A PSYCHOMETRIC EVALUATION OF ATTITUDES TO AGEING MEASURES AMONG YOUNGER PEOPLE

A thesis submitted to The University of Manchester for the degree of
Doctor of Philosophy
in the Faculty of Biology, Medicine and Health

2018

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<td>AAS</td>
<td>Anxiety about Ageing Scale</td>
</tr>
<tr>
<td>AAQ</td>
<td>Attitudes to Ageing Questionnaire</td>
</tr>
<tr>
<td>ANOVA</td>
<td>Analysis of Variance</td>
</tr>
<tr>
<td>APQ</td>
<td>Aging Perceptions Questionnaire</td>
</tr>
<tr>
<td>AoA</td>
<td>Awareness of Ageing</td>
</tr>
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<td>ASE</td>
<td>Ageing Self-expectation</td>
</tr>
<tr>
<td>At-Ageing-VAS</td>
<td>Attitude to Aging- Visual Analogue Scales</td>
</tr>
<tr>
<td>ATOA</td>
<td>Attitudes to Own Ageing</td>
</tr>
<tr>
<td>AUS</td>
<td>Australia</td>
</tr>
<tr>
<td>BMI</td>
<td>Body Mass Index</td>
</tr>
<tr>
<td>CFA</td>
<td>Confirmatory Factor Analysis</td>
</tr>
<tr>
<td>CFI</td>
<td>Comparative Fit Index</td>
</tr>
<tr>
<td>CMIN</td>
<td>Chi Square Statistic</td>
</tr>
<tr>
<td>COSMIN</td>
<td>Consensus-based Standards for the Selections of Health Status Measurement Measures.</td>
</tr>
<tr>
<td>CTT</td>
<td>Classical Test Theory</td>
</tr>
<tr>
<td>CVI</td>
<td>Content Validity Index</td>
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<tr>
<td>DIF</td>
<td>Differential Item Functioning</td>
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<td>EFA</td>
<td>Exploratory Factor Analysis</td>
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<td>ERA-12/38</td>
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<tr>
<td>ESEM</td>
<td>Exploratory Structural Equation Modeling</td>
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<td>GAE</td>
<td>General Ageing Expectation</td>
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<td>GDS</td>
<td>Geriatric Depression Scale</td>
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<tr>
<td>GFI</td>
<td>Goodness-of-Fit Statistics</td>
</tr>
<tr>
<td>ICC</td>
<td>Intraclass Correlation Coefficient</td>
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<tr>
<td>ILR</td>
<td>Interagency Language Roundtable</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>IRT</td>
<td>Item Response Theory</td>
</tr>
<tr>
<td>LS</td>
<td>Life Satisfaction</td>
</tr>
<tr>
<td>M-AAS</td>
<td>Malay- Anxiety about Ageing Scale</td>
</tr>
<tr>
<td>MCPA</td>
<td>Monte Carlo Parallel Analysis</td>
</tr>
<tr>
<td>MEPU</td>
<td>Malaysian Economic Planning Unit</td>
</tr>
<tr>
<td>MI</td>
<td>Modification Indices</td>
</tr>
<tr>
<td>ML</td>
<td>Maximum Likelihood</td>
</tr>
<tr>
<td>M-RAQ</td>
<td>Malay-Reactions to Ageing Questionnaires</td>
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<tr>
<td>NA</td>
<td>Negative Affect/ Not Available</td>
</tr>
<tr>
<td>NFI</td>
<td>Normed Fit Index</td>
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<tr>
<td>PA</td>
<td>Positive Affect</td>
</tr>
<tr>
<td>PAA</td>
<td>Personal Anxiety toward Ageing</td>
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<td>PEA</td>
<td>Personal Experience of Ageing</td>
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<tr>
<td>PGCMS</td>
<td>Philadelphia Geriatric Center Morale Scale</td>
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<td>RAQ</td>
<td>Reactions to Ageing Questionnaires</td>
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<td>RCT</td>
<td>Randomised Control Trial</td>
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<tr>
<td>RMR</td>
<td>Root Mean Residual</td>
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<tr>
<td>RMSEA</td>
<td>Root Mean Square Error of Approximation</td>
</tr>
<tr>
<td>RSES</td>
<td>Rosenberg Self-Esteem Scale</td>
</tr>
<tr>
<td>SET</td>
<td>Stereotypes Embodiment Theory</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
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<tr>
<td>SRH</td>
<td>Self-rated Health</td>
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<tr>
<td>SRMR</td>
<td>Standardised Root Mean Square Residual</td>
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<td>SWLS</td>
<td>Satisfaction with Life Scale</td>
</tr>
<tr>
<td>SWE</td>
<td>Sweden</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
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<tr>
<td>WEMWBS</td>
<td>Warwick- Edinburgh Mental Well-being Scale</td>
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LIST OF SYMBOLS

≤  Less than or equal to
≥  Greater than or equal to
%  Percent
α  significance level
b  y intercept
B  Unstandardised beta
β  Standardised beta
CI  Confidence Interval
d  Different between paired data
Df  Degrees of freedom
F  F distribution
M  Mean
n  Sample size
N  Population size
ŋp²  Partial eta squared: Effect size
p  Probability value (p value)
r  Coefficient of linear correlation
R²  Coefficient of determination
SD  Standard Deviation
SE  Standard Error
t  t-test score
X²  Chi-squared
The attitudes of people aged under 60 towards ageing have important links with well-being outcomes. Despite this, there has been little consideration of how attitudes to ageing are measured, and how relationships between attitudes and wellbeing develop and are moderated by age, particularly in non-Western populations. The aims of this thesis were, therefore, to translate, adapt, and psychometrically assess selected measures of attitudes to ageing, and assess how attitudes to ageing are associated with well-being outcomes in an Eastern (Malay) population aged from 18-60 years. These aims were achieved through four empirical studies. Study 1 was a systematic review of the psychometric properties of measures of attitudes to ageing among people younger than 60. Twenty-one articles relating to ten different measures in ten languages were identified. In studies 2 and 3, two of these measures, namely the Anxiety about Ageing Scale (AAS: reflecting concerns/anxiety about growing older) and Reactions to Ageing Questionnaire (RAQ: reflecting anticipations about future ageing), were translated and culturally adapted for an adult Malay population. The psychometric properties of the AAS and the RAQ, and the effects of age, gender, and education were also examined in a sample of 911 Malay participants aged 18-60. Only slight modifications were required to the original four-factor structure of the AAS. Of the four factors identified from the Malay RAQ (M-RAQ), three were similar to those found in Western populations, and one (‘Family and Religion’) was new to this population. A core set of items that worked well across several cultural groups was also identified for each scale. For both scales, more negative attitudes to ageing were generally found in younger and female participants. Those with lower levels of education had more negative attitudes to ageing on the total score and two subscales of the Malay AAS (M-AAS), but there were no effect of education on the M-RAQ or its subscales. Study 4 examined the moderating effects of age on the potential relationships between attitudes to ageing and well-being outcomes in the same Malay population. More negative attitudes to ageing were linked to lower levels of well-being and life-satisfaction. Age moderated the links between the M-AAS and well-being and life satisfaction, with a stronger effect identified in younger compared to older participants. No moderating effects of age were seen when using the M-RAQ. A number of important conclusions can be drawn from the findings of this thesis: First, there are a number of conceptual differences in the ways that attitudes to ageing have been measured in younger adults. Second, the M-AAS and the M-RAQ provide good measures of the attitude constructs ‘current concerns about growing older’ and ‘anticipations about future ageing’, achieving satisfactory psychometric properties in Malay adults younger than 60. Third, some items assessing attitudes to ageing work well across a variety of cultures, whereas others may be more culturally-specific. Finally, there is a moderating effect of age on the links between the M-AAS and well-being outcomes, showing that these relationships are stronger in younger than older people. These findings illustrate the importance of selecting measures of attitudes to ageing that are culturally appropriate, and which capture the specific level and type of attitudinal construct. They also suggest that interventions aimed at enhancing positive attitudes to ageing would be best targeted at reducing concerns and anxiety to ageing in younger adults.
DECLARATION

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ACKNOWLEDGEMENTS

I sincerely would like to thank my supervisor, Dr. Laura Brown for her guidance throughout the entire process in completing this thesis. Thank you for allowing me to develop as an independent researcher, and for giving me the opportunity to do research under your supervision. You were the person who spotted my weaknesses but who was always optimistic about my capabilities to do a PhD. Your commitment to the utmost research standards was a great inspiration for me. Your constant support, kindness, patience and devotion to me and this thesis also motivated me to be as a great lecturer as you are. Without your guidance and assurance, I would probably not have been able to complete this thesis. Thank you again for bringing out the best in me and always being there for me in the most difficult times.

I would also like to express my special gratitude to my second supervisor, Professor Chris Armitage, who has also encouraged and inspired my research with critical discussion and great ideas. I gained valuable knowledge from your feedback and suggestions in the process of writing this thesis. Your expertise in publishing a scientific manuscript in psychology also offered me great exposure to the academic field. Moreover, would like to express my appreciation to my co-supervisor, Associate Professor Christina Bryant from the University of Melbourne, Australia. Your warm words, advice and support will always be remembered. Meeting you once was a great memory in my life. For all my supervisors, I am truly blessed to be able to gain so much valuable knowledge and experiences from you. I hope I can shed as much wisdom and guidance on my future students as you have given to me over the years working together.

My thesis was financially sponsored by a doctoral fellowship of the Ministry of Malaysia Higher Education, and supported by the Northern University of Malaysia. They provided me with the freedom to solely focus on my thesis, and offered me a great start to my academic career when I return to Malaysia, for which I am incredibly thankful. My special thanks also go to Afzarini Ismail, for your encouraging and inspiring support, when studying and working together. The study participants also deserve a word of thank for their interest and openness and also for taking the time and effort involved in responding to the detailed questionnaires. Similarly, I would like to recognise all the managers for their time in distributing the questionnaires to the participants.

And I would like to express special thanks to my family; my parents, ‘mak’ and ‘abah’, as well as my siblings. Thanks for your prayers and support throughout all the years of my studies which made me persistent and strong. Finally, I want to express special thanks to my husband, Muhamad Ridzuwan. Your patience, encouragement and
unwavering optimism during the last three years gave me the confidence to undertake this endeavour. When times were stressful, you were always there for me.

Farah Nadia Mohd Faudzi,

June, 2018,

University of Manchester, UK.
DEDICATION

For my grandparents – Tok Ramlah & Tok Siti Minah – my first and most inspiring reason for doing research on ageing. They left the world during my journey in completing this thesis (Oct 2016 & Dec 2017). May they rest in peace...
CHAPTER ONE

OVERVIEW OF THESIS
CHAPTER 1

OVERVIEW OF THESIS

1.0 Introduction

The way that people think and feel about ageing is known to be associated with important health and well-being outcomes (Bryant, Bei, Gilson, Komiti, Jackson & Judd, 2012; Shenkin, Laidlaw, Allerhand, Mead, Starr & Deary, 2014; Kalfoss, Low & Molzahn 2010). However, the majority of previous work in this area has focused on older adults (e.g. those aged 60 years and older) living in Western countries. This leaves an important gap in the literature, given that there are known cultural differences between Eastern and Western populations in the way that ageing and older people are perceived (Lockenhoff, Lee, Buckner, Moreira, Martinez & Sun, 2015), and that health and well-being in later life are affected by the attitudes and behaviors that are present at younger ages (Levy, Slade & Kasl, 2002; Klusmann, Sproesser, Wolff & Renner, 2017). One reason that could explain this research gap is the lack of valid and reliable measures of attitudes to ageing that can be used with these populations.

The aims of this thesis were to address this lack of measures suitable for adults under 60 from Eastern populations through a series of studies. The first steps were to identify measures of attitudes to ageing that are relevant for adults younger than 60, review their psychometric properties, and translate and culturally adapt them for young, Eastern populations. These measures were then used to examine the relationships
between attitudes to ageing and well-being outcomes, and explore the moderating effect of age upon these relations, in a large sample of adults living in Malaysia.

