# Research on Attitudes Toward Ageing, Social Participation, and Depressive Symptoms Among Older Adults in China

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# Abstract

Depressive symptoms are one of the most common mental health problems in later life. Although previous studies examined the social determinants of depressive symptoms, older adults' attitudes toward ageing and the underlying mechanisms are understudied, especially in developing country contexts such as China. The objective of this study was to examine the mediator role of attitudes toward ageing on the relationship between social participation and depressive symptoms among older Chinese adults. The data were drawn from the 2014 baseline wave of China longitudinal Ageing Social Survey, and a total of 8568 respondents aged 60 years and older were included in this study. Path analysis was used to test the hypotheses. The results indicated that both psychological loss and psychological growth (i.e., two types of attitudes toward ageing) had direct effect on depressive symptoms. In addition, attitudes toward ageing were found to play significant mediator roles on the relationship between social participation and depressive symptoms among older adults. In conclusion, this study implicated the importance of older adults' attitudes toward ageing in reducing depressive symptoms, and engaging in social activities could modify attitudes toward ageing and further reduce the risk of depressive symptoms.


# Introduction

The world's population is ageing rapidly. According to the United Nations [1], the proportion of the world's population aged 65 years or older will grow from 9% in 2019 to 16% in 2050. In China, older adults will account for 26.1% of the population by 2050. There will be approximately 480 million old people aged 65 and above in China by 2050 [2]. Mental health is an important indicator of healthy ageing. Depressive symptoms are the most common mental health problems among old people [3]. More than 300 million people suffered from depression in 2015, and the prevalence rate increases with age [4,5]. Due to the different tools and samples, the prevalence rates of depression and depressive symptoms among older people varied across studies, ranging from 2.3–38.9% [6]. Huang, et al. [7] and Haigh, et al. [5] reported that approximately 4.1% and 35% Chinese older adults experienced depression and depressive symptoms respectively. Individuals from low-income regions, rural areas and women have higher risk of depression symptoms than others [4,7].

Furthermore, depression is the major causes of both disability and suicide [4]. Old people experiencing depression were more likely to have chronic diseases, such as asthma, coronary heart disease and rheumatoid arthritis [3] and higher risk of suicide [4,8,9]. As the aged population grows, the number of depressed seniors will continue to increase. Although depression and depressive symptoms can be treated through psychological interventions or medications, 76–85% people in low- and middle-income countries still have no access to effective treatment [4,10]. Therefore, reducing the prevalence of depressive symptoms is beneficial to promote older people's mental and physical health, improve their life quality, and eventually achieve the goal of healthy ageing. Thus, it is important to examine the potential factors of depressive symptoms and develop corresponding effective policies and interventions.

Empirical studies have examined various factors of depressive symptoms among older people. These factors could be classified into a) sociodemographic characteristics, including gender, age, marital status [11–13]; b) physical health, such as chronic diseases and disability [11,13]; c) socioeconomic status (SES), such as income and education [9,11,14]; d) social support [15] ; e) health behaviors, such as smoking and drinking [16], and social participation [17–19]. In addition, some studies indicated that older people's attitudes toward ageing (hereafter, ATA) were also modifiable social determinants of depressive symptoms [20–22]. However, most existing studies examined the direct effects of ATA on depressive symptoms in western countries. And the interplay between ATA and social participation and their influence on depressive symptoms remains understudied. Therefore, it is necessary to examine the mechanisms linking ATA and social participation to depression among older Chinese people.

# Theoretical Framework

The Active Ageing Framework highlighted that in order to maintain health, including physical health, mental health, and social well-being, old adults should be encouraged to participate in social activities, and be provided adequate protection, security and care when they needed. Active ageing refers to "the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age (p.12)" [23]. "Active" emphasize continued participation in social activities after retirement. At present, the promotion of social participation has become a key development strategy of active aging and a vital issue of public policy in all countries. In addition, according to Beck [24] cognitive theory of depression, people's negative cognitions are the major causes of depression. Beck believed that the construct of schemata, which was defined as stored knowledge, would affect individual's understanding and processing of information. People with "depressogenic" schemata tend to explain all the events in a negative way. Individuals who engaged in this cognitive process were more likely to develop "negative cognitive triad", which refers to negative views of oneself, the world, and the future [25]. Beck hypothesized that these negative cognitions would increase the risk of depression. Therefore, older people who hold negative ATA may have a higher risk of suffering depression.

