Social and psychological implications of actual and de-facto childlessness among older persons in East and Southeast Asia

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This work is supported by Singapore's Ministry of Education Academic Research Fund Tier 2 (MOE2019-T2-2-084), the Institute of Social Welfare at Seoul National University, and Asian Universities Alliance (AUA) Scholars Award.

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Abstract

We examine how aging without children is linked to older adults' social participation and psychological distress in selected East and Southeast Asian countries (South Korea, China, Thailand, Vietnam, Myanmar). Recognizing the nuances of such aging experience, we distinguish between actual childlessness (elderly without children) and de-facto childlessness (elderly whose all children lived faraway). We harmonize and analyze recent nationally-representative survey data from the five countries utilizing both descriptive and multivariate approaches. First, we investigate prevalence and dimensions of actual and de-facto childlessness. Second, we examine the extent to which actual and de-facto childlessness are associated with old-age social participation and psychological distress. The analyses focus on gender and wealth differentials. We find that actual childlessness is associated with lower social participation in Southeast Asian countries and greater psychological distress in Korea, Thailand, and Myanmar. The effects of de-facto childlessness are mixed. We discuss social and psychological implications of childlessness for older adults across varying societal contexts of the five Asian countries.

Keywords: childlessness, social participation, psychological distress

Introduction

Traditionally, adult children across Asia play a predominant role in material, emotional, and personal care support for aging parents. An absence of children in later life often raises concerns about potential negative implications for the well-being of older persons (Croll 2006; Raymo et al. 2008). The region's major demographic shifts over the last half century, including rapid fertility decline, rising singlehood, and increased migration, have brought about an unprecedented and growing number of older persons across developed and developing Asia who are aging without the continuing presence of adult children (Kreager and Schröder-Butterfill 2005; Yeung 2022). Existing studies usually focus on the later-life disadvantages of older Asians who never had children in their lives (e.g., Chou and Chi 2004; Feng 2018; Quashie and Pothisiri 2018; Zhang and Liu 2007). For instance, alarmists warn that childlessness makes older persons more vulnerable to social isolation and depression (Onishi 2017; Woodard 2014). Being childless in developing Asia are thought to be particularly vulnerable because welfare states there are underdeveloped (World Bank 2016). Even in wealthy Asian nations (e.g., Japan and South Korea) where there are more concerted efforts to address population aging, the governments continue to emphasize adult children as the frontline of old-age support, thus possibly marginalizing older adults without children (Kodate and Timonen 2017).

A few population-based studies notwithstanding (e.g., Schröder-Butterfill and Kreager 2005), past research has paid little attention to the nuances of aging experience without children. Among older adults aging without children, some of them never had children in their lives (i.e., actual childlessness), while others have no adult children living nearby as the children all migrated from the locality (i.e., de-facto childlessness). Understanding the nuances of aging experience without the continuing presence of children is

important because the findings can inform policy makers of the differential needs of older adults who are childless and those who have children but lack immediate contact or instrumental support from adult children. Subsequently, tailored services can be developed to meet the needs of increasingly diverse older-adult populations. Cross-national comparison of such effects can further help us understand how social, cultural, and institutional environments influence the lives of childless older adults.

Based on nationally representative survey data from China, South Korea, Thailand, Vietnam, and Myanmar, this study examines how actual and de-facto childlessness are associated with older persons' social participation and psychological distress. Not only are survey data from the five East and Southeast Asian countries available and largely comparable (Teerawichitchainan and Knodel 2015), but these selected countries also represent a wide spectrum of Asia's economic development levels, demographic trajectories, cultural underpinnings, and government responses to population aging. These variations thus allow us to examine how diverse societal contexts may have different implications for the well-being of older persons who age without the constant presence of adult children. First, we investigate prevalence of childlessness and distinguish between actual and de-facto childlessness. Second, we assess the extent to which actual and de-facto childlessness are associated with older adults' social participation and psychological distress. Third, we examine how gender and wealth moderate these associations. Importantly, we compare prevalence and consequences of actual and de-facto childlessness across the five countries to understand how structural and institutional factors and cultural norms may matter for these two dimensions of childlessness.

Literature review

The availability of children may be linked to the well-being of older persons through various mechanisms. For example, the social exchange theory suggests that adult children enhance older persons' physical and psychological health by offering them social support and a sense of purpose and meaning in life (Rossi and Rossi 1990). Moreover, according to the convoy model of social relations, children are considered an integral part of older adults' social convoys which provide them different types of support (e.g., material, instrumental, and emotional support) and consequently contribute to their well-being (Antonucci and Akiyama 1987). Additionally, the intergenerational solidarity theory posits that children promote connectedness and continuity between generations and that the sense of intergenerational solidarity and cohesion can in turn improve one's later-life well-being (Bengtson and Roberts 1991). Furthermore, since parenthood is shown to be closely linked to adult development process and psychological growth, childless people are often perceived to have missed out on crucial adult development phases that may have long-run implications for their social integration and social networks (Dykstra and Hagestad 2007). Given that adult children are consistently theorized to play an important role for one's later-life well-being, older adults who have no children or experience continuing absence of children are often hypothesized to experience greater risks of social isolation and psychological distress compared to those with adult children nearby (Aboderin 2014).

Existing studies conducted primarily in western settings offer mixed empirical evidence regarding the association between childlessness and older adults' well-being. For outcomes related to later-life social participation, some studies demonstrate that childless older adults have smaller social networks and fewer interactions with relatives compared to those with children (Dykstra 2006; Vincente and Guadalupe 2022; Vikström et al. 2011), whereas others report no difference between the two groups in network size, voluntary work, and social engagements (Keith 1983; Wenger et al. 2007). Similarly, existing research

demonstrates that the effects of childlessness on psychological well-being is largely inconclusive in western countries and that the relationship is contingent upon various factors such as gender, marital status, and societal contexts. For example, Koropeckyj-Cox (1998) shows that childlessness marginally, yet significantly, increases loneliness among American women aged 50-84 but not among men. Vikström and colleagues (2011), however, report no significant difference in loneliness between parents and the childless among Sweden's oldest old. Furthermore, Zhang and Hayward (2001) demonstrate no significant effect of childlessness on depression and loneliness among older Americans, although childless men who are divorced, widowed, or never married show significantly more loneliness than childless women with comparable marital status.

Nevertheless, compared to research conducted in western countries, relevant studies in Asian settings demonstrate more consistent evidence regarding the relationship between childlessness and psychological distress. For example, childlessness is usually linked to lower life satisfaction, higher anxiety, negative affect, and greater loneliness among Chinese elderly, particularly the widowed (Cheng et al. 2014; Zhang and Liu 2007). Comparative cross-national research further suggests that the negative effect of childlessness on psychological well-being and life satisfaction may be contingent upon societal contexts, such as the degree of tolerance towards childlessness, societal level of social contacts, and pronatalist norms (Huijts et al. 2011; Tanaka and Johnson 2014).

