Trajectories and covariates of life satisfaction among older adults in Taiwan

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ABSTRACT

The goals of this study were to identify different life satisfaction trajectory groups among the Taiwanese elderly and to explore the relationships between life satisfaction and time-varying physical, mental, social, health, and economic variables. The data used herein were from five waves of a longitudinal study conducted from 1993 to 2007. Those who completed at least three waves were included in the analysis, for a total of 2584 participants. A group-based trajectory model was used to analyze the data. Time-constant variables and time-varying covariates were used as the moderators of changes in life satisfaction trajectories. Four life satisfaction trajectories were identified: low (21.8%), middle (39.7%), increasing (25.9%), and high-declining (12.5%). Having more education and better physical and psychological health, social support, and economic satisfaction were predictors of a higher life satisfaction trajectory, and maintaining good physical and emotional health, having a spouse, and having better economic satisfaction were associated with an increase in life satisfaction over time.

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1. Introduction

Life satisfaction is a subjective indicator of well-being for the elderly, and life satisfaction is related to health and mortality (Stålbrand et al., 2007). Factors affecting life satisfaction have been studied previously. However, most past studies were cross-sectional. In the few existing longitudinal studies, researchers used only a single trajectory of the population to illustrate the average change over time (Pinquart and Schindler, 2007; Busseri et al., 2009). This means that past studies were conducted using a variable-centered approach (Muthén and Muthén, 2000), so only the average change in life satisfaction over time and how individuals deviate from this average were modeled, and the heterogeneity in life satisfaction within the elderly population could not be distinguished. However, individuals may experience different levels and rates of change (declining, increasing, stable, or other patterns) in life satisfaction over time, rather than a single trajectory. Therefore, a person-centered approach (Muthén and Muthén, 2000) is needed to depict the heterogeneity in life satisfaction among members of the population. In addition, the dynamic factors that increase or decrease life satisfaction over time have not been studied extensively and therefore need to be examined. In this study, we used group-based trajectory analysis, which allowed us to identify groups of trajectories, to estimate the proportion of the population following each trajectory, and to examine the different relationships among individual characteristics (Nagin, 1999).

1.1. Covariates of life satisfaction

A number of covariates of life satisfaction also should be considered when evaluating life satisfaction trajectories. Previous research has described the relationship between physical health, self-rated health, and life satisfaction of the elderly (Berg et al., 2006; Borg et al., 2006; Röcke and Lachman, 2008). Mroczek and Spiro (2005) reported that time-varying physical health is related to changes in life satisfaction. However, physical disability was not found to be related significantly to life satisfaction in the Taiwanese elderly (Hsu, 2009). Psychological health is usually related to subjective well-being, and previous studies reported a significant relationship between depressive symptoms and both cognitive function and life satisfaction (Berg et al., 2006; Rabbitt et al., 2008; Hsu, 2009).

Social support also affects life satisfaction among the elderly. For example, those with a spouse report greater life satisfaction than those without a spouse (Chipperfield and Havens, 2001). Change in marital status is related to the life satisfaction trajectory (Mroczek and Spiro, 2005), and new widowhood is related to morale and social engagement (Bennett, 2005). Family support is related to psychological well-being for the Chinese elderly (Deng et al., 2010). Family support has a greater effect on happiness when family income is lower (North et al., 2008), and emotional support has been found to buffer life satisfaction during traumatic periods (Krause, 2004). For the Japanese community-based elderly, relationships with friends are more important to the life satisfaction (Ho et al., 2003). Continued working and participating in volunteer activities or community events also are related to higher subjective well-being (Warr

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et al., 2004; Kawamoto et al., 2005; Pinquart and Schindler, 2007; Schwingel et al., 2009).

Several longitudinal studies revealed that age or time is related to the decline of life satisfaction over time (Fujita and Diener, 2005; Gerstorf et al., 2008), and old women reportedly have a lower subjective well-being than old men (Pinquart and Sörensen, 2001; Carmel and Bernstein, 2003). A relationship between subjective well-being and economic status has been reported in several studies (Diener et al., 1993; Chou and Chi, 2002; Ball and Chernova, 2008). Socioeconomic status was found to be related to life satisfaction, but only in elderly men (Berg et al., 2006). Work and retirement patterns also have been found to be related to life satisfaction (Warr et al., 2004; Pinquart and Schindler, 2007).

1.2. Goals of the study

The goals of this study were to (1) identify different life satisfaction trajectories within a 14-year, five-wave panel data set from Taiwanese elderly using analysis of group-based trajectories and (2) compare the time-varying covariates that associate with different life satisfaction trajectories. The covariates related to life satisfaction were based on the successful aging framework (Rowe and Kahn, 1997) (i.e., less disease risks, better physical and mental function, and more engagement with life (in terms of social support and social participation)). In addition, economic satisfaction and demographic characteristics were controlled in the analysis. By applying the group-based trajectory model, the heterogeneity among the elderly over time can be discriminated, and the person-centered trajectories of the life satisfaction over time can be described.

