



Research Paper

# The Influence of Retirement Resources on Well-Being in Middle-Aged and Elderly Populations: The Mediating Role of Voluntary Service

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## Abstract

The purpose of this paper is to explore the influence of retirement resources on well-being in middle-aged and elderly populations, and use voluntary service as an intermediary factor to explore its mediating effect. The research results show that retirement resources have a positive effect on voluntary service among middle-aged and elderly populations. Retirement resources also positively impact retirement well-being in this group. Additionally, voluntary service positively influences retirement well-being, and it mediates the relationship between retirement resources and retirement well-being.

**Keywords:** retirement resource, well-being, middle-aged, voluntary service

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## I. Introduction

With the advancement of medical technology and societal progress in Taiwan, combined with a comfortable lifestyle, the average life expectancy has shown a steady increase over the years. It is estimated that around 3.78 million people will retire by 2023, while the working-age population will only increase by approximately 1.81 million over the next decade, resulting in a shortfall of nearly 2 million. Faced with both a declining birthrate and a wave of retirements, the reduction in the labor force means that middle-aged and elderly individuals joining the workforce will become the new norm.

The impact of the COVID-19 pandemic in 2020 may have caused fluctuations in the average retirement age, but data up to 2023 indicates that retirement age has stabilized, with the average retirement age remaining around 62. These figures reflect an overall trend of increasing retirement age in Taiwan as time progresses.

In the study by Leung & Earl (2012), it was noted that having access to various retirement resources is crucial throughout the retirement process. These resources include physical resources (e.g., health status), financial resources (e.g., pensions and savings), social resources (e.g., social support and relationships), emotional resources (e.g., emotional support for life), cognitive resources (e.g., knowledge and skills), and motivational resources (e.g., expectations for the future). Their research points out that individuals with more retirement resources tend to adapt more easily to retirement life. For example, good health, stable financial conditions, and rich social connections can help retirees' better cope with the changes and challenges brought by retirement. Moreover, the study emphasizes the importance of resource allocation during retirement, suggesting that retirees should purposefully allocate their resources according to their needs and values to achieve their retirement goals and expectations. Overall, the findings of Leung & Earl (2012) highlight the significance of retirement resources in the personal retirement process and provide valuable insights to help better understand and manage the challenges and opportunities retirement may bring.

Additionally, Wang & Shi (2014) indicated that during the entire retirement transition, the flexibility and adaptability of resources significantly affect retirees' well-being. Their research focuses on key issues related to the retirement transition. The primary findings include: (1) Resource flexibility: the study suggests that during the retirement transition, the resources available to retirees should possess flexibility and adaptability to meet changing needs and environments. This includes financial resources, social resources, and physical health, among others. (2) Well-being and resource allocation: the research found that retirees could allocate resources purposefully according to their personal needs and values to enhance well-being and quality of life. This allocation should align with the individual's lifestyle and expectations. (3) Psychological adjustment: the retirement

transition may be accompanied by psychological adjustment challenges, such as the loss of work identity and changes in daily routines. Shultz & Wang (2011) proposed that retirement is not a singular event but a process that takes years to complete, offering a three-stage coping approach: retirement planning, retirement decision-making, and retirement adjustment, with the ultimate goal of helping individuals enjoy a fulfilling and pleasant retirement life. Therefore, retirees need to learn how to face these changes and develop a positive mindset and coping strategies. (4) The importance of resources: the research highlights the importance of resources during the retirement transition, including financial resources, social support, and physical health. Having more resources can help retirees better navigate the challenges and opportunities of retirement life. In summary, Wang & Shi (2014) provide valuable insights that contribute to our understanding of the retirement transition and its related issues. These findings hold significant reference value for personal retirement planning and the pursuit of well-being.

Based on the above information, the main objective of this study is to explore the impact of resource-based retirement planning and adjustment strategies on individual well-being after retirement. Through an in-depth examination of the relevant factors, the study aims to provide effective recommendations for individuals approaching or already in retirement, including early planning, adaptive adjustments, and self-awareness, thereby promoting and enhancing well-being in post-retirement life.

