

A Pre-Investigation of Model Testing on Subjective Well-Being Among Single Emerging Adults

Ding yuanhu, Rajitha Menon Arikatt, Mingxian Shen, Jimei

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Abstract

Purpose: This study aims to examine the psycho-social model of gratitude and its impact on subjective well-being and physical health among Chinese single emerging adults. It investigates both direct and indirect pathways, mediated by perceived social support, prosocial behavior, and relationship quality. **Research design, data and methodology:** A cross-sectional study will be conducted using Structural Equation Modeling (SEM) to analyze the relationships among gratitude, subjective well-being, and physical health. A sample of 700 Chinese single emerging adults (aged 18-30) residing in Suzhou will be recruited through online data collection. Standardized psychological scales will be used to measure gratitude (CGQ-6), subjective well-being (CFS), physical health (CSRH), perceived social support (CMSPSS), prosocial behavior (CPSA), and relationship quality (CFQQ). **Results:** The study hypothesizes that gratitude will have significant direct effects on subjective well-being and physical health, and indirect effects through perceived social support, prosocial behavior, and relationship quality. **Conclusions:** Findings will contribute to the understanding of gratitude's role in well-being and provide practical insights for psychological interventions and well-being enhancement programs for single emerging adults.

Keywords: Subjective Well-being, Gratitude, Model Testing, Single Emerging Adults, SEM

1 Introduction

According to the 2023 China Population Yearbook, the unmarried population in China has been steadily rising. Specifically, the unmarried rate among individuals aged 25-29 has reached 56.9%, while the rate among 30-34-year-olds stands at 20% (China Population and Employment Statistics Yearbook, 2023). These figures indicate a growing trend of delayed marriage and increased singlehood among young adults. For instance, Zhang (2020) conducted a survey among college students in China and found that over 70% of them were single.

Prior studies have predominantly centered on marriage, the nuclear family, and conventional household structures, with relatively little emphasis on singlehood (Council et al., 2023). Within this body of research, marriage has often been linked to numerous benefits compared to remaining single, including increased life expectancy (Sbarra & Nietert, 2009), lower rates of depression (Wade & Pevalin, 2004), reduced substance abuse (Power et al., 1999), better overall health (Hughes & Waite, 2009), and heightened happiness and well-being (Johnson & Wu, 2002). Additionally, research suggests that married individuals tend to have stronger financial stability (Pearlin & Johnson, 1977). In fact, Carr and Springer (2010) argue that the key question is not whether marriage enhances quality of life, but rather how and at what stage it exerts its influence, based on an extensive review of data examining marital status in relation to physical and mental health.

However, the notion that marriage inherently provides significant benefits has been challenged by various studies. This suggests that directly comparing the life satisfaction of single and married individuals may not be the most effective approach to understanding the well-being of singles or evaluating marriage's advantages from the perspective of the need-to-belong theory. First, a comprehensive review of multiple datasets indicates that the happiness gap between married and single individuals is relatively small (Purol et al., 2020). Some findings even suggest that this gap is narrowing, with

single individuals reporting higher levels of happiness in recent years (Böger & Huxhold, 2020). Furthermore, the relationship between marital status and happiness varies across different cultural contexts and family norms (Perelli-Harris et al., 2019). Second, the positive effects of marriage may not persist indefinitely. Certain studies indicate that happiness tends to increase prior to marriage, peak around the wedding year, and subsequently decline (Lucas & Clark, 2006). Third, a selection effect may be at play, where individuals who are already happier are more inclined to enter romantic relationships than those experiencing lower well-being (Stutzer & Frey, 2006). This aligns with research suggesting that positive emotions can enhance people's motivation for social interactions, including dating (Whelan & Zelenski, 2012). These findings imply that factors present before entering a romantic relationship may significantly influence an individual's decision to pursue one. Additionally, another study found that after controlling for selection effects-where happier individuals are more likely to marry-the differences in life satisfaction between married and cohabiting individuals across different countries become negligible (Perelli-Harris et al., 2019). This trend underscores the importance of considering baseline life satisfaction and contextual differences when comparing groups.

Previous research has often relied on an oversimplified theoretical framework, which does not necessarily assert that a specific type of relationship is essential to fulfill the need for belonging. It is possible that single individuals derive fulfillment from non-romantic relationships (Fisher et al., 2021). Some consistently express a preference for remaining single (Lehmann et al., 2015), likely because they have other meaningful connections (Chopik, 2017). In such cases, their sources of well-being may differ from those in romantic relationships (Pepping et al., 2018). Consequently, several researchers have argued against merely comparing the overall life satisfaction of married and single individuals, advocating instead for a focus on the unique factors contributing to well-being within each group.

Gabriel-Quillen et al. (2011) define social support as the exchange or provision of resources among individuals, including friends, family members, and others. A strong support network has been shown to alleviate symptoms of depression and PTSD, enhance overall well-being, and contribute to mental health maintenance (Shakespeare-Finch et al., 2015; Whitley et al., 2016). Alkozei and colleagues (2017) introduced a psycho-social model suggesting that trait gratitude fosters creative thinking and encourages individuals to explore various ways to reciprocate acts of kindness. This, in turn, helps build stronger relationships and enhances perceived social support, ultimately leading to improvements in both physical and subjective well-being.

Multiple studies (Kong et al., 2015) have found a positive association between trait gratitude and social support across different populations, including athletes, university students, and adolescents. Additionally, prior research (Wang et al., 2020) has highlighted a link between social support and subjective well-being. A recent study further supports this connection, demonstrating that trait gratitude enhances perceived social support, which subsequently influences the subjective well-being of Taiwanese undergraduate students, aligning with the psycho-social model (Lin, 2016).

Statement of the Problem

A substantial body of research (e.g., Lambert et al., 2012; McCullough et al., 2004) has established a link between higher degree of gratitude and greater satisfaction of life, vitality, happiness, optimism, hope, and increased positive affect. Additionally, gratitude has been linked with lower anxiety and depression symptoms. Some scholars conceptualize gratitude as a cognitive-emotional process that fosters long-term social and personal benefits by broadening individuals' thought to action repertoires, strengthening their long-lasting personal resources, and enhancing their coping abilities. Fredrickson (2004) coined this framework as the "broaden-and-build" theory.

Subjective well-being is closely tied to strong interpersonal relationships (Diener & Seligman, 2002). Individuals with higher degrees of trait gratitude tend to have better social support and a stronger inclination to help others (Wood et

al., 2008). Additionally, gratitude is thought to have evolved as a mechanism to promote both upstream and reciprocal altruism-where individuals pass benefits to both third parties and benefactors. Research suggests that gratitude plays a crucial role in establishing and maintaining close social bonds (Algoe, 2012).