To date, past studies have seldom distinguished the consequences of de-facto childlessness (no adult children nearby) from those of actual childlessness using population-based data. Furthermore, to our knowledge, no study has yet attempted to situate the relationship between childlessness, psychological distress, and social engagement across Asia's vastly different social, cultural, and policy contexts. In particular, little is known about the extent to which childlessness exerts similar or different influences on older adults' well-

being in cultures where filial piety remains a norm, yet socioeconomic contexts of old-age support is changing dramatically due to decreasing family size, increased migration of working-age adults, and development of formal care arrangements. To fill in these research gaps, our study explores the extent to which various dimensions of childlessness are correlated with older adults' social participation and psychological distress in the contexts of five Asian countries with different demographic trajectories, economic, and social policy development.

Moderating effects of gender and wealth

Research has shown that the experience of childlessness and its impact on one's later-life well-being can differ between men and women as well as among individuals of varying economic resources (Wenger et al. 2007). The life course theory provides a useful lens for understanding the extent to which childlessness is associated with older adults' social participation and psychological distress may be contingent upon one's gender and wealth (Dykstra 2006). The theory suggests that gender and wealth differences in one's later-life well-being may result from earlier-life experiences and transitions (Silverstein and Giarusso 2011; Umberson and Gove 1989). For example, childless women tend to experience more negative social stigma than their male counterparts who generally experience less societal pressure to have children and tend to have more resources to pursue personal interests. The gender differences may put childless women in a disadvantaged situation, increase their risk of social isolation, and adversely affect their social participation and psychological well-being (Koropeckyj-Cox 1998). Moreover, given that women are more likely to outlive their spouse, the constant presence of children might be more important for the well-being of older women than that of older men (Umberson et al. 1992).

Furthermore, wealth may also condition the effect of childlessness on older person's social and psychological well-being. Individuals with greater wealth, for instance, may have more resources to pursue various sources of fulfillment (e.g., career advancement, hobbies) and better access to healthcare that can help mitigate the negative impacts of childlessness in late adulthood (Wenger et al. 2007). Additionally, since those who have greater financial resources may be less dependent on their children for support and can participate in social activities without financial concerns (Mood and Jonsson 2016), they may be less negatively influenced by continuing absence of children. We examine these potential moderating effects of gender and wealth.

Country settings

While all study countries share strong filial norms (Croll 2006), there are contextual differences which may condition how an absence of children shapes aging experiences of older women and men across different wealth strata. As demonstrated in Table 1, the study countries vary in demographic trajectories and economic development. South Korea (hereafter Korea) has the lowest total fertility rate and is the most economically developed, followed by China and Thailand that witness below-replacement fertility and relatively higher per-capita Gross Domestic Product (GDP) compared to Vietnam and Myanmar. Myanmar is the least developed. Furthermore, migration rates of working-age adults from rural to urban areas and abroad are high in China and across Southeast Asia, affecting the age structure of the rural populations and raising concerns about the welfare of left-behind older persons (Knodel et al. 2010; Teerawichitchainan and Low 2021). These socioeconomic contexts are likely to affect the capacity of the public sector in supporting older adults who age without children. Also, older adults in less developed countries may have less economic power to purchase public or private services in old-age support (e.g., caregiving). Thus, we expect childlessness, be it actual or de-facto childlessness, to assert more negative effect on

older adults in less-developed countries, and that individual wealth will have a greater moderating effect in these countries.

[Table 1 about here]

Furthermore, the inclusion of China as a comparative case study is important, given the broad implications of China's one-child policy and massive migration for understanding the prevalence and consequences of de-facto childless. Extensive research, for instance, demonstrates how smaller family size and out-migration of adult children may lead to shifting values related to intergenerational relationships (Liang, 2016; Liu, 2021) as well as changes in caregiving arrangements and social support for left-behind older Chinese (Guo at al., 2009; Gustafson and Huang, 2014).

In addition, the five study countries differ in their cultural contexts. Although filial responsibility for aging parents remains a cultural imperative in all of them, particularly as repayment for parental sacrifices in the course of childrearing (Croll 2006), these countries vary in their kinship systems. The patrilineal kinship system prevailing in Korea, China, and Vietnam emphasizes the roles of married sons and daughters-in-law in supporting aging parents. Meanwhile, the bilateral kinship system prevalent in Thailand and Myanmar is more flexible regarding which children should care for older parents. These differences, particularly degrees of norm adherence, may have implications for the well-being of older parents compared to childless counterparts. While the rigid norms of filial care in patrilineal societies may magnify the negative effect of childlessness, the relative flexibility observed in bilateral kinship systems may mitigate such effect (Teerawichitchainan et al. 2015). Similarly, given the stigma of childlessness for women in patrilineal societies, the burden of childlessness may be greater for older women there compared to those in societies with bilateral kinship systems (Yang 2012).

Finally, we attend to different political systems in our study countries, which can affect social protection measures for older persons in general and the childless in particular. For example, Korea's mandatory long-term care insurance introduced in 2008 has enabled childless older adults who cannot perform activities of daily living to receive formal care at institutions. In China, a public system of care is evolving rapidly. The government has developed pension schemes and community-based care system for older adults (Liu and Sun 2016; World Bank 2016). These old-age protection measures may mitigate adverse social and health effects of being childless or not having children nearby. In comparison, welfare states in Southeast Asia are largely underdeveloped, although the Thai government has recently expanded old-age support via universal health insurance and social pension schemes (Teerawichitchainan and Pothisiri 2021). Given these commonalities and differences, cross-national comparisons permit examination of how societal contexts may shape the outcomes of childlessness and its association with old-age well-being.

Methods

Data sources

We analyze samples of persons aged 60 and over from five nationally-representative aging surveys: the 2012 Korean Longitudinal Study of Aging (KLoSA), 2011 China Health and Retirement Longitudinal Study (CHARLS), 2011 Survey of Older Persons in Thailand (SOPT), 2011 Vietnam Aging Survey (VNAS), and 2012 Myanmar Aging Survey (MAS).

The KLoSA is a nationally-representative (except Jeju Island) longitudinal study of South Korean residents aged 45 and older. Using a stratified multistage probability sampling method, the baseline survey was conducted in 2006 (n=10,254), with subsequent bi-annual data collection. We analyze the 2012 wave which includes 5,289 persons aged 60 and over. The CHARLS is a nationally-representative panel study of Chinese residents aged 45 and

older. The baseline survey conducted in 2011 includes about 17,500 individuals (of which 7,453 were aged 60 and older) in 150 counties/districts and 450 villages/resident committees. The individuals were followed up every two years. The 2011 SOPT was the fourth in a series of Thai government surveys of older persons that began in 1994. We analyze the 2011 sample which consists of over 60,000 persons aged 50 and over (of which, 34,173 were aged 60 and older). The VNAS is the first nationally-representative aging survey in Vietnam. Conducted in 2011, the survey consists of approximately 4,000 adults aged 50 and older (including 2,789 aged 60 and older) in 200 communes throughout Vietnam. The MAS is the first national survey of its kind in Myanmar conducted in 2012. Its multi-stage sampling approach includes 4,080 persons aged 60 and older in 60 townships throughout the country.

