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An Analysis of Factors to Improve the Capacity and Value of Older Persons in Thailand

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The capacity and value of older persons is affected by physical activity and functional health factors. This study, based on a survey of 636 persons in Singburi, Pathum Thani and Nakhon Ratchasima provinces, applies logistic regression to analyze the factors influencing the value and capacity of older persons. Factor analysis identifies three significant factors: (1) physical activity (24% of variance); (2) functional health, which had high loading, variance and cumulative variance (32%); and (3) social functioning, which also had high loading, variance and cumulative variance (39%). Logistic regression found that heavy exertion (i.e., running fast, lifting heavy objects, and strenuous sports activity), gender, hypertension, faintness, wooziness and dizziness had positive predictive values, and these were statistically significant predictors of the current employment status of older persons. Heavy exertion, membership in a senior citizens group, gender and faintness, wooziness and dizziness, with statistically significant positive predictive values, were best able to predict the value of older persons as measured by their contribution to community services and assistance to their family. These findings suggest that improved capacity and value of older persons can be positively influenced by physical activity and functional health as well as social functioning factors.

Keywords: *older persons; capacity; value; employment status; community service*

Introduction

Thailand is one of the countries in the world that have been successful in controlling population growth through reduced fertility, and that achieved reduced growth in a remarkably short period of time. Thailand has also been successful in national improvements in clinical care, public health, and socio-economic development. Accordingly, life expectancy of the Thai population has increased from 40 years in 1927 to 72 years as of 2011. By sex, female life expectancy is 76.3 years and, for males, 69.5 years (Institute for Population and Social Research (IPSR), 2011). These demographic phenomena have produced dramatic changes in the age structure of the Thai population. For example, the number and proportion of the child population (age < 15 years) has declined as the number and proportion of older

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persons (age 60 years or older) has increased steadily. In 1990, the Thai National Housing and Population Census enumerated four million older persons. This number increased to 6, 7, 8 and 10 million (6.8%, 9.4%, 10.7%, 12.2% and 14.9% of the total population) in 1994, 2002, 2010, 2011 and 2014 respectively (National Statistical Office (NSO), 2014). In just one generation (25 years), the number and proportion of older persons of the total population more than doubled.

Population projections conducted by the National Economic and Social Development Board (NESDB) forecast that the proportion of the population that is over the age of 60 will have increased from 10% in 2000 to 14% in 2015, and is expected to reach 15% by 2025 (Lunlawong, 2015). The aging dependency ratio (ADR), defined as the number of older persons divided by the population age 15 to 59 years multiplied by 100, is projected to increase from 14% in 2000, to 21% and 31% in 2015 and 2020, respectively. This means that, at present, 100 working-age Thais theoretically have to support 31 persons who are past the age of retirement (Vapattanawong & Prasartkul, 2015). By 2025, it is projected that there will be 14 million older persons and, as a proportion, this completes Thailand's transition into an aging society (Thai Rath Online, 2014). Even though Thai older persons may be experiencing better health and welfare than in the past, the speed of the transition to an aging society will have widespread and significant impact on a range of socio-economic dimensions.

Fully 91.3% of Thai older persons still reside with a spouse or family member (NSO, 2014). Even the 6.8% who live alone are likely to receive financial support from their children or younger relatives who work and live elsewhere (Thai Gerontology Research and Development Institute (TGRI), 2014; NSO, 2014). Thus, the Thai cultural tradition of children caring for their older parents and relatives is still the norm. This norm is strongest for families from the Northeast Region, followed by the North, South and Central Regions. The type of support that the younger generation provides to its older relatives includes cash, food, and care, and this support is generally the same for males and females. However, daughters are more likely to provide care for older relatives in times of illness or injury than are sons (NSO, 1995). Thus, few Thai older persons live in isolation; usually there is a child, grandchild or relative of the older person nearby or in the home (Chayovan, 1996). The National Statistical Office of Thailand's 2010 Survey of Older Persons found that there is a declining trend in the number of older persons who live with a child, while the proportions that live only with their spouse are increasing (Knodel, Chayovan &Prachuabmoh, 2013). Accordingly, co-habiting extended families are less common today, and older persons who are still economically dependent on their children face the risk of periods of deprivation, especially in the case of rural households in which the adult children have abandoned farm work to migrate for jobs outside the area. Another trend is the increasing proportion of single (never-married) persons over the age of 60 and, unless these persons are well-prepared, they could face serious problems due to the lack of younger relatives to support them in times of need (Romo et al., 2013). One way to address this challenge in the near term is to increase the capacity of older persons to care for themselves and remain active in society, to preserve and/or increase their sense of self-worth, and to provide more activities for older persons to interact with others in the community. Nevertheless, it is inevitable that most will develop chronic illness or disability as they age, and will ultimately have to rely on the assistance of others or the state. However, Thailand's system of social security is still limited in coverage and is inadequate to cover the essential expenditures of many older persons. Until that problem is solved, it is crucially important to help older persons remain active, healthy and productive through capacity building and increasing opportunities for active participation in society (Yaiyong & Lerbuntawatchai, 2011).