1.1 Thesis Format

The research carried out in this thesis has resulted in novel and publishable findings. Therefore, the journal format was chosen as the most appropriate way to present the thesis. The resultant thesis comprises of seven chapters, with a focus on four individual studies (reported in Chapters 3 – 6) that contribute to the growing body of literature on attitudes to ageing. Chapter 2 provides a literature review that offers background to the key theoretical and contextual issues addressed in this thesis. This chapter begins with an overview of definitions and concepts related to attitudes to ageing, as well as current theoretical understanding of the formation of attitudes to ageing. Literature highlighting the importance of cultural differences in, as well as significant correlates of, attitudes to ageing is then presented. Chapter 2 also defines the concept of well-being and presents empirical evidence for links between attitudes to ageing and well-being outcomes, along with theoretical explanations for these links. The moderating effects of age on these relationships are then explored. This chapter ends with a review of literature relevant to ageing and attitudes to ageing in a Malaysian population.

Chapters 3 to 6 present the empirical work of the thesis. Chapter 3 is a systematic review of existing psychometric measures of attitudes to personal ageing that have been validated in populations under 60 years of age. The aims of this review were to identify the range of tools that are available for assessing attitudes to personal ageing in adults
aged younger than 60 years old, and to assess their psychometric properties. This systematic review was initially conducted in November 2016, and then updated in May 2018 to include new studies published in the preceding 18 months. Two additional studies were found during this update (including one study published from the work of this thesis), increasing the total number of studies being assessed in this review to twenty-one. As this review revealed no satisfactory or recommended measures of attitudes to ageing for Malay adults aged under 60, the need for measures specifically designed for this population became more prominent.

The systematic review in Chapter 3 also demonstrated the considerable diversity in the way that attitudes to ageing have been conceptualised and measured in younger adults, highlighting the need for more than one measure to assess attitudes to ageing. For example, Kornadt, Voss and Rothermund (2015) examined anticipations of a future old age, while people’s current concern about getting older was the focus of Lasher and Faulkender (1993). Therefore, this thesis used two different measures that focussed on participants’ anticipated reactions to being over the age of 65 (Gething, 1994) and their current fears and anxieties about ageing and older people (Lasher & Faulkender, 1993).

Chapters 4 and 5 describe the process of translation, cultural adaptation, and psychometric assessment of two measures of attitudes to ageing (the Anxiety about Ageing Scale (AAS) and Reactions to Ageing Questionnaire (RAQ)) for a Malay population. These chapters also examine the effects of key demographic variables (age, gender, and education) on attitudes to ageing in a Malay population. Chapter 4 focusses on the translation and evaluation of the AAS, which was selected as an appropriate measure of current concerns/ anxiety about the general process of ageing, because it had
been shown to be reliable when applied to a number of non-English-speaking countries. Although it had not been validated previously in a Malaysian sample, it was shown to be reliable with minimal adaptation in other Eastern cultures (Chinese and Persian), and so seemed likely to be well-suited to a Malay population. Confirmatory factor analysis was used to assess the structural validity of the AAS.

Chapter 5 focusses on the translation, cultural adaptation, and psychometric assessment of the Reactions to Ageing Questionnaire (RAQ), which captures participants’ anticipation of what their life will be like after the age of 60. This measure was selected as being the most appropriate measure of anticipations of future ageing because it has been shown to be applicable to a broad age range (e.g., 15-69: Gething, 1994). As the RAQ had previously been validated in Western countries only, an additional process of cultural adaptation (involving the generation of new items to capture relevant attitudinal items not featured in the original scale) was also performed. The structural validity of this scale was then assessed through exploratory factor analysis.

In Chapter 6, the two translated measures (M-AAS & M-RAQ) were used to examine the relationship between attitudes to ageing and well-being-related outcomes in a Malay population, and to investigate how these relationships are moderated by age. A better understanding of the moderating effect of age on these relationships was considered important to enable better targeting of resources to be used with those age groups most at risk of the effects of negative attitudes to ageing. Finally, an integrated discussion of the findings from the four individual studies, as well as a discussion of the strengths, limitations, and future implications of the work, is provided in Chapter 7.
Each of the four empirical chapters (chapters 3-6) has been submitted for publication in a peer-reviewed journal in either the same or similar format to its presentation in this thesis. The first author of each paper is the author of this thesis, who collected all of the data, and took the lead role in designing the studies, conducting the analyses, interpreting the data, and writing the manuscripts. The co-authors on each paper are Laura Brown, Chris Armitage and Christina Bryant, who are the candidate’s PhD supervisors. The co-authors contributed to the planning of the research, the interpretation of findings, and provided guidance, advice and feedback on iterative drafts of each manuscript. They also approved the final draft of each manuscript. In accordance with the journal format, reference lists of sources cited in each chapter are presented at the end of each chapter.
References


CHAPTER TWO

BACKGROUND
CHAPTER 2  

BACKGROUND

2.0 Introduction

Attitudes to ageing can be defined as affective, cognitive or behavioural representations of one’s own ageing (Hess, 2006), or of ageing as a more general construct (Kornadt & Rothermund, 2015). The terms ‘ageing’ and ‘attitudes to ageing’ are often applied to people who are considered older (e.g., 60 years old and above: United Nations, 2015) or to those who are close to becoming an ‘older person’ (e.g., middle aged) (Lachman, 2004). However, ageing is best conceived as a gradual process that begins in early adulthood (Stuart-Hamilton, 2011). For example, cognitive slowing begins in the 20s and 30s (Salthouse, 2009), muscle strength begins to decline in the 40s (Keller & Engelhardt, 2013), and physical ability starts to decline in the 50s (Hall et al. 2017). Moreover, there is also evidence indicating that adults younger than 60 perceive ageing as relevant to them by expressing fears or worry about the process of ageing (O’Hanlon & Coleman, 2008). This shows the importance of studying attitudes to ageing across the lifespan, not only in people who are already considered old or close to old in their life.

Ageing is also an important subject to study worldwide, because it is a global demographic trend (United Nations, 2013). However, most studies of attitudes to ageing have focused on Western populations (most often including North America, Australasia,
and Europe: Kurth, 2003), despite the fact that 66 percent of the increase in the ageing population between 2015 and 2050 will take place in Asia. In contrast, the increases of ageing population in the Western regions between these years are approximately 40 percent in Northern America; and 23 percent in Europe (United Nations, 2015). Moreover, the current growth of ageing population in Asia is extensively quicker than occurred in other nations in the past. For example, with 508 million people aged 60 or older in 2015, Asia was home to 56 percent of the global older population. In the next 15 years, this number is projected to increase to 845 million older adults, making it home to more than half of the world’s older persons (United Nations, 2015).

Young adults’ attitudes to ageing in Asian countries are worthy of research as they have broad relevance, and are growing older in the coming years. In order to explore this, this chapter is divided into three main sections: First, it reviews the construct of attitudes to ageing, including a discussion of their definition and conceptualization, theoretical formation, cultural differences and correlates. Second, it presents literature examining the relationships between attitudes to ageing and health and well-being outcomes, including definitions of well-being and discussions of the theoretical explanations of, and moderating effect of, age on these relationships. Finally, this chapter provides insights into the specific cultural context of ageing in Malaysia, such as demographic details of the ageing populations, as well as what is known about attitudes to ageing in this cultural context.
2.1 Attitudes to Ageing

This section focuses on the literature related to different constructs of attitudes to ageing, along with the theories that developed the formation of attitudes to ageing. Moreover, it presents the literature on cultural differences between Eastern and Western perspectives of ageing and older people, as well as other factors that may influence one’s attitudes to ageing.

2.1.1 Definitions, Conceptual Distinctions, and Measures of Attitudes to Ageing

Attitudes have been defined as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour” (Eagly & Chaiken 1993, p.1), reflecting three distinct, but related components: affective, cognitive and behavioural (Kite & Wagner, 2004). The affective components are represented by emotions/feelings that individuals have towards ageing, such as fears, concerns or worries about ageing/old age (Lasher & Faulkender, 1993; Kornadt & Rothermund, 2015; Nash, 2015) or towards older individuals (Kite & Wagner, 2004). The cognitive components are represented by beliefs, perceptions, interpretation, reactions, opinions, scheme or/and expectations related to growing older (Kornadt & Rothermundt, 2015; Levy, 2003; Nash, 2015; Steverink, Westerhof, Bode & Dittmann-Kohli, 2001; Gething, 1994; Sarkisian, Hays, Berry & Mangione, 2002a; Westerhof, Whitbourne & Freeman 2012) or about older people (Kite & Wagner, 2004). Finally, the behavioural components involve dispositions of action, intentions, activities or decisions connected with ageing. These include behaviours towards the consequences of the ageing process.
(Janeckova, Dragomorecka, Holmerova & Vankova, 2013; Nash, 2015), such as discrimination (Kite & Wagner, 2004); or behavioural intentions towards older adults, such as willingness to be together with the elderly (Lifshitz, 2002).

Some important conceptual distinctions between age-related attitudes need to be made. First, attitudes towards older people can be distinguished from attitudes towards ageing as a process (Hess, 2006). Attitudes towards older people refer to evaluations of the status of the elderly in the larger community (Hickey, Bragg, Rakowski & Hultsch, 1979). This includes the view that older adults have greater life experience and wisdom (Lu, Kao & Hsieh, 2010), or the perception that they have some physical illness (Lifshitz, 2002). One of the earliest scales of attitudes to older people is the Tuckman-Lorge Questionnaire (Tuckman & Lorge, 1952), which was developed in the 1950s to assess misconceptions and stereotypes about older people, and includes items such as “Old people become more interested in religion”. Since then, more instruments specifically developed for evaluating the attitudes to older people have been established, including Kogan’s Attitudes towards Older People Scale (KAOPS: Kogan, 1961) (e.g., “Most old people are irritable, grouchy, and unpleasant”) and the Ageing Semantic Differential Scale (ASD: Rosencranz & McNevin, 1969) (e.g., “According to your immediate judgment, older people are effective or ineffective?”)

Attitudes to older people can be contrasted with attitudes to ageing, which are more likely to be perceived from individual-level approach (Hickey et al., 1979), and comprise evaluations of own/personal ageing (Hess, 2006) and generalised beliefs about the ageing process (Kornadt & Rothermund, 2015). Attitudes to ageing can include self-referential evaluations that an individual holds on his/her own ageing
For instance, an individual may think that, at old age, they will grow old with someone they love (e.g., \textit{I look forward to growing old with someone I love}; Gething, 1994) or face memory problems (e.g., \textit{I expect that as I get older I will become more forgetful}; Sarkisian, Steers, Hays & Mangione, 2005b). Moreover, although attitudes to older people and attitudes to ageing are conceptually distinguished from each other, they are also likely to influence one another. For instance, there are some measures of attitudes to ageing that also include items that capture attitudes to older people (e.g., ‘\textit{I enjoy being around old people; I like to go visit my older relatives}’ from the Anxiety about Ageing Scale: AAS; Lasher & Faulkender, 1993).

Attitudes to ageing are understood to differ in some important ways for young and older adults (Barret & Montepare, 2015). For older adults, attitudes to ageing may be informed by their personal experiences of age-related changes (O’Hanlon & Coleman, 2008). This includes changes to their appearance (e.g., wrinkled skin, graying hair), functioning (e.g., reduced stamina, memory loss), health (e.g., heart attacks, strokes) (Diehl, Brothers, Wahl & Miche, 2015), reproductive system (e.g., the onset of menopause) (O’ Hanlon & Coleman, 2008) or normative age-graded practices (e.g., retiring from the work role) (Barret & Montepare, 2015). In this regard, when assessing attitudes to own ageing in older adults, many instruments ask about the specific experience of ageing that generally appears in the last stage of life. For example, the Attitude to Ageing Questionnaire (AAQ) was developed to capture the experiences and attitudes of older people (Laidlaw, Power & Schmidt, 2007), and it directly questions respondents about their experiences of ageing, such as ‘\textit{Problems with my physical health do not hold me back from doing what I want}’; ‘\textit{I want to give a good example to}'}
younger people’. Scales like this are therefore not suitable for those who have not yet experienced any significant age-related changes.