China's collectivist culture differs significantly from Western societies. A study by Zhang & Han (2023) examined Chinese college students' orientations toward individualism and collectivism, finding that a strong collectivist tendency is closely linked to prosocial behaviors, increased social support, and a stronger sense of Chinese cultural identity. Another relevant study by Pan et al. (2022), which compared Swedish and Chinese participants, explored the connection between prosociality and psychological well-being during the COVID-19 pandemic. Their findings indicate that individuals who reported a higher propensity for prosocial behaviors-such as actions aimed at alleviating pandemic-related burdens-also exhibited greater psychological well-being.

According to Alkozei et al. (2017), gratitude may exert a psycho-social influence on well-being. By increasing the exchange of social support, gratitude may enhance relationship quality, ultimately leading to improved physical health and higher subjective well-being. Furthermore, these well-being gains may encourage further expressions of gratitude, creating a self-reinforcing feedback loop.

Given this context, the present study seeks to testify whether the proposed direct and indirect relationships between gratitude, and subjective well-being&physical health hold true among single Chinese emerging adults.

Purpose of the study

This study will test the psycho-social model of gratitude on subjective well-being& physical health among Chinese single emerging adults, a) the direct effect of trait gratitude on subjective well-being and physical health, b) the indirect effects that mediated by perceived social support, prosocial behaviour, and relationship quality.

Operational Definitions of Terms

Chinese Single Emerging Adults: In this study, participants are individuals aged 18 to 30 who have not been in a serious romantic relationship for the past six months and are currently residing in Suzhou, China.

Gratitude: This study focuses on trait gratitude, which differs from state gratitude. The definition of trait gratitude is a stable tendency to recognize and cherish life's positive aspects (Wood et al., 2008). It is measured by Gratitude Questionnaire-6 (GQ-6), which is developed by McCullough et al. (2002), in total six items rated on a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree). The overall range of the total score from 6 - 42, with higher scores indicating a greater level of gratitude. A score of 6–18 represents low trait gratitude, 19–30 indicates a moderate level, and 31–42 signifies a high level of trait gratitude.

Subjective Well-Being: This study adopts a eudaimonic perspective on subjective well-being, assessed using the Chinese translation of the Flourishing Scale (CFS). The scale measures psychological well-being based on various aspects including good relationships, competence, and meaning in life (Xiao et al., 2016). The total score ranges from 8 to 56, with higher scores indicating greater subjective well-being. A score of 8–24 is considered low, 25–40 moderate, and 41–56 high subjective well-being.

Physical Health: Physical health in this study is assessed through self-rated health, using the Chinese version of the Self-Rated Health (CSRH) scale. This is typically measured with a single-item question offering response options from "excellent" to "poor," with greater ratings indicating better perceived health.

Perceived Social Support: Social support in this study is defined by assistance received from family, friends, and others. It is measured by Chinese version of the Multidimensional Scale of Perceived Social Support (CMSPSS) (Zimet

et al., 1990). The scale contains 12 items, and questions are rated on a 7-point Likert scale from strongly disagree to strongly agree, covering three subdomains: family, friends, and others. The total score ranges from 12-84, participants who scored higher reflecting greater social support perceived. Scores of 12–36 (total) or 4–12 (subscales) indicate low social support, 37–60 (total) or 13–20 (subscales) indicate moderate levels, and 61–84 (total) or 21–28 (subscales) represent high levels of perceived social support.

Prosocial Behavior: In this study, prosocial behavior is defined by voluntary behaviors intended to benefit others and is assessed using the Chinese translation of the Prosocialness Scale for Adults (CPSA), originally developed by Caprara et al. (2005). This reliable instrument evaluates prosocial behaviors based on item response theory (IRT). The scale consists of 16 items rated on a 5-point Likert scale (1 = never; 5 = always). 16 -80 is the overall range, with higher scores indicating greater prosocial tendencies. A score of 16–40 suggests low prosocial behavior, 41–60 moderate levels, and 61–80 indicates moderately high prosocial behavior.

Relationship Quality: Relationship quality in this study refers to the quality of interpersonal relationships, measured using the Chinese version of the Friendship Quality Questionnaire (CFQQ). This 16-item scale, developed from Parker and Asher's (1993) Friendship Quality Questionnaire and modified for Chinese youth (Zou et al., 1998), assesses the quality of friendships with a specific friend. Each item is rated on a 5-point Likert scale from "not true at all" to "completely true". The total score ranges from 16 -80, with higher scores reflecting stronger and grater-quality relationships.

2. Review Of Related Literature

2.1 Subjective well-being

Over the past four decades, the field of psychology has increasingly focused on understanding well-being, which is defined as the optimal psychological state and functioning. Much of this interest can be traced to the contributions of psychologists like Diener (1984), who have explored subjective well-being (SWB). SWB is often defined as a subjective experience, with individuals assessing the extent to which they feel they are experiencing a sense of wellness. It is commonly operationalized as the presence of high positive affect, low negative affect, and general life satisfaction. Individuals who report strong feelings of these three components are typically considered to have high SWB. As a result, SWB is frequently equated with happiness, and the pursuit of well-being is often understood as the pursuit of happiness.

However, while SWB has been extensively researched, it is not the only framework through which well-being can be understood. An alternative perspective, known as eudaimonia (Waterman, 1993), offers a more expansive view of well-being. Eudaimonia emphasizes living well and actualizing one's human potentials, rather than merely experiencing happiness or positive affect. According to this viewpoint, well-being is a continuous process of discovering one's actual self and reaching one's moral potential rather than only an endpoint or final condition, and living in accordance with one's purpose. This perspective draws inspiration from Aristotle (as translated by Irwin, 1985) and resonates with humanistic psychology. The eudaimonic approach suggests that well-being encompasses more than happiness, aligning with the holistic development of individuals and emphasizing the fulfillment of deeper personal values.

The distinction between hedonism and eudaimonism stems from differing perspectives on human nature. The hedonic approach, which is closely aligned with the standard social science model (Tooby & Cosmides, 1992), views the human organism as being essentially blank at birth and susceptible to social and cultural influences. In this view, individuals derive meaning and purpose from external societal norms. In contrast, the eudaimonic approach believes that

humans possess inherent content or nature that should be uncovered and nurtured. It focuses on understanding the intrinsic aspects of humanity and the conditions that foster or hinder the realization of human potential.