As Thailand accelerates through this population transition, it is important to study the perceived value of older persons in society, especially in terms of the capacity of and esteem toward older persons. Valued older persons experience quality of life and self-reliance with honor and respect, are a source of support for their children and grandchildren, and can continue to contribute constructively to society. For these reasons, this study investigated older persons' capacity for self-reliance and their sense of value and acceptance by the family and society. The goal of the analysis is to forecast the factors which boost the value of older persons and promote their ability to work and engage in community services and family assistance.

Conceptual Framework

Continuous declines in disability among older people affect an individual's and society's well-being. The larger the numbers of the older population who have the ability to work, the more substantial the reduction in the cost of medical and long-term care (Stallard, 2004). Therefore, this study focused on paid and unpaid employment (meaning any type of work including farming, self-employed, own business, etc. as well as work as an employee). In Thai society, as in other places, the value of older people has intangible and tangible dimensions. In New Zealand, Stephens, Breheny & Mansvelt (2015) found that the value of older persons is based on capability. Whatever their present status, physical ability was promoted to develop healthy aging in the lives of older persons and to improve understanding of resilience and capability (Stephens, Breheny, & Mansvelt, 2015). A study of working-age and student populations found that both groups still believed in the importance of caring for parents in old age, and value and respect older persons (Tangchonlatip et al., 2010). Youth and workers who live away from home visit aging parents and relatives on important national holidays. These types of valuation of older persons are attitudinal and intangible. Older persons who can continue to pursue gainful employment after age 60 will have a higher level of self-reliance and pose fewer burdens on the family or society at-large.

Another dimension of the value of older persons is as a repository of wisdom and knowledge of the traditional ways of doing things (Soonthorndhada, 2010). This attribute is seen as a source of honor, stability, and views the older person as a cornerstone of the family. This wisdom or know-how can be passed on to the younger generation to benefit themselves, the family, the community and society. Irrespective of the extent to which society, the external community and the family views and honors them, older persons may retain a sense of inner self-worth (TGRI, 2012). The degree to which older persons develop and nurture this self-esteem is, to a large extent, under their control. They can increase their sense of utility by participating in community activities, providing advice about community affairs, socializing with others, and assisting those in need. This will increase their friendship network and reduce the sense of isolation or worthlessness. One study found that socio-economic factors and social engagement predict participation rates of older persons (Chou, 1984). Social participation or activities of older people reflect an intangible dimension of value. The number of contacts in a person's social network and the frequency of communication with people in that network reinforce connectivity and importance of the network (Litwin & Landau, 2000). This can be augmented by care and support from family members and society to maximize the quality of life of older persons as they participate, and how that participation is valued by the family and society (Nilsson, Grafstrom, Zaman, & Kabir, 2005). Though Thai society is evolving, older persons are still venerated for their endurance and ability to survive and thrive, and as a source of counsel to others. Despite their extensive knowledge, experience and

traditional wisdom, older persons of today are also being challenged to expand their network of relationships and support (Rideout, 2005). This represents a form of capacity building and self-reliance that was not available in the past.

A tangible dimension of the capacity of older persons that can also be examined is their physical activities. Physical capacity can serve as a proxy for general capacity of older persons as it affects their ability to attend to personal needs and to assist the family and the community in various ways. Physical activities help restore social position and construction of valuable aging identities for older persons. Regardless of their health status, exercise may help prevent frailty and improve health in general (Tulle, 2008), and protect against long-term illness (Doyle, McKee, & Sherriff, 2010). Basically, the capacity of older persons depends on their functional health and activity level.

In this study, functional limitations across the health dimension were assessed using the "Short Form (36) Health Survey" which defines both physical and health status (Ware, 1999). Three levels of capacity were defined as 'capable', 'somewhat capable', and 'incapable'. Various activities were selected as proxy measures of 'capable' older persons such as the ability to engage in heavy labor, to walk fast, to lift heavy objects, and to participate in strenuous sports. 'Somewhat capable' was defined based on the ability to move a table, to perform gardening tasks, to ride a bike, to swim, to lift and carry ordinary household objects, to walk two kilometers, and to climb several flights of stairs. 'Limited' capability was measured as the ability to pick up objects on the floor, to climb a few stairs, to walk 100 meters, and to bathe and dress oneself. These factors related to physical ability were analyzed along with the employment status of older persons as measures of their value and capability. At the same time, older persons are also seen to have tangible economic value in terms of utility, employment, income and savings.