In contrast, for adults younger than what is generally defined as “older age” (e.g., under 60, United Nations, 2013), fewer obvious age-related changes are relevant at the stage where they are in life. Consequently, their attitudes are more likely to be informed by observations of other people’s ageing (Gilbert & Ricketts, 2008), or from cultural stereotypes of old age (Levy, 2009), such as what individuals have heard from others, or what others have taught them (Mandy, Lucas & Hodgson, 2007). Therefore, attitudes to ageing held in younger life tend to refer to expectations or concerns about future experience of ageing, which comprise of anticipations, hopes and fears about how an individual will be in old age (Kornadt, Voss & Rothermund, 2015).

When considering younger people’s attitudes to ageing, another important conceptual distinction can be made between one’s current concerns or fears about growing older (Kessler, Tempel & Wahl, 2014) versus their anticipations of being older in the future (Gething, 1994). Fears of growing older are likely linked to ageing in the present (Brunton & Scott, 2015), while anticipation of being older reflects expectations about different possible scenarios that might occur or not in the future (Kornadt et al., 2015). Current concerns and fears of growing older centre on worries during the process of growing old, including declines in health and physical functioning and changes in physical appearance and social losses (Kafer, Rakowski, Lachman & Hickey, 1980; Lasher & Faulkender, 1993). For example, when asked about whether the ageing is initiating any anxious feeling, the participants who were aged between 20-59 years old reported that they are currently concerned about their own ageing with regards to the
physical changes that occur with the ageing process, fear of loneliness and worries about looking old (Minhat, Hamizah & Nor Afiah, 2015a; Bernard 1998).

In contrast, anticipation of being older in the future refers to one’s projected sense of self as an old person (Gething, 1994), emphasising a more generalised viewpoint about future ageing (Hickey et al., 1979), and expectations about how the individual will direct their life during old age (Kornadt et al., 2015). This is perceived by considering whether certain aspects of ageing will apply to themselves in their older years, or in their own life in the future (Best & Williams, 1996). For example, when a group of university students were asked about their anticipations of ageing in the future, they expressed that they would not be as happy and satisfied with their life as they were younger, signifying that they have negative attitudes to their future old age (Best & Williams, 1996). There is therefore evidence that current fears about growing older and anticipation of being older in the future are conceptually different constructs, although this distinction has not yet been tested in the literature.

Another important distinction to make when assessing attitudes to ageing is between items that capture generalised beliefs about ageing (Kornadt & Rothermund, 2015) and those that are self-referential to the individual (Kornadt, Voss & Rothermund, 2015). Measures of non-self-referential attitudes to ageing relate to old age as a general construct (e.g., “Quality of life declines as people age”; Sarkisian et al., 2002a), and do not necessarily reflect what people think their own old age will be like. They are likely to be suitable for use with all age groups, although, as discussed previously, individuals’ responses might be informed by different factors (e.g. their personal experiences of ageing versus cultural stereotypes of ageing) according to their level of experience of
ageing. Self-referential items include things like “I expect that as I get older I will spend less time with friends and family” (Sarkisian et al., 2005b, p.247). Some measures, such as the Expectations Regarding Ageing (ERA-12) scale (Sarkisian et al., 2005) include both self-referential and non-self-referential items, showing how individual measures of attitudes to ageing may not adhere to the conceptual distinctions that have been made in the literature.

Taken together, there are clear distinctions between attitudes to older people and attitudes to ageing, but the more specific conceptual distinctions that can be made remains complex, and are inconsistently applied. As there are clear age-related differences in the ways in which the attitudes to ageing are informed and assessed, it is important to ensure that any measure of attitudes to ageing is suitable for the age range of the population in question.

2.1.2 Formation of Attitudes to Ageing

In an attempt to explain the formation of attitudes to ageing, Levy (2003) proposed the internalisation hypothesis, which suggests that ageing stereotypes are developed several decades before becoming old (e.g., as children) and are reinforced in adulthood. According to this theory, children usually learn about ageing from cultural information by observing what older people do during their ageing process; or sometimes the experience of ageing is conveyed by the elder generation (Levy, 2003). Therefore, during the process of attitude formation, parents and other adult family members serve as an initial source of ageing information for young family members (Gilbert & Ricketts, 2008). External factors, such as various forms of media, particularly
books and television (Neumann, Faux & Larimer, 1997), as well as intergenerational programmes with older people (Chamberline, Fetterman & Maher, 1994) also provide children with information about ageing. According to Levy (2003), children who have internalised ageing stereotypes earlier in their life also experience anticipation of their own process of ageing. For example, when children in fourth and fifth grade were asked about how they would feel about becoming an older person, 35 percent of them reported thinking of old age as strange, isolated and frightening, while 12 percent viewed old age as fun and good (Neumann et al., 1997). This could be interpreted as an indication that people as young as children are able to report their own attitudes to ageing.

The internalisation hypothesis also posits that ageing stereotypes operate outside the individual’s conscious awareness (Levy, 2003). As such, people tend to accept negative age stereotypes impulsively without inquiring about their validity (Levy & Banaji, 2002). This is especially true in younger ages, when ageing is far from their current situation (Lynch, 2000) and not self-relevant yet (O’Brien & Hummert, 2006). Consequently, they are less able to differentiate between fact and fiction (McGuire, Klein & Couper, 2005). Later, when individuals grow older, and self-define as being old, they internalise age stereotypes learned earlier in life into their self-concepts, and the age-stereotype of older groups turns into a self-relevant concept of their ageing (Levy, 2009).

A longitudinal study by Rothermundt and Brandstätter (2003) revealed evidence of internalisation of age stereotypes during old age by focusing on participants aged between 54 and 77. They found that age stereotypes predicted changes in the self-stereotype over a longitudinal interval of eight years. For example, over eight years,
individuals with a negative perception of old age and ageing subsequently demonstrated
more negative views of the self, whereas individuals with positive age-stereotypes showed an improved rating on their self-concept. The pattern of these changes was found to correspond to the individual’s earlier view of the typical old person. A more recent longitudinal study by Kornadt, Voss and Rothermund (2017), also indicated a similar direction as Rothermund and Brandtstädter’s (2003) findings. This study reported that the self-view of ageing in participants aged between 30-80 years changed in accordance with the age-stereotypes that they held four years earlier.

The internalisation hypothesis is relevant to this thesis, as it provides important insights about the source from which attitudes to ageing arise and the process underlying this formation. For example, it holds that one’s attitudes to ageing are at least partly a reflection of personally held age stereotypes, meaning that younger adults will likely experience their future ageing in a way that is consistent with what they previously or currently believe about old age. This suggests the need to study attitudes to ageing in adults before old age (e.g., below 60 years old), so that successful ageing at old age can be achieved in later years.

2.1.3 Cultural Differences in Attitudes to Ageing

Culture can be defined as the collective way in which a group of people share and interpret their ideas, practices, and experiences of the world, in a way that reflects their values, beliefs, norms, rules, and which motivates their thinking, reactions or attitudes (Pecchioni, Ota & Sparks, 2008). Cultural differences are likely to influence the attitudes that people have towards ageing. The Self-Concept Enhancement Tactician
model (SCENT) by Sedikedes, Gaertner and Toguchi (2003), for example, might be the best model to describe the psychological process of how an individual’s culture can influence attitudes to ageing. Based on this model, cultural systems bring influence to the cultural members in accomplishing certain standards in their culture, such as what creates a ‘good person’ or what the person is supposed to do to be accepted in their culture. In this regard, people are motivated to fulfil the sanctioned roles dictated by their own culture to be good cultural members, such as positively differentiating the self from other group members on important attributes that bring a meaning to their culture.

With regard to ageing, important cultural differences in attitudes to ageing may result from differences in self-concepts associated with Western and Eastern societies. Western culture refers primarily to Western Europe (e.g., the United Kingdom; France; Germany), which is derived from Greek philosophy, and now promote modernism and science (Memmi, 2017). Western societies generally hold a liberalism principle (Kim & Yamaguchi, 1995) that has encouraged the independent individual (individualist) who is capable to make self-decisions on their own rights and about developing their own unique potentials (Markus & Kitayama, 1991). Westerners also typically attempt to distinguish themselves from others and they tend to focus on the needs of individuals over the needs of groups (Lockenhoff et al., 2009). As such, personal rights and goals, rather than social norms, tend to form the motivation of one’s social behaviour (Pecchioni et al., 2008). In this way, such focus on independence and ability to succeed by themselves without assistance from others (Kim, Cheng, Zarit & Fingerman, 2015) may lead to concerns that Western countries devalue their older people, reflecting ageist attitudes (Chappell, 2003). Moreover, perceptions of ageing in Western cultures are
influenced largely by age-related losses in cognitive and physical competency (Karasawa et al., 2011) due to the focus on self-centered and personal success (Markus & Kitayama, 1991). Consequently, this individualistic culture most probably has influenced negative attitudes to ageing in Western countries (Lockenhoff et al., 2009).

In contrast, Eastern cultures (e.g., China, Korea, and Malaysia) are societies that are strongly inspired by Chinese cultures, which have been built on Confucianism, Taoism and Buddhism (Kim et al., 2015), mixed with indigenous traditions (Memmi, 2017) as a principle of life. These cultures emphasise humanism and orientation to maintain social harmony with others in the same groups (Pecchioni et al., 2008), and not to differentiate the self from other people (Markus & Kitayama, 1991), so that the feelings about the self are not as important in Eastern cultures (Lockenhoff et al., 2009). In this respect, there is a guiding principle of filial piety that demands younger people’s obedience to older people, and a responsibility to ensure the emotional and physical well-being of one’s aged parents (Kim & Yamaguchi, 1995). These values are reflected in the expectations that young people in Asia will look after their older family members and live with their extended families (Chong, Ng, Woo & Kwan, 2006), while providing health care and financial assistance to them (Ng, 2004). Moreover, older adults are also highly respected in these cultures, which lead to increased willingness of older adults to receive personal care and help from their children (Kim et al., 2015). The values held by Eastern cultures may help them to view old age positively.

Given these broad cultural differences, there is a widely accepted view that attitudes to ageing are more positive in Eastern compared to Western countries (Palmore, 1975). However, research findings suggest a more nuanced picture, with
attitudes to ageing in Eastern cultures actually being more negative than those of Western counterparts in some respects. For example, people in South Korea and Turkey were found to have greater levels of anxiety about ageing and more physical appearance concerns about ageing compared to the people in the U.S (McConatha, Hatya, Rieser-Danner, McConatha & Polat, 2004; Yun & Lachman, 2006). In another study by Laidlaw, Wang, Coelho and Power (2010), who compared attitudes to ageing in people living in the UK and China, Chinese people were found to have more negative attitudes to age-related psychosocial loss and physical changes compared to the British people. These findings, therefore, support the notion expectations related to values of filial piety (Laidlaw et al., 2010) and providing social support (Ramirez & Palacious-Espinosa, 2016) leads to negative attitudes to ageing.

A possible explanation of these findings could be shifts in the ways young generations in Asian societies treat their elderly (Tien, Alagappar & David, 2011), leading them to reject expectations to assist and support the elder parents (Ogawa, Retherford & Matsukura, 2006). For example, it has been found that the beliefs of filial piety that are endorsed in Eastern societies (e.g., China) have weakened over time due to industrialisation and urbanisation transformation (Wang, Laidlaw, Power & Shen, 2009). This shift can mean that younger generations are becoming more individualistic in nature, as family structure changes and becomes disturbed (Lockenhoff et al., 2015). Moreover, the perception that the elderly are a burden might also be valid in Eastern cultures (Sabzwari, Badini, Fatmi, Jamali & Shah, 2016), particularly due to caregiving duties and less reciprocity support from the spouse and the elderly (Ugargol & Bailey, 2018).
However, research exploring attitudes to ageing in Eastern cultures is still limited. Indeed, most of the literature deals largely with Western cultures, therefore most of established measurements of attitudes to ageing have been largely based on the experiences and perspectives of people in Western cultures (Barker O’Hanlon, McGee, Hickey & Conroy, 2007; Laidlaw et al., 2007; Lawton, 1975; Sarkisian et al., 2002a), meaning that their content may be biased towards Western understanding, and not suitable for non-Western populations. This is consistent with research conducted by Schellingerhout, Heymans, Verhagen, de Vet, Koes and Terwee (2011), who reported that simple translation and lack of cross-cultural validation affects the validity of the questionnaires, because the meaning/ contents of the items may depend on the specific context of a particular culture. As such, simple translation of an original questionnaire is not sufficient. Instead, items need to be carefully translated, using, for example, the back translation method when applied in new populations. Also, the translators should work independently from each other. Moreover, the content may need to be culturally adapted or enriched in order to capture the attitudes to personal ageing that are held by non-Western populations. This is important to ensure that the constructs underlying the original questionnaire are represented adequately by the questionnaire in the new language. Taken together, this suggests a need for the adaptation and validations of measures of attitudes to ageing that are suitable for use within Eastern populations.