Measures

The Korean and Chinese surveys are parts of the Health and Retirement Study (HRS) family surveys and contained many similar measures. Meanwhile, the three aging surveys in Southeast Asia were conducted independently, although several measures are comparable to one another and to HRS family surveys. We make significant efforts to harmonize the five datasets and some modifications to accommodate their differences.

Dependent variables: This study considers both social and psychological well-being in late adulthood. *Index of social participation* measures the extent to which older persons are socially engaged in community-based activities common in each country. The index is constructed based on whether and how often respondents recently participated or are currently participating in the selected activities. We standardized the composite scores. Higher score indicates greater social participation. *Psychological distress* is assessed with different sets of measures for each country. For China and Korea, ten items from the Center for Epidemiological Study Depression (CES-D) scale are used. For Southeast Asian

countries, we aggregate the answers to questions related to the mental well-being of older adults during the one week (Vietnam) and one month (Myanmar and Thailand) prior to the survey. The questions were adapted from the SF-36 health assessment instrument, which has been validated in several Asian contexts (Ware and Sherbourne 1992). The scale is standardized and higher scores indicate greater psychological distress. Appendix 1 summarizes specific questionnaire items in respective surveys that are used for constructing the two dependent variables.

Independent variable: Actual childlessness refers to older persons who do not have any living children. De-facto childlessness refers to older adults who have living children but all of them live beyond the elder's locality. Similar locality refers to the same province in China, Thailand, and Vietnam; same township in Myanmar; and within a two-hour distance by public transportation in Korea. For each survey, the independent variable is incorporated as a mutually exclusive categorical variable indicating whether the respondent is actual childless; de-facto childless; or has at least one child in the same locality (reference).

Control variables: We incorporate socio-demographic characteristics as control variables, including gender (1=female, 0=male), age, marital status, educational attainment, pension (1=receiving, 0=not receiving), work status (1=has worked during the past year, 0=has not worked), living arrangement (1=lives alone, 0=lives with someone), urban/rural location of residence (1=urban, 0=rural), household wealth, and self-assessed health (1=excellent, 5=very poor). Educational attainment is constructed as a categorical variable assessing whether the respondent attained no education (reference), some primary, complete primary, secondary and beyond. Marital status is a categorical variable indicating whether the respondent is currently married (reference), divorced/separated, widowed, or never married.

Household wealth is assessed differently depending on available information in each survey. For Thailand, Myanmar, and Vietnam, it is constructed based on the respondent's

ownership of household assets and housing quality such as TV, refrigerator, motor vehicle, modern housing amenities. The index is derived from multiplying a normalized score for each household possession by its weight based on a principal component analysis. In China and Korea, household wealth is constructed by summing up the values of all financial assets at the household level. All debts were subtracted from the total value. We used standardized z-scores and higher scores indicate greater wealth.

Analysis plan

First, based on weighted samples, we describe means and standard deviations of all analytic variables and additionally the prevalence of actual and de-facto childlessness by gender, age, and residential area. Next, we use ordinary least squares (OLS) regression models to investigate the associations between childlessness and social participation and psychological distress. We use hierarchical regression to examine differential effects of childlessness by gender and wealth. In Model 1, we examine the main effects of childlessness. In Model 2, we include interaction terms between childless dummy variables and moderating variables (gender and wealth). All models control for socio-demographic factors (full results are shown in the appendices).

Results

Sample description

Table 2 describes characteristics of older persons by analytic variables. Social participation index and psychological distress are standardized, and thus have a mean close to 0 and standard deviation close to 1. Proportions of women are slightly higher than those of men in all countries except for China, where the sample is split evenly between women and men. Average age varies narrowly between 69 and 70 years. Over 70% of older Koreans and

Chinese are married at the time of survey, while smaller proportions of Southeast Asian counterparts remained married. Mean number of living children is lower for older Koreans (3.3), Chinese (3.2) and Thais (3.5) than those of Vietnamese (4.7) and Myanmar elders (4.3), reflecting their different trajectories in fertility history.

[Table 2 about here]

Socioeconomic variables such as educational attainment and pension also demonstrate noteworthy cross-country differences. For example, percentages of older persons with pension are substantially higher in East Asian countries where the level of population aging and economic growth has been higher and where concerted efforts by governments to address population aging are more apparent than Southeast Asian countries. Among the Southeast Asian countries, Vietnam showed higher percentage of pension recipients than Thailand and Myanmar possibly due to its socialist legacy, particularly state-owned enterprises. Mean self-rated health scores ranged from 2.7 to 3.9, with older adults in Korea, China, and Vietnam on average reporting poorer self-assessed health than those in Thailand and Myanmar. Solitary living is more common in Korea, China, and Thailand compared to Vietnam and Myanmar.

Prevalence and dimensions of childlessness

Results in Table 3 show significant variations in the prevalence of actual and de-facto childlessness among persons aged 60 and above. Actual childlessness is most prevalent in Myanmar (7%) and least prevalent in Korea (2%), with Thailand (6%), Vietnam (5%) and China (4%) falling in-between. Meanwhile, proportions of older persons experiencing de-facto childlessness are higher in Thailand (11%) and Korea (10%) compared to 3% in Myanmar and 2% in China and Vietnam.

[Table 3 about here]

Furthermore, within each country, there are considerable differences in levels of actual and de-facto childlessness across gender, age groups and urban/rural locations. For Southeast Asian countries and to some extent Korea, actual childlessness is more common among women than men and among urban than rural older persons, reflecting higher non-marriage rates among women and urban residents. Meanwhile, the opposite is true for China. Furthermore, prevalence of actual and de-facto childlessness in Southeast Asia is generally higher among persons aged 60-69 than older age groups indicating that the proportion of recent cohorts entering old age that are childless has been recently increasing. In Thailand and particularly in Korea, de-facto childlessness is clearly more typical in rural than urban areas.

Childlessness and social participation

Table 4 shows the extent to which actual and de-facto childlessness are linked with social participation after controlling for various confounders. Model 1 shows that actual childlessness is significantly associated with lower levels of social participation among older persons in all Southeast Asian countries, but it does not have a significant effect in East Asian countries. It is only in China that de-facto childlessness is associated with lower social participation.

[Table 4 about here]

When interaction terms are considered in Model 2, we find marginally significant gender differences in the effect of childlessness in Korea only. In Korea, actual childlessness is associated with more social participation among women yet less social participation among men ($p<0.10$). In Korea, China, and Thailand, household wealth significantly moderates the effect of childlessness. In Korea and Thailand, older adults who are de-facto childless and report greater wealth show higher levels of social participation than those who are de-facto

childless and report less wealth, suggesting that household wealth made these people afford both time and resources to participate in social activities. However, wealth shows an opposite effect for actual childlessness in Korea and China, with actual childless older adults with greater wealth showing lower levels of social participation than their peers with lower wealth ($p<0.10$).