Methodology

Data collection

Health status data were collected by administering a structured interview at the individual level. The survey was part of the 2013 "Survey of Health Status of Older Persons" conducted by the College of Public Health Sciences, Chulalongkorn University. The sample is comprised of 1,019 older males and females residing in Nakhon Ratchasima, Singburi and Pathum Thani Provinces, Thailand. It was conducted in conjunction with the pilot project on "Senior Citizens Groups in Thailand" conducted by Thai Gerontology Research and Development Institute. Thus the sampling for the research was based on the sites for the pilot project. The samples were drawn in three stages. First, three provinces (Pathum Thani, Singburi, and Nakhon Ratchasima) were randomly selected from Thailand's 76 provinces (excluding Bangkok). Second, one rural area (Ban Pang) and one urban area (Thap Ya) of Singburi, three rural areas (Ban Khok Krachai, Ban Bueng O, and Ban Don Chomphu) and one urban area (Joho) of Nakhon Ratchasima and one urban area (Rangsit Municipality) of Pathum Thani were selected based on the area listing of where active senior citizen groups were located, which was obtained from Thai Gerontology Research and Development Institute (TGRI). Third, all households in each area which had a member(s) aged 50-79 were interviewed. The current

research selected a subset of 636 retired older persons aged 58-75 years[3]. It was assumed that most of the people in this age group still had the ability to work and were motivated to continue working regardless of retirement status.

Variable selection and data analysis

In identifying the factors affecting the capacity and value of older persons, a set of variables measuring physical activity and functional health were analyzed. To a certain extent, employment status and whether the older person assists in or provides community services and assistance to their family are proxies for the capacity and value of older persons and thus were used as the dependent variables in this study. Independent variables were carefully selected as they influence employment status and assisting or provision of community services and family assistance. Items measuring physical activity and functional health in the survey were developed from the Form (36) Health Survey, which has high levels of internal validity and good test-retest properties.[4] This is particularly important for measures of health, value and capability of older persons (Brazier, Harper, Jones, O'Cathain & Thomas, 1992). The survey items with summary statistics of the two dependent and twenty independent variables are shown in Table 1. Employment status (Y_1) and assisting or providing community services and family assistance (Y_2) as dependent variables were scored as 0 = incapable/no; 1 = yes/somewhat. The relationship, as expressed by the correlation coefficients, between independent variables and the dependent variables was, in general, high and significant (Carlson & Thorne, 1997). The small standard deviation (SD) values for most variables also indicate the narrow range among observed values in the study areas.

Table 1: Descriptive of dependent variables and independent variable considered for logistic regression analysis

Variable code	Variable description	Mean	SD	Correlation coefficient to Y_1	Correlation coefficient to Y_2
Y_1	Older persons employed at present	0.49	0.5		
Y_2	Older persons assisting the work or social services	0.41	0.49		
X_1	Heavy exertion: running fast, lifting heavy objects, strenuous sports activity	0.67	0.47	0.27**	0.19**
X_2	Moderate exertion: moving tables, gardening, bike riding, swimming	0.88	0.33	0.23**	0.16**
X_3	Lifting/carrying everyday household objects	0.97	0.18	0.14**	0.09*
X_4	Climbing two or three flights of stairs	0.86	0.35	0.20**	0.11**
X_5	Climbing one stair	0.86	0.35	0.17**	0.14**
X_6	Picking up objects on the floor	0.97	0.17	0.09*	0.04
X_7	Kneeling	0.83	0.37	0.22**	0.13**
X_8	Walking on tip-toe	0.9	0.31	0.23**	0.13**
X_9	Walking two kilometers	0.75	0.44	0.27**	0.19**
X_{10}	Walking 500 meters	0.91	0.29	0.24**	0.16**

[3] Respondents aged 58-59 years were selected who had 'early-retired' from employment.

[4] The Short Form (36) Health Survey is a short questionnaire with 36 items which measures physical and social functioning (12 items), physical problems (4), emotional problems (3), mental health (5), energy and vitality (4), pain (3), and general perception of health (5).

Variable code	Variable description	Mean	SD	Correlation coefficient to Y_1	Correlation coefficient to Y_2
X_{11}	Walking 100 meters	0.89	0.31	0.24**	0.18
X_{12}	Being a member of a senior citizens group	1.45	0.5	0.01	-0.08*
X_{13}	Age	66.38	5.2	-0.24**	-0.09*
X_{14}	Gender	0.67	0.47	-0.14**	-0.16**
X_{15}	Arthritis (wrist, finger, foot knee) and rheumatism	0.67	0.47	0.02	0.02
X_{16}	Vision (strabismus, cataracts, blurred vision) and acuity	0.45	0.5	0.00	-0.03
X_{17}	Hypertension	0.42	0.49	-0.16**	-0.07
X_{18}	Faintness, wooziness and dizziness	0.38	0.49	0.05	-0.02
X_{19}	Body strain, headache, backache, lumbar pain, and muscular pain	0.74	0.44	-0.09*	-0.04
X_{20}	Insomnia	0.42	0.49	0.19**	0.19**