## **II. Literature Review and Research Hypotheses**

There is a reciprocal relationship between retirement resources and well-being among middle-aged and elderly populations. Adequate retirement resources can enhance well-being, while a high level of well-being in retirement can, in turn, contribute to further accumulation and utilization of these resources, creating a positive cycle that promotes the happiness and health of this demographic. Therefore, this section will further explore the relevant literature on this topic

### **2.1 Retirement life**

According to Erik Erikson's psychosocial development theory (1982), individuals over the age of 50 are in the final stage of life, referred to as late adulthood or old age. The developmental crisis and task in this stage involve ego integrity versus despair. Successful development in this stage is characterized by contentment and the ability to enjoy one's remaining years, while developmental obstacles manifest as regret over past actions and a sense of hopelessness. For middle-aged and elderly individuals, having worked for a lifetime, it is natural to hope for sufficient resources and high well-being in retirement.

Lin Donglong, Yu Bin, and Chen Wuzong (2010) point out that retirement is not the end of life, but rather the beginning of a new stage. As life progresses, role transitions can lead to changes in power, prestige, self-awareness, and identity, all of which can impact psychological well-being and behavior. The significant changes brought by retirement are closely linked to quality of life and health in old age, with retirement's impact on health being a key factor influencing the well-being of middle-aged and elderly individuals (Oshio & Kan, 2017).

Scholars have differing views on whether retirement affects health positively or negatively. Some argue that retirement provides more time for physical activities, spending time with family, traveling, engaging in social services, or volunteering, thus making life healthier and more meaningful. On the other hand, some people may experience boredom due to increased free time, reduced income, the inability to engage in constructive activities, and a loss of social roles, all of which can negatively impact their lives (Oshio & Kan, 2017). The life changes brought by retirement may trigger psychological factors that interact with personal mental health and well-being (Laberon, Grotz, Amieva, Pérès, & Vonthron, 2019).

American sociologist Atchley (1976, 1982, 1988), who studied retirement issues, believed that retirement should be divided into pre-retirement considerations and preparations, as well as post-retirement adjustments. He proposed six stages of retirement adjustment:

**Pre-Retirement Phase:** This is a phase of self-awareness and psychological preparation before retirement. At this stage, individuals have not yet considered retirement seriously and are unprepared for it.

**Honeymoon Phase:** The first six months before retirement are typically the happiest, with no pressure, allowing individuals to enjoy themselves and pursue activities they love.

**Disenchantment Phase:** Six months to a year after retirement, individuals may experience feelings of loss and concern due to changes in their lifestyle and financial situation, leading to a disillusionment with the idealized image of retirement.

**Reorientation Phase:** Within a few years of retirement, individuals actively reorganize and preplan their retirement life, adopting a more positive and pragmatic attitude.

**Stability Phase:** Retirees have adapted to retirement life and are able to accept and face the realities of retirement with ease.

**Termination Phase:** Due to mobility issues, illness, or death, retirees' attention and life focus shift,

marking the end of retirement.

Laberon, Grotz, Amieva, Pérès, and Vonthron (2019) also noted in their study that the earlier individuals recognize, adjust to, and accept the end of their working life, the more likely they are to experience higher life satisfaction, better health, and reduced depression post-retirement. Therefore, it is hypothesized that:

## **2. 2 Retirement Resource Planning**

Retirement resources refer to the various resources individuals can utilize after retiring. These resources help retirees maintain a stable standard of living, promote health and well-being, and address potential challenges. According to Wang & Shi (2014), retirement resources are flexible and adaptable during the transition to retirement. Retirees can invest more resources according to their needs, which in turn affects their well-being. Thus, retirement resources can serve as a long-term adjustment strategy for retirees. The study by Topa et al. (2017) also highlights the broad scope of retirement resources, defining any resource related to retirement as a retirement resource. Below is a brief description of the key retirement resources:

**Financial Resources:** This includes pensions, personal savings, and investment returns. Sufficient financial resources enable individuals to maintain their living standards, cover expenses, and handle unforeseen costs after retirement.

**Social Resources:** These encompass family, friends, community, and other social relationships. Strong social resources provide emotional and social support, contributing to a sense of meaning in life and alleviating loneliness, which enhances well-being.

**Health Resources:** This includes physical health, mental health, and access to healthcare. Maintaining a healthy lifestyle, seeking timely medical care, and having adequate healthcare resources promote personal health and well-being.

**Emotional Resources:** These consist of self-identity, self-worth, and psychological resilience. Strong emotional resources help individuals build a positive mindset, enabling them to cope with challenges and changes in life.

**Activity Resources:** These include hobbies and interests in retirement life. Having a variety of activities enriches retirement life, improving quality of life and well-being.

**Educational Resources:** These include personal knowledge and skills, as well as opportunities for further learning and development. Such resources help individuals remain active, confident, and engaged in a meaningful life.