Childlessness and psychological distress

Table 5 shows the extent to which actual and de-facto childlessness are associated with one's psychological distress among older persons after controlling for socio-demographic differences, including solitary living. By and large, Model 1 indicates that relative importance of actual versus de-facto childlessness differs across the five study countries. In Thailand and Myanmar, only actual childlessness but not de-facto childlessness is associated with greater psychological distress ($p<0.10$ in Myanmar), whereas in China and Vietnam only de facto childlessness exerts significant effects. In Korea, actual childlessness is associated with greater distress, whereas de facto childlessness is associated with lower distress, although only marginally significant. These effects are net of the effect of solitary living, suggesting that childlessness has a unique effect on psychological distress apart from its effect through solitary living.

[Table 5 about here]

Model 2 shows significant gender difference in the effect of actual childlessness in Vietnam. With respect to psychological distress, women are less likely to be affected by negative effects of actual childlessness than men. Significant moderating effects of household wealth exist in Vietnam and Myanmar. Specifically, wealth mitigates the association between childlessness (both actual and de facto) and greater psychological distress in Vietnam

($p<0.10$). In Myanmar, wealth attenuates the negative effect of de facto childlessness. Moderating effects of gender and wealth are insignificant in Thailand, Korea, and China.

Discussion and Conclusion

The foregoing analyses of population-based data from five East and Southeast Asian countries indicate that it is not uncommon for older Asians to age without the continuing presence of children, particularly among the young old. Actual and de-facto childlessness rates combined, the prevalence among adults aged 60-69 ranges from 7% in China to 21% in Thailand. Preliminary analyses (not shown) suggest that some had no living children (mostly due to being never married), while others did not have any residentially proximate children (primarily due to out-migration of all children). Although the current cohorts of Asian adults aged 60 and above usually have multiple children reflecting past fertility trends, members of younger cohorts that have fewer or no children will soon enter old age. For example, 13% of Thai adults presently in their 50s have no children, with actual childlessness being as high as 30% among these female cohorts from Bangkok (Thailand's capital city) (National Statistical Office 2022). Moreover, East Asia and many parts of Southeast Asia are aging rapidly and have one of the world's lowest fertility rates. Even in countries with relatively lower percentages of older persons (e.g., Myanmar), their older-aged populations will substantially increase in coming decades (Knodel and Teerawichitchainan 2015). Thus, aging without children will likely emerge as a pressing issue in the foreseeable future.

Furthermore, our study contributes to the growing literature on childless aging by distinguishing aging experience of actual and de-facto childlessness and sorting out how the two dimensions of childlessness are associated with later-life well-being, net of marital status, solo living, and other confounding factors. Cross-national comparison also allows us to interpret how societal contexts shape the influences of childlessness in old age. As in

previous research conducted primarily in western countries (e.g., Hank and Wagner 2013; Wenger et al. 2007), our findings demonstrate nuanced relationships between childlessness on older adults' social participation and psychological distress in Asia.

Lower levels of social participation among actual childless older adults in Southeast Asia is apparent, although similar effects are not detected in East Asian countries. The negative effect of actual childlessness on social participation among the three developing Southeast Asian societies may be in part due to lack of community-based infrastructures (e.g., senior centers) as well as fewer social and economic resources to support childless older adults (Devasahayam 2014). Also, with relatively higher fertility rates in Southeast Asia, norms regarding older adults' social life that is closely tied to the presence of children may still prevail (Yeung et al. 2018). Nevertheless, we do not find any distinct cultural differences between patrilineal versus bilateral kinship systems. In particular, we initially expected that patrilineal kinship system common in Korea, China, and Vietnam would magnify the negative effects of both actual and de-facto childlessness on social participation; yet this is not apparent.

Regarding the effects of childlessness on psychological distress, some unexpected findings emerge. For example, in China and Vietnam, only de-facto childlessness, not actual childlessness, is linked to psychological distress. Although caution should be taken in interpreting these findings, several speculations are possible. For instance, in China, with the government's welfare policies specifically targeting older adults without any sources of support, older adults who do not have children may be better equipped to deal with challenges of aging (Chan et al. 2008). On the other hand, with growing out-migration of young adults from rural to urban areas, a substantial number of older adults living far away from their children (de-facto childless) may feel more isolated and have fewer economic and social resources to address their needs. Alternatively, de-facto childlessness may have a

greater influence on older adults' psychological distress in countries like China and Vietnam because of the strong filial norms. When the norm is not fulfilled because of children's geographic distance, it may cause psychological distress among older Chinese and Vietnamese (Teerawichitchainan et al. 2015). Meanwhile, older adults with no children (i.e., actual childless) may have already adapted to childlessness, and thus do not feel great distress (Zhang and Hayward 2001).

Furthermore, the finding that de-facto childless older adults in Korea show lower psychological distress (than those with children) is also surprising. This may suggest that geographic distance to adult children may not matter much given Korea's relatively short distance between urban and rural areas and advanced transportation and telecommunications. Some older Koreans may in fact feel better when they have their own autonomous life, not having to worry about their children or grandchild-related chores. Alternatively, we are mindful that the criteria used for determining de-facto childlessness (i.e., children live more than 2 hours away by public transportation) may not be adequately sensitive to our research inquiry.

Finally, results show that the effects of childlessness differ by gender and wealth of older adults. Generally, when the effects are significant, being female mitigates the effect of actual childlessness on social participation and psychological distress. These findings are contrary to the previous research suggesting that childlessness is more stigmatizing for women than for men (Yang 2012); yet, they are consistent with the gerontological literature suggesting that older women are generally better than men at maintaining close informal relationships with relatives and friends (Antonucci and Akiyama 1987). However, the effects of wealth differ depending on the types of childlessness. A particularly interesting finding is that greater wealth helps de-facto childless older adults in Korea and Thailand to be socially engaged, but they reduce social participation of the actual childless in Korea and China.

While positive effects of wealth may suggest that older adults with greater economic resources are better equipped to engage in social activities and interact with others in distance, the negative effect found in the case of actual childlessness imply that wealth does not always lead to greater social participation. For Vietnam, the moderating effects of wealth are consistent across different types of childlessness, suggesting greater wealth helps reduce the psychological distress of both actual and de-facto childlessness. More research is necessary to understand the mechanisms through which wealth creates divergent experiences of childless older adults across settings.

Our study has several limitations. First, we cannot completely rule out the selection effect. Older adults who are actually childless and de-facto childless may be selective of persons who share different characteristics that may be associated with different levels of social participation and psychological distress. The lack of statistical power due to small sample sizes of older adults who are childless may also have influenced the results. Second, the surveys do not ascertain whether actual childlessness was voluntary or involuntary and the reasons for involuntary childlessness (e.g., infertility, loss due to death). Previous research has shown that voluntary childlessness has less negative or even positive impact on older persons (e.g., no need to spend financial resources or time on childrearing) compared to involuntary childlessness even in cultures where old-age support from children remains a norm (Dykstra and Hagestad 2007; Feng 2018). Losing a child to death also brings insurmountable grief to parents and may influence parents' social and psychological functioning (Li et al. 2005). With increasing diversity in family formation and fertility decisions, future research can explore whether voluntariness in or reasons for childlessness create meaningful differences in the effects of actual childlessness.