Note: ** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Model specification

The capacity and value of older persons are influenced by a complex set of physical activities and functional health factors. The analysis includes both descriptive statistics and measures of association. The descriptive statistics examine the value of older persons in the socio-economic context. The analysis of statistical associations aims to identify factors which promote capacity and value of older persons in the context of work in community services and assisting the family. This study used factor analysis to extract significant variables based on measures of correlation (positive and negative). Factors in like groups have high inter-correlation while those in unlike groups have low or no inter-correlation. Principal components analysis (which uses varimax with Kaiser Normalization rotation technique) was used to identify the significant factors as principal components in Equation (1). Principal component analysis is a modeling technique in which the factors are based on the total variance, and can be defined as a linear combination of optimally-weighted observed variables (Griffith & Amrhein, 1997). The general form for the formula to compute scores on the first component extracted in a principal component analysis is as follows:

$$C_1 = b_{11}(X_1) + b_{12}(X_2) + \ldots b_{1p}(X_p) \qquad (1)$$

Where C_1 = the factor's score on principal component 1 (the first component extracted), b_{1p} = the weight for observed variable p, as used in creating principal component 1, and Xp = the subject's score on observed variable p.

This results in the most parsimonious set of variables with the highest loading. Those variables with eigenvalues of 0.5 or higher were statistically significant predictors for continued employment of older persons and assisting with community services and the family as determined by logistic regression. Logistic regression represents the two groups of interest as a binary variable with values of 0 and 1. It does not matter which group is assigned the value of 1 versus 0, but this assignment must be noted for the interpretation of the coefficients, which can be represented as shown in Equation (2), in order to identify the most significant independent variables. The estimated coefficients for the independent variables are estimated

using either the logistic value or the odds value in Equation (3) as the dependent measure as indicated in these models as follows (Hair et al, 2006; Pruchno & Wilson-Genderson, 2012):

$$Log\frac{p(x)}{1-p(x)}=b_0+ b_1X_1+\ldots\ldots\ldots\ldots+b_nX_n \qquad (2)$$

$$Odds_i=\left(\frac{p(x)}{1-p(x)}\right)=e^{b_0+b_1X_1+ \ldots\ldots+b_nX_n} \qquad (3)$$

Where b is the coefficient, and p is the probability; we predict Y=1 when p≥0.5 and Y = 0 when p< 0.5, and this means guessing 1 whenever $b_0+ b_1$arenon-negative and 0 otherwise.

Results

The presentation of results is divided into a description of factors influencing capacity development and value of older persons, differences between employed and unemployed older persons, desire for work, self-reliance, and care for the family, assisting the community and society, full and part-time employment by age/gender, and unemployed status by age/gender too. The second part of this section is a summary of the results of the multivariate analysis of the independent variables and value of older person variables, the loading factors, and the predictive variables based on logistic regression.

Working and non-working older persons

The sample includes older persons who were working and not working at the time of the survey. The proportions are similar for both groups: 49.2% and 50.8%, respectively. Those aged 70 years or older are a majority group who were not working at the time of the study (18% for males, 23% for females). Some persons retired prior to age 60 while others continued to work beyond the official retirement age of 60 years. By gender, fewer males were working than females in the age groups of 58-59, 60-64, 65-69 and 70-75 years. It is important to note that employment status is not a stationary variable and can increase or decrease for a given individual over time depending on unforeseen events and conditions at different ages. For some, continuing to work in older age is a matter of choice; for others it is a matter of necessity and survival. Inevitably though, both males and females drop out of the work force at increasing rates when reaching an advanced age.

Older persons who were employed worked in either a full- or part-time capacity. More employed men and women age 60-64 were working in a full-time job at the time of the study than those in older age groups (21% for males, 17% for females). After that age, the proportion employed full-time begins to decline. In the more advanced ages, women were more likely to be part-time workers than their male counterparts. This trend is certainly more a function of declining physical ability rather than lack of motivation to work, even though the motivation to work also declines steadily from age 65 onward.

Desire for employment and self-reliance

Older persons in this study were motivated to remain employed if they were able to do the work. About one-fifth of the female and male samples in this study were still motivated to be employed up to the age of 70 (29% and 26% respectively). More males felt that they could work until age 70 than females. The motivation to keep working could be due to the need for

additional income and desire to be self-reliant. For older persons who lived alone, remaining employed may be equivalent to survival. It is important to note however the apparently increasing desire (or realism) of older persons to want to be economically self-sufficient, and to support community services.

Of the unemployed group, about three-fourths wanted to find a job but may have had physical limitations or lack of confidence in the ability to perform the tasks. The study found that 47% of males and 34% of females would like government or private sector support for wages and benefits; 12% of males and 19% of females would be satisfied with just steady wages; 16% of males and 9% of females would expect only occasional compensation for work; and 10% of males and 26% of females would be satisfied with nothing and/or are too old to work (Table 2). There were no distinct differences by age group of retired older persons in the desire for employment and self-reliance because some of the retired older persons would be willing to work for no pay or subsidies.