The investment model of commitment has been applied to various areas, including relationship studies (Rusbult et al., 1998). While initially used to understand commitment in romantic relationships, this model can also be applied to any aim or course of behavior. The investment model posits that commitment to a goal leads to a shift in motivation that increases perseverance toward that objective. The model highlights three key factors that predict higher commitment levels: investment, quality of alternatives, and satisfaction (or expected future satisfaction). According to this model, individuals who feel happier being single and believe that alternatives to singlehood are less positive or accessible (e.g., those with low self-esteem or limited desire for a partner) are more likely to remain single.

Beyond general life and singlehood satisfaction, researchers have also explored other theoretically significant outcomes related to singlehood. Fredrickson's broaden-and-build theory (2001) suggests that while negative results in singlehood studies may reflect societal biases about being single, it is important to consider both positive and negative outcomes simultaneously. It's possible that both results are not exclusive of one another, and studying both might provide important details about the unmarried experience. In a study by Hsu and Barrett (2020), differences in positive well-being indicators were found between singles, married people, and divorced individuals, while no differences in negative well-being indicators were observed. Unmarried singles had the greatest degree of autonomy but the lowest levels of social interactions, life purpose, and self-acceptance. This suggests that researchers studying singlehood should consider extending their focus beyond general well-being indicators and examine other aspects such as happiness, development, purpose, and the abundance of life, which may be particularly relevant to the single experience.

Recent studies have highlighted various factors influencing well-being among different groups. For instance, Zhang, W., et al. (2023) explored the impact of social activity on subjective well-being in elderly Chinese individuals. The study found a significant positive correlation between higher levels of social activity and increased subjective well-being. This research suggests that social interaction can improve well-being by fostering a sense of belonging and community. In another study by Liu, H., et al. (2023), the impact of sports participation on subjective well-being among Chinese schoolchildren was examined. The study found a strong positive correlation between regular involvement in sports and higher levels of subjective well-being, suggesting that physical exercise has beneficial effects on mental health. Both studies illustrate the important role that social engagement and physical activity play in enhancing well-being.

2.2 Physical health

Physical health is a key aspect of overall well-being, encompassing the physiological condition of the body and its capacity for optimal functioning. It is characterized by the absence of illness or injury, as well as the ability to perform everyday tasks without limitations. This includes factors such as cardiovascular fitness, muscle strength, flexibility, body composition, and general functional capacity (World Health Organization, 2021). Physical health is influenced by a variety of factors, such as genetics, lifestyle choices, environmental factors, social determinants, and access to healthcare services.

Humans, as complex beings, undergo a lengthy period of development before they can reproduce. Given their dependence on parents during this time, raising sexually mature offspring requires substantial and sustained parental commitment (Kim et al., 2012). In many cultures, communities collaborate in child-rearing to share the considerable costs and responsibilities associated with raising children (Hrdy, 2011). Additionally, intimate relationships often provide crucial financial and emotional support, both of which enhance an individual's survival prospects. Research consistently

shows that those in intimate relationships live longer, report greater life satisfaction, and experience better health, including lower blood pressure risk and a reduced risk of heart disease (Waite & Lehrer, 2003; Wilcox, 2011).

Long-term committed relationships also correlate with a lower likelihood of contracting sexually related diseases, many had severe consequences in earlier human history. According to Lancaster and Lancaster (1987), these advantages translate into evolutionary benefits for survival and reproduction, which is why long-term intimate relationships are favored by natural selection. Over time, mechanisms such as emotions have evolved to encourage the formation of enduring relationships (Apostolou, 2022). This is why most people establish long-term partnerships, often through marriage, across cultures and historical periods (Coontz, 2006). Statistics show that, for example, 96% of Americans aged 75 and older have marriage experience at least once (<https://flowingdata.com/2017/11/01/who-is-married-by-now/>).

However, research has also indicated a connection between being single and maintaining good physical health. One of the key advantages of single life is the increased opportunity for self-development. Bella DePaulo (2007) suggests that single individuals have more time and resources available for personal growth, education, and career advancement. Without the responsibilities and compromises typically associated with romantic relationships, singles can focus more on their interests and ambitions. This autonomy allows them to engage in meaningful activities, explore new hobbies, and pursue personal goals without the need to consider a partner's preferences. As a result, single individuals often experience increased independence, self-reliance, and life satisfaction. Additionally, singles typically have more discretionary time, which they can devote to physical exercise and maintaining a healthy lifestyle.

Nomaguchi and Bianchi (2004) found that single adults are more likely to participate in physical activities than their married counterparts. This is partly due to the absence of family obligations, such as child-rearing or managing household duties, which can limit the time available for exercise. Research by Park and MacDonald (2022) supports the idea that single individuals often lead healthier lifestyles. They have more time and motivation to prepare nutritious meals, follow regular exercise routines, and engage in health-promoting behaviors. Without the need to accommodate the dietary preferences or schedules of a partner, singles can make health-conscious decisions more easily.

Recent studies focusing on the physical health outcomes of Chinese singles have emphasized several factors that contribute to their health. One study, applying data from the Chinese General Social Survey (CGSS), examines the relationship among physical health, mental health, as well as subjective well-being among older Chinese adults, emphasizing social support networks is important in enhancing overall well-being (Zhang & Sun, 2024). Another comprehensive study evaluated the lifestyle and health-related quality of life factors in China, such as body mass index, nutrition, physical activity, tobacco use, and alcohol intake. This research revealed significant variations in health-related quality of life among individuals with different lifestyles and medical histories, suggesting that regular physical activity and a balanced diet are crucial for improving physical health outcomes (Zou et al., 2024).

2.3 Gratitude

There appears to be no universal agreement on the definition of gratitude, as evidenced by the wide range of definitions found in psychological literature (Olson et al., 2019). Gratitude has been described in various ways, including as positive emotions, attitudes, moral virtues, psychological states, personality traits, character strengths, or coping mechanisms (Elosua, 2015). Gratitude is often defined as a transient, joyful emotion that follows an unsolicited act of kindness that is both valued and altruistic (Wood et al., 2008). It is also seen as a tendency to feel thankful, which refers to a general disposition to recognize and respond to positive events with happiness, particularly in social contexts (McCullough et al., 2002).

However, gratitude does not only emerge through human interaction. Increasingly, researchers are describing it as a personal sense of thankfulness and admiration for life (Lin & Yeh, 2014, p. 206), expanding its meaning beyond the feeling of gratitude that follows assistance from others. Emmons and Stern (2013) suggest that gratitude may have two dimensions: transcendent and worldly. The former pertains to the spiritual aspect of gratitude, which is common in many religious practices, but this is not its sole interpretation. Positive psychology research on gratitude has recently adopted the life orientation perspective, which views gratitude as the recognition and appreciation of the positive aspects of life (Wood et al., 2010).