In addition to examining different pathways to actual childlessness, future studies can pay attention to diverse aspects of de-facto childlessness. While some de-facto childless

elders may live alone or with only their spouse, others may form a skip-generation household (i.e., coresiding with one or more grandchildren but with no members other than his/her spouse). Different types of de-facto childlessness may have different social and psychological implications for old-age well-being. Given its increasing prevalence across low- and middle-income countries (Zimmer and Treleaven 2020), considering skip-generation households as part of de-facto childlessness warrants future investigation.

Finally, while numerous efforts have been made to harmonize data, the issues of comparability cannot be entirely discounted. For example, for the measure of de-facto childlessness, geographic proximity to children is defined differently across the five countries. In particular, unlike other countries where distance was determined based on geographic boundaries (e.g., within the same province), distance was measured with time in Korean data (e.g., within two hours). Thus, a more comparable measure of de-facto childlessness may yield different findings. Furthermore, variables such as social participation and household wealth were constructed with different items due to limited data availability of the same measures across surveys. Caution should therefore be taken in interpreting cross-national differences.

In conclusion, our study is among the first to compare the prevalence and implications of actual and de-facto childlessness across East and Southeast Asia. Our findings underscore the importance of contextualizing childlessness across different societal contexts to understand its nuanced consequences. Our findings also offer important insights for each country or region as it prepares for aging societies and rising trends in childlessness. For example, the finding that social consequences of childlessness are more apparent in Southeast Asian countries calls for more investment in community networks and resources that can be used when childless older adults are in need of social and emotional support. Likewise, countries with a large rural to urban migration of younger generations may need to consider

the unique needs of older adults who have children but cannot receive adequate support due to the geographic distance. The implications of childlessness will become an even more important subject to study in the near future (Verdery et al. 2019). Will childlessness have less of an impact on future cohorts of older-aged populations, given normalization of childlessness and ultra-low fertility? Or, will it create a greater divide in older adults' social and psychological well-being? What kind of support systems will childless older adults rely on, especially in countries where formal care systems are at a nascent stage? These questions warrant further investigation of the implications of childlessness as the cohorts with fewer or no children move into older ages not only in Asia but around the world.

References

Aboderin I. (2004). Modernisation and ageing theory revisited: Current explanations of recent developing world and historical western shifts in material family support for older people. *Ageing & Society*, 24(1), 29–50.

Antonucci T. and Akiyama H. (1987). Social networks in adult life and a preliminary examination of the convoy model. *Journal of Gerontology*, 42(5), 519-527.

Bengtson VL and Roberts REL (1991). Intergenerational solidarity in aging families: An example of formal theory construction. *Journal of Marriage and Families*, 53(4), 856-870.

Chan CK, Ngok K and Phillips D (2008) *Social policy in China: Development and well-being*. Policy Press.

Cheng S-T, Chan TWS, Li GHK and Leung EMF (2014) Childlessness and subjective well-being in Chinese widowed persons. *Journals of Gerontology* 69, 1, 48-52.

Chou K-L and Chi I (2004) Childlessness and psychological well-being in Chinese older adults. *International Journal of Geriatric Psychiatry*, 19(5) 449-457.

Croll E. (2006). The intergenerational contract in the changing Asian family. *Oxford Development Studies*, 34(4),473-491.

Devasahayam T. (Ed.) (2014). *Gender and ageing: Southeast Asian perspectives*. Singapore: Institute of Southeast Asian Studies.

Dykstra PA (2006). Off the beaten track: Childlessness and social integration in late life. *Research on Aging* 28, 6, 749-767.

Dykstra PA and Hagestad GO (2007) Childlessness and parenthood in two centuries: Different roads-different maps? *Journal of Family Issues* 28, 11, 1518-1532.

Feng Z (2018) Childlessness and vulnerability of older people in China. *Age and Ageing*, 47(2), 275-281.

Guo, M, Aranda, MP, and Silverstein, M. (2009). The impact of out-migration on the intergenerational support and psychological wellbeing of older adults in rural China. Ageing & Society, 29, 1085-1104.

Gustafson, K and Huang, B. (2014). Elderly care and the old-child policy: Concerns, expectations and preparations for elderly life in a rural Chinese township. Journal of Cross-Cultural Gerontology, 29, 25-36.

Hank K and Wagner M (2013) Parenthood, marital status, and well-being in later life: evidence from SHARE. Social Indicators Research 114, 2, 639-653.

Huijts, T, Kraaykamp, G and Subramanian, SV. (2011). Childlessness and Psychological Well-Being in Context: A Multilevel Study on 24 European Countries. *European Sociological Review* 29(1), 32-47.

Keith PM (1983) A comparison of the resources of parents and childless men and women in very old age. *Family Relations* 32, 3, 403-409.

Knodel, J., Kespichayawattana, J., Saengtienchai, C., Wiwatwanich, S. 2010. How left behind are rural parents of migrant children? Evidence from Thailand. *Ageing & Society*. 30(5), 811–841.

Knodel J and Teerawichitchainan B (2015) Population ageing and the need for research on ageing: correcting a misconception. *Population Horizons* 12, 2, IV-VI.

Kodate N and Timonen V (2017) Bringing the family in through the back door: the stealthy expansion of family care in Asian and European long-term care policy. *Journal of Cross-cultural Gerontology*, 32(3), 291-301.

Koropeckyj-Cox T (1998) Loneliness and depression in middle and old age: Are the childless more vulnerable? *The Journals of Gerontology Series B*, 53B, 6, S303-S312.

Kreager, P., & Schröder-Butterfill, E. (2005). *Ageing Without Children: European and Asian Perspectives on Elderly Access to Support Networks*. New York and Oxford: Berghahn Books.

Li J, Laursen TM, Precht DH, Olsen J and Mortensen PB (2005) Hospitalization for mental illness among parents after the death of a child. New England Journal of Medicine 352, 12, 1190-1196.

Liang, Z. (2016). China's Great migration and the prospects of a more integrated society. Annual Review of Sociology, 42, 451-471.

Liu, J. (2021). Aging and intergenerational ambivalence in China: An urban-rural comparison. In Silverstein, M.D. (Ed.). Aging Families in Chinese Societies (pp. XX-XX). Routledge

Liu T and Sun S (2016) Pension reform in China. *Journal of Ageing & Social Policy* 28, 1, 15-28.

National Statistical Office. (2022). Executive Summary of the Survey of Older Persons in Thailand 2021 (in Thai). Bangkok, Thailand.

Mood C and Jonsson JO (2016) The social consequences of poverty: an empirical test on longitudinal data. *Social Indicators Research* 127, 2, 633-652.

Ônishi N (2017) *A generation in Japan faces a lonely death*. *The New York Times*. Available online at https://www.nytimes.com/2017/11/30/world/asia/japan-lonely-deaths-the-end.html. Accessed on December 7, 2018.

Quashie NT and Pothisiri W (2018) Parental status and psychological distress among older Thais. *Asian Social Work and Policy Review* 12, 3, 130-143.