Many Western countries also contain people who have migrated from an Eastern country, or have ancestors from an Eastern country, and still identify with Eastern cultures. Such societies are considered multicultural, meaning that people with diverse cultural and religious root incorporated of people from another community due to
consequences of changes in politic, social and cultural (Byram, 2009). Multicultural societies have tendencies to preserve their native language, religion and traditional customs, as well as develop their own culture, whilst also observing aspects of local culture, traditions and norms (Olagunju & Alaverdyan, 2016). However, there are also possibilities that less interaction with other culture might lead to the separation, rather than integration of cultures, which make the people unable to understand other than their own cultures (Durisova & Cambal, 2015).

For this reason, multicultural societies are important to consider when developing and using psychometric tools. For example, there is evidence indicate that the components of structure of measure of ethnic identity is inconsistent between multi ethnic in Australia (e.g., Anglo-Australian, Australian-born with a British heritage, Southern European, Asian) with the researchers reporting one, two and three factor solution for this measure (Dandy, Durkin, McEvoy, Barber & Houghton, 2008). This suggests that a tool developed for one country performed differently when applied to different cultural groups living within that country, indicates that a tool is not equally suitable for all people. Therefore, it is important to acknowledge the cultural differences of various groups within the community, and examine the suitability of the tools before simply using it to multicultural populations. The content of the scales that developed in the Western countries might not be suitable for all people living in these Western countries. Similarly, when developing a tool for an Eastern country/culture, it is important to ensure that people from all cultural groups are included in the development and validation of it, therefore the meaning and construct of the tools are retained (Van Widenfelt, Treffers, de Beurs, Siebelink & Koudijs, 2005).
2.1.4 Correlates of Attitudes to Ageing

There is evidence indicating that attitudes to ageing are correlated with a range of demographic variables, including age, gender, and education levels. Evidence relating to these factors is discussed in detail in the following sections.

2.1.4.1 Age

Many studies report that ageing is perceived more positively by people as they get older. Lynch (2000), for instance, asked 1200 respondents (aged 18 to +65) to rate their attitudes to ageing using the Ageing Anxiety Scale (Kafer, Rakowski, Lachman & Hickey 1980). The results indicated that the attitudes to ageing of older people (+65) were more positive in comparison to those of young (18-39) and middle aged-adults (40-49 & 50-64). Moreover, another study that involved students and older participants aged between 20 to +60 found that older people provided more positive responses to open-ended questions about ‘what they will be when they are older’ (e.g., wise, thankful and healthy), compared to middle and younger people (Laditka, Fischer, Laditka & Segal, 2004). Similar results were also reported in studies with people aged over 60, which revealed a tendency for attitudes to ageing to become more positive with increasing age (Bryant et al., 2012; Kim, 2009; Lu et al., 2009; Shenkin et al., 2014). Studies with people younger than 60 have also demonstrated a similar pattern of attitudes becoming more positive as people become older (Abramson & Silverstein, 2006; Cumming, Krofpt & De Weaver, 2000; Draper, Gething, Fethney & Winfield, 1999; Golden, Gammonley, Hunt, Olsen, & Issenberg, 2013; Mosher-Ashley & Ball, 1999; Unsworth, McKee & Mulligan, 2001; Yan, Silverstein & Wilber, 2011).
A possible explanation for this tendency of attitudes to be more positive with increasing age is that people are capable of adjusting to potential negative age-related changes that occur at old age (Kotter-Gruhn & Hess, 2012). Moreover, ageing for older adults is considered as normal or an ‘on-time event’ (Neugarten, 1972), therefore, they have a more realistic perception of ageing (Lynch, 2000). As explained by Martin, Rott, Poon, Courtenay and Lehr (2001), through experience and maturation, older people develop more effective coping strategies and thus, fewer issues emerge as problematic (Aldwin, Sutton, Chiara & Spiro, 1996). In contrast, young adults might have unrealistic views about future ageing, because there is much time before they become old (Lynch, 2000). Consequently, ageing is considered as an ‘off-time’ event (Neugarten, 1972), and apparently more of a crisis (Wurm, Tomasik & Tesch-Romer, 2008). For example, Abramson and Silverstein (2006) found that more than 50 percent of people aged between 18 and 64 think that, at old age, they are more likely to experience health problems, loneliness and lack of money to live on. In contrast, less than 20 percent of these problems were actually experienced by people aged 65 and above. This indicates that young people’s attitudes to ageing are more negative than the reality that is experienced by older adults. In this regard, it is important to gain insight into the attitudes to ageing in younger adults, as they are at risk of developing negative attitudes to ageing. Moreover, the effect of age may differ according to other factors, such as the cultural background, gender and education, and so, relevant research is required to look at the interaction between some of these factors.
2.1.4.2 Gender

Studies have consistently indicated that women are generally less positive towards their ageing than men (Abramson & Silverstein, 2006; Barret & Robbins, 2008; Cumming et al., 2000; Draper et al., 1999; Golden et al, 2013; Lynch, 2000; McConatha et al., 2004; Yun & Lachman, 2006), especially with regard to concerns about physical appearance (Gao, 2012; Kalfoss, 2016; Koukouli, Pattakou-Parasri & Kalaitzaki, 2013). These differences in the expectations and experience of ageing could be partly due to the so-called “double standard of aging” (Wilcox, 1997, p.550). According to this concept, the construction of femininity in women emphasises physical attractiveness (Barret & Vohn Rohr, 2008) and youthfulness (Armitage, 2016), leading to increase concerns about health declines, physical appearance changes, loss of fertility (Barret & Robbins, 2008) and quality of life (Barret & Von Rohr, 2008). That is, women are often considered to become less attractive, have less value (Kalfoss, 2016), and be held in lower regard with increasing age (Goswami, 2013). In contrast, men have been described as ageing gracefully, gaining in status and becoming more dignified as they grow older (Halliwell & Dittmar, 2003), indicating that ageing can give extra value to men. Moreover, constructions of masculinity in men focus on individual’s capability, independence, authority and self-control (Barrett & Von Rohr, 2008). All these qualities may well increase with age, whilst physical appearance is less important (Tiggemann, 2004), therefore, the age-related changes in appearance are relatively less important to men than women (Halliwell & Dittmar, 2003).

Despite the general pattern of more positive attitudes to ageing in men compared to women, a few studies have failed to find gender differences in attitudes to ageing
(Kafer et al., 1980; Gething, 1994; Watkins, Coates & Ferroni, 1998). Other reports have even found that men have more negative attitudes to certain aspects of ageing, such as fear of old people (Brunton & Scott, 2015; Lasher & Faulkender, 1993; McConatha et al., 2004) and fear of losses (Lasher & Faulkender, 1993). The discrepancy of these findings indicates the need for studies that examine the specific facet/sub-domains of attitudes to ageing that may differ across genders. In addition, the effects of gender on attitudes to ageing may differ in non-Western cultural contexts, given that women in Eastern cultures often serve as primary caregivers of the elderly (Yun & Lachman, 2006).

2.1.4.3 Education

Attitudes to ageing also seem to be affected by levels of education. In particular, people with lower levels of education have been found to carry more negative attitudes to ageing, particularly for those aged above 60 (Jang, Poon, Kim & Shin, 2004; Rashid, Azizah & Rohana, 2014). The influence of education in adults younger than 60 years, however, is less clear. Although studies with middle aged participants have shown higher levels of education to be associated with more positive attitudes to ageing (Joshi, Malhotra, Lim, Ostbye & Wong, 2010; Kweon & Jeon, 2013; Yan et al., 2011), studies with a broader range of younger participants (e.g. aged 15 – 69 years) have found no effects of education on attitudes to ageing (Gething, 1994; Gething, Fethney, Mckee, Goff, Churchward & Matthews, 2002; Gething et al., 2004; Mir & Mir, 2014). One reason for this discrepancy in the effects of education could be that the younger populations in the studies by Gething (1994), Gething et al. (2002; 2004) and Mir and Mir (2012) were healthcare workers/students, who are more likely than the general
population to have higher levels of education, and also more contact with older people. This is consistent with the findings by Flood and Clark (2009), who report that allied health care workers have more knowledge about ageing than those not related to healthcare. In this regard, more studies involving participants not related to healthcare are needed to clarify the effect of education on one’s attitudes to ageing.

2.2 The Relationships between Attitudes to Ageing and Health and Well-being Outcomes

A large body of evidence suggests that individuals’ attitudes to ageing have implications for their health and well-being across adulthood. To provide an adequate background for the subsequent literature on attitudes to ageing, and its association with health and well-being, the following section will first review the definitions of well-being, and note why it is an important subject to study. Theoretical explanations for the links between attitudes and health and well-being outcomes are then discussed, together with evidence for the moderating effect of age upon these relations.

2.2.1 Definitions of Well-being

Definitions of well-being tend to fall into two distinct philosophies: hedonic and eudaimonic. Hedonic well-being defines well-being as comprised of happiness or pleasure (Kahneman, Diener & Schwarz, 1999), which is generally related to the concept of subjective well-being (SWB) (Diener, 1984). According to Diener (1984), SWB is generally interpreted as experience of a high positive affect, lack of negative
affect and greater satisfaction with life. Several measures are available to assess SWB. These include the Affect Balance Scale by Bradburn (1969), which is developed to measure both positive and negative affect, and the Satisfaction with Life Scale (SWLS) to assess one’s general satisfaction with life (Diener, Emmons, Larsen & Griffin, 1985). Although the three components are considered to be related to one another, and often occur to some degree within the same individuals (Diener & Lucas, 1999), they are separable (Diener, Suh, Lucas & Smith, 1999).

The second type of well-being relates to the concept of eudaimonia. This conceptualisation maintains that well-being is not only about happiness and pleasure as introduced by Diener (1984), but also includes the importance of developing and recognising the potential of one’s true self (Ryff & Keyes, 1995). Therefore, under circumstances of eudaimonia, a person would feel alive and realistic about themselves (Ryan & Deci, 2001). As eudaimonic well-being represents aspects of human actualisation, it has also been referred to as psychological well-being (PSW) (Ryan & Deci, 2000), which includes six distinct characteristics of psychological well-being: mastery, independence, personal development, self-approval, meaning of life, and positive relatedness (Ryff, 1989).

Taken together, well-being is possibly best perceived as a multidimensional phenomenon that comprises both hedonic and eudaimonic aspects. In order to measure the concept comprehensively, it is therefore important to use an instrument that can tap into both of these aspects. One such measure is the Warwick-Edinburgh Well-being Scale (WEMBS), which was established by Tennant et al. (2007) to enable the measurement of the positive aspect of mental well-being. This measure comprises of 14
items that incorporate both the hedonic and the eudaimonic aspect of well-being including: feelings of optimism, cheerfulness, self-assurance, feeling good and intimate to other people, sense of helpfulness, feeling relax, feeling curiosity in other people and new things, having energy, problem handling, being rational, decision taking and love. Therefore, by using the WEMWBS, the overall concept of well-being might be well accessible. This measure has been previously validated in many different languages and countries (Stewart-Brown, 2013), including China (Dong et al., 2014) Ireland (Llyod & Devine, 2012) and Germany (Lang & Bachinger, 2017). It can thus be considered as suitable to use with a range of different cultural groups. Moreover, as life satisfaction is not part of either the hedonic (that consists of pleasure and displeasure affect) (Deci & Ryan, 2008) or the eudaimonic aspect, it is also important to examine individual’s life satisfaction separately to gain an overall picture of the concept of well-being. Accordingly, another instrument of life satisfaction, such as the Satisfaction with Life Scale (SWLS) by Diener et al. (1985) would also be an appropriate measure to use in the present study. This scale has been widely used and validated across several cultures and languages (Sachs, 2003; Vazquez, Duque & Hervas, 2013).