Alkozei (2017), drawing from the Broaden and Build Theory, proposed two models to explain the relationship between trait gratitude and subjective well-being: the cognitive framework and the psycho-social framework. The Cognitive Framework extends Fredrickson's theory, suggesting that gratitude can broaden one's perspective, encouraging individuals to view challenging or ambiguous situations more positively, recall past experiences with greater fondness, and focus on positive environmental stimuli rather than negative ones. These actions can, in turn, build emotional and physical resources for coping with stressors, enhancing emotional health and well-being. This process creates a feedback loop, where increased subjective well-being fosters greater feelings of gratitude. The Psycho-Social Model, which is also related to Fredrickson's (2004) model, posits that gratitude can inspire individuals to think to respond their benefactors, potentially strengthening ties and increasing social support. This enhances psychological and physical health, creating another feedback loop whereby greater well-being leads to increased gratitude.

Recent research has explored the relationship between happiness and gratitude among single individuals, particularly within the Chinese cultural context. These studies highlight the positive effects of gratitude on various well-being factors, such as psychological and emotional health.

Krause and Hayward (2014) published a comprehensive study in the *Journal of Gerontology* examining the connection between psychological well-being and gratitude in single individuals. Their findings revealed a strong link between gratitude and enhanced mental well-being, including increased life satisfaction, reduced depressive symptoms, and greater happiness. The study suggests that gratitude helps mitigate the negative effects of social isolation, which are often experienced by single individuals. Similarly, Wood, Joseph, and Maltby (2008) conducted research published in the *Journal of Research in Personality*, exploring how gratitude can enhance the well-being of single people. Their research indicated that gratitude is linked with reduced levels of negative emotions and depressive symptom, as well as higher levels of positive emotions and life satisfaction. The authors argue that gratitude fosters positive social connections and a more optimistic outlook on life, ultimately improving well-being.

Wang and Wong (2020), in their study published in the *Asian Journal of Social Psychology*, explored the cultural influences between gratitude and well-being in the Chinese context. Their findings revealed that gratitude was correlated with emotional well-being and life satisfaction among single Chinese individuals. The researchers argued that the expression and experience of gratitude are heavily shaped by cultural values, such as collectivism and filial piety, which in turn impact well-being. Chan (2013) also studied the effect of gratitude on the well-being of single Chinese individuals, as published in *Social Indicators Research*. The research found that higher levels of life satisfaction and less depression symptoms were associated with gratitude. Chan suggested that gratitude could enhance the overall well-being of single individuals in China by helping them navigate social pressures and expectations surrounding marriage and family life.

Figure 1. Cognitive model of gratitude on subjective well-being and physical health

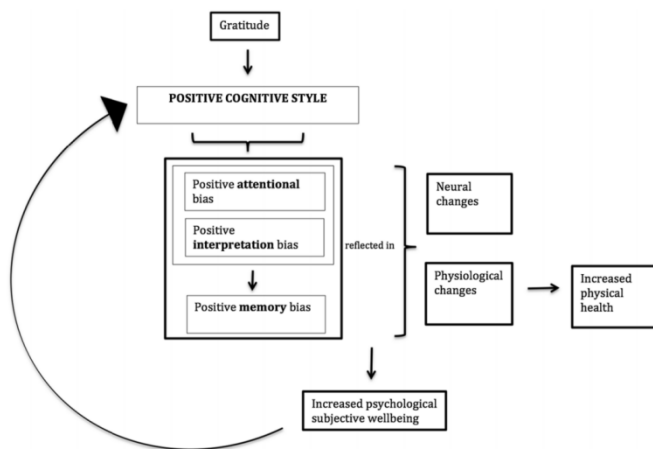
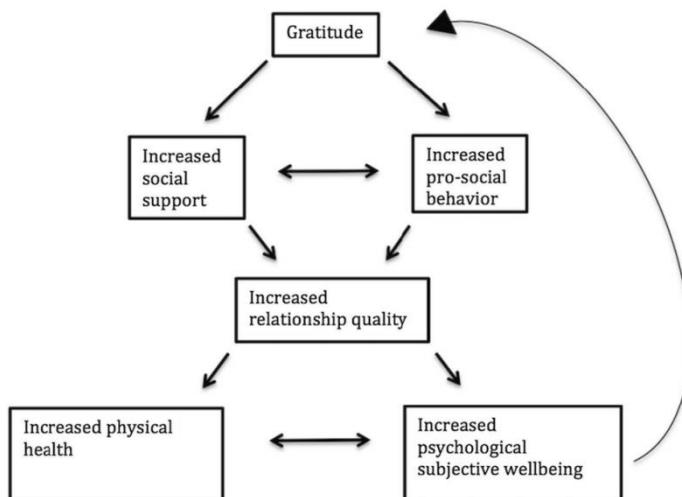


Figure 2. Psycho-social model of gratitude on subjective well-being and physical health



2.4 Perceived social support

Perceived social support, according to Demaray and Malecki (2002), is the degree to which people think their social network is ready to provide assistance. Wethington and Kessler (1986) and Pinquart and Sörensen (2003) suggest that perceived social support may have a stronger impact than real support. Social support is crucial in reducing feelings of loneliness, according to research. (Bernardon et al., 2011). For example, studies by Pierce et al. (1991) and Schmitt and Kurdek (1985) found that the sense of friendship support was the most powerful predictor of reduced loneliness, and that perceived social support from friends and family served as a buffer against loneliness.

It has been found that the presence of a intimate partner at the time can influence the level of perceived social support based on relationship status. In a study by Zimet (1990), married individuals reported receiving significantly more support from their partner compared to single individuals. Similarly (2002) found that while there were no significant differences in family support between married and non-married individuals, married individuals reported receiving stronger support from their significant others than single individuals. A Polish study of college students aged 19-25 found no significant

differences in the self-reported social support from friends and family between unmarried and partnered people. However, single participants reported feeling less support from significant others on a subjective level than their coupled counterparts.