Table 2: Percentage of non-working elderly persons who would like some support from government or private sources to return to the labor force

Types of assistance desired	Gender	Age				Total	
		58-59	60-64	65-69	70-75	n	%
Employed older persons	Male	7.0	20.7	15.5	16.0	126	59.2
Unemployed older persons		2.3	8.9	11.7	17.8	87	40.8
Total		**9.4**	**29.6**	**27.2**	**33.8**	**213**	**100.0**
Employed older persons	Female	7.8	16.5	10.9	9.0	187	44.2
Unemployed older persons		3.5	14.4	14.4	23.4	236	55.8
Total		**11.3**	**31.0**	**25.3**	**32.4**	**423**	**100.0**
Unemployed older person who would return to work if they received:							
- Wages	Male	0.0	1.1	3.4	6.9	10	11.5
- Benefits		0.0	4.6	1.1	8.0	12	13.8
- Wages and benefits		3.4	11.5	13.8	18.4	41	47.1
- Occasional compensation		1.1	1.1	5.7	8.0	14	16.1
- Nothing/too old		1.1	2.3	4.6	2.3	9	10.3
- No response		0.0	1.1	0.0	0.0	1	1.1
Total		**5.7**	**21.8**	**28.7**	**43.7**	**87**	**100.0**
- Wages	Female	0.4	5.1	5.1	8.1	44	18.6
- Benefits		0.8	3.0	1.3	1.7	16	6.8
- Wages and benefits		3.0	8.1	9.3	14.0	81	34.3
- Occasional compensation		0.4	3.0	2.1	3.4	21	8.9
- Nothing/too old		1.3	5.5	5.9	13.1	61	25.8
- To be a housewife who has never worked		0.4	0.4	0.8	0.4	5	2.1
- No response		0	0.8	1.3	1.3	8	3.4
Total		**6.4**	**25.8**	**25.8**	**41.9**	**236**	**100.0**

Care for family, assistance and community services

Assisting the family and society is one proxy of the capacity and value of older persons. Older persons who are active in this area will be a source of support for their family members, children and grandchildren. The type of care the older persons provide can include home maintenance and looking after the house, as well as care for young children. The study found that about half the sample reported having regularly looked after the house/children and continue to do so (44% of males, 52% of females) on behalf of their children who were away. Over one-third (40% of males, 34% of females) had never looked after the family household.

Older persons said they could help the community and society by providing advice to neighbors, but fully 65% of males and 75% of females never provided advice to neighbors (Table 3).

Table 3: Percentage of older persons assisting the family and community

Activity	Gender	Age				Total	
		58-59	60-64	65-69	70-75	n	%
Assisting the family							
- Looked after the house in the past but not now	Male	0.9	2.3	2.3	5.6	24	11.3
- Looked after the house and continue to do so		4.7	15.0	10.8	13.6	94	44.1
- Never looked after the house		2.8	9.9	13.6	13.6	85	39.9
- No children/grandchildren		0.9	2.3	0.5	0.9	10	4.7
Total		**9.4**	**29.6**	**27.2**	**33.8**	**213**	**100**
- Looked after the house in the past but not now	Female	0.7	3.3	2.8	4.0	46	10.9
- Looked after the house and continue to do so		6.4	15.4	13.9	16.5	221	52.2
- Never looked after the house		4.0	11.6	7.6	10.9	144	34.0
- Looked after the house sporadically		0	0.2	0.2	0.2	3	0.7
- No children/grandchildren		0.2	0.5	0.7	0.7	9	2.1
Total		**11.3**	**31.0**	**25.3**	**32.4**	**423**	**100**
Assistance to the community and society							
- Provided advice in the past but not at present	Male	0.9	1.9	4.7	5.6	28	13.1
- Continue to provide advice		1.4	8.9	4.7	7.0	47	22.1
- Never provided advice		7.0	18.8	17.8	21.1	138	64.8
Total		**9.4**	**29.6**	**27.2**	**33.8**	**213**	**100**
- Provided advice in the past but not at present	Female	1.2	3.8	1.9	0.9	33	7.8
- Continue to provide advice		2.4	6.6	5.0	3.3	73	17.3
- Never provided advice		7.8	20.6	18.4	28.1	317	74.9
Total		**11.3**	**31.0**	**25.3**	**32.4**	**423**	**100**