2.2.2. Links between Attitudes to Ageing and Health and Well-being Outcomes

Attitudes towards ageing and their relationship with well-being outcomes constitute an important area of study. Numerous studies have reported that positive attitudes to ageing are associated with various health and well-being outcomes. For example, a cross-sectional study by Bryant et al. (2012), which involved 421 adults older than 60 years old, found a relationship between positive attitudes to ageing and
greater degree of life satisfaction, physical and mental health; and lower self-ratings of anxiety and depression, even after adjusting for potentially confounding correlates, including age, education, gender and self-rated health. Similarly, much research involving older adults has also demonstrated that individuals with more positive attitudes to ageing have higher levels of physical (Dogra, Al-Sahab, Manson & Tamim, 2015; Jang et al., 2004; Kim, 2009; Shenkin et al., 2014) and mental health (Kalfoss et al., 2010; Kavirajan, Vahia, Thompson, Depp, Allison & Jeste, 2011; Kim, 2009; Lai, 2009; Loi et al., 2015; Lucas-Carrasco, Laidlaw, Gomez-Benito & Power, 2013; Shenkin et al., 2014; Quinn, Laidlaw & Murray, 2009;) as well as life satisfaction (Lamont, Nelis, Quinn & Clare, 2017; Suh, Choi, Lee, Cha & Jo, 2012). Older adults who view ageing more negatively are also less likely to take part in physical activity (Beyer, Wolff, Warner, Schüz & Wurm, 2015; Sarkisian, Prohaska, Wong, Hirsch & Mangione, 2005a) and seek health care (Sarkisian, Hays & Mangione, 2002b), suggesting a behavioral pathway that may partly account for the decreased levels of health and well-being.

Longitudinal data have also illustrated links between attitudes to ageing and health and well-being outcomes. Empirical evidence from Kotter-Gruhn, Kleinspehn-Ammerlahn, Gestorf and Smith (2009) and Sargent-Cox, Anstey and Luszcz (2013), for example, showed that participants with more negative attitudes towards their ageing and old age between 65 and 103 years were more likely to die in the subsequent 12 to 16 years than those with more positive attitudes to ageing, even after controlling for other risk elements such as physical health, cognitive functioning and well-being. In contrast, more positive attitudes to ageing in older adults have been found to predict longevity 7.5
years longer (Levy & Myers, 2005), reduced anxiety and depression (Freeman, Santini, Tyrovolas, Rummel-Kluge, Haro & Kayonagi, 2016), reduced risk for future adverse outcomes (e.g., hospitalisations and disability) over time (Moser, Spagnoli & Santos-Eggimann, 2011) and increased levels of self-worth (Coleman, Aubin, Robinson, Ivani-Chalian & Briggs, 1993) and functional health over 13 years (Levy, Slade & Kasl, 2002a). Taken together, this body of research advocates that one’s attitudes to ageing are important for their current well-being and health-related outcomes.

In addition to work done with older adults, a number of studies have revealed similar patterns in middle-aged participants. For instance, in a cross-sectional study with 300 middle-aged participants (aged 49 – 51 years), more negative attitudes to ageing were related to lower levels of physical and mental health, including depression, anxiety, hyper tension and asthma (Thorpe, Pearson, Schluter, Spittlehouse & Joyce, 2014). Several cross-sectional studies have also explored these associations among middle aged participants older than 40 years and reported that attitudes to ageing are related with mental health (Joshi et al., 2010) and physical activity (Sparks, Mesiner & Young, 2012). Furthermore, a similar pattern was also found in a longitudinal study involving middle aged adults above 40 years old, in which more positive attitudes to ageing predicted a constant physical activity over six years (Wurm, Tomasik & Tesch-Romer, 2010). Taken together, the associations between attitudes to ageing and well-being outcomes in middle aged adults seem to follow the same pattern as older adults.

In contrast to work carried out with middle-aged and older participants, there has been little research exploring the health and wellbeing correlates of attitudes to ageing of younger adults, who have little or no personal experiences of ageing.
However, some more recent studies have explored the potential associations with health-related constructs or behaviours. For instance, in a sample of adults aged 18-64 years old, more negative attitudes to ageing were found to be related to increased inclination for a short life, while more positive attitudes to ageing were related to wanting to live longer than expectancies (Bowen & Skirbekk, 2017). A longitudinal study by Klusmann et al. (2017) also showed that positive attitudes to ageing at baseline predicted healthier eating patterns over a one-year follow-up period in both middle-aged (36-64 years) and younger (18-35 years) adults, even after controlling for participants’ gender and baseline eating behaviour, health, and BMI. Negative attitudes to ageing among young (30-49 years) and middle aged (50-65 years) adults, also predicted more negative life events (e.g., death, illness) in the following four years (Voss, Kornadt & Rothermund, 2017). Taken together, these findings suggest that attitudes to ageing may be associated with current and future well-being outcomes in both younger and older adults. Such associations between attitudes to ageing and engagement in various health and well-being outcomes highlight the importance of understanding the content and valence of attitudes to ageing held by people before they reach later life.

A limitation of previous work exploring these associations in adults under 60 years is that they used attitudinal measures specifically assessing some particular experiences of ageing that are related to older adults, for example the changes in bodily functioning and mobility, as well declines in social interaction. This is included in measures like the AAQ (Thorpe et al., 2014), the ERA-12/38 (Joshi et al. 2010; Sparks et al., 2014), and the Personal Experience of Ageing (PEA: Wurm et al., 2010; Klussman et al. 2017). Such measures might not be suitable for use with younger adults.
who have not encountered any salient age-related changes compared to older adults. Moreover, Bowen and Skirbekk (2017) have administered a brief self-developed measure for assessing future expectations about ageing in younger participants, but this measure was not validated in the targeted populations, thus raising doubts about its reliability and validity, in terms of how well it measures the construct of ageing. Therefore, in order to investigate attitudes to ageing among younger generations, it is important to use reliable measures that are suitable for, and have been validated in this population. Moreover, there has been little work that has examined the association between attitudes to ageing and well-being outcomes in Eastern cultures. For example, although a study by Joshi, Malhotra, Lim, Ostbye and Wong (2010) has examined the relations between attitudes to ageing, and well-being outcomes in non-Western country (e.g., Singapore), their samples however were limited to participants above 42 years old with using an English version of attitudes to ageing measure. Therefore, the reported attitudes might not represent the whole populations of younger age, also the context of attitudes to ageing might not be suitable for Eastern cultural use.

2.2.3 Theoretical Explanations for the Links between Attitudes to Ageing and Health and Well-being Outcomes

The main theoretical explanation of the links between attitudes to ageing and health-related behavior and well-being outcomes comes from the Stereotype Embodiment Theory (SET). This theory was proposed by Levy (2009) and it focuses on four key points: (1) age-stereotypes are internalised since childhood, and the process constantly occurs across the life span; (2) age-stereotypes become increasingly self-
relevant when individuals recognise themselves as being old; (3) the process of developing age-stereotypes takes place without the individuals realising it; and (4) age-stereotypes exert their influence on cognitive and physical functioning in multiple pathways.

The latter two elements, thus, provide an account of how attitudes to ageing can impact behaviour and functioning. For example, the internalisation of age-stereotypes during childhood is operating outside one’s awareness, and any negative information about ageing held at a younger age may negatively influence the way an individual expects to experience the process of ageing (Levy, 2003). Eventually, as individuals age and reach old age, they may adjust their health and behaviour to match these age-stereotype expectations in self-fulfilling ways (Wurm, Warner, Ziegelmann, Wolff & Schuz, 2013). Therefore, these expectations may become reality and, in turn, have negative influence on their later health and functioning (Levy, 2009).

According to this theory, attitudes to ageing exert their influence on health and well-being via three pathways: behavioural, psychological and physiological. Behavioural pathways of attitudes to ageing are illustrated by health practices, such as positive attitudes to ageing at baseline predicting engagement in healthy practices, including increased physical activity (Robertson, Savva, King-Kallimanis & Kenny, 2015; Wurm et al., 2010), eating a balanced diet (Levy & Myers, 2004), or making regular health check-ups (Meisner & Baker, 2013). The psychological pathway that links attitudes to ageing with health and well-being outcomes includes control beliefs. For instance, individuals who perceive themselves as having more control over their ageing-related deteriorations are more likely to undertake adaptive behaviours, such as
physical activity (Lachman, 2006). Finally, the physiological pathway of negative stereotypes of ageing is most likely embodied by the autonomic nervous system, which corresponds to environmental pressure (Levy, 2009). For example, older people who carry negative age stereotypes show increased cardiovascular reactivity to stress (Levy, Hausdorff, Hencke & Wei, 2000), which then might increase the probability of cardiovascular events in future life (Levy, Zonderman, Slade & Ferrucci, 2009). Overall, the SET portrays the theoretical background for the hypothesised links of attitudes to ageing and well-being outcomes. Consistent with this theory, it is assumed that attitudes to ageing have effects on a wide range of outcomes, including well-being and life satisfaction, as reported in the literature.

2.2.4 Moderating Effects of Age on the Relationships between Attitudes to Ageing and Well-being

Previous findings provide support for the presence of associations between attitudes to ageing and health and well-being outcomes. However, it is important to understand whether age has a moderating effect on these relationships so as to provide insights into the mechanisms underlying these relationships and to identify the point(s) in the life cycle at which people are most at risk of the effects of negative attitudes to ageing. Some work has already looked at the effects of age on the links between attitudes to ageing and well-being, but the focus was on attitudes relating to one’s personal experience of ageing (in those who could already be considered to be older), rather than attitudes to future ageing (e.g., as measured in those who have not yet
experienced older age). Therefore, the extent to which the relationships between attitudes to future ageing are moderated by chronological age is not yet known.

With regards to attitudes towards one’s current experiences of ageing, the earliest work was done by Levy et al. (2002a) who followed participants aged 50 years and older for 18 years. By using the ATOA subscale from the PGCMS (Lawton, 1975), Levy et al. (2002a) showed that the relationship between attitudes to ageing and functional health is stronger for older adults, and decreases in younger age groups, therefore suggesting that this correlation gets stronger over time. In line with the SET theory, these findings suggest that age stereotypes about ageing are more self-relevant with increasing age (e.g., Levy, 2009). However, the results of more recent studies are not consistent with this explanation. For example, there were no moderating effects of age on the relationships between attitudes to ageing and physical functioning or life satisfaction in participants ranging from mid-adulthood to later life (Brothers, Miche, Wahl & Diehl, 2017), even though this study used similar measures to those used in Levy et al.’s (2002a) study. Thus, it is not clear how or why age moderates this relationship and the mechanisms that underlie these relationships should be the focus of more studies.

There is an alternative theoretical explanation for the way that attitudes to ageing and well-being links might be affected by age, and this relates to affective forecasting errors. For example, there is a large body of work showing that younger, but not older, people exhibited more forecasting errors (Nielsen, Knutson & Cartensen, 2008; Scheibe, Mata & Carstensen, 2012) in which, there is high probability that young people may overestimate the impact of future negative events (e.g., ageing) and create unnecessary
dread and anxiety about the future, which would affect well-being. This is due to the fact that individuals might overestimate the impact that future events will bring, overlooking other possible events that might occur and underestimating their capability in handling their emotions, especially when the event that unfolds is not what they expected (Wilson & Gilbert, 2005). Therefore, in the current context, younger adults might overestimate how the experiences of age-related changes would affect their well-being. As such, it perhaps can be assumed that the links between attitudes to ageing and well-being are stronger in younger adults.