Previous studies on different sex in social support have yielded mixed results, with some reporting no differences between men and women and others indicating higher support levels for women (Coventry et al., 2004). Women have been found to seek support from different sources more frequently than men and tend to have larger overall social support networks (Day and Livingstone, 2003). Gender differences were also observed in the types of support sought. Research suggests that women are more likely to seek support from friends, coworkers, and family, whereas men are more likely to feel supported by their bosses (Day and Livingstone, 2003). Furthermore, women reported receiving more support from friends and significant others, as well as overall greater support than men in Zimet et al. (1988); however, no gender differences were observed in support from family members. Duru (2007) conducted a study in Turkey and found that female students reported receiving more overall support, including from friends and family, compared to male students. The study included a sample of university psychology students aged 17-52. According to Day and Livingstone (2003), women were more likely to turn to their partners and friends for support than men. In contrast, male received greater support from relatives when they were younger (ages 19 to 25) or older (ages 46 to above 65), according to Prezza and Pacilli's (2002) study, which included a sample ranging from 18 to 77 years old. Compared to men, younger women (up to about 45 years old) reported stronger peer support. However, it can be deduced that single women may perceive higher levels of social support than single men because marriage is frequently thought to offer men greater social, psychological, and financial benefits than women (Bernard, 1972), women typically have stronger support systems than men (e.g., Turner & Marino, 1994), and single women receive more social support from friends and family within their larger social networks (Carbery & Buhrmester, 1998).

Recent studies on Chinese singles have highlighted the unique cultural factors influencing the relationship between social support and well-being. Zhang et al. (2020) conducted research that investigated the connection between Chinese single people's well-being and social assistance. Their results showed that among Chinese singles, social support was substantially linked to improved life satisfaction and lower levels of depressive symptoms. The study emphasized that social support perceptions and experiences in China are heavily influenced by the country's collectivist culture, which values interdependence and close-knit family and community bonds. In another study published in the *Asian Journal of Social Psychology*, Chen and Chung (2021) explored the role of family support in the well-being of Chinese singles. Their findings indicated that family support was a significant predictor of emotional stability and life satisfaction. The authors argued that family support provides single individuals with a sense of security and belonging, which is crucial for thriving within the Chinese cultural context, where family ties are highly cherished.

2.5 Prosocial behavior

Prosocial behavior is defined as voluntary actions aimed at benefiting others. This broad category includes behaviors such as helping, sharing, donating, cooperating, and volunteering (Eisenberg & Mussen, 1989). Prosocial actions are typically motivated by a combination of internal and external factors, including empathy, moral values, social norms, and expectations of reciprocity.

Single individuals exhibit distinct patterns of prosocial behavior shaped by their available time, social networks, and cultural contexts. Their involvement in volunteering, participation in social groups, and support for friends and colleagues demonstrate the diverse forms of prosocial behavior that contribute to community well-being.

Single individuals often have more discretionary time and fewer family obligations compared to their married counterparts. This availability allows them to participate more actively in volunteer activities. Volunteering provides a sense of purpose and community connection, which is particularly valuable for single individuals seeking social bonds outside of a familial structure (Haller et al., 2022). Research has shown that single people are more likely to engage in community service and charitable organizations, dedicating their time to causes they care about (Padilla-Walker et al., 2018).

Social groups and clubs offer single individuals opportunities to build and maintain social networks. These groups can range from hobby-based clubs, such as book clubs or sports teams, to professional associations and support groups. Participation in these groups not only fulfills social needs but also often involves prosocial behavior, such as organizing events, supporting other members, and contributing to group activities (Malonda et al., 2019). For instance, single individuals might take on leadership roles within these groups, fostering a sense of belonging and facilitating group cohesion.

Without the time constraints associated with family obligations, single people might be more available to assist friends and colleagues. This assistance can include helping with personal tasks, offering emotional support, or participating in cooperative efforts at work. These prosocial behaviors help build stronger social connections and networks, providing both emotional and practical benefits (Haller et al., 2022). The flexibility and availability of single individuals enable them to be reliable sources of support within their social and professional circles.

The extent and nature of prosocial behavior among single individuals are influenced by cultural norms and socioeconomic status. In many cultures, single individuals may engage more in community-oriented prosocial activities to integrate and find support. Economic factors also play a role; individuals from lower socioeconomic backgrounds might engage in prosocial activities that do not require monetary investment, such as volunteering time or providing direct support to others (Padilla-Walker et al., 2018). Cultural expectations and socioeconomic conditions shape the opportunities and motivations for prosocial behavior, highlighting the diverse ways single individuals contribute to their communities.

Cultural values like Confucianism and collectivism are important in influencing prosocial conduct in the Chinese environment. Prosocial conduct is frequently encouraged in collectiveist cultures, which place a strong emphasis on interdependence and group harmony, in order to preserve social cohesiveness and familial ties. Chinese people who strongly identify with collectivist principles are more likely to participate in prosocial acts and report better levels of life satisfaction, according to a study by Chen et al. (2019) published in *Frontiers in Psychology*. According to the study, prosocial activity is motivated more by collectivist principles, which increases social support and well-being (Chen et al., 2019). Prosocial activity might have a special effect on solitary people in China. The *Journal of Social and Personal Relationships* published a research by Li and Zhang (2020) that examined the connection between prosocial activity and wellbeing among Chinese individuals who are single. Prosocial behaviors, such as volunteering and lending a hand to friends, were shown to be linked to lower levels of depression symptoms and better levels of life satisfaction. The study emphasizes that prosocial action offers a significant strategy to create social relationships and improve well-being for single people who might not have access to traditional sources of social support (Li & Zhang, 2020).

The beneficial effects of prosocial conduct on the well-being of Chinese single people are explained by a number of factors. Prosocial activity, in the first place, promotes social ties, which are essential for belonging and emotional support. According to a research published in *Personality and Individual Differences* by Yang and Wang (2021), prosocial conduct among single Chinese people is associated with stronger social networks and a better sense of perceived social support, both of which improve well-being. According to Yang and Wang (2021), prosocial conduct serves as a protective factor

against loneliness and stress for single people by fostering the development of meaningful relationships. Second, acting in a prosocial manner improves one's feeling of purpose and self-worth. Social Science & Medicine research by Sun et al. (2022) indicates that Chinese single people who regularly participate in prosocial activities report greater levels of self-esteem and a stronger feeling of purpose in life. According to the study, engaging in prosocial conduct gives people the chance to positively influence others, which increases their sense of self-worth and contentment with life (Sun et al., 2022).

2.6 Relationship quality

Social relationships refer to the connections and interactions between individuals within a social network, encompassing various kinds of partnerships, such as familial, professional, and friendship ties. High-quality social relationships are characterized by positive interactions, emotional support, and mutual respect (Holt-Lunstad et al., 2010).