Furthermore, proponents of social psychology believed that behavior is associated with attitude. Self-perception theory indicated that people could infer their attitudes and emotions by observing their own behavior [26]. Individual would change their attitudes to prove the rationality of behaviors and keep consonance of cognition. Thus, older people who engaged in activities actively were more likely to have positive ATA. Therefore, ATA may play a mediator role in the association between social participation and depressive symptoms among older people.

# Social Participation and Depressive Symptoms

Social participation was defined as "a person's involvement in activities that provide interaction with others in society or the community" (p.2148) [27]. Empirical evidence indicated that engaging in social activities (e.g., political activities, volunteering activities, economic activities) was benefit to older people's mental health, including reducing the risk of depressive symptoms [28–34]. An intervention study found that

established community group activities can influence the reduction of depression and suicide attention [18]. A relevant systematic review also suggested that most of the research showed formal social participation had a positive impact on older people's physical and psychosocial well-being [17]. Moreover, some studies suggested that the effects of social participation varied from its type of activities, and high frequency of social participation was associated with low level of depressive symptoms [35,36]. Older people who participated the single type of activities had a higher risk of depression than those who participated two or three types of physical, social, and religious activities [19].

# The Mediator Role of ATA in the Association between Social Participation and Depressive Symptoms

ATA refers to older people's subjective evaluation and feelings to the process of ageing, including positive and negative attitudes, and it also can be measured by three dimensions: psychological loss, psychological growth, and physical change [37]. Many relevant studies found that negative ATA was associated with higher level of depressive symptoms [21,38–41], while positive ATA was associated with lower risk of depression and anxiety symptoms, and higher level of life satisfaction [20,42–44] A systematic review reported negative ATA, ageism, and ageing stereotypes predicted higher level of depression and anxiety among older people in all the 12 studies [45]. A cross-sectional study showed that people aged 80 and older had a more negative ageing attitudes than its younger counterpart group (aged 57 to 79). And positive ATA was associated with better quality of life [46]. Meanwhile, one Chinese study reported that psychological loss had positive impact on depressive symptoms, while the effects of psychological growth on depressive symptoms was not significant [47]. The inconsistent conclusions may result from different measurements and sample size in different countries.

Furthermore, empirical evidences suggested that older people's social participation and health behaviors was associated with their ATA [46,48]. Some studies indicated that social participation was an effective strategy to modify older people's negative ATA. For example, a study on the relationship between older people's ATA and cognitive function found that engaging in more social activities could reduce the impact of negative age stereotype on the decline of episodic memory [49]. In addition, a randomized control trial study indicated that participating in physical activities could change older people's ATA: Compared with two control groups, the behavior intervention combined with "views-on-ageing-component" had higher effects on the improvement of positive ATA [50]. These findings indicated that encouraging older people to participate activities may be beneficial for fostering positive ATA, which could further reduce the risk of depressive symptoms.

Although previous studies had examined the effect of social participation and ATA on older people's mental health, there still have some research gaps. First, existing studies are mainly based on Western countries, limited studies examined the relationship between ATA and depressive symptoms among older adults in China. ATA may be impacted and shaped by social and cultural determinants [51], therefore, it is important to understand the ageing attitudes and its effects on depressive symptoms in Chinese context.

Secondly, previous studies have mostly examined the direct effects of ageing attitudes on depression and depressive symptoms, however, the underlying mechanisms have not been fully examined. To our knowledge, no studies have examined the mediation mechanisms among social participation, ATA and depressive symptoms in China. Based on a national survey data, this study would examine the mediation role of ATA on the relationship between social participation and depressive symptoms among older Chinese adults. Therefore, we proposed two hypotheses:

1. 1. Psychological loss mediates the association between social participation and depressive symptoms among older Chinese adults.
2. 2. Psychological growth mediates the association between social participation and depressive symptoms among older Chinese adults.

## Methods

# Sampling

We drew the data from 2014 China Longitudinal Aging Social Survey (hereafter, CLASS), which was conducted by National Survey Research Centre at Renmin University of China. The data collection is in accordance with the ethical standards of the institutional research committee. Informed consent forms were obtained from all the respondents before data collection. This is a national representative survey of the adults aged 60 or older in China, using a stratified multistage sampling design to select responses randomly. Firstly, 134 counties (including counties, county-level cities and districts) were selected as primary sampling unit (PSU). Secondly, 462 rural/ urban communities were selected as secondary sampling unit (SSU). Thirdly, a plot sampling method was used to select sample households, and one elderly was interviewed in each household. Finally, this survey covered 29 provinces/autonomous regions/municipalities (excluding Hong Kong, Taiwan, Macao, Hainan, Xinjiang and Tibet), and a total of 11511 old adults were surveyed. Due to the failure on cognitive function test, 2943 participants did not be allowed to answer the questions about ATA and depressive symptoms [44]. therefore, after dropping the 2943 data, the final analytic sample size is 8568 in the present study.