Overall, the previous literature includes many contrasting rationales, but these speculations have never been tested in the relations of attitudes to future ageing, especially in people as young as 18 years old. Moreover, the moderation effect of age on the relationships between attitudes to ageing and well-being has never been tested in non-Western populations, so that the direction of age on these relationships is unknown. This is important given that younger adults in Eastern cultures hold a notion of filial piety and are ready to provide care to their elderly family members due to obligation as a child (Long & Harris, 2000) which may encourage a fear and anxiety-provoking experiences towards advancing age (Lynch, 2000). For this reason, there is a need to explore whether age can moderate the links between attitudes to ageing and well-being in young people living in Eastern countries.
2.3 Ageing in Malaysia

2.3.1 Demographics of Malaysia

Malaysia is a multi-ethnic and multi-cultural country, with Malays representing the predominant ethnic group and comprising 69 percent of the total population. The remaining population consists of Chinese (23%), Indian (7%) and other (1%) ethnic groups, within an overall population of 31.7 million (Department of Statistics Malaysia, 2016). This diversity in ethnicity is due in part to the large number of Chinese and Indian migrants who moved to Malaysia in the 19th century (Fee, 2001). Whilst each ethnic group preserves its own culture and value, in terms of food, language or religion, they have also assimilated into the national identity as Malaysian (Tey et al., 2016). For example, the official language of Malaysia is Malay, which is used as the language of instruction in national schools or in official business related to government agencies (Hassan, Angterian & Yusop, 2017). The Malay language is spoken not only by all ethnic groups in Malaysia, but also by people who reside in other Southeast Asian countries, such as Indonesia, Brunei, Singapore and southern Thailand, developing a large Malay-speaking community of more than 250 million (Huang & Tanangkingsing, 2005).

2.3.2 Defining Old Age in Malaysia

According to the WHO (2014), most developed nations have acknowledged the chronological age of 65 years as the threshold for a person to be considered as ‘elderly’ or old. Nevertheless, both the United Nations (2013) and the World Population Prospect
(2017) indicated that, in less developed countries, a person is considered to be old when they reach 60 years of age. Thus, the age threshold does not seem to be consistent or equally applicable to every part of the world. For developed countries, such as America and the UK, the chronological age of 60 might be considered young or early, but for developing countries such as Malaysia, Thailand and India, where the life expectancy is not as high as in developed countries, 60 years seems more appropriate as the threshold to old age (Ambigga, Ramli, Suthahar, Tauhid, Clearihan & Browning, 2011). As reported by Rashid, Ong and Wong (2012), the maximum age of 60 reflects the point at which people in Malaysia are likely to start feeling that they are in the ‘old age’ category. This cut-off of age is also consistent with the compulsory retirement age for public servants in Malaysia (Malaysia Law, 2012). In this regard, old age in Malaysia is directly linked to the starting point of retirement at the age of 60.

2.3.3 Ageing Population in Malaysia

According to the United Nations (2015), Malaysia is currently ranked as number 102 out of 201 countries in terms of the proportion of population aged 60 and over. As this report shows, 14.4% of the overall population in Malaysia consists of people aged 60 or more, with this number projected to increase to 23.6% by 2050, indicating that Malaysia will be in the category of ageing nations in later years. The increased number of ageing population in Malaysia is believed to be due to changes in fertility and mortality, migration to the cities, improvement of education systems, work prospects, quality of health care, medical technologies and living conditions (Tey et al., 2016).
This means that people live longer, wealthier, and healthier lives compared to previous years, especially at later ages.

This demographic trend also supports the notion that some research effort should be devoted to people who have not yet reached an old age. For instance, people aged 40-49 and 50-59 years constituted 12% and 9.3% respectively of the whole Malaysian population in 2016 (Statistic on Women, Family and Community, 2016), which suggests that in few years, more young adults are more likely to reach older age, especially with the projected increase of life expectancy from 70.0 to 72.0 years for males and 74.7 to 77.1 years for females from 2000 to 2011 (Malaysia Department Statistics, 2016).

2.3.4 The Cultural Context of Ageing in Malaysia

Following the norms and value of Eastern cultures, people in Malaysia tend to apply a collectivist orientation (Burns & Brady, 1992), practicing traditional values such as filial piety (Ismail, Jo-Pei & Ibrahim, 2009), caregiving (Minhat et al., 2015b) and family support for the elderly (Wan Ibrahim & Zainab, 2014). Parents are also responsible for directing their children towards the right behavior and attitudes, and are regarded as having authority over their children (Keshavarz & Baharudin, 2009), in terms of informing them about religious rituals and traditions (Mehta, 1997). The family bond is also strong, and children are responsible for providing the formal and informal care for older family members when they get old (Kok & Yap, 2014). As such, it has been reported that more than 70% of older Malaysians live with their adult children (Kooshiar, Yahaya, Hamid, Abu Samah & Sedaghat, 2012), who provide care and support to the parents when they are old (Teh, Ng, Tey & Siti Norlasiah, 2013). The
Malaysian Government also encourages familial support of older persons by providing a tax incentive for those children who live with their parents; or if their adult children are unable to support them, personal welfare assistance to aged parents is also provided (Da Vanzo & Chan, 1994).

However, Malaysia is facing challenges and obstacles in the way their people hold traditional values in daily life. For instance, family size is beginning to decrease due to declines in fertility, life expectancies becoming greater, family members being geographically scattered, and the increasing tendency of Malaysian women to pursue their education and work, instead of being the caregivers of the household and family members (Leng, Khan, Vergara & Khan, 2016). With that in mind, it seems that younger people in Malaysia are facing a great challenge in perceiving old age positively, which justifies the need of research in this population.

2.3.5 Attitudes to Ageing in Malaysia

As the number of older people in Malaysia is increasing, it is essential to be informed about the way individuals perceive their own ageing. Quantitative studies using the AAQ (Mohamad Yunus, Abd Manaf, Omar, Juhdi, Omar & Salleh, 2016; Rashid et al., 2012; 2014) and a scale developed by the authors (Momtaz, Hamid, Masud, Haron & Ibrahim, 2013) have shown that Malaysian people aged 60 years old and older generally perceive ageing positively rather than negatively. Similarly, in a qualitative study that was conducted with Malaysian older adults aged 60-83 years old, the participants were found to generally view ageing as positive (Mazanah & Merriam, 2000). The participants in this study, for example, characterised ageing as a period of
contentment, freedom from responsibility and respect. Some issues related to ageing were also identified, including health, spiritual life, family and community that are important in their life when they are older. Moreover, positive attitudes to ageing among older adults were proved to significantly contribute to various outcomes of well-being, such as the increase in an individual’s quality of life and sleep (Rashid et al., 2012), social support (Rashid et al., 2014), health status (Yunus et al., 2016) and increase in spouse’s psychological well-being (Momtaz et al., 2013).

However, the findings to date are limited by the fact that the instruments used to assess attitudes to ageing were developed for Western cultures, and were not adapted for, or validated in the Malaysian population. For example, there is no evidence that instruments of attitudes to ageing were translated into the Malay language using adequate procedures so as to ensure that the meaning of the construct to be measured remained unchanged. This is important because the content of attitudes to ageing might differ across cultures, since what is assumed positive or negative in one culture may not be perceived in the same way in other culture (Boduroglu, Yoon, Lou & Park, 2006).

Moreover, the findings reported to date mainly focused on attitudes to ageing among people older than 60 with only limited findings on the attitudes to ageing in younger populations. For example, qualitative reports indicate that younger people in Malaysia aged 35-59 viewed ageing negatively (Minhat et al., 2015a; 2015b). In these studies, 36 younger women were interviewed in a focus group discussing about their perceptions towards the ageing process, and whether the ageing process is causing any anxiety feelings. The participants in these studies viewed ageing as a time of decline in health and ability, which is characterised by sensitive feelings due to their children
getting married and hormonal changes because of menopause symptoms (Minhat et al., 2015b). Additionally, they expressed anxiety about physical changes that occur with the ageing process, caregiving at old age, welfare and care of their children when they are old (Minhat et al., 2015a), suggesting that younger people in Malaysia view ageing negatively and are concerned about their own ageing. One explanation for more negative attitudes to ageing in younger adults in Malaysia could be the increase of anxiety while residing with older adults (Allan & Johnson, 2008) as well as the decreased sense of filial piety responsibility among younger Malaysians (Damulak, Minhat & Rahman, 2015). However, these findings are limited to qualitative data of younger women, and thus, more studies are required to explore attitudes to ageing in a broader sample of Malaysian adults through the use of measures that have been adapted for, and validated in, this population.

Overall, there is a lack of suitable instruments to assess attitudes to ageing in younger adults in Malaysia. Because there is increasing research concerning the ageing population in Malaysia, the validation of measurements of ageing attitudes in the Malaysian sample seems warranted, as this would contribute to gerontological practice and public policies in the future. Moreover, there is little research on the anxieties of young Malaysians regarding their experience of growing older and their expectations of their future age and ageing. Therefore, it is also crucial to examine how these attitudes to the ageing processes relate to indicators of well-being before appropriate strategies for a successful ageing population could be developed. Therefore, the aim of this thesis is to fill this gap in the literature by translating and culturally adapting measures of current concerns, and future anticipations, about ageing for a Malay population, and
then using these measures to examine the correlates of attitudes to ageing in a sample of younger participants aged 18-60. Taking into account the aforementioned discrepancy of attitudes to ageing in Eastern cultures, a large sample of the Malaysian population was used in this thesis.
References


CHAPTER THREE

STUDY ONE:

A SYSTEMATIC REVIEW OF THE PSYCHOMETRIC PROPERTIES OF SELF-REPORT MEASURES OF ATTITUDES TO AGEING

This manuscript has been submitted to the journal ‘Research on Aging’ for peer-review.

The format of Research in Aging manuscripts is used in the chapter.
CHAPTER 3

A Systematic Review of the Psychometric Properties of Self-Report Measures of Attitudes to Ageing

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Abstract

Attitudes to ageing are associated with subsequent health and wellbeing outcomes. Reliable and valid methods for assessing attitudes to ageing in younger populations are therefore important for supporting healthy ageing. The aim of this study was to describe and evaluate the psychometric properties of attitudes to ageing measures that have been validated in adults younger than 60 years old. Electronic searches were performed in MEDLINE, EMBASE, CINAHL, PsychINFO, Web of Science and ASSIA. Studies were assessed for methodological quality using the Consensus-based Standards for the Selections of Health Status Measurement Measures (COSMIN). Best evidence synthesis was then performed to summarise the level of evidence available for the psychometric property of each measure. Twenty-one articles, relating to 10 different measures, in nine languages, were identified. Instruments consisted of single-items through to multiple-items with numerous sub-scales. Some instruments were only validated in participants who were middle-aged and above, while others were validated in a wider age range. Quality ratings varied from poor to excellent, with ‘fair’ being the most frequent rating across all domains assessed. The Expectations Regarding Ageing (ERA-12) and the Anxiety about Aging Scale (AAS) were the two measures that received positive ratings for the greatest number of psychometric domains, although mixed or negative results were also found for some properties of these scales or their composite subscales. A range of tools are available that would differently suited to different age range, but more high quality studies that assess the psychometric properties of these scales are needed.

Keywords: Systematic Review, Measurement Properties, Psychometric Assessment, Attitudes to Ageing, younger adults.
Introduction

Attitudes to ageing can be defined as expectations, experiences or feelings about the process of ageing (Hess, 2006), or how an individual envisages old age (Kornadt & Rothermund, 2015). There is consistent evidence for long-term consequences of attitudes to ageing on individuals’ health and well-being outcomes (Wurm, Diehl, Kornadt, Westerhof & Wahl, 2017). For example, negative attitudes to ageing held in early or middle adulthood are predictive of future cognitive, physical or mental health, longevity and mortality (Levy, Slade, Kunkel & Kasl, 2002; Sargent-Cox, Anstey & Luszcz, 2013; Wurm, Tesch-Römer & Tomasik, 2007). Reliable and valid methods for assessing attitudes towards ageing in younger populations are therefore important for supporting healthy ageing.