In psychological research, retirement is often conceptualized as a decision-making process, emphasizing that when individuals decide to retire, they make choices about their psychological commitment to work and their withdrawal from work-related activities (Adams et al., 2002). This conceptualization also highlights the importance of retirement decisions as a major life event and explains some normative motivations for retirement, such as health issues, family caregiving needs, attitudes toward one's work, employer, and career, as well as a desire for leisure activities (Wang & Shultz, 2010). When conceptualizing retirement as a decision, older adults base their retirement decision on the resources they have available for their retirement life.

Specifically, the rational choice theory has been used to link older workers' financial status and the external economic environment to their retirement decisions. This theory views the retirement decision as the result of comparing the financial resources required at retirement with the resources already accumulated (Gwenith et al., 2016). Therefore, workers will only retire if they believe their accumulated financial resources and anticipated future economic conditions will support their consumption needs during retirement.

Several theories related to retirement resources frequently link these resources to retirement decisions. For example, Image and Role Theory connects workers' demographic characteristics, work experience, marital life, industry type, and productivity to their retirement decisions (Adams et al., 2002). All these factors relate to how individuals perceive themselves and their roles within the broader social context, creating a comparative standard for workers to evaluate whether their retirement behavior aligns with their self-image or role. If there is alignment, the decision to retire is made (Brougham & Walsh, 2007).

The Theory of Planned Behavior links workers' retirement decisions to their attitudes toward their work, employer, career, and retirement, as well as workplace norms (Zhan et al., 2013). The general premise of this theory emphasizes the influence of workers' attitudes toward retirement and its alternatives—such as continuing to work—on their retirement decisions. It also highlights the role of retirement stress in shaping individual retirement decisions.

Finally, Expectancy Theory connects workers' productivity, job characteristics, health status, and subjective life expectancy to their retirement decisions (Shultz & Wang, 2010). Specifically, this theory suggests that when workers perceive low expectations of achieving productivity or rewards from their job, they are more likely to retire rather than continue working. As Wang & Shultz (2010) pointed out, the conceptualization of retirement decisions is limited by the fact that not all retirement decisions are voluntary. Thus, the theoretical utility of this conceptualization depends on the extent to which the retirement decision is truly a motivated choice,

and this motivation is often influenced by the availability of post-retirement resources.

### **2.3 Retirement Well-Being**

Retirement well-being refers to an individual's overall satisfaction and sense of happiness in life after retiring. It encompasses various aspects, including physical health, social relationships, financial stability, and self-actualization. A retiree's well-being is often influenced by a wide range of factors, such as pre-retirement career experiences, post-retirement lifestyle and activities, financial security, family relationships, and community involvement.

Research shows that retirement well-being is closely related to factors such as socio-economic status, health condition, social support, and overall life satisfaction. For instance, a study found that having a rich social network and active social participation after retirement can significantly enhance well-being (Litwin & Shiovitz-Ezra, 2006). Another study revealed that maintaining stable financial income and good health is crucial for improving retirees' well-being (Easterlin, 2003). In summary, retirement well-being is a complex concept, influenced by various factors. By studying and understanding these factors, policies and measures can be developed to enhance the well-being and quality of life for retirees.

According to Shih Jianbin (1995), there are nine key sources of well-being:

1. Self-esteem Satisfaction: The need to be respected by others.
2. Harmony in Relationships: The desire and need for harmonious interactions with family and friends.
3. Pursuit of Wealth: The belief that happiness comes from earning a lot of money.
4. Achievement in Work: The satisfaction derived from personal accomplishments at work.
5. Contentment with Life: A sense of ease when life is smooth and free from confusion.
6. Comparative Superiority: The idea of being better off than others.
7. Control and Self-Realization: Achieving personal ideals and goals.
8. Short-Term Joy: The happiness derived from enjoyable life events.
9. Need for Health: Maintaining good physical and mental health.

These factors were used to revise the Oxford Happiness Inventory (OHI), offering a basis for subsequent research into related factors.

Well-being has a positive impact on physical and mental health. It is a critical measure of life quality and a universal goal pursued by all human societies (Yang & Srinivasan, 2016). For post-retirement well-being, essential elements include financial security, good physical health (being able to eat well, sleep soundly, and stay physically active), having a home to live in, avoiding frequent medical visits, maintaining strong social ties with friends, engaging in healthy leisure activities, cultivating positive emotions and mindfulness, having a life purpose, and being willing to engage with others. Achieving well-being involves aligning the mind, body, and spirit in harmony.