Raymo, JM, Kikuzawa, S, Liang, J, and Kobayashi, E. (2008). Family structure and well-being at older ages in Japan. *Journal of Population Research*, *25*(3), 379–400. https://doi.org/10.1007/BF03033896

Rossi AS and Rossi PH (1990). *Of human bonding: Parent-child relations across the life course.* New York, Aldine de Gruyter.

Schröder-Butterfill E and Kreager P (2005) Actual and de facto childlessness in old age: Evidence and implications from East Java, Indonesia. *Population and Development Review,* 31, 1, 19-55.

Silverstein M and Giarrusso R. (2011). Aging individuals, families, and societies: Micro-meso-macro linkages in the life course. In R.A. Settersten and J.L. Angel (Eds.), *Handbook of Sociology of Aging* (pp.35-50). Springer.

Tanaka, K and Johnson NE. (2014). Childlessness and Mental Well-Being in a Global Context. *Journal of Family Issues* 37(8):1027-45.

Teerawichitchainan, B and Knodel, J. (2015). Data mapping on ageing in low- and middle-income countries in Asia and the Pacific. Chiang Mai, Thailand: HelpAge International East Asia and Pacific Regional Office.

Teerawichitchainan, B, Pothisiri, W and Long, GT (2015) How do living arrangements and intergenerational support matter for psychological health of elderly parents? Evidence from Myanmar, Vietnam, and Thailand. Social Science and Medicine 136-137, 106-116.

Teerawichitchainan, B and Low, Timothy. (2021). The Situation and well-being of custodial grandparents in Myanmar: Impacts of cross-border and internal migration. *Social Science & Medicine*, 277(2021), 113914.

Teerawichitchainan, B and Pothisiri, W. (2021). Expansion of Thailand's social pension policy and its implications for family support for older persons. International Journal of Social Welfare, 30(4), 428-442.

Umberson D and Gove WR. (1989). Parenthood and psychological well-being: Theory, measurement, and state in the family life course. *Journal of Family Issues*, 10(4), 440-462.

Umberson D, Wortman CB, and Kessler RC. (1992). Widowhood and depression: Explaining long-term gender differences in vulnerability. *Journal of Health and Social Behavior*, 33(1), 10-24.

Verdery AM, Margolis R, Zhou Z, Chai X, and Rittirong J (2019) Kinlessness around the world. *The Journals of Gerontology: Series B* 74, 8, 1394-1405.

Vincente HT and Guadalupe S. (2022). Childlessness, personal social networks and wellbeing at advanced ages: A cross-sectional study in a southern European familistic welfare state. *Aging & Society*, 1-25. doi:10.1017/S0144686X22000320

Vikström J, Bladh M, Hammar M, Marcusson J, Wressle E and Sydsjö G (2011) The influences of childlessness on the psychological well-being and social network of the oldest old. *BMC Geriatrics* 11, 78.

Ware JE and Sherbourne CD (1992). The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Medical Care* 30, 6, 473-483.

Wenger GC, Dykstra PA, Melkas T and Knipscheer KCPM (2007) Social embeddedness and late-life parenthood: Community activity, close ties, and support networks. *Journal of Family Issues* 28, 11, 1419-1456.

Woodard K (2014) *Who will support people who are ageing without children? The Guardian*. Available online at https://www.theguardian.com/society/2014/nov/12/ageing-without-children. Accessed on July 11, 2019.

World Bank (2016). *Live long and prosper: Aging in East Asia and Pacific (World Bank East Asia and Pacific Regional Report).* The World Bank. Available online at

https://openknowledge.worldbank.org/handle/10986/23133. Accessed on July 11, 2019.

Yang S (2012) An autoethnography of a childless woman in Korea. Affilia - Journal of Women and Social Work 27, 4, 371-380.

Yeung WJJ, Desai S and Jones GW (2018) Families in Southeast and South Asia. *Annual Review of Sociology* 44, 1, 469-495.

Yeung, WJJ (2022). Demographic and Family Transition in Southeast Asia. Springer.

Zhang W and Liu G (2007) Childlessness, psychological well-being, and life satisfaction among the elderly in China. *Journal of Cross-Cultural Gerontology*, 22(2), 185-203.

Zhang Z and Hayward MD (2001) Childlessness and the psychological well-being of older persons. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 56, 5, S311-S320.

Zimmer, Z. and Treleaven, E. (2020). The rise and prominence of skip-generation households in lower- and middle-income countries. Population and Development Review, 46(4), 709-733.

List of Abbreviations

Actual childless (AC)

De-facto childless (DC)

Center for Epidemiological Study Depression scale (CES-D scale)

China Health and Retirement Longitudinal Study (CHARLS)

Gross Domestic Product (GDP)

Health and Retirement Study (HRS)

Korean Longitudinal Study of Aging (KLoSA)

Myanmar Aging Survey (MAS)

Ordinary least squares regression (OLS regression)

Survey of Older Persons in Thailand (SOPT)

United Nations Development Program (UNDP)

Vietnam Aging Survey (VNAS)

Table Legends

Table 1

Demographic and development indicators of the study countries

	S. Korea	China	Thailand	Vietnam	Myanmar
Total population, 2018 (in thousands)[a]	51,677	1,417,069	71,128	94,914	52,666
% aged 60+, 2018[a]	21.04	17.21	18.66	12.14	9.73
% aged 60+, 2050 (medium projection)[a]	46.41	38.81	38.33	26.53	19.33
Total fertility rate, 2013-18[a]	0.97	1.55	1.38	1.94	2.21
% in urban areas, 2018[b]	81.5	59.2	49.9	35.9	30.6
GDP per capita, Current US $, 2018[c]	33,436.92	9,905.34	7,298.95	3,230.93	1,250.17
Human development index rank (out of 188 countries), 2018[d]	22	87	80	118	148

Sources:

a United Nations, Department of Economic and Social Affairs, Population Division, 2022. World Population Prospects: The 2022 Revision, New York: United Nations.

b United Nations, Department of Economic and Social Affairs, Population Division, 2018. World Urbanization Prospects: The 2018 Revision. New York: United Nations.

c World Bank. World Development Indicators Data Bank (accessed August 23, 2022).

d United Nations Development Program (UNDP), 2019 Human Development Report. New York: United Nations.

