

Subtypes of longitudinal association between late life cognitive function and negative affect: a parallel progress growth mixture model

Ni Yuhan, Huang Yingshi, Zhang Minqiang (Corresponding Author)
School of Psychology, South China Normal University, Guangzhou, 510631,
2640726401@qq.com

Abstract: Successful aging is a public health and research priority as the number of older adults is increasing worldwide, especially in China. Cognitive function declines during late adulthood, although there are marked individual differences in the rate of decline. It is therefore important to understand the predictors, determinants and consequences of these changes. Poor cognitive function and cognitive decline are associated with negative affect, particularly depression. Cognitive decline and negative affect tend to occur simultaneously in older adults, but previous studies have not yet known whether negative affect is a risk factor for cognitive decline or a psychological response to cognitive decline. On the other hand, because of the heterogeneity of the population, the latent co-morbid manifestation that changes in cognitive performance correlate with changes in cognitive function over time may diverse in different subgroups among older adults. The comorbid effect of negative affect and cognitive decline may reflect a causal effect or a common cause, which may also depend on the effects of other risk factors. The purpose of this study is to provide a scientific basis for the prevention and treatment of cognitive decline and negative affect comorbidity, and to provide a theoretical basis for improving the quality of life of the elderly in later life.

The study data was derived from the tracking data of the Chinese Longitudinal Healthy Longevity Survey (CLHLS) from 2002 to 2014. The study included 1,066 elderly people over the age of 75. Parallel process growth mixture models were applied to identify unobserved groups of individuals with similar linear developmental bivariate trajectories of cognitive function (i.e., orientation, registration, attention and calculation, recall, and language) and negative affect (i.e., neuroticism, loneliness, and perceived loss of self-worth) among older adults. Meanwhile demographic background variables were included as time-varying covariates to test the comorbid effect of cognitive function and negative affect in the elderly. The results show that:

(1) three classes “stable Negative affect - stable Cognitive function (SNA-SCF)”, “stable Negative affect – declined Cognitive Function (SNA-DCF)”, and “declined Negative affect - improving Cognitive Function (DNA-ICF)” are identified with older adults in the largest class “SNA-SCF” (61.9%) demonstrating flatter rate of decline than those in other classes. For all classes, there is a prospective association between cognitive function and negative affect. But only for “SNA-DCF” class changes in negative affect over time are associated with cognitive shifts.

(2) gender, marriage, exercise status and ADL difficulties have statistically significant effects on cognitive function and negative affect for all classes. For all classes, non-marriage status and ADL difficulty are risk factors for cognitive function change. For “SNA-DCF” class, ADL difficulty is a risk factor for negative affect change, meanwhile for “SNA-SCF” and “DNA-ICF” class participation in marriage status, or having regular exercise may tend to improving affective well-being.

This study does not support the hypothesis that negative affect may be a risk factor for cognitive decline in the general population, but applied in part of them. In addition, this study provides differential treatment effects across subtypes of cognitive decline and negative affect comorbidity, which has potential applications for the treatment, as well as the benefit for tailored intervention programs of late negative affect and the prognosis of cognitive outcomes.

Keywords: late life, cognitive function, negative affect, growth mixture model

晚年认知功能与消极情感纵向关系的亚类型：并行混合增长模型

倪雨菡 黄颖诗 张敏强（通讯作者）

华南师范大学心理学院，广州，510631，2640726401@qq.com

摘要 发展中国家随着人均寿命延长与生育率的下降，人口老龄化问题日益严重。老龄化问题是公共卫生和研究的重点。认知功能在成年后期呈现下降的趋势，尽管下降率存在明显的个体差异。因此，了解这些变化的预测因素、决定因素和后果非常重要。认知衰退和消极情感常常在老年人中同时发生，但现有研究尚未得知，消极情感是否是认知能力下降的危险因素，或是认知能力下降导致的一种心理反应？另一方面，由于群体的异质性，在不同的老年人亚群体中，认知功能与消极情感的潜在共变也可能是不同的。该共病效应可能反映了一种因果效应或共同原因，或取决于其他因素的影响。本研究旨在为制定科学合理的认知障碍与抑郁共病防治策略，为提高老年人晚年生活质量提供理论依据。

本研究数据来源于2002年至2014年中国老年人健康影响因素追踪调查（CLHLS）项目。被试包括1066名75岁以上的老年人，采用并行增长混合模型来识别具有类似的认知功能与消极情感变化的老年人亚群体。同时纳入婚姻状态、社交活动、吸烟、饮酒、锻炼等变量作为时变协变量，以检验影响晚年认知功能和消极情感共变效应的因素。结果表明：

（1）晚年认知功能和消极情感共变效应存在“消极情感稳定-认知功能稳定组（SNA-SCF）”“消极情感稳定-认知功能下降组（SNA-DCF）”“消极情感减弱-认知功能上升组（DNA-ICF）”三个类别，其中，“SNA-SCF”类别是个体最多的亚群体（61.9%），表现出比其他类别更为平缓的变化速率。对于三个类别的老年人而言，认知功能与消极情感之间均存在前瞻性关联，但只有“SNA-DCF”类别的老年人消极情感随时间的变化与认知功能的转变有关。

（2）在三个类别中，性别、婚姻、锻炼情况及ADL困难对老年认知功能与消极情感的影响均有统计学意义，其中，非在婚状态与ADL困难是认知功能转变的危险因素，性别、婚姻及ADL困难为认知功能和消极情感的共同影响因素。对于“SNA-DCF”类别的个体来说，ADL困难是消极情感转变的危险因素；同时在“SNA-SCF”和“DNA-ICF”类别的个体中，在婚状态、参加锻炼与无是消极情感转变的保护因素。

本研究并不支持消极情感可能是一般性老年人群体认知能力下降的危险因素的假设，该假设仅在部分老年人中得到了验证。此外，还探究了对认知功能与消极情感共变亚类型的影响因素，对于晚年认知衰退与消极情感的预后具有潜在的应用意义。

关键词 晚年，认知功能，消极情感，增长混合模型