Factors affecting the value of older persons

The twenty independent variables were sorted on capacity of older persons into groups of associated factors, and determination of loading values. Principal component analysis was used to extract factors or components having eigenvalues >1.0. The results included a total of 17 out of 20 independent variables in one of the components based on its higher data loading, which indicates the correlation between the original variable and its factor interpreted as a correlation coefficient. Three factors were identified as follows: physical activity (tolerance and agility variables), functional health, and social functioning and demographic variables. The first factor (physical activity) was scored as 0 = 'incapable'; 1 = 'somewhat capable'; 2 = 'fully capable'. Many variables had high loading factors, e.g., between 0.527 and 0.730, including heavy exertion, i.e., running fast, lifting heavy objects, strenuous sports activity (X_1), moderate exertion, i.e., moving tables, gardening, bike riding, swimming (X_2), lifting/carrying everyday household objects(X_3), climbing two or three flights of stairs (X_4), climbing one stair (X_5), kneeling (X_7), walking on tip-toe (X_8), walking 100 meters (X_{11}) and walking 500 meters(X_{10}) with communality value of 22.2%. The outcomes for the second factor (functional health) include a range of values from 0.516 to 0.656 for factor loading. Four variables were found to have a significant relationship including arthritis (wrist, finger, foot knee) and rheumatism

(X_{15}), faintness, wooziness and dizziness (X_{18})[5], body strain, headache, backache, lumbar pain, and muscular pain (X_{19}) and insomnia (X_{20}) with a cumulative variance of 31.5%. In addition, the outcomes for the third factor (social functioning) showed a range of values from – 0.686 to 0.556 for factor loading. Two variables were found to have a significant relationship, including being a member of a senior citizens group (X_{12}), with a cumulative variance of 38.8% (Table 4).

Table 4: Factor Analysis of predictors of value of elderly persons

Variable	Factor			Communality
	1	2	3	
Heavy exertion: running fast, lifting heavy objects, strenuous sports activity (X_1)	**0.54**	-0.20	0.39	0.48
Moderate exertion: moving tables, gardening, bike riding, swimming (X_2)	**0.73**	-0.08	0.19	0.58
Lifting/carrying everyday household objects (X_3)	**0.54**	0.00	-0.06	0.30
Climbing two or three flights of stairs (X_4)	**0.67**	-0.14	0.16	0.50
Climbing one stair (X_5)	**0.67**	0.10	-0.08	0.46
Picking up objects on the floor (X_6)	**0.58**	-0.04	-0.34	0.45
Kneeling (X_7)	**0.53**	-0.30	0.12	0.38
Walking on tip-toe (X_8)	**0.66**	-0.16	-0.03	0.46
Walking two kilometers (X_9)	**0.62**	-0.19	0.38	0.57
Walking 500 meters (X_{10})	**0.70**	-0.07	0.16	0.51
Walking 100 meters (X_{11})	**0.61**	0.10	-0.01	0.39
Being a member of a senior citizens group (X_{12})	-0.22	0.05	**0.56**	0.36
Age (X_{13})	-0.15	-0.16	**-0.69**	0.52
Gender (X_{14})	-0.12	0.19	-0.28	0.13
Arthritis (wrist, finger, foot knee) and rheumatism(X_{15})	-0.05	**0.66**	-0.03	0.43
Vision (strabismus, cataracts, blurred vision) and acuity (X_{16})	-0.07	0.19	-0.27	0.12
Hypertension (X_{17})	-0.20	0.26	-0.05	0.10
Faintness, wooziness and dizziness(X_{18})	-0.02	**0.60**	0.00	0.36
Body strain, headache, backache, lumbar pain, and muscular pain (X_{19})	0.03	**0.52**	-0.08	0.27
Insomnia (X_{20})	-0.05	**0.63**	0.04	0.40
Eigenvalue	4.74	1.70	1.32	
%variance	22.18	9.31	7.32	
%Communality	22.18	31.49	38.81	

Note: Factors in bold are significant factors

Measuring capacity and value of older persons, including a sense of self-worth and perception of worth by the family, community and society can be done by examining employment status, assistance to the family, and contribution to society. The summary variables of tolerance and agility were used as proxies. Additional variables include membership in a senior citizens group (X_{12}), gender (X_{14}), arthritis (wrist, finger, foot knee) and rheumatism (X_{15}), vision (strabismus, cataracts, blurred vision) and acuity (X_{16}), hypertension (X_{17}), faintness, wooziness and dizziness (X_{18}), body strain, headache, backache, lumbar pain, and muscular pain (X_{19}) and insomnia (X_{20}). These were combined in the logistic regression analysis to identify

[5] Faintness, wooziness and dizziness refer to the property of being without strength, lightheadedness and feelings of unsteadiness. These sensations occur even when standing still or lying down.

predictors of current employment status of older persons (Y_1) and assisting the family or community (Y_2). The analysis found that the positive significant predictors of current employment status of older persons (Y_1) include heavy exertion, i.e., running fast, lifting heavy objects, strenuous sports activity (X_1), kneeling (X_7), walking on tip-toe (X_8), walking 100 meters (X_{11}), hypertension (X_{17}), arthritis (wrist, finger, foot knee) and rheumatism (X_{15}), and faintness, wooziness and dizziness (X_{18}) (Table 5). Thus, the more older persons engaged in these activities the more likely they were to be employed, and by definition, have greater capacity and perceived worth.