Relationship quality, refers to the subjective evaluation of the positivity and satisfaction derived from these social connections (Fincham & Beach, 2010). Gottman and Levenson (1992) stress the importance of positive communication patterns and conflict resolution skills in fostering high-quality relationships. Effective communication, characterized by empathy, active listening, and constructive problem-solving, contributes to greater relationship satisfaction and longevity (Burleson, 2003).

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2.7 The current study

This paper aims to test gratitude and subjective well-being through the proposed psycho-social model. Therefore, The study aims to test the structural model in order to verify the relationships hypothesized among gratitude, perceived social support, prosocial behavior, relationship quality, physical health, and subjective well-being in Chinese single emerging adults.

2.8 Research questions

The literature review, along with the theoretical theory and model employed in this investigation, provide the basis for addressing the subsequent research questions: To what extent the prediction model can explain the structural relationships hypothesized among gratitude, perceived social support, prosocial behavior, relationship quality, physical health, and subjective well-being in Chinese single emerging adults.

2.9 Research Hypotheses

Based on the literature review, the theoretical model, and the research questions in this study, the following research hypotheses are investigated:

Hypothesis 1 (H1): The prediction model can explain the structural relationships hypothesized among gratitude, perceived social support, prosocial behavior, relationship quality, physical health, and subjective well-being in Chinese single emerging adults.

Hypothesis 1.1 (H1.1): Gratitude directly and positively influences subjective well-being in Chinese single emerging adults.

Hypothesis 1.2 (H1.2): Gratitude directly and positively influences physical health in Chinese single emerging adults.

Hypothesis 1.3 (H1.3): Gratitude indirectly and positively influences physical health in Chinese single emerging adults by being mediated by relationship quality.

Hypothesis 1.4 (H1.4): Gratitude indirectly and positively influences subjective well-being in Chinese single emerging adults by being mediated by relationship quality.

Hypothesis 1.5 (H1.5): Gratitude indirectly and positively influences physical health in Chinese single emerging adults by being mediated by perceived social support and relationship quality.

Hypothesis 1.6 (H1.6): Gratitude indirectly and positively influences physical health in Chinese single emerging adults by being mediated by prosocial behavior and relationship quality.

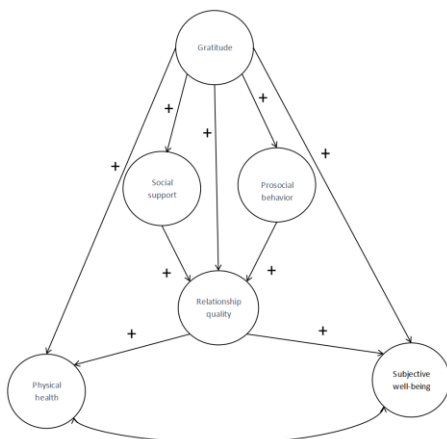
Hypothesis 1.7 (H1.7): Gratitude indirectly and positively influences subjective well-being in Chinese single emerging adults by being mediated by perceived social support and relationship quality.

Hypothesis 1.8 (H1.8): Gratitude indirectly and positively influences subjective well-being in Chinese single emerging adults by being mediated by prosocial behavior and relationship quality.

2.10 Conceptual Framework

The following depicts a model based on the hypotheses. It shows the possible direct and indirect impacts of gratitude on subjective well-being and physical health, and the mediators: perceived social support, prosocial behavior, and relationship quality.

Figure 3. The Proposed Conceptual Framework



3. Research Methods and Materials

3.1. Research Design

Study II aims to examine the effects of gratitude, both direct and indirect, on the physical and subjective well-being of Chinese single emerging adults. Structural Equation Modeling (SEM) will be used to investigate the proposed model. Among the Chinese single emerging adults' criteria factors, it is projected that gratitude has both direct and indirect impacts on physical health and subjective well-being. These effects are thought to be mediated by perceived social support, prosocial behavior, and relationship quality.

3.2. Participants of the Study

Participants will be chosen from a data collecting firm. This recruitment procedure will utilize a convenience sampling technique. Participants will provide informed consent (see Appendix C, D). Participants aged 18 to 30, who have not been in a committed romantic relationship in the last six months and are now residing in Suzhou, China, will be included for convenience sampling. The reason to choose Suzhou city due to the following reasons. First, Suzhou is a famous city in China with 2500 years of history and is highly industrialized with fast growing economy to attract tens of thousands of young people (immigrants) each year, second, Suzhou due to its size is neither too small nor too big and can be considered a representative city in China.

For CFA (Confirmatory Factor Analysis) and SEM (Structural Equation Modeling), the rule of thumb is to use the ratio of cases to free parameters (N:q). Kyriazos (2018), Schumacker & Lomax (2015), and Jackson (2003) advocate using N: q for minimal recommendations and 10:1 to 20:1 for maximum recommendations. The suggested minimum number of responses is 590 (N:Q = 10:1). Jackson (2003) examined the impact of varying sample sizes (N=50, 100, 200, 400, and 800) on confirmatory factor analysis results. He stated that there is no single figure that can reflect the word "large enough." Jackson (2003) found that the standard deviation of factor correlations was nearly three times lower at a sample size of N=400 compared to N=50. Therefore, 700 participants (which is more than 590) will be considered in this study

3.3. Research Instruments

The Chinese version of the Gratitude Questionnaire-6 (CGQ-6) is used to measure trait gratitude, consisting of six items rated on a 7-point Likert scale from strongly disagree to strongly agree. Previous research has demonstrated its reliability and validity in Chinese populations. Chen and Kee (2008) found that the CGQ-6 had a Cronbach's alpha of 0.82 among adolescent athletes, indicating good internal consistency, with significant positive correlations with life satisfaction and positive affect. Similarly, Kong et al. (2015) reported a Cronbach's alpha of 0.80 in a study with Chinese university students, further confirming its psychometric strength through correlations with self-esteem, subjective well-being, and social support. Sun and Kong (2013) examined late adolescents and found a Cronbach's alpha of 0.83, reinforcing its validity through significant associations with life satisfaction and positive affect.

The Chinese version of the Multidimensional Scale of Perceived Social Support (CMSPSS) assesses perceived social support from family, friends, and significant others. This scale comprises 12 items rated on a 7-point Likert scale, ranging from strongly disagree to strongly agree. Research has confirmed its reliability and validity in Chinese cultural contexts (Zhao et al., 2018).