# Measurements

*Dependent Variable.* Depressive symptoms were measured by a Revised Version of Centre for Epidemiological Studies Depression Scales (CES-D) [52], which has been proved reliable and valid. The respondents need to answer nine questions about their feelings in the past week, including positive feelings, (e.g., feeling happy), negative feelings, (e.g., feeling upset), and somatic symptoms, (e.g., having trouble sleeping). Each item was scored with 0 (no), 1 (sometimes), and 2 (often). Three positive items were reversed-coded before calculated. Total scores of 9 items were summed, ranging from 0 to 18, with higher scores indicating greater depressive symptoms. In this study, the Cronbach's alpha is 0.76.

*ATA.* Referring to previous studies and present data, a 6-items scale was used to measure the ATA of older adults, which consists of two dimensions: psychological loss and psychological growth [44]. The

dimension of psychological loss was measured by three items, such as “As I get older, I find it more difficult to make new friends”. The dimension of psychological growth was also measured by three items, such as “Wisdom grows with age”. Answers were measured on a 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). An average score was calculated by the items of each dimension separately, higher scores indicating higher psychological loss or higher psychological growth (ranging from 1 to 5). Cronbach’s alpha was 0.63 for psychological loss and 0.60 for psychological growth.

*Social participation.* In this study, social participation includes three type activities: political participation, economic participation, and community volunteer participation [53]. Political participation was measured with a single-item question, “Did you have voted in a local election in recent three years?” Economic participation was measured by the question, “Are you engaged in any paid work or activities?” volunteer activities participation, was measured by the question, “Did you have participated in any of the following community volunteer activities in the past three months?” eight volunteer activities were listed, including security patrol in the community, helping old people, take care of children from other households, environmental protection. Each type of activity was recoded as binary variable (0 = no, 1 = yes). Total scores of the ten items were calculated to present the frequency of respondents’ social participation. Scores range from 0 to 10, with higher scores representing more social activities participation. In this study, 35.37% respondents did not participate in any social activities.

*Covariates.* In this study, control variables included 1) socio-demographic characteristics: age (in years), gender (0 = male; 1 = female), household registration (0 = urban; 1 = rural), marital status (1 = married; 0 = others); 2) SES: education (0 = primary school and below, 1 = secondary school and above), annual income; 3) physical health: the number of chronic diseases, ADLs. ADLs were measured by seven items [54], such as eating, dressing, bathing, toileting, moving on and off bed. A total score was summed to assess the daily activity abilities (ranging from 0 to 14), and higher scores indicated higher limitations in physical function.

# Data Analysis

Path analysis was applied to examine the hypotheses in Mplus 7.4 [55]. The total sample in this study was 8568, except for the income variable (missing values accounting for 8.25%), the missing value proportion of other variables ranged from 0–1.07%. To make the estimation results more effective and robust, the estimator method of MLR (Maximum Likelihood Robust Estimator) would be used [55]. Model included two ATA variables (psychological loss; psychological growth), one social participation variable, one depressive symptoms variable, and eight control variables. The establishment of the mediation model included two steps. First, the total effects of social participation on depressive symptoms were tested. Then, ATA variables were put into the model to examine its mediator roles in the association between social participation and depressive symptoms. The chi-square test ($\chi^2$/df), comparative fit index (CFI), Tucker Lewis index (TLI), standardized root mean-square residual (SRMR) and the root-mean-square error of approximation (RMSEA) were used to evaluate model fit. The criteria are as follows: Nonsignificant chi-square test values, values CFI and TLI values $\geq 0.90$, and RMSEA and SRMR values $\leq 0.05$ [55].

## Results

# Descriptive Statistics

Table 1 shows the sociodemographic characteristics of the respondents. Of the 8568 samples, more than half (54.24%) were men, and the mean age was 69.10. Approximately two-thirds were urban residents, and 43.92% had completed secondary school or more. The average of self-reported annual income was higher than 20000 RMB. In terms of health status, the average score of ADL was 0.18. 93.39% and 27.85% participants reported that they had no ADL limitations and chronic diseases separately. In addition, the average score of negative ATA was 3.00 (ranging from 1 to 5) and positive ATA was 2.76 (range from 1 to 5). In terms of depressive symptoms, the mean score was 4.54 (range from 0 to 18).