2. Methods

2.1. Data

Data were taken from the "Survey of Health and Living Status of the Elderly in Taiwan," which is a nation-representative, longitudinal survey that was first conducted in 1989. Face-to-face interviews were conducted with a random sample of individuals ($\geq$60 years old) taken from the entire elderly population of Taiwan. A few of the participants lived in institutions, but most (99.0%) lived in a community. A three-stage proportional-to-size probability sampling technique was used. The data used in our study were taken from the five waves of interviews conducted in 1993, 1996, 1999, 2003, and 2007. In 1989, the initial samples included 4049 people. The number of missing subjects and people who died increased during follow-up. Only those who completed three or more waves of interviews and self-reported respondents were included in the analysis. In total, 2584 people were included in the analysis (see Fig. 1). Imputations were conducted for the missing items for the included samples. Missing variables were imputed from multiple sources, such as other items in the same measure scale, the values in adjacent waves, and the reasonable predictors to the missing variables.

2.2. Measures

2.2.1. Outcome variable: life satisfaction

Life satisfaction was measured using the Life Satisfaction Rating (LSR) (Neugarten et al., 1961); the correlation between LSR and the clinical rating made by clinical psychologists was 0.64. The LSR uses a 10-item scale, but in the 1993 wave only four variables were available. For consistency, only these four variables were used in our study: (a) Compared to other people, my life is better than most; (b) These are the best years of my life; (c) I expect some interesting and pleasant things to happen to me in the future; and
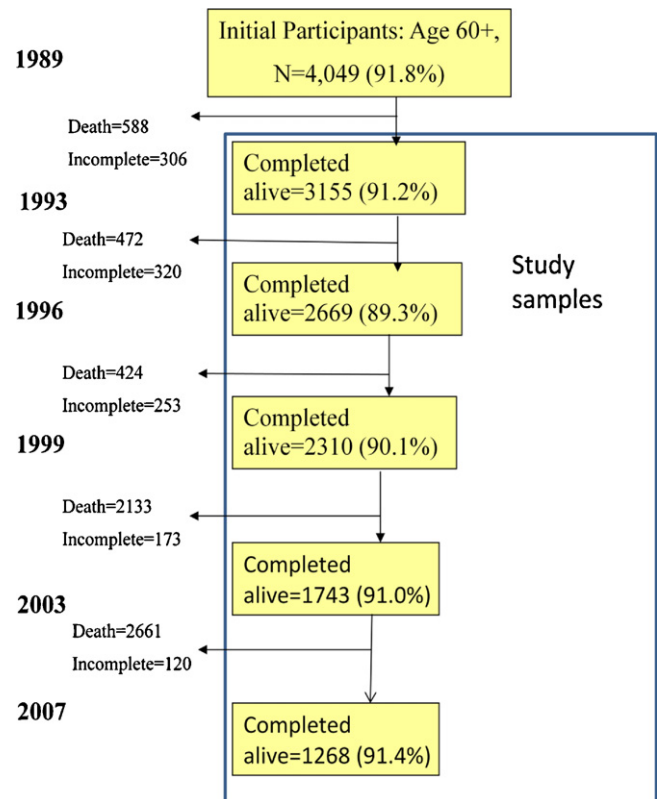

Fig. 1. Study samples.

(d) I would say I am satisfied with my way of life. Each item was rated by yes or no (scored 1 or 0). The total score ranged from 0 to 4.

3. Time-varying covariates

Time-varying variables were included in the analysis as covariates, thus the moderating effects of these dynamic variables on changes in life satisfaction could be identified. The time-varying covariates were contemporaneous with life satisfaction at each wave. The following time-varying variables were analyzed in this study:

Self-rated health was measured by rating the respondent's health. The score ranged from 1 to 5, indicating very bad to very good.

Depressive symptoms were measured using the Center for Epidemiologic Studies Depression Scale. The original version was a 20-item scale (Radloff, 1977), but we used a 10-item version (Kohout et al., 1993). Each item was scored from 0 to 3, and the total score ranged from 0 to 30.

Marital status was viewed as a measure of social support. It was coded as 0/1, where 1 = married or living with a partner and 0 = otherwise (i.e., separated, divorced, widowed, or never married).

Social support was measured by the degree to which social support was received and provided. Receiving support measured the degree to which (a) family/relatives/friends care about you, (b) family/relatives/friends listen to you, (c) you can count on family/relatives/friends when you are ill, and (d) you are satisfied with the care and support that you receive from family/relatives/friends. Providing support included two variables: (a) How often do family or friends come to consult you about your opinions, and (b) to what degree do you feel that you are being helpful to your family or friends. Each item was scored from 0 to 3. The values for the six variables were added, and the total score ranged from 0 to 18. A higher scored indicated greater social support.