Retirement well-being is also influenced by personal attitudes and expectations regarding retirement. Some studies have shown that attitudes and expectations toward retirement can affect post-retirement well-being and life satisfaction. For example, a positive attitude and expectations for retirement are often associated with higher levels of happiness and quality of life (Fasbender et al., 2016). Conversely, negative attitudes toward retirement and worries about future uncertainties can lead to emotional problems and stress after retirement (Wang & Shi, 2014). Additionally, cultural and social environments play a role in influencing retirement well-being. Different cultural backgrounds and social values may impact individual retirement well-being in various ways. For instance, a society that emphasizes family and community connections may have a positive effect on retirees' well-being, as they continue to enjoy family and community support after retirement (Diener & Oishi, 2005).

Retirement resources have a profound impact on retirement well-being, a fact that has been confirmed by numerous studies. The study by Leung & Earl (2012) aimed to explore the influence of retirement resources on retirees' adjustment to retirement. They emphasized that having sufficient retirement resources is crucial during the retirement process, and these resources include physical, financial, social, emotional, cognitive, and motivational aspects. The study found that the more abundant the retirement resources, the better the retirees' ability to adjust, meaning they are more capable of adapting to retirement life while maintaining good mental health and life satisfaction.

Specifically, Leung & Earl (2012) found that stable financial resources can help retirees more easily manage financial challenges in retirement, reducing financial worries and, in turn, increasing their well-being. Additionally, good physical health and access to health resources enable retirees to participate in various activities, enjoy life, and maintain a positive mindset and emotional state. Social resources, which refer to rich social networks and social support, provide emotional support and social interaction, helping to alleviate feelings of loneliness and isolation, thereby improving well-being. Based on this literature review, the first research hypothesis for this study is formulated as follows:

*H1: Retirement resources have a positive impact on retirement well-being.*

## **2.4 Voluntary Service**

Voluntary service refers to the various supportive services that individuals provide to society out of their own free will, not based on personal obligations or legal responsibilities. These services are performed with sincerity, utilizing knowledge, physical abilities, labor, experience, skills, and time, without the intention of receiving compensation. The goal is to enhance the efficiency of public affairs and promote the common good in society.

Volunteering is defined as an individual's willingness to contribute to society with a joyful and willing heart, offering their knowledge, experience, skills, limited time, and physical strength, without seeking any form of remuneration. It embodies the concept of "giving back to society what is taken from society."

Voluntary services can be either dynamic or static, and they can be categorized as professional or non-professional, as well as technical or non-technical. To recognize the selfless contributions of volunteers, Taiwan enacted the Voluntary Service Act on January 20, 2001. This law provides a framework for volunteer training programs, including "basic volunteer training courses" and "specialized volunteer training courses." These programs aim to enhance the different types of services and offer professional guidance and certification.

Volunteers who complete more than 300 hours of service are awarded an Honorary Volunteer Card as a form of recognition. Volunteers also enjoy certain rights, such as priority access to professional training and events organized by volunteer centers, the opportunity to be recommended for key activities or conferences, and the option to request letters of recommendation when applying to schools or for scholarships. Volunteering thus offers numerous benefits, both for society and for the individual, creating a win-win situation.

In academic research, studies on voluntary service primarily focus on several key areas, such as its social impact. Research investigates how voluntary service influences society, including community development, social cohesion, the formation of social capital, and the realization of social justice. These studies often examine the contributions volunteers make to beneficiaries, communities, and society as a whole, as well as the role of voluntary service in addressing and improving social issues (Wilson, 2000).

Another focus is on the characteristics of volunteers. Research analyzes the personal traits, motivations, and participation patterns of volunteers, along with the impact of volunteering on them. These studies cover factors such as age, gender, education level, health status, and socio-economic background, as well as the reasons for participating in voluntary service, expectations, and satisfaction levels (Penner, 2002).

Furthermore, research explores the relationship between voluntary service and personal development. Studies examine whether voluntary service has a positive effect on volunteers' personal growth and development, including enhancing self-esteem, social skills, emotional connections, and interpersonal relationships. These studies often investigate the impact of voluntary service on volunteers' mental health, life satisfaction, and subjective well-being, as well as its effects on career development and academic achievements.