[Insert Table 1 about here]

# Path analysis: the mediating role of ATA

The initial model showed that social participation was associated with depressive symptoms (β = -0.072, $p < 0.001$). The model fit indexes were as follows: $\chi^2(2) = 2.072$, p = .035, CFI = 1.000, TLI = 1.000, SRMR = 0.002, RMSEA = 0.002. After adding psychological loss and psychological growth as mediators, the effect of social participation on depressive symptoms was still significant (β = -0.048, $p < 0.001$). In addition, social participation was negatively related to psychological loss (β = -0.065, $p < 0.001$) and positively related to psychological growth (β = 0.038, $p = 0.002$). Furthermore, psychological loss and psychological growth were significantly associated with depressive symptoms (psychological loss: β = 0.270, $p < 0.001$; psychological growth: β = -0.169, $p < 0.001$). Thus, two types of ATA played partial mediators in the relationship between social participation and depressive symptoms ($\beta_{PSYL} = -0.062$, $p < 0.001$; $\beta_{PSYG} = -0.022$, $p = 0.003$). The estimates of fit indexes indicated the mediator model had a good fitness: $\chi^2(3) = 0.003$, p = 1.000, CFI = 1.000, TLI = 1.000, SRMR = 0.000, RMSEA = 0.000.

[Insert Fig. 1 about here]

# Sensitive analyses

In this study, we conducted two sensitivity analyses to test the robustness of our results. Fist, given the relatively high missing rates in the income variable, we conducted a sensitivity analysis by rerunning the models without income. The results are in line with the original model. In addition, some studies argued that older people who had negative ATA, such as ageing stereotypes and ageism, were less likely to have healthy lifestyle (e.g., physical exercise, balance diet) and engage in social activities [56,57]. Considering this situation, we built a second model to examine whether social participation had mediating effect in the relationship between ATA and depressive symptoms. Results showed that the mediator effects of social participation on psychological loss and psychological growth were significant but small ($\beta_{PSYL} = 0.010$, $p < 0.001$; $\beta_{PSYG} = -0.004$, $p = 0.038$), which accounted for 3.15% of the total effects of ATA on depressive symptoms. The direct effect of psychological loss and psychological growth on depressive

symptoms only changed from 0.273 and − 0.171 to 0.270 and − 0.169 respectively. Therefore, older people's ATA is more likely to influence depressive symptoms directly, instead of through social participation.

# Discussion

As societies age, it is becoming increasingly important to identify modifiable factors that may optimize older adults' health. The present study is one of the first to investigate the mechanism among ageing attitudes, social participation, and depressive symptoms of older adults in China. Using path analysis by combining cognitive theory of depression, active ageing framework and self-perception theory, our findings proved that ATA was more likely to play a mediator role in the relationship between social participation and depressive symptoms. The total mediator effects of ATA accounted for about 33% of the total effects of social participation on depressive symptoms.

The findings are in line with empirical evidence that positive ageing attitudes were associated with a decrease in depressive symptoms in later life, while negative ageing attitudes were associated with an increase in depressive symptoms [42,44]. Low self-worth and sense of guilty are typical characteristic of depression [4], and ATA include negative and positive self-evaluations and feelings in the process of ageing. Thus, ageing attitudes could have significant effects on depressive symptoms. Compared with positive ageing attitudes, negative perceptions of aging exhibited a stronger direct impact on depression. This can be framed by the cognitive theory of depression, in that older adults with negative ageing attitudes are more likely to ruminate selectively and focus more on negative aspects of ageing process, which could be detrimental to mental health [22,44]. Furthermore, with age, older adults may experience internal and external changes, with decline in cognitive and physical functions combined with limited social support, all of which may increase the negative evaluation of themselves and limit their capacity to maintain mental health [34]. Additionally, such a relationship might be partially explained from a cultural perspective: due to loss of prior roles tied to occupational or formal systems, older Chinese adults may experience a negative self-image (e.g., feeling of unworthiness) and lower self-efficacy, considering themselves as a burden to their families, which may lead to increased risk of depression [58].