Attitudes to ageing can be measured throughout the lifespan, but likely take on different meanings at different life stages (Barret & Montepare, 2015). For instance, the attitudes to ageing held by younger adults (i.e., those younger than 60 years, see United Nation, 2013) are based on observations of other people’s ageing (Gilbert & Ricketts, 2008) or cultural stereotypes of old age (Levy, 2009), whereas those of older adults (i.e., those over 60 years of age, see United Nation, 2013) are additionally influenced by their personal experiences of age-related changes (O’Hanlon & Colemen, 2008). This is reflected in the content of some measures of attitudes to ageing, whereby those designed for older adults may draw on reflections of the individual’s experience of ageing, and so not be well-suited to those who have not yet experienced ageing. For example, the Attitudes to Ageing Questionnaire (AAQ: Laidlaw, Power & Schmidt, 2007) was
specifically developed for people aged over 60, and contains items that directly question respondents’ experiences of ageing, such as ‘I am losing my physical independence as I get older’. Measures that have been designed for older adults may therefore not be appropriate for use in younger populations.

Given the known longitudinal relationships between attitudes to ageing and health and wellbeing outcomes, reliable and valid assessments of attitudes to ageing among younger people are crucial for targeting, developing and evaluating interventions designed to promote healthy ageing. However, no review of psychometric properties of the tools available to assess attitudes to ageing in younger populations has yet been conducted. To address this gap, the aims of the present systematic review were therefore to: (a) identify and describe the range of tools that have been developed to assess attitudes to ageing in adults aged younger than 60 years old, and (b) assess the psychometric properties of these tools as measures of attitudes to ageing.

Methods

Search Strategy

Six electronic databases (PsycINFO, MEDLINE, CINAHL, EMBASE, Web of Science and Applied Social Sciences Index and Abstracts (ASSIA)) were systematically searched from inception to 1 May 2018. The search strategy consisted of three concept strands: (1) Psychometric Property; (2) Measurement Tool; and (3) Attitude to Ageing, which were combined with the AND operator. Each concept strand contained various synonyms, spelling variants, and truncations of the construct of interest, and relevant
MeSH terms, where available, which were combined with OR operators. The search strategy was initially developed for use in PsycINFO, EMBASE and MEDLINE, and then adapted when necessary for use in the other databases. Appendix i (Supplementary material) provides an example of the search strategy that was used for PsycINFO. Backward searching of papers listed in the reference sections of articles identified for inclusion in the review was also performed.

**Inclusion Criteria**

Studies were qualified if they met the subsequent inclusion criteria:

(i) The study included a measure of “attitudes to ageing”. In line with conceptual definitions of the construct (Janeckova, Dragomorecka, Holmerova & Vankova, 2013; Kornadt & Rothermundt, 2015; Levy, 2003; Steverink, Westerhof, Bode & Dittmann-Kohli, 2001), the measure could relate to affective (e.g., fears, concerns, feelings, or worries about ageing), cognitive (e.g., experiences, perceptions, beliefs or and expectations related to growing older), and/or behavioral (e.g., activities or decisions connected with ageing) components of attitude. Furthermore, measures could contain (1) self-referential items that relate to one’s own ageing, such as ‘Getting older makes everything a lot harder for me’ (Barker, O’Hanlon, McGee, Hickey & Conroy, 2007); ‘I expect that as I get older I will become more forgetful’ (Sarkisian, Steers, Hays & Mangione, 2005); or (2) non-self-referential items that assessed attitudes to ageing or old age as a general construct, such as ‘Old age is a time to enjoy life (Sarkisian, Hays, Berry &
Mangione, 2002); ‘There is a lot to look forward to in regard to being old’ (Gething, 1994).

(ii) An identified aim of the study was to assess one or more of the psychometric properties of the measure. This is in line with published recommendations for performing systematic reviews of measurement properties (Terwee, de Vet, Prinsen & Mokkink, 2011a), which advise against including studies in which only indirect evidence about measurement properties of the target measures are reported, for instance assessing responsiveness of a measure as part of a randomised control trial (RCT) of an intervention study, due to problems in identifying and interpreting such evidence. If the attitudes to ageing scale was a subscale of a broader measure, then the article was only included if psychometric properties of the relevant subscale(s) were examined.

(iii) The majority of study participants, or the majority of a discrete subsample that was analysed independently, were adults under 60 years of age. This was operationalised as either: at least 75% of the participants were aged 18 to 60 years, or the mean or median age of the sample was lower than 60 years. Studies that did not provide an age breakdown, but which described their sample using terms that implied that they were young adults (e.g. ‘students’ or ‘employees’ etc.) were included, whilst studies using terms that implied that the sample were older adults (e.g., “elderly” etc.) were excluded.
(iv) The measurement tool must be publicly available (either free to view; for purchase; or provided by the authors on request), so that it can be utilised in future studies.

(v) The study must have published in a peer-reviewed journal. Grey literature articles were excluded. This is because non-peer reviewed literature in this field is subject to higher levels of bias due to political motivations (e.g., by those seeking to exaggerate the negative effects of ageing), and vested interests (e.g., business interests) in presenting certain measurement tools more or less favorably.

**Study Selection**

After removing duplicate entries, one member of the research team (FNMF) and one researcher external to the research team each independently screened a subset of titles and abstracts, and then compared the decisions made. The initial process involved 300 of 5509 records (approximately 5%) of titles and abstracts screened by both researchers. This resulted in some discrepancy between the first and second researcher, with the first researcher (FNMF) retaining 15 articles, while the second researcher retained just nine. Through discussion, the researchers clarified the inclusion criteria, and agreed that more than nine of the articles should have been retained. Following this calibration exercise, another 300 of records were independently screened by the same two researchers. This time both researchers retained the same 11 articles, indicating that the screening process was reliable. The remaining records were then screened by the first researcher only. A similar process was used when screening full text articles. This time, both researchers identified the same four articles from the first 25 (approximately
10%) of full texts as meeting the inclusion criteria. As agreement was so high, the remaining full text articles were screened by the first researcher only, with any ambiguities resolved through discussion with one or more other team members.

**Data Extraction**

Data relating to the nature of the scale being assessed, the country and sample in which it was assessed, and the assessed psychometric properties of the scale were extracted by one researcher (FNMF). For articles describing the original development of a scale, data relating to the process of scale development were also retrieved. For those articles that did not describe the original scale development, the original paper that described the scale development (regardless of the age group it was developed in) was retrieved, and data relating to the process of scale development was extracted. Data relating to the psychometric properties of the measures was extracted by FNMF, and then checked for accuracy by a second researcher (LJEB). Authors of papers were contacted, when necessary, to provide additional information not reported in the papers.

**Assessment of Study Quality**

The Consensus-based Standards for the Selections of Health Status Measurement Measures (COSMIN) checklist by Terwee, Mokkink, Knol, Ostelo, Bouter and de Vet (2011b) was used to assess the methodological quality of the assessment of each psychometric property in each study. This checklist contains nine sets of items that relate to the following specific measurement properties: internal consistency (A), reliability (B), measurement error (C), content validity (D), structural validity (E), hypothesis testing (F), cross-cultural validity (G), criterion validity (H), and
responsiveness (I). Boxes (A) to (C) are grouped into the reliability domain, whilst boxes (D) to (G) are grouped into the validity domain. An additional box of items is used to assess the requirements of studies that apply Item Response Theory (IRT) methods. The COSMIN Checklist is a modular tool, meaning that only the boxes relating to the specific psychometric properties assessed in a study need to be completed. Each item within a section is scored using a four-point scoring system (0 = poor, 1 = fair, 2 = good, and 3 = excellent). A quality score for each box is attained by using a ‘worse score counts’ method; or the lowest rating of any item in a box (Terwee et al., 2011b).

The COSMIN checklist does not yet include a rating box for assessing measurement invariance. Therefore, following consultation with one of the authors of the COSMIN team, (C.B.Terwee, personal communication, May 22, 2017), studies assessing measurement invariance were assessed using items 1-3, and 12-15 (except for the items on translation) of the cross-cultural validity box (Box G). Quality assessments of each paper were performed independently by two members of the research team (FNMF and LJEB), who then met to discuss and resolve any discrepancies.

Best Evidence Synthesis: Level of Evidence

To summarise the evidence, data relating to each psychometric property of each included instrument was first rated using checklists of criteria, adapted from Terwee et al. (2007) that assess the strength of the psychometric property that was evaluated. This results in one of the following rating options being applied to each psychometric property (e.g., internal consistency) assessed in each study: (+) = adequate, (-) = not
adequate, (?) = unclear, or (0) = no information available. As with the COSMIN checklist, ratings of measurement invariance were made using the criteria for cross-cultural validity. These ratings were then synthesised across all studies that rated a particular property of a particular tool using the levels of evidence criteria adapted from the Cochrane Back Review Group (van Tulder, Furlan, Bombardier, Bouter & Editorial Board, 2003). The levels of evidence for overall quality of measurement properties have been used in various systematic reviews (e.g. Coombes, Wiseman, Lucas, Sangha & Murtagh, 2016; Dobson, Hinman, Hall, Terwee, Ross & Bennell, 2012). This method takes the number and methodological quality of the studies, and the consistency of results, into account to produce one of eight overall ratings of the level of evidence available for the psychometric property of each measure. Evidence summary and synthesis ratings were made by one researcher (FNMF), and then checked by a second researcher (LJEB), with any discrepancies resolved through discussion.

Results

Selection of Studies

The search of electronic databases yielded a total of 8351 hits. After removing 2842 duplicates, a further 5253 articles were excluded through title and abstract screening. A further 257 articles were then excluded at the full-text review stage. One additional article (Ornelas, Gasté, Jeanette and Judith, 2016) was identified through manual searching of the reference list of an included paper, resulting in 21 articles being included in the review (Figure 1). These 21 articles related to 10 different measures of attitudes to ageing.
Figure 1 Flowchart of the Search and Study Selection Process.

Records identified through database searching (n = 8351)

Records after duplicates removed (n = 5509)

Excluded based on title/abstract (n = 5232)

Articles selected for full-text review (n = 277)

Additional 1 article identified from manual searching of references

Full text excluded with reasons (n = 257)
- Did not assess psychometric properties = 112
- Did not measure attitudes to ageing = 62
- Study participants aged >60 years = 44
- Not a peer-reviewed article = 37
- Article not retrievable = 2

Total number of articles = 21
Total number of instruments = 10

Medline
796 records

PsycInfo
1316 records

Embase
1243 records

CINAHL
1140 records

Web of Science
1382 records

ASSIA
2474 records
Characteristics of Measures

Table 1 provides an overview of the characteristics of the 10 original measures included in the review. All measures were developed between 1975 and 2014, and in the English language, except for the Personal Experience of Ageing (PEA: Steverink et al., 2001), which was developed in German. Five of the measures (AAQ: Laidlaw et al., 2007; Ageing Perception Questionnaire (APQ: Barker et al., 2007); Attitudes to Own Ageing (ATOA: a subscale of the Philadelphia Geriatric Center Morale Scale (PGCMS: Lawton, 1975); Expectations Regarding Ageing (ERA-38: Sarkisian et al., 2002); and ERA-12 (Sarkisian et al., 2005)) were originally developed for assessing the attitudes of older people, and then subsequently applied to, or modified for use with adults younger than 60.

The other five measures were developed for various age ranges, including younger adults. Specifically: the PEA (Steverink et al., 2001) was developed for adults aged 40-69 years; the Attitude- Aging- Visual Analogue Scales (At-Ageing-VAS: Ligon, Ehlman, Moriello, Russo & Miller, 2014) was developed for younger adults, aged from 18 to 42; whereas the Anxiety about Ageing Scale (AAS: Lasher & Faulkender, 1993); Reactions to Ageing Questionnaire (RAQ: Gething, 1994); and Personal Anxiety toward Ageing (PAA: Kafer, Rakowski, Lachman & Hickey, 1980) were all developed for a broad age range from young (18 years/twenties) to older adults (65 years +).