Li & Ferraro (2005) explored the impact of voluntary service on the health and personal growth of middle-aged and older adults. Their research found that engaging in voluntary service can enhance social engagement and promote physical and mental health in these age groups, while also providing opportunities for self-actualization and goal achievement. Morrow-Howell et al. (2003) studied the effects of voluntary service on the well-being and life satisfaction of older adults. Their findings suggest that participating in voluntary service can improve social engagement, quality of life, and have positive effects on mental health and well-being in older adults.

Morrow-Howell et al. (2003) also compared the impact of volunteering and paid work on the health and longevity of older adults. The research found that both voluntary service and paid work are associated with health and longevity, but voluntary service may have a more positive impact on the health of older adults.

Based on this literature review, the following research hypotheses are established:

*H2: Retirement resources have a positive impact on voluntary service.*

*H3: Voluntary service has a positive impact on retirement well-being.*

## **2.5 The Relationship between Retirement Resources, Voluntary Service, and Retirement Well-Being**

According to the research by Okun & Schultz (2003), participation in voluntary service has a positive impact on retirement planning and retirement well-being. They pointed out that engaging in voluntary service activities helps individuals build social connections, acquire new skills, and maintain an active lifestyle, which in turn increases confidence and a sense of control over their future retirement life (Okun & Schultz, 2003).

Additionally, the research by Morrow-Howell et al. (2003) supports this view, finding that participation in voluntary service enhances retirees' well-being. They noted that voluntary service activities can inject new meaning and purpose into retirement life, thereby enhancing self-worth and overall well-being (Morrow-Howell et al., 2003). Finally, Pilkington et al. (2012) further indicated that voluntary service helps expand social networks and reduce feelings of loneliness among retirees. Their research revealed that through participation in voluntary service, retirees can form more social connections and reduce feelings of social isolation, thereby improving well-being (Pilkington et al., 2012). Based on the above literature review, the following research hypothesis is proposed:

H4: Voluntary service mediates the relationship between retirement resources and retirement well-being.

### III. Methodology

#### 3.1 Proposed research framework and assumptions

This study aims to investigate the relationship between Retirement Resources on Well-Being and proposes a research framework (Figure 1) based on the research objectives and relevant literature. To achieve this, the study employs Pearson correlation analysis to examine the association between the tested samples concerning retirement resources, voluntary service, and well-being. Furthermore, stepwise regression analysis is conducted to explore whether a positive relationship exists between these variables.

Subsequently, the PROCESS software developed by Hayes (2018) is utilized, employing Model 4 in the plug-in model to conduct bootstrap analysis with 5,000 repeated samplings. This analysis aims to test the mediating effect of retirement resources and retirement well-being. The research variables consist of retirement resources as the independent variable, voluntary service as intermediary variables, and retirement well-being as dependent variable. The research model is visually represented in Figure 1 below.

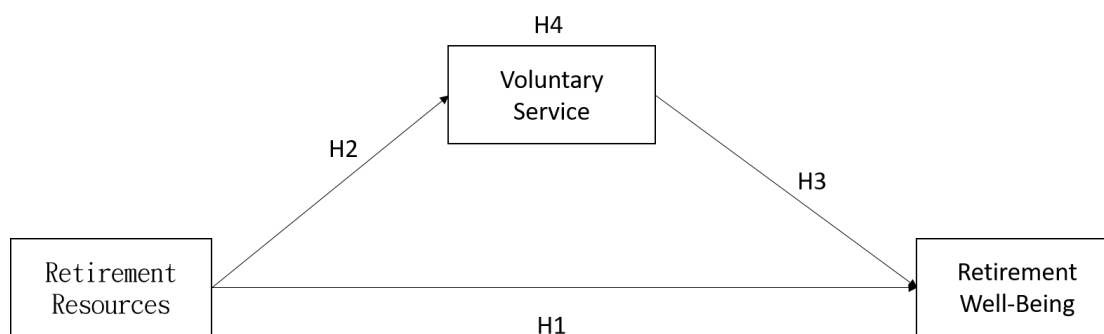


Figure 1. Research Framework

#### 3.2 Sample and Data Collection

This study explores the impact of retirement resources on retirement well-being among middle-aged and older adults, with voluntary service as a mediating factor. The research was conducted through a Google Forms survey, and the data was analyzed using statistical methods. The primary respondents of this study included individuals who are not yet retired, those approaching retirement, and those who have already retired. The study employed descriptive statistics, independent sample t-tests, correlation analysis, and regression analysis to derive the findings, aiming to test the hypotheses and assess the overall fit of the model regarding the relationships between the variables.