Table 2

Socio-demographic characteristics of the samples, Older persons 60 and over in selected East and Southeast Asian countries

	S. Korea	China	Thailand	Vietnam	Myanmar
Dependent variables					
Social participation index (standardized)	0.03(1.02)	0.01(1.02)	0.00 (1.00)	-0.08 (1.01)	0.05 (0.99)
Psychological distress (standardized)	-0.04(1.00)	-0.05(0.98)	0.10 (1.03)	-0.03 (0.93)	-0.03 (0.99)
Socio-demographic characteristics					
Female (%)	55.8	50.7	55.9	57.0	54.0
Mean age (s.d.)	70.37(7.85)	69.26(7.57)	69.24 (7.47)	70.71 (8.38)	70.46 (7.86)
Currently married (%)	71.1	74.3	64.7	68.5	54.2
Mean number of children (s.d.)	3.34(1.44)	3.20 (1.63)	3.51 (2.13)	4.69 (2.38)	4.27 (2.44)
Educational attainment (%)					
No education	19.6	36.3	11.8	18.4	22.1
Some primary	4.0	19.2	4.7	31.7	44.8
Complete primary	28.7	23	72.7	17.7	14.9
Secondary and beyond	47.7	21.5	10.7	32.2	18.1
Have pension (%)	34.2	49.6	7.5	18.4	8.3
Worked last year (%)	31.4	37.8	42.7	38.8	29.9
Urban (%)	73.5	48.9	33.5	32.9	31.4
Household wealth index (standardized)	0.04(1.04)	0.10(1.04)	0.00(1.00)	0.20(1.02)	0.05(1.00)
Self-rated health	3.90(0.88)	3.15(0.92)	2.70(0.82)	3.69(0.73)	2.84(0.87)
Solitary living (%)	14.7	10.7	8.6	5.3	4.9
Unweighted N	*5,289*	*7,453*	*34,173*	*2,789*	*4,080*

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012.

Table 3

Prevalence of actual and de-facto childlessness among older persons in selected East and Southeast Asian countries

	S. Korea		China		Thailand		Vietnam		Myanmar	
	% actual childless	% de facto childless	% actual childless	% de facto childless	% actual childless	% de facto childless	% actual childless	% de facto childless	% actual childless	% de facto childless
All older persons	2.3	9.9	3.7	2.4	6.4	10.8	4.7	2.3	6.8	2.8
Male	2.2	11.6	4.9	3.1	4.5	12.8	1.5	1.8	4.6	2.3
Female	2.5	8.6	2.7	1.8	7.9	9.2	7.2	2.6	8.6	3.3
Age 60-69	2.7	10.3	3.2	3.5	7.2	13.7	7.2	3.6	8.2	3.6
Age 70-79	1.4	10.5	4.5	1.2	5.6	7.8	3.7	1.4	5.4	1.6
Age 80+	3.5	7.1	4.5	0.2	4.5	3.1	1.4	0.6	4.8	2.9
Urban	2.8	7.4	2.7	3.1	9.8	10.2	5.2	2.1	7.2	4.4
Rural	0.9	17.0	4.9	1.7	4.6	11.1	4.5	2.3	6.6	2.1

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012.

Analyses are weighted.

Table 4

Actual and de facto childlessness and social participation among East and Southeast Asian older persons: OLS regression results

Variables	S. Korea		China		Thailand		Vietnam		Myanmar	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Childlessness (children nearby=ref)										
Actual childless (AC)	0.13	-0.31	-0.18	-0.06	-0.13***	-0.16**	-0.58***	-0.80***	-0.18*	-0.24*
Defacto childless (DC)	0.01	0.06	-0.16*	-0.22*	0.01	0.01	-0.05	0.05	-0.10	0.07
Moderating variables										
Female	0.12***	0.12***	0.08*	0.07*	0.10***	0.10***	-0.11**	-0.12**	-0.13***	-0.13***
HH wealth	0.09***	0.08***	0.05***	0.05***	0.01†	0.01	0.06**	0.06**	0.07***	0.07***
Interaction terms										
AC*female		0.40†		-0.24		0.04		0.31		0.12
DC*female		-0.02		0.23		0.03		-0.12		-0.24
AC*HH wealth		-0.35†		-0.18†		-0.04		0.11		0.05
DC*HH wealth		0.21***		0.12		0.06**		-0.13		-0.07
Constant	0.67***	0.69***	0.09	0.09	0.76***	0.768***	-0.11	-0.09	1.98***	1.99***
Unweighted number	5,125	5,125	4,936	4,936	22020	22020	2576	2576	4080	4080

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012. Sociodemographic variables are controlled.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$

Table 5

Actual and de facto childlessness and psychological distress among East and Southeast Asian older persons: OLS regression results

Variables	S. Korea		China		Thailand		Vietnam		Myanmar	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Childlessness (children nearby=ref)										
Actual childless (AC)	0.33**	0.26	-0.12	-0.11	0.19***	0.19***	0.14	0.70***	0.12†	0.16†
Defacto childless (DC)	-0.08†	-0.11†	0.15*	0.19*	0.03	0.01	0.21***	0.23*	0.02	0.09
Moderating variables										
Female	-0.01	-0.02	0.19***	0.19***	0.06***	0.05***	0.25***	0.27***	0.21***	0.21***
HH wealth	0.02	0.02†	-0.14***	-0.14***	-0.14***	-0.14***	-0.19***	-0.19***	-0.26***	-0.25***
Interaction terms										
AC*female		0.16		-0.02		-0.01		-0.67***		-0.06
DC*female		0.03		-0.04		0.04		0.01		-0.04
AC*HH wealth		0.07		0.07		-0.04		-0.12†		-0.02
DC*HH wealth		-0.06		0.06		0.003		-0.18†		-0.19**
Constant	-1.76***	-1.75***	-1.12***	-1.13***	-0.69***	-0.69***	-2.22***	-2.27***	-1.28***	-1.27***
Unweighted number	5,125	5,125	4,936	4,936	22020	22020	2592	2592	3796	3796

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012. Sociodemographic variables are controlled.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$

Appendix 1

Measurements of dependent variables (social participation index and psychological distress).

	South Korea	China	Thailand	Vietnam	Myanmar
Social participation index	Respondents were asked how frequently they currently participate in church or other religious groups; social clubs; sports clubs, arts or music groups or classes for senior; alumni society, society for people from the same hometown, family councils; volunteer groups; political party, NGOs, interest groups.	Respondents were asked how frequently, during the past 1 month, they interacted with friends, played ma-jong /cards/chess or went to community club, went to a sport, social, or other kind of club, took part in a community-related organization, done voluntary or charity work, attended an educational or training course.	Respondents were asked how frequently, during the past 12 months, they participated in community-based groups (e.g., elderly clubs, co-operative/saving groups) and attended temple/church/mosque.	Respondents were asked how frequently, during the past 12 months, they participated in social activities in their community, including the Elderly Association, Farmers Union, Veterans Association, and Women's Union.	Respondents were asked how frequently, during the past 12 months, they participated in community or political meetings, attended religious ceremonies (including offering food to monks) or group physical exercises, and socialized with friends and neighbors.
Psychological distress	*Adapted from CES-D*		*Adapted from SF-36 health assessment instrument*		
	Respondents were asked the extent to which, during the past week, respondents felt that things bothered them; had trouble keeping mind on things doing; felt depressed; everything was an effort; felt fearful; sleep was restless; happy; lonely; could not get going; hopeful about the future.	Respondents were asked extent to which, during the past week, respondents felt that things bothered them; had trouble keeping mind on things doing; felt depressed; everything was an effort; felt fearful; sleep was restless; happy; lonely; could not get going; enjoyed life.	Respondents were asked whether, during the past month, they felt sad, unhappy, depressed, lonely, experienced loss of appetite, moody/upset, worried a lot, hopeless, that life was not worthwhile.	Respondents were asked whether during, the past week, they felt sad, unhappy, depressed, lonely, experienced loss of appetite, experienced sleeping difficulties, happy, peaceful.	Respondents were asked whether, during the past month, they felt sad, unhappy, depressed, lonely, experienced loss of appetite, moody/upset, experienced sleeping difficulties, happy, peaceful.

