75*(5), 1333–1349. doi:10.1037/0022-3514.75.5.1333.
Muthén, L. K., & Muthén, B. O. (1998–2011). Mplus user's guide. Los Angeles, CA: Muthén & Muthén.
Oishi, S., & Diener, E. (2001). Re-examining the general positivity model of subjective well-being: The discrepancy between specific and global domain satisfaction. *Journal of Personality, 69*(4), 641–666. doi:10.1111/1467-6494.694158.
Praag, B. M. S., Frijters, P., & Ferrer-i-Carbonell, A. (2003). The anatomy of subjective well-being. *Journal of Economic Behavior & Organization, 51*, 29–49.
Pragg, B. M., & Ferrer-i-Carbonell, A. (2007). *Happiness quantified: A satisfaction calculus approach*. Oxford: Oxford University Press.
Rodgers, W. (1982). Trends in reported happiness within demographically defined subgroups, 1957–78. *Social Forces, 60*(3), 826–842. doi:10.1093/sf/60.3.826.
Rojas, M. (2006). Life satisfaction and satisfaction in domains of life: Is it a simple relationship? *Journal of Happiness Studies, 7*(4), 467–497. doi:10.1007/s10902-006-9009-2.
Ryder, N. B. (1965). The cohort as a concept in the study of social change. *American Sociological Review, 30*(6), 843–861.
Satorra, A., & Bentler, P. (2001). A scaled difference Chi square test statistic for moment structure analysis. *Psychometrika, 66*(4), 507–514. doi:10.1007/bf02296192.
Satorra, A., & Bentler, P. (2010). Ensuring positiveness of the scaled difference Chi square test statistic. *Psychometrika, 75*(2), 243–248. doi:10.1007/s11336-009-9135-y.
Schimmack, U., Diener, E., & Oishi, S. (2002). Life-satisfaction is a momentary judgment and a stable personality characteristic: The use of chronically accessible and stable sources. *Journal of Personality, 70*(3), 345–384.
Schimmack, U., Krause, P., Wagner, G. G., & Jurgen, S. (2010). Stability and change of well being: An experimentally enhanced latent state-trait-error analysis. *Social Indicators Research, 95*, 19–31. doi:10.1007/s11s05-009-9443-8.
Schneider, L., & Schimmack, U. (2010). Examining sources of self-informant agreement in life-satisfaction judgements. *Journal of Research in Personality, 44*(2), 207–212.
Schwarz, N., & Strack, F. (1991). Evaluating one's life: A judgment model of subjective well-being. In F. Strack, M. Argyle, & N. Schwarz (Eds.), *Subjective well-being: An interdisciplinary perspective* (1st ed.). New York: Oxford Press.
Settersten, R. A. (2002). Propositions and controversies in life-course scholarship. In R. A. Settersten (Ed.), *Invitation to the life course: Toward new understanding of later life*. Amityville, NY: Baywood Publishing Company, Inc.
Shmotkin, D. (1990). Subjective well-being as a function of age and gender: A multivariate look for differentiated trends. *Social Indicators Research, 23*(3), 201–230. doi:10.1007/bf00293643.
Strack, F., Schwarz, N., & Gschneidinger, E. (1985). Happiness and reminiscing: The role of time perspective, affect, and mode of thinking. *Journal of Personality and Social Psychology, 49*(6), 1460–1469.

Thomas, P. A. (2010). Is it better to give or to receive? Social support and the well-being of older adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 65B*(3), 351–357. doi:10.1093/geronb/gbp113.

Trauer, T., & Mackinnon, A. (2001). Why are we weighting? The role of importance ratings in quality of life measurement. *Quality of Life Research, 10*, 579–585.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*(1), 4–70. doi:10.1177/109442810031002.

Wang, J., & Wang, X. (2012). *Structural equation modeling: Applications using Mplus*. UK: Wiley.

Wannous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall job satisfaction: How good are single-time measures? *Journal of Applied Psychology, 82*(2), 247–252.

Westerhof, G. J., & Barrett, A. E. (2005). Age identity and subjective well-being: A comparison of the United States and Germany. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 60*(3), S129–S136. doi:10.1093/geronb/60.3.S129.

Widman, K. F., & Reise, S. P. (1997). Exploring the measurement invariance of psychological instruments: Applications in the substance use domain. In K. J. Bryant, M. Windle, & S. G. West (Eds.), *The science of prevention: Methodological advances from alcohol and substance abuse research* (pp. 271–324). Washington, D. C.: American Psychological Association.

Wu, C. H., Chen, L., & Tsai, Y. M. (2009). Investigating importance weighting of satisfaction scores from a formative model with partial least squares analysis. *Social Indicators Research, 90*(3), 351–363.

Wu, C. H., & Yao, G. (2006). Do we need to weight satisfaction scores with importance ratings in measuring quality of life? *Social Indicators Research, 78*(2), 305–326.

Yang, Y. (2007). Is old age depressing? Growth trajectories and cohort variations in late-life depression. *Journal of Health and Social Behavior, 48*(1), 16–32. doi:10.1177/002214650704800102.

Yang, Y. (2008). Social inequalities in happiness in the United States, 1972 to 2004: An age-period-cohort analysis. *American Sociological Review, 73*(2), 204–226. doi:10.1177/000312240807300202.

Yu, C. Y. (2002). *Evaluating cutoff criteria of model fit indices for latent variable models with binary and continuous outcomes*. Los Angeles: University of California Los Angeles.

Zou, C. (2010). The contribution of domain satisfaction to life satisfaction: Convergent validity of importance measures. Master Thesis. Graduate Department of Psychology, University of Toronto.