Our study utilized a survey questionnaire as the primary data collection method. Initially, we developed the questionnaire by drawing insights from relevant literature. To ensure its clarity and appropriateness, we conducted a pretest with 50 questionnaires. Based on their feedback, we made necessary revisions to the questionnaire. The main objective was to assess the distribution or patterns of their responses and make further improvements to the questionnaire based on the findings.

The finalized version of the questionnaire was distributed to our target population via email and Google Form. We sent out the survey three times, with intervals of two weeks between each distribution. As a result, we obtained a total of 300 responses. After carefully reviewing the responses, 266 were deemed usable, resulting in an impressive effective response rate of 89%.

To provide a comprehensive understanding of the research sample, we categorized the respondents into eleven groups: gender, age, marital status, education level, and occupation. The details of this categorization are presented in Table 1 below:

Table 1 Demographic Information of the Data

Variables	Item	Samples
Gender	Men	128 (48.1%)
	Women	138 (51.9%)
Age	Under 40 years old	6(2.3%)
	41-50 years old	46 (17.3%)
	51-60 years old	88 (33.0%)
	61-70 years old	96 (11.3%)
	Over 71 years old	30 (3.7%)
Education	Senior high school	86 (32.3%)
	College	50 (18.8%)
	University	70 (26.3%)

Marriage	Master	60 (22.6 %)
	Single	224 (84.2%)
Occupation	Married	42 (15.8%)
	Manufacturing	214 (44.1%)
Retirement Status	Service industry	271 (55.9%)
	Non-retiree	146 (54.9%)
Occupation Categories	Will retire within 10 years	38 (14.3%)
	Retiree	82 (30.8%)
	Military, public, and educational employees	38 (14.3%)
	Manufacturing industry	38 (13.5%)
	Service industry	78 (29.3%)
	Financial industry	12 (4.5%)
	Industry and commerce	44 (16.5%)
Pre-Retirement Average Monthly Income	Students	52 (19.5%)
	Others	6 (2.3%)
	Under 30,000 (TWD)	46 (17.3%)
	30,000~50,000	72 (27.1%)
	50,001~70,000	64 (24.1%)
	70,001~100,000	44 (16.5%)
Average monthly disposable income after retirement	Over 100,001	40 (15.0%)
	Under 20,000 (TWD)	50 (18.8%)
	20,001~50,000	158 (59.4%)
	50,001~70,000	26 (9.8%)
Job position before retirement	Over 70,001	32 (12%)
	Frontline staff	94 (35.3%)
	Frontline supervisor	52 (19.5%)
	Middle management	52 (19.5%)
Place of residence before retirement	Senior manage	68 (25.6%)
	Northern region	234 (88%)
	Central region	20 (7.5%)
	Southern region	10 (3.8%)
Place of residence after retirement	Eastern region	2 (0.8%)
	Northern region	226 (85%)
	Central region	22 (8.3%)
	Southern region	14 (5.3%)
	Eastern region	4 (1.5%)

Source: Compiled by this study

## IV. Findings

### 4.1 Analysis Results of Reliability and Validity

This study meticulously developed the questionnaire to ensure its reliability and validity. A comprehensive review of previous literature was conducted, and the relevant theoretical framework of previous studies was adopted. Key theoretical components suitable for the research background and scope were carefully selected to construct the questionnaire. The questionnaire survey method employed in this study consists of three parts: retirement resources, voluntary service, and retirement well-being. The retirement resources scale was adapted from Wang & Shi (2014), while voluntary service was based on the scale developed by Okun & Schultz (2003). Well-being items were revised from retirement life satisfaction scale proposed by Beehr et al. (2010).

To ensure the reliability of the measurements, a confirmatory factor analysis was performed. The construct reliability was assessed using both composite reliability (CR) and Cronbach's alpha. The results, presented in Table 2, indicate that all measurements exceeded the recommended minimum value of 0.7 for both CR and Cronbach's alpha (Hayes, 2018), signifying a high level of reliability. Additionally, convergent and discriminant validity tests were conducted to evaluate the dimensionality of the constructs. All items demonstrated clear loadings on their intended factors, with factor loadings surpassing the 0.60 cutoff value. The average variance extracted (AVE) for each scale was also above the 0.5 threshold, indicating a satisfactory level of convergent validity (Nunnally, 1967). These outcomes provide substantial support for the validity of our factor solution.