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012.

Appendix 2

Actual and de facto childlessness and social participation among East and Southeast Asian older persons: OLS regression results

Variables	S. Korea		China		Thailand		Vietnam		Myanmar	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Childlessness (children nearby=ref)										
Actual childless (AC)	0.13	-0.31	-0.18	-0.06	-0.13***	-0.16**	-0.58***	-0.80***	-0.18*	-0.24*
Defacto childless (DC)	0.01	0.06	-0.16*	-0.22*	0.01	0.01	-0.05	0.05	-0.10	0.07
Moderating variables										
Female	0.12***	0.12***	0.08*	0.07*	0.10***	0.10***	-0.11**	-0.12**	-0.13***	-0.13***
HH wealth	0.09***	0.08***	0.05***	0.05***	0.01†	0.01	0.06**	0.06**	0.07***	0.07***
Interaction terms										
AC*female		0.40†		-0.24		0.04		0.31		0.12
DC*female		-0.02		0.23		0.03		-0.12		-0.24
AC*HH wealth		-0.35†		-0.18†		-0.04		0.11		0.05
DC*HH wealth		0.21***		0.12		0.06**		-0.13		-0.07
Control variables										
Age	-0.00	-0.00	0.00	0.00	-0.01***	-0.01***	-0.002	-0.002	-0.02***	-0.02***
Marital status (currently married=ref)										
Never married	-0.42	-0.37	-0.07	-0.27	-0.13**	-0.12*	0.04	0.04	0.10	0.08
Divorced/separated	-0.43***	-0.41***	-0.14	-0.14	-0.16***	-0.15***	0.17	0.18	-0.06	-0.06
Widowed	-0.02	-0.02	-0.01	-0.01	-0.06***	-0.05***	-0.08	-0.08†	-0.06†	-0.06†
Education (no educ=ref)										
Some primary	0.15*	0.15*	0.05	0.05	0.05	0.05	0.14**	0.14**	0.11***	0.11**
Complete primary	0.23***	0.23***	0.12**	0.12**	0.17***	0.17***	0.36***	0.35***	0.14***	0.15**

Beyond primary	0.47***	0.46***	0.32***	0.32***	0.03	0.03	0.40***	0.40***	0.05	0.06
Pension	0.11***	0.10***	0.16***	0.16***	0.06*	0.06*	0.68***	0.68***	0.15**	0.15**
Worked last year	0.00	-0.00	-0.15***	-0.15***	0.15***	0.15***	0.14**	0.13***	0.11***	0.11**
Urban	-0.03	-0.03	0.06†	0.06†	-0.46***	-0.46***	-0.35***	-0.36***	-0.13***	-0.13***
Self-rated health	-0.22***	-0.22***	-0.08***	-0.08***	-0.12***	-0.12***	-0.01	-0.01	-0.11***	-0.11***
Solitary living	0.07	0.07	0.24***	0.24***	0.08***	0.08***	-0.04	-0.03	-0.004	0.002
Psychological distress	-0.09***	-0.09***	-0.10***	-0.10***	-0.05****	-0.05***	0.06*	0.06**	-0.13***	-0.13***
Constant	0.67***	0.69***	0.09	0.09	0.76***	0.768***	-0.11	-0.09	1.98***	1.99***
Unweighted number	5,125	5,125	4,936	4,936	22020	22020	2576	2576	4080	4080

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012. Sociodemographic variables are controlled.
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$

Appendix 3

Actual and de facto childlessness and psychological distress among East and Southeast Asian older persons: OLS regression results

Variables	S. Korea		China		Thailand		Vietnam		Myanmar	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Childlessness (children nearby=ref)										
Actual childless (AC)	0.33**	0.26	-0.12	-0.11	0.19***	0.19***	0.14	0.70***	0.12†	0.16†
Defacto childless (DC)	-0.08†	-0.11†	0.15*	0.19*	0.03	0.01	0.21***	0.23*	0.02	0.09
Moderating variables										
Female	-0.01	-0.02	0.19***	0.19***	0.06***	0.05***	0.25***	0.27***	0.21***	0.21***
HH wealth	0.02	0.02†	-0.14***	-0.14***	-0.14***	-0.14***	-0.19***	-0.19***	-0.26***	-0.25***
Interaction terms										
AC*female		0.16		-0.02		-0.01		-0.67***		-0.06
DC*female		0.03		-0.04		0.04		0.01		-0.04
AC*HH wealth		0.07		0.07		-0.04		-0.12†		-0.02
DC*HH wealth		-0.06		0.06		0.003		-0.18†		-0.19**
Control variables										
Age	0.01***	0.01***	-0.00	-0.00	-0.001	-0.001	0.01***	0.01***	-0.003†	-0.004†
Marital status (currently married=ref)										
Never married	0.04	0.06	0.21	0.24	-0.12*	-0.11*	-0.19	-0.23	-0.29***	-0.28**
Divorced/separated	0.14	0.14	0.40***	0.40***	0.27***	0.27***	-0.18	-0.19	0.02	0.02
Widowed	0.11**	0.12**	0.17***	0.17***	0.12***	0.12***	0.16***	0.16***	0.06†	0.06†
Education (no educ=ref)										
Some primary	0.03	0.03	-0.03	-0.03	0.01	0.01	-0.03	-0.03	0.04	0.04
Complete primary	-0.09*	-0.09*	-0.14***	-0.14***	-0.04	-0.04	0.03	0.04	0.02	0.02
Beyond primary	-0.12**	-0.12**	-0.23***	-0.23***	-0.12***	-0.12***	-0.07	-0.05	-0.06	-0.07

Pension	-0.03	-0.03	-0.17***	-0.17***	-0.02	-0.02	-0.02	-0.02	-0.09†	-0.09†
Worked last year	-0.26***	-0.26***	-0.00	0.00	-0.12***	-0.12***	0.04	0.05	0.05†	0.05
Urban	-0.02	-0.02	-0.06*	-0.06*	0.05**	0.05**	0.01	0.02	0.17***	0.17***
Self-rated health	0.27***	0.27***	0.42***	0.42***	0.32***	0.32***	0.41***	0.42***	0.46***	0.46***
Solitary living	0.06	0.05	-0.08	-0.08	0.05*	0.05	0.43***	0.42***	0.06	0.04
Constant	-1.76***	-1.75***	-1.12***	-1.13***	-0.69***	-0.69***	-2.22***	-2.27***	-1.28***	-1.27***
Unweighted number	5,125	5,125	4,936	4,936	22020	22020	2592	2592	3796	3796

Sources: KLoSA 2012, CHARLS 2011, SOPT 2011, VNAS 2011, MAS 2012. Sociodemographic variables are controlled.
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$