Table 5: Odds Ratios from the logistic regression of independent variables as predictors of employment status of the elderly persons

Variables in the Equation	Odds Ratio	S.E.	95.0% C.I.		p-value
Heavy exertion: running fast, lifting heavy objects, strenuous sports activity (X_1)	1.94	0.24	1.23	3.08	**0.05**
Moderate exertion: moving tables, gardening, bike riding, swimming (X_2)	1.12	0.42	0.48	2.53	0.81
Lifting/carrying everyday household objects (X_3)	1.35	0.72	0.33	5.51	0.68
Climbing two or three flights of stairs (X_4)	1.15	0.37	0.56	2.36	0.70
Climbing one stair (X_5)	0.55	0.39	0.26	1.18	0.12
Picking up objects on the floor (X_6)	0.59	0.80	0.12	2.85	0.51
Kneeling (X_7)	1.79	0.30	0.99	3.23	**0.05**
Walking on tip-toe (X_8)	2.51	0.46	1.02	6.18	**0.04**
Walking two kilometers (X_9)	1.46	0.27	0.85	2.49	0.17
Walking 500 meters (X_{10})	1.98	0.54	0.69	5.72	0.21
Walking 100 meters (X_{11})	2.52	0.46	1.01	6.26	**0.04**
Being a member of a senior citizens group (X_{12})	1.14	0.18	0.08	1.62	0.47
Gender (X_{14})	0.75	0.19	0.52	1.09	0.13
Arthritis (wrist, finger, foot knee) and rheumatism(X_{15})	1.45	0.19	0.99	2.13	**0.05**
Vision (strabismus, cataracts, blurred vision) and acuity (X_{16})	1.21	0.18	0.85	1.72	0.29
Hypertension (X_{17})	0.59	0.18	0.42	0.85	**0.01**
Faintness, wooziness and dizziness(X_{18})	1.64	0.19	1.12	2.41	**0.01**
Body strain, headache, backache, lumbar pain, and muscular pain (X_{19})	1.29	0.21	0.86	1.94	0.21
Insomnia (X_{20})	0.74	0.19	0.51	1.07	0.11
Constant	0.32	1.08			0.01
2 Log livelihood	762.07				
Cox & Snell R Square	0.17				
Nagelkerke R Square	0.23				

Note: Dependent variable: Y_1 Older persons employed at present
The factors in bold are significant factors at the level of 0.05

For predictors for assisting the family or community services (Y_2), five variables were found to have a significant relationship with capacity and value of older persons and, thus, the models containing a combination of those variables were generated by logistic regression. The five variables consist of measures of exertion, i.e., running fast, lifting heavy objects, strenuous sports activity (X_1), walking 100 meters (X_{11}), as the physical activities variable, membership in a senior citizens group (X_{12}) and gender (X_{14}), and faintness, wooziness and dizziness (X_{18}) with statistically significant positive predictive capacity of the value of older persons (Table 6). Thus, the more that older persons engaged in these activities the more likely they were to

assist the family and participate in social services and, by definition, have greater capacity and perceived worth.

Table 6: Odds ratios from the logistic regression of independent variables as predictors for assisting the family and/or doing community service by elderly persons

Variables in the Equation	Odds Ratio	S.E.	95.0% C.I.		p-value
Heavy exertion: running fast, lifting heavy objects, strenuous sports activity (X_1)	1.6	0.24	1.01	2.54	**0.04**
Moderate exertion: moving tables, gardening, bike riding, swimming (X_2)	1.12	0.41	0.49	2.49	0.79
Lifting/carrying everyday household objects (X_3)	1.04	0.64	0.29	3.64	0.95
Climbing two or three flights of stairs (X_4)	0.75	0.36	0.37	1.52	0.43
Climbing one stair (X_5)	1.08	0.37	0.53	2.19	0.84
Picking up objects on the floor (X_6)	0.64	0.65	0.18	2.28	0.49
Kneeling (X_7)	1.28	0.29	0.72	2.28	0.39
Walking on tip-toe (X_8)	1.22	0.42	0.54	2.76	0.64
Walking two kilometers (X_9)	1.45	0.28	0.84	2.48	0.18
Walking 500 meters (X_{10})	0.98	0.51	0.37	2.65	0.97
Walking 100 meters (X_{11})	2.42	0.47	0.96	6.06	**0.05**
Being a member of a senior citizens group (X_{12})	0.71	0.17	0.51	0.99	**0.04**
Gender (X_{14})	0.59	0.18	0.42	0.85	**0.04**
Arthritis (wrist, finger, foot knee) and rheumatism(X_{15})	1.32	0.19	0.91	1.93	0.15
Vision (strabismus, cataracts, blurred vision) and acuity (X_{16})	1.04	0.17	0.71	1.41	0.98
Hypertension (X_{17})	0.82	0.18	0.58	1.16	0.26
Faintness, wooziness and dizziness(X_{18})	1.40	0.19	0.94	2.02	**0.05**
Body strain, headache, backache, lumbar pain, and muscular pain (X_{19})	0.87	0.20	0.59	1.29	0.50
Insomnia (X_{20})	0.92	0.19	0.64	1.32	0.64
Constant	0.39	0.87			0.28
2 Log livelihood	798.88				
Cox & Snell R Square	0.91				
Nagelkerke R Square	0.12				