The Chinese Version of the Prosocialness Scale for Adults (CPSA), developed by Caprara et al. (2005), measures prosocial behavior using a 16-item, single-dimensional scale rated on a 5-point Likert scale from never to always. Zhan et al. (2023) reported a test-retest reliability of 0.801 and an internal consistency reliability of 0.890 when applied to a

sample of Chinese students. The study further confirmed its construct validity through significant correlations with subjective well-being and life satisfaction, while also demonstrating negative correlations with depression and anxiety, highlighting its effectiveness in measuring prosocial behavior in Chinese populations.

The Chinese version of the Friendship Quality Questionnaire (CFQQ), adapted from Parker and Asher's (1993) original scale, assesses three dimensions of friendship: trust and support, validation, and disclosure and communication. Zou et al. (1998) validated this 16-item version, and confirmatory factor analysis (CFA) indicated a good model fit ($\chi^2/df = 2.32$, RMSEA = 0.05, CFI = 0.97, NFI = 0.95, NNFI = 0.97). The standardized factor loadings for the three dimensions ranged from 0.34 to 0.69, with Cronbach's alphas of 0.72, 0.67, and 0.69 for trust and support, validation, and disclosure and communication, respectively (Zhou et al., 2012).

The Chinese version of the Flourishing Scale (CFS) has demonstrated excellent internal consistency, a strong one-factor structure, and robust convergent and discriminant validity. Designed to measure psychological well-being from a eudaimonic perspective, this eight-item scale assesses key aspects of human functioning, such as positive relationships, competence, and a sense of meaning and purpose in life (Xiao et al., 2016).

The Chinese version of Self-Rated Health (CSRH) is commonly used to assess perceived physical health through a single-item measure with response options ranging from "excellent" to "poor." Recognized as a valid indicator of chronic morbidity and public health, the CSRH has demonstrated strong psychometric properties. Cheng et al. (2015) reported that, among Chinese urban women, the scale showed good reliability, with Cronbach's alpha and split-half reliability coefficients of 0.917 and 0.831, respectively. Construct validity was supported through significant correlations with health-related measures, such as positive associations with objective health indicators and physical functioning and negative correlations with chronic illness and disability. This evidence suggests that the CSRH is an effective tool for assessing perceived health status in Chinese populations.

3.4. Data Collection Procedure

The study will only be conducted with approval from Assumption University Institutional Review Board (IRB). Participants will be recruited online. The study intends to examine the relationship between gratitude and subjective well-being. The survey's first page will detail all procedures and give informed consent. After perusing the materials and clicking the 'agree' option, participants will be directed to questions about the relationship between gratitude and subjective well-being. The seven questionnaires will be completed in the same order by all participants: Demographic Questionnaire; CGQ-6, CMSPSS, CPSA, CFQQ, CFS, and CSRH. The expected time taken to complete this questionnaires will be 20-25 minutes.

To secure participants' privacy and anonymity, the data collection procedure involves informed consent and password-protected computer files. This research is exempt from the Protection of Human Subjects requirements because it will be conducted with participants aged 18 or older, do not collect sensitive information, do not involve deception, do not use specialized cases like pregnancy or prisoners, and do not pose a foreseeable risk to participants. To minimize participant risk, the research design will be carefully constructed to minimize any potential psychological or physical harm. Overall, this study adhered to the guidelines of the Belmont Report (1979).

3.5. Data Analysis

This study is designed to examine the direct and indirect relationships among gratitude, subjective well-being, physical health, perceived social support, prosocial behavior, and relationship quality through the application of structural equation modeling (SEM). The SEM method will be employed to test the hypothesized model and all proposed

hypotheses, as well as to evaluate the goodness-of-fit indices. By utilizing SEM, the study enables a direct comparison of the goodness-of-fit indices of different models, helping to determine which model best accounts for the theoretical direct and indirect effects, considering exogenous, mediator, and criterion variables. The "Lavaan" package in R 4.1.2 will be used for model testing in this study.

For model estimation, this study will follow the three main stages proposed by Kline (2013). Prior to this, Study I will focus on assessing the validity and reliability of the measurement instruments. Internal consistency will be considered acceptable if Cronbach's alpha is greater than 0.70 (Kawabata, Mallett, & Jackson, 2008). The model fit will be evaluated using two fit indices: $CFI \geq 0.95$ and $RMSEA \leq 0.08$. Based on the SEM results of the hypothesized model, a revised model will be proposed to enhance model fit, refine theoretical understanding, and account for practical considerations. In Study II, all hypotheses will be tested.

Goodness-of-Fit Indices

To evaluate model fit, two dimensions of SEM fit indices will be used: (a) sample-based fit indices, such as the likelihood ratio test statistic (McDonald, 1989), and (b) absolute and relative fit indices. Absolute fit indices, including the Root Mean Square Error of Approximation (RMSEA; Steiger & Lind, 1980) and the Root Mean Square Residual (RMR; Afthanorhan, 2013), will be utilized to assess the model fit, with lower RMSEA and RMR values indicating a better fit. Relative fit indices, such as the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973) and the Comparative Fit Index (CFI; Bentler, 1990), will also be employed, with higher values suggesting a better model fit.

Mediation Effect of Relationship Quality

The mediation effect of relationship quality on the relationship between gratitude, physical health, and subjective well-being will be examined. The significance of both direct and indirect effects will be assessed. If both the direct and indirect effects are significant, partial mediation will be established. If only the indirect effect is significant, full mediation will be confirmed. The significance of indirect effects will be tested using Sobel tests, product distribution, bootstrapping, and Monte Carlo methods (Preacher & Selig, 2012).

Figure 4. Relationship quality mediates the relationship between gratitude and physical health

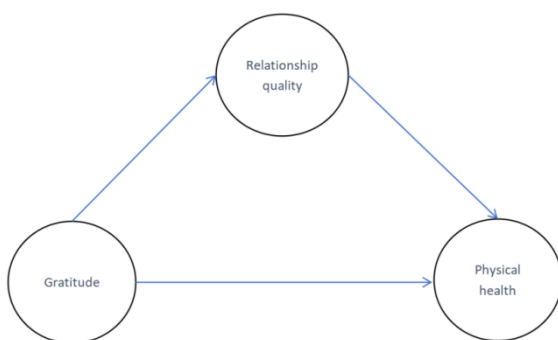
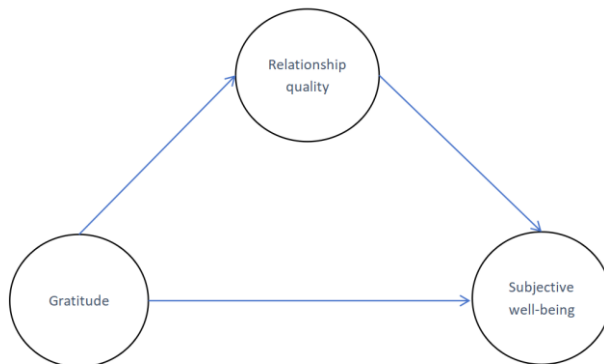


Figure 5. Relationship quality mediates the relationship between gratitude and subjective well-being



The serial mediation effect of perceived social support and relationship quality

The serial mediation effect of perceived social support and relationship quality on the link between gratitude, physical health and subjective well-being will be investigated. The importance of the indirect impact will be assessed. If the indirect impact is significant, a complete mediation effect will be established. The importance of the indirect effects will be assessed using Sobel, product distribution, bootstrapping, and Monte Carlo procedures (Preacher & Selig, 2012).