In addition, another important finding in this study was that the experiences of participating social activities had influence on older people's ageing attitudes. Some unpleasant life experiences from social participation might also result in negative emotions about ageing and further increase risk of depression. By contrast, high quality of social participation could contribute to positive ATA and reduce the level of depressive symptoms. A physical activity intervention study showed that behavior intervention with challenging negative ageing beliefs could change negative ATA [50]. In addition, Chan, et al. [49] reported that social participation could buffer the adverse effect of negative age stereotypes of cognitive function. These results were also consistent with self-reception theory.

Our research has important implications for future professional interventions and policy initiatives. This study highlights the significant impact of ageing attitudes on depressive symptoms. Therefore, future

programs for depression may include assessment of ageing attitudes as a potential target of treatment [41]. Furthermore, public health policy should consider the group-specific strategies. Our findings suggest that negative ageing attitude is a stronger factor. Thus, geriatric psychiatry practitioners and social workers could guide older adults to shape perceptions of ageing towards a more positive view of ageing [59]. Psych-education programs are needed for them to attain scientific understanding of the ageing process [44,60]. Additionally, considering that social participation appears to be a critical protective factor in depression, supportive services, and resources to prevent depression should be considered, such as designing various social activities, improving the social environment, involving older persons in community affairs, and providing sufficient instrumental, informational, and emotional support to older adults [41,61]. In view of the effects of social participation on ATA [50], the experience of activity participation is also important. Organizers should pay more attention to the quality of activities, and ensure that the difficult of activities could be commensurate with older people's physical and cognitive condition.

Our findings also offer direction for further research. We only explore the mediating mechanisms among social participation, ATA and depressive symptoms. However, some studies have suggested that other important moderators, such as location [44], age group [62], and social support [41], may buffer the adverse impact of negative ageing attitudes or strength the protective impact of positive ageing attitudes. Moreover, future studies on the mental health could examine how relationships between ATA and health differ by types and intensity of social activity to offer a more comprehensive view on health implications of ageing attitudes in later life.

There are limitations in this study. First, the direction of the causal relationships among ageing attitudes, social participation, and depressive symptoms cannot be determined from the cross-sectional design as ATA was only measured in 2014 CLASS. Future longitudinal design or experimental approaches are recommended to validate and expand current study. The second limitation concerns the measure of social participation. Similar to the research of Liu., et al. [44], our study is limited by a lack of more detailed information on social participation, such as intensity and where the activity was conducted. If this information were considered, it would be possible to further our understanding on the mediating effect of social participation on health. Lastly, the information on the third dimension of ageing attitudes (physical change) is not available in the data. Our study did not examine the effects of physical change on the mechanism of ATA, social participation and depressive symptoms. Although assessing the ATA through short version of AAQ may be an oversimplification of a complex reality, this measure has been validated among Chinese samples and successfully used to predict life satisfaction, depression, and loneliness [41,63].

# Conclusion

In summary, these findings advance our knowledge on the relationship among ATA social participation and depressive symptoms. Results highlighted that ATA, including both psychological loss and psychological growth, mediates the association between social participation and depressive symptoms

among older people. Our study shows that both positive ageing attitude and participation in social activities are protective factors in depression, which indicates that the design of programs and policies should consider evaluating ageing attitude as well as involving older adults more in social activities which focus on promoting positive ATA.

# Declarations

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**Ethics approval:** The data collection is in accordance with the ethical standards of the institutional research committee. Informed consent forms were obtained from all the respondents before data collection.

**Author contribution**: SM contributed to original draft preparation, statistical analysis, and revision. YZ contributed to paper writing and revision. NL made contribution to study design, statistical analysis, and paper revision.

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**Data availability:** The datasets analyzed during the current study are available in the CLASS repository: http://class.ruc.edu.cn

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# Table

Table 1

Sample Characteristics (N = 8568)

| Percentage | Means (SD) | N | |
|---|---|---|---|
| **Gender** (%) | | | 8564 |
| 1 = Female | 3919 (45.76) | | |
| 0 = Male | 4645 (54.24) | | |
| **Age (60-113)** | | 69.06 (7.47) | 8567 |
| 60-64 years | 3052 (35.63) | | |
| 65-74 years | 3425 (39.98) | | |
| 75 years or above | 2090 (24.40) | | |
| **Household registration** (%) | | | 8568 |
| 1 = Rural | 2925 (34.14) | | |
| 0 = Urban | 5643 (65.86) | | |
| **Marital status** (%) | | | 8558 |
| 1 = Married | 6080 (71.04) | | |
| 0 = Other status | 2478 (28.96) | | |
| **Education level** (%) | | | 8565 |
| primary school or lower | 4803 (56.08) | | |
| Secondary school or above | 3762 (43.92) | | |
| **Annual income (RMB)** | | 21123.73 (25475.49) | 7861 |
| **Health status** | | | |
| Number of chronic diseases (0-16) | | 1.55 (1.67) | 8557 |
| ADL (0-14) | | 0.18 (0.99) | 8568 |
| Psychological loss (1-5) | | 3.00 (1.04) | 8499 |
| Psychological growth (1-5) | | 2.76 (1.03) | 8476 |
| Social participation (0-8) | | 0.99 (0.99) | 8568 |
| Depressive symptoms (0-18) | | 4.54 (3.54) | 8554 |