The scale data underwent confirmatory factor analysis, during which inappropriate items were excluded. The Cronbach's alpha values of all facets remained higher than 0.8 (environmental activities = 0.920, social activities = 0.935, governance activities = 0.922, internal market-oriented culture = 0.953, job crafting = 0.856, organizational performance = 0.887, financial performance = 0.934), indicating strong convergent validity and high reliability. The confirmatory factor analysis was conducted on a sample of 485 data points, and the results are presented in Table 2.

Table 2 Results of Confirmatory Factor Analysis (N = 266)

Factors	Item	Factor loading	S.E.	CR	AVE	Cronbach's $\alpha$
Retirement Resources	RR1	0.832***	0.8216	0.925	0.593	0.819
	RR2	0.878***	0.7719			
	RR3	0.878***	0.7903			
	RR4	0.776***	0.9032			
Voluntary Service	VS1	0.846***	0.7716	0.936	0.621	0.928
	VS2	0.885***	0.8038			
	VS3	0.856***	0.7962			
	VS4	0.870***	0.8260			
Retirement Well-Being	RW1	0.816***	0.6883	0.928	0.601	0.943
	RW2	0.813***	0.8863			
	RW3	0.883***	0.8467			
	RW4	0.842***	0.8905			

Notes. T-values for n = 266 samples; CR, composite reliability; SE, standard error; AVE, average variance extracted; \*\*\* p < 0.001.

#### 4.2 Analysis Results of Correlations

Table 3 displays the means, standard deviations, and correlations among the variables in our study. As anticipated by our hypotheses, all correlations between the variables are positive and statistically significant, confirming the expected direction of the relationships. Interestingly, the direct relationships between variables exhibit higher correlations compared to the indirect relationships, in line with our theoretical models.

To ensure the absence of multicollinearity, we conducted an examination of the variance inflation factor (VIF) scores. The results indicate that none of the variables display multicollinearity issues. Moreover, the maximum VIF score observed in the models was 4.77, comfortably below the commonly accepted rule-of-thumb cutoff point of 10.

Table 3 Descriptive Statistics and Correlation Matrix (N = 485)

	Mean	SD	1	2	3
1. Retirement Resources	4.465	0.6703	1	0.563**	0.631**
2. Voluntary Service	4.469	0.6699	0.563**	1	0.8527**
3. Retirement Well-Being	4.432	0.6840	0.631**	0.527**	1

Notes. SD: Standard Deviation; \* p < 0.05; \*\* p < 0.01.

#### 4.3 Analysis Results of Hierarchical Multiple Regression

Following the analysis and processing of the aforementioned data, this study employs hierarchical multiple regression analysis to investigate the relationships among retirement resources, voluntary service and retirement well-being. Demographic variables such as gender, age, marital status, education, and occupation are included as control variables. Retirement resources as the independent variable, retirement well-being as the dependent variable, voluntary service as mediating variable ..

The results of the hierarchical multiple regression analysis, as presented in Table 4, include Model 1 to Model 4. These models examine the impact of retirement resources on retirement well-being, as well as the influence of internal voluntary service on retirement resources and retirement well-being, while controlling for all the demographic variables.

The coefficients for retirement resources on voluntary service and retirement well-being (b = 0.0.563 and b = 0.719, p < 0.001), voluntary service on retirement well-being (b = 0.605 p < 0.001) are all positive and statistically significant, thus providing support for Hypotheses 1, 2 and 3 respectively.

Table 4 Hierarchical Multiple Regression for ESG and Organizational Performance.

	Voluntary Service		Retirement Well-being	
	M1	M2	M3	M4
Independent Variables				
Retirement Resources (RR)	0.563**	0.719**		
Voluntary Service (VS)			0.605**	
RR x VS				0.554**
				0.294**



Adj-R <sup>2</sup>	0.311	0.513	0.361	0.575
F	60.713	139.981	75.665	88.111
Change in R <sup>2</sup>	0.317	0.517	0.366	0.059

Notes. \*\*\* p < 0.001, \*\* p < 0.01, \* p < 0.05.

#### 4.4 Analysis Results of Mediation Effect

Baron and Kenny (1986) introduced the causal step approach, which does not require a formal quantification of the indirect effect or the need for inferential testing. In this study, to estimate indirect effects statistically in our mediation models, we utilized a bootstrap method with 5,000 samples (Preacher & Hayes, 2008) to compute the lower limits (LLCI) and upper limits (ULCI) of a 95% confidence interval.