Figure 6. The serial mediation effect of perceived social support and relationship quality on gratitude and physical health

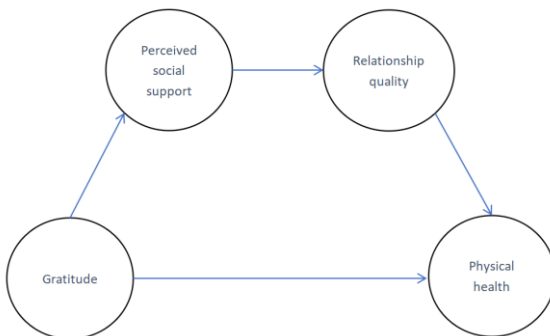
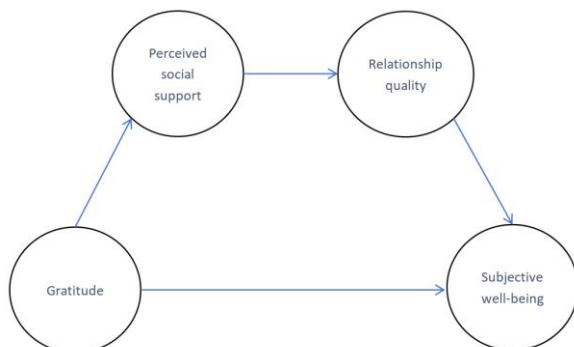


Figure 7. The serial mediation effect of perceived social support and relationship quality on gratitude and subjective well-being



The serial mediation effect of prosocial behavior and relationship quality

The serial mediation effect of prosocial behavior and relationship quality on the link between gratitude, physical health and subjective well-being will be investigated. The importance of the indirect impact will be assessed. If the indirect impact is significant, a complete mediation effect will be established. The importance of the indirect effects will be assessed using Sobel, product distribution, bootstrapping, and Monte Carlo procedures (Preacher & Selig, 2012).

Figure 8. The serial mediation effect of prosocial behavior and relationship quality on gratitude and physical health

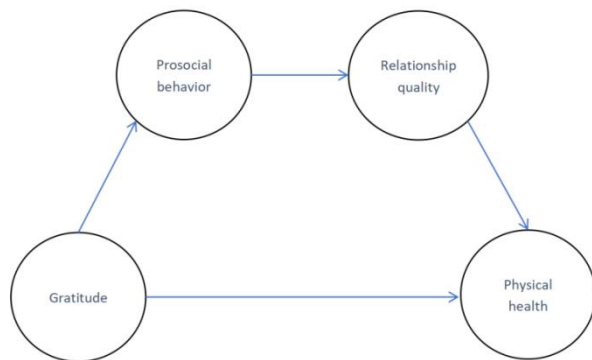
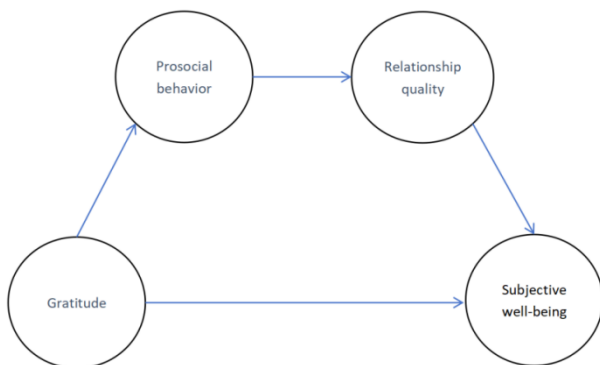


Figure 9. The serial mediation effect of prosocial behavior and relationship quality on gratitude and subjective well-being



4. Discussion

Although previous studies have explored the psycho-social mechanisms linking gratitude and subjective well-being, direct examinations of a comprehensive psycho-social model remain limited. For instance, Kong et al. (2021) investigated the relationship between trait gratitude and subjective well-being in Chinese adolescents, identifying the mediating roles of resilience and social support. Their findings indicated that social support and resilience independently mediated the link between gratitude and subjective well-being, highlighting both cognitive and psycho-social pathways. Similarly, Garg et al. (2022) examined the mediating roles of psychological and social capital in the relationship between gratitude and job satisfaction among Indian university instructors. Their results suggested that gratitude is both a necessary and sufficient condition for workplace happiness, with psychological and social capital playing significant moderating roles. However, no study has directly tested a psycho-social model of gratitude (Alkozei, 2017). This study aims to be the first

to evaluate the model fit of a proposed psycho-social model of gratitude in relation to subjective well-being and physical health within a Chinese cultural context.

5. Suggestion

Future research can test the same model in different culture background to validate the conceptual framework, furthermore, researchers can consider testing the possibility of moderating effect(perceived social support, prosocial behavior, and relationship quality) in this model. Physical health is measured by self-rated health in this study, giving to the fact of subjectivity of this scale, other health related measurement tools are encouraged for future research.

Future research can also consider to adopt gratitude intervention based psychotherapies to enhance subjective wellbeing among single emerging adults.

6. Conclusion

This study aims to test the direct and indirect model of proposed psycho-social model of gratitude. This study is particularly valuable for mental health practitioners, educators, and policymakers seeking effective strategies to enhance psychological well-being at both individual and community levels.

Limitations: 1: In this paper, the psychological activities and behaviors of single people are affected by many factors, including individual characteristics, social culture, environmental conditions, etc., so it is difficult for this study to fully control and predict the influence of these complex factors. 2: This study used samples to be representative of the population as a whole, but the samples may be biased and not fully representative of the population as a whole, so the results may not be comprehensive and accurate enough. 3: This study relies on individual self-reports, but self-reports may have problems such as memory bias and social expectations, which affect the accuracy of the study results.

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