Note: Dependent variable Y_2 Older persons assisting the work or community services
The factors in bold are significant factors at the level of 0.05

Discussion

This analysis of factors affecting the development of capacity and value of older persons has helped to explain how older persons positively influence the family. Maximizing the potential of the older population is crucially important for aging societies in order to maintain quality of life and improve the ability of older persons to be self-sufficient and a valuable resource for the family and society. Thus, this study attempted to identify the predictors for promoting capacity and value of older persons in Thai society. The worth of older persons is both an internal concept as well as an external societal perception. One indicator of worth is the ability of older persons to keep working in productive occupations. Even though Thais may reach the official retirement age of 60 years, many may wish to keep working (full-time or part-time)

given the improved life expectancy and health of older persons in Thailand today. Older persons are also an important source of advice and wisdom for the younger generation and the community at-large and, in this way, they remain a cornerstone of the family and community. Thai society still values and venerates the older members of society and is receptive to including them as active and productive members of the work force.
Thus, the employment status of today's older persons is an important indicator of their capacity and value, for themselves and for the society as a whole. The value of older persons is greater or lesser depending on the extent of their labor force participation. An important dimension of this is participation of older persons in social assistance programs (Pruchno, Wilson-Genderson, Rose, & Cartright, 2010; Heenan, 2008). Even work in non-paying functions such as home maintenance and caretaking on behalf of children and grandchildren is a social and economic good. This non-monetized benefit includes being a source of wisdom and advice for neighbors, and being a member of senior citizens groups.

This study found that similar proportions of older persons are either working or not working, though women tend to be more economically active in the early stages of old age than men. Full-time employment decreases over time starting at age 65. By the age of 70, part-time workers, both male and female, outnumber their full-time counterparts. Regardless of retirement age or status, older persons who are capable may wish to continue working in constructive endeavors or occupations. Most would like wages, benefits or some sort of compensation for this work as a means of supplementing household income and improving self-sufficiency.

The multivariate analysis examined predictors of capacity and value of older persons, as conducted by other investigators (Menz & Kuhling, 2011). Composite variables of physical tolerance and agility as well as functional health were analyzed for their predictive power of value of older persons. Gender was a positive predictor for assisting or provision of social services of older persons. However, the more that the older persons engaged in tolerance and agility activities, as well as functional health, the more likely they were to be employed and contribute to community and social services and thus, by definition, have greater capacity and perceived worth. For this reason, older person's potential and value may be the main reason to extend the retirement age to 65 years in Thailand.

Conclusion

The study analyzed data from three provinces to explore the factors which boost the value of older persons and promote their ability to work and engage in community services and family assistance. Some persons retired prior to age 60 while others continued to work beyond the official retirement age of 60. By gender, fewer males were working than females in the different age groups. Employment status is not a stationary variable and can increase or decrease for a given individual over time depending on unforeseen events and conditions at different ages. Older persons in this study were motivated to remain employed if they were still able to do the work. For older persons who lived alone, remaining employed may be equivalent to survival. It is important to note however the apparently increasing desire of older persons to want to be economically self-sufficient, to support community services and to assist their families. In addition, some of the retired older persons would be willing to work for no pay or subsidies. Assisting the family and the community is one proxy of capacity and value of older persons. Older persons could help the community and society by providing advice to neighbors. The logistic regression model analysis identified significant positive

predictors of current employment status of older persons, including heavy exertion, i.e., running fast, lifting heavy objects, strenuous sports activity, kneeling, walking on tip-toe, walking 100 meters, being a member of a senior citizen group, gender, arthritis and rheumatism, hypertension including faintness, wooziness and dizziness. Thus, the older persons engaged in these activities the more likely they were to be employed and, by definition, have greater capacity and perceived worth. In addition, the significant positive predictors for assisting work or social services include measures of exertion, i.e., running fast, lifting heavy objects, strenuous sports activity as the composite tolerance variable, membership in a senior citizens group and gender. Thus, the more that older persons engaged in these activities the more likely they were to assist the work and social services and, by definition, have greater capacity and perceived worth.

The included variables in the developed models suggest that the factors determining capacity and value of older persons as expressed by physical activity and functional health are context-based. These factors may differ by age and gender contexts. Thus, there may be a need for different sets of activities if the issues of employment status, assisting their families and participating in community services, and improvement are to be addressed.

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