The results of the bootstrap significance test for the total, indirect, and direct effects of voluntary service on retirement resources and retirement well-being is presented in Table 5. The findings demonstrate that both the indirect and direct effects of voluntary service on retirement resources and retirement well-being is significantly positive, which corroborates the conclusions drawn from the hierarchical multiple regression analysis. Therefore, Hypotheses 4 is supported.

Table 5 Bootstrap Significance Test for Mediating Effect

Effect	B	Boot (SE)	P value	Boot LLCI	Boot ULCI
Total effect	0.7061	0.0597	0.000	0.5881	0.8242
Direct effect	0.5438	0.0679	0.000	0.4094	0.6782
Indirect effect	0.1623	0.0626	0.000	0.0614	0.3069

Notes. Mediation analyses include all the control variables. LLCI: Low Limit Confidence Interval; ULCI: Upper Limit Confidence Interval. Bootstrap samples: 5,000.

## V. Conclusion and management implications

### 5.1 Conclusion

According to the results, the retirement resources enhance retirement well-being. Moreover, our mediation analysis revealed that voluntary service fully mediates the relationship between retirement resources and retirement well-being. After the aforementioned statistical analysis, the research results are summarized in Table 6.

Table 6 Hypothesis Test Summary Table

Hypotheses	Result
H1: Retirement resources have a positive impact on retirement well-being	Accepted
H2: Retirement resources have a positive impact on voluntary service.	Accepted
H3: Voluntary service has a positive impact on retirement well-being.	Accepted
H4: Voluntary service mediates the relationship between retirement resources and retirement well-being.	Accepted

From the results, retirement resources have a direct and obvious positive impact on voluntary service and retirement well-being. In terms of mediating effects, voluntary service has a mediating effect on retirement resources and retirement well-being. From the results of the above collation, it can be seen that the research hypotheses are all accepted.

### 5.2 Management implications and recommendations

#### (1) Policy Formulation and Resource Allocation

The findings indicate a positive impact of retirement resources on retirement well-being, underscoring the importance for policymakers and organizations to focus on providing adequate retirement resources. Beyond financial support, these resources should encompass multi-faceted aspects, including psychological support and health care, to ensure a sustained quality of life for middle-aged and elderly populations.

#### (2) Promotion and Support for Voluntary Service

Given that voluntary service enhances retirement well-being and mediates the impact of retirement resources, management should consider establishing structured platforms or incentive programs that encourage retirees to participate in social service. Such initiatives can foster a greater sense of belonging, self-worth, and happiness among retirees, enhancing their overall quality of life.

#### (3) Corporate Internal Retirement Support Mechanisms

Organizations should consider integrating voluntary service as part of retirement planning by offering resources and platforms for employees to engage in volunteer activities. This approach not only contributes to the

well-being of retired employees but also enhances the corporate social image through retiree contributions to societal welfare.

#### (4) Retirement Transition Counseling and Workshops

To support middle-aged and elderly individuals in transitioning to retirement, organizations may develop retirement transition counseling that includes guidance on voluntary service involvement. This would assist retirees in adopting active and healthy lifestyles and improving their post-retirement well-being.

Furthermore, regarding recommendations as following:

##### (1) Broader and Diverse Sample Expansion

Future research could extend to various countries and cultural backgrounds to understand how different retirement systems and cultural factors influence retirement resources, voluntary service, and well-being outcomes.

##### (2) Consideration of Diverse Types of Voluntary Service

Voluntary service encompasses a range of fields (e.g., education, environmental, medical). Future studies might examine whether different types of voluntary service contribute distinctively to retirement well-being, thereby offering more precise practical recommendations.

##### (3) Longitudinal and Tracking Studies

Conducting longitudinal studies is recommended to observe the long-term effects of retirement resources and voluntary service on well-being. Such research would enable a deeper understanding of how retirement well-being evolves over time, leading to more timely and effective managerial recommendations.

##### (4) Exploring Psychological Factors as Mediators or Moderators

Future studies could incorporate psychological factors (e.g., self-efficacy, happiness, self-esteem) to explore potential mediating or moderating effects that further elucidate the mechanisms through which voluntary service enhances retirement well-being.

##### (5) Comparison of Different Retirement Resource Components

Further investigation into the specific components of retirement resources (e.g., financial resources, social support, and health security) and their respective impacts on well-being would be valuable. Understanding which resources are most effective in enhancing well-being could guide more targeted resource allocation and policy formulation

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