*Note*: ADL, activities of daily living; SD, standard deviation.

# Figures

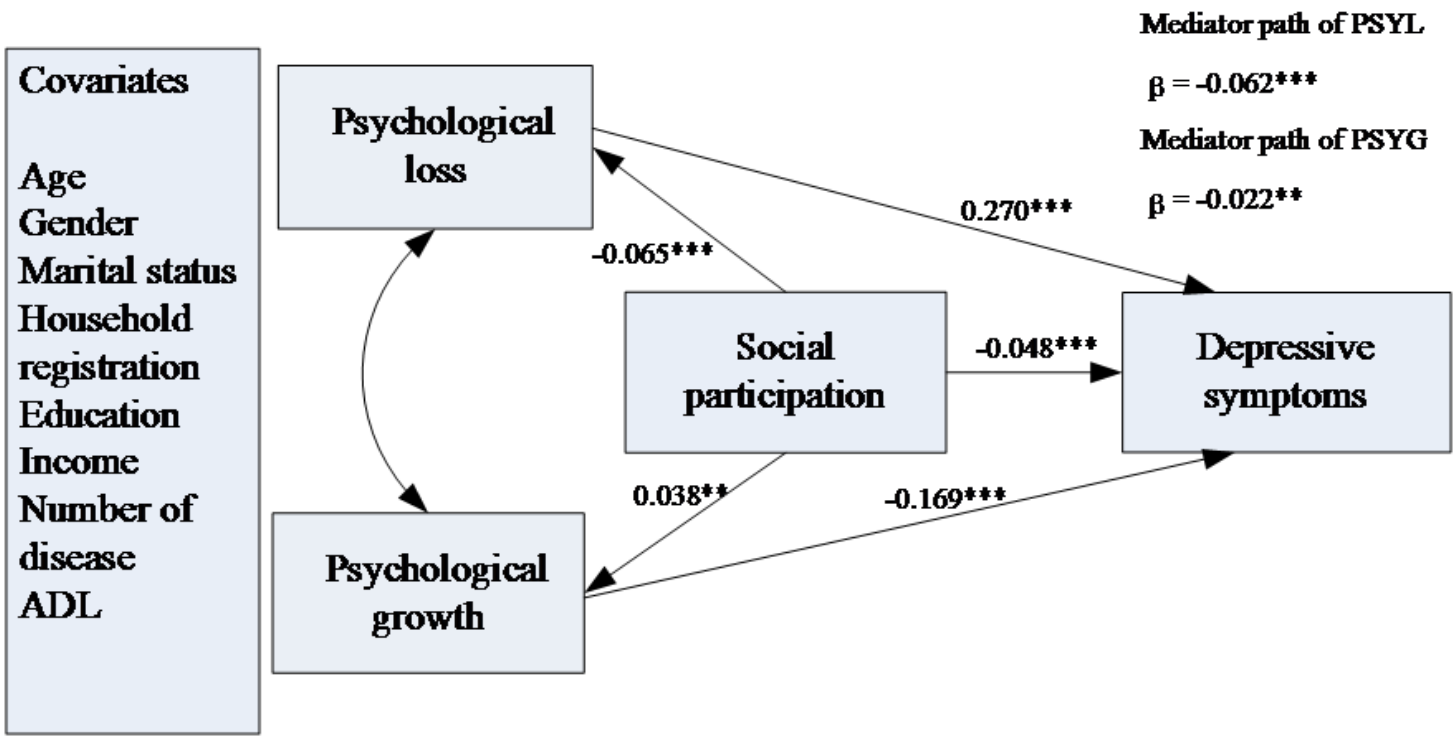


Figure 1

Final model of the mediator role of attitudes toward ageing in the association between social participation and depressive symptoms.