The number of items in each measure ranged from one (At-Ageing-VAS) to 38 (ERA-38). Seven scales contained subscales, with the numbers of subscales ranging
from three (ERA-12, AAQ, PEA) to 10 (ERA-38). The items of five measures were developed from focus groups with middle-aged or older adults (ERA-38; ERA-12; ATOA; PEA) or health care participants (RAQ). The items of three measures (AAS; PAA; and APQ) were developed from literature reviews, whilst the items of the AAQ were developed using both a literature review and focus groups. The single-item of the At-Ageing-VAS was developed by the researchers and later refined by experts in gerontology.
<table>
<thead>
<tr>
<th>Scale &amp; Authors</th>
<th>Country &amp; Language</th>
<th>Initial Process of Scale Development</th>
<th>Scale Structure</th>
<th>Response Option &amp; Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety about Ageing Scale (AAS) (Lasher &amp; Faulkender, 1993).</td>
<td>USA (English)</td>
<td>- 84 items were derived from a literature review and categorised into seven sub-categories. - All items were administered to 312 participants, aged from under 25 to over 74, recruited from a university or a foster grandparent program. - Items loading above .40 or showing good face validity were retained.</td>
<td>20 items; 4 subscales</td>
<td>4-point scale from 1 (absolutely agree) to 4 (absolutely disagree). Higher scores indicate higher levels of aging anxiety. (Score range: 20–80).</td>
</tr>
<tr>
<td>Reactions to Ageing Questionnaire (RAQ) (Gething, 1994).</td>
<td>Australia (English)</td>
<td>- 35 items were first developed from the responses of 60 nurses who were asked to write open-ended responses about how they felt about their own ageing. These items were administered to 300 nurses and 150 members of the general public in a pilot study. - Items with poor reliability, or that loaded inconsistently, were excluded. A shorter version with 30 items was then administered to 531 health professionals aged 20-69 in main study - Items that did not achieve high loading were removed.</td>
<td>27 items; 6 subscales</td>
<td>6-point scale from 1 (agree very much) to 6 (I disagree very much) Higher scores indicate more positive attitude towards ageing. (Score range: 27 – 162)</td>
</tr>
<tr>
<td>Expectations Regarding Ageing (ERA-38)</td>
<td>USA (English)</td>
<td>- 26 domains were identified from qualitative interviews and focus group with 38 older adults (M = 78 years), and were used to construct a survey. - 94 items were administered to 58 older</td>
<td>38 items; 10 subscales</td>
<td>4 point scale from 1 (definitely true) to 4 (definitely false). Higher values indicate more positive expectations regarding ageing. (Score range: 38 – 152)</td>
</tr>
</tbody>
</table>
participants from senior centers in pilot study. Items with many missing responses or that had extreme distributions were eliminated.

- 56 items were then administered to 588 older adults. Items with high ceiling effects or that correlated less than .30; were redundant; or had lower correlation with all scales were removed.

- 38 items finally were administered to 429 older adults \( M = 76, \ SD = 6.9 \) recruited from community residing

ERA-12
(Sarkisian et al., 2005)

USA (English & Spanish)

- 636 older adults aged from 65-100 \( M = 77.5, \ SD = 6.5 \) recruited at senior centers

- 12 items from ERA-38 (Sarkisian et al., 2002) were selected using principle components analyses; examination of focus group rankings; internal consistency data; and correlations with related variables, to produce a shorter scale representing the same constructs as the ERA-38.

Personal Anxiety toward Ageing (PAA): subscale of the Ageing Opinion Scale (AOS)
(Kafer et al., 1980)

USA (English)

- To create the AOS, a 203 item-pool was created from three relevant instruments identified through a literature review, then sorted into 15 categories by two graduate students.

- These content areas were used as a guide to generate 120 new items (Form 1). These were administered to 20 adults. Items with minimal variances were removed.

- 60 items (Form 2) were administered in second study to 100 students and 100 practitioners. Items that were factorially

(iv) Functional independence (5);
(v) Sexual function (2);
(vi) Pain (2);
(vii) Urinary incontinence (1);
(viii) Sleep (2);
(xi) Fatigue (4); &
(x) Appearance (1)

12 items, 3 subscales

(i) Physical Health (4);
(ii) Mental Health (4); &
(iii) Cognitive Function (4)

4 point scale from 1 (definitely true) to 4 (definitely false).
Higher values indicate more positive expectations on ageing
(Score range: 12-48)

PAA (the subscale that assesses attitudes to ageing) contains 15 items.

The other two subscales of AOS are:
(i) Stereotype Age Decrement (15)
(ii) Social Value of the Elderly (15).

5 point scale from 1 (strongly agrees) to 5 (strongly disagree).
Higher scores indicate lower negative stereotypes, anxiety to personal ageing and high perceived social value.
(Score range: 15-75).
complex or had low correlations with the total score were removed. New items were constructed to replace those eliminated items.
- The revised 60 items (Form 3) were administered to 102 students ($M = 21.9$, $SD = 5.2$) and 118 practitioners ($M = 36.8$, $SD = 14.8$).
- Factorial analysis revealed four subscales with fifteen items each. One subscale was excluded due to low reliability (Adaptive Ability of Older People, $\alpha = .47$).

**Attitudes to Ageing Questionnaire (AAQ)** (Laidlaw et al., 2007).

- A set of items were generated from a literature review and developed through focus groups with 35 older adults (aged 62-95, $M = 75$) worldwide (e.g: Scotland, Spain, UK, USA) (English).
- Further focus groups were run in 15 centers in different cities around the world; involving older adults aged 60 – 80+ years to generate subject areas for inclusion in a measure.
- A preliminary set of items and subject areas were reviewed in a Delphi exercise involving 15 centers to get feedback on content, translation issue, format and design of the scale.
- From the feedback from focus group and Delphi exercise, 44 items were generated and administered in pilot study involving 1356 older adults aged over 60 years old. A series of EFAs and CFAs were conducted and some items were eliminated on the basis of their psychometric properties.
- 33 items from the preliminary study and 24 items; 3 subscales
  (i) Psychological Loss (8);
  (ii) Physical Change (8); &
  (iii) Psychological Growth (8).

5 point scale from 1 (strongly disagree) to 5 (strongly agree). Higher total scores indicated more positive attitudes toward one’s own aging process.
(Score range: 24 – 120)
an additional five items (from the Center’s responses) were administered to 5566 older adults (aged 60-100 years) in a field trial involving 20 centers. CFA and IRT analyses were run, and some items removed.

<table>
<thead>
<tr>
<th>Ageing Perceptions Questionnaire (APQ)</th>
<th>Ireland and Northern Ireland (English)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Older adult focus group participants were asked about their experience of ageing, along with questions based on an adapted version of the Self-Regulation Model (Leventhal, Halm, Horowitz, Leventhal &amp; Ozakinci, 2004). The results were thematically analysed, and used by 16 experts in ageing to develop a pool of items.</td>
<td>32 items; 7 subscales</td>
</tr>
<tr>
<td>-Psychometric properties of 35 items were examined in the first preliminary study (n= 129) and second preliminary study (n = 143) with older adults aged 65 and over, to determine which items should be retained.</td>
<td>(i) Timeline chronic (5);</td>
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<td>(ii) Timeline cyclical (5);</td>
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<td></td>
<td>(iii) Consequences positive (3);</td>
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<tr>
<td></td>
<td>(iv) Consequences negative (5);</td>
</tr>
<tr>
<td></td>
<td>(v) Emotional representations (5)</td>
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<tr>
<td></td>
<td>(vi) Control positive (5); &amp;</td>
</tr>
<tr>
<td></td>
<td>(vii) Control negative (4)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Attitude Toward Own Ageing (ATOA) subscale of the Philadelphia Geriatric Center Morale Scale (PGCMS)</th>
<th>USA (English)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-The PGCMS was developed using 22 items from a morale scale developed by Lawton (1972, cited in Lawton, 1975). These items were validated against ratings given by staff about several hundred older residents’ homes for the elderly. Factor analysis yielded six factor solutions.</td>
<td>The ATOA subscale contains 5 items.</td>
</tr>
<tr>
<td>-The 22 items were completed by 828 older tenants and community residents (M= 72.6).</td>
<td>The other two subscales are:</td>
</tr>
<tr>
<td>-A factor analysis of 17 items with the highest factor loadings from a previous analysis showed three factor solutions.</td>
<td>(i) Agitation (6); &amp;</td>
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<td></td>
<td>(ii) Lonely Dissatisfaction (6)</td>
</tr>
</tbody>
</table>

Participants provide ‘Yes’ and ‘No’ responses. Each ‘yes’ response receives a score of “1” and each ‘no’ response a score of “0”.

(Score range: 0-17)
| **Personal Experience of Ageing (PEA)**  
(Steverink et al., 2001) | Germany (German) | 47 statements were formulated by the research team based on the results of two pilot studies.  
-All 47 items were administered to 4034 Community dwelling participants. 1446 (36%) of participants were aged 40-54; 1475 (36.6%) aged 55-69. \(M = 60\).  
-After a series of EFA, items with factor loading below .4 were removed; 30 items were retained  
-Another factor analysis revealed five factors. The three factors with internal consistency values of at least .70 were retained. | 12 items, 3 subscales (i)Physical decline (4); (ii) Continuous Growth (4); & (iii) Social Loss (4) | 4 point scale from 1 (completely true) to 4 (completely not true). Higher score indicated more positive experience of ageing. (Score range: 12 – 48) |
| **Attitudes Toward Aging VAS (At-Aging-VAS)**  
Ligon et al., (2014) | USA (English) | The wording of the item and scale anchors was developed by the researchers, and later refined on the basis of feedback from six experts in ageing. | One of two single-item visual analogue scales (the other assessing attitudes to older adults). | Participants place an ‘X’ on scale of 0% to 100% anchored with the words ‘Negative’ and ‘Positive’ (10 centimeter in length). The number closet to the ‘X’ was considered to be numeric representation of participants’ attitudes to own ageing. |
Details of the Validation Studies

Table 2 presents the details of the 21 validation studies identified through the systematic review. The five scales that were originally developed for use in older people were validated in younger samples to which they had been developed for. The other five scales were validated in the same or similar age groups to which they were developed. Nine of the validation studies resulted in slightly modified versions of the original scales being produced with, for instance, items revised, deleted or moved to different subscales.

The measure that had been validated most frequently in younger populations was the AAS, which was validated in six studies (Gao, 2012; Koukouli, Pattakao-Parasyri & Kalaitzaki, 2013; Lasher & Faulkender, 1993; Mir & Mir, 2014; Ornelas et al., 2016; Sargent-Cox, Rippon & Burns, 2014), followed by the RAQ (n = 4) (Gething, 1994; Gething et al., 2004; Netz, Guthrie, Garamszegi & Dennerstein, 2001; Faudzi, Armitage, Bryant & Brown, 2018). Two studies validated the ERA-12 (Joshi, Malhotra, Lim, Ostbye & Wong, 2010; Park & Kweon, 2014); the PAA (Kafer et al., 1980; Lynch, 2000); and ATOA (Miche, Elsasser, Schilling & Wahl, 2014; Jung & Siedlecki, 2018). The other five measures were validated in just one study each (e.g., ERA-38; AAQ; APQ; PEA; AT-Ageing-VAS).

All articles were written in English, except those by Ornelas et al. (2016) and Park and Kweon (2014), which were written in Spanish and Korean, respectively. Most of the measures were validated in their original language: German for the PEA, and English (in Australian, British, American, Canadian, and Singaporean populations) for
the remainder. Translated versions of some measures were also validated. Authors of eight of these studies performed the translations themselves. These were for the AAS (which was translated into Chinese, Greek & Persian); RAQ (Swedish, Malay); ERA-12 (Korean), APQ (French); and ATOA (German), although the translation process was not described for the latter scale (Miche et al., 2014; Jung & Siedlecki, 2018). One study (Ornelas et al., 2016) used an existing Spanish version of the AAS by Rivera-Ladesma, Lena, Rangel and Sanchez-Sosa (2007) in a Mexican population. Quality ratings of the translation procedures for this study (i.e. items 4-11 cross-validity box of COSMIN) were therefore made on the basis of information from the Rivera-Ladesma et al., (2007) paper.
Table 2 Details and Results of the Validation Studies Identified in the Review.

<table>
<thead>
<tr>
<th>Measures</th>
<th>Country &amp; Scale Validated Version</th>
<th>Study Design</th>
<th>Sample Characteristics</th>
<th>Version of Measure Assessed</th>
<th>Modifications Made to Measure</th>
<th>Reliability</th>
<th>Validity</th>
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<tbody>
<tr>
<td>AAS</td>
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<tr>
<td>Lasher &amp; Faulkender (1993)</td>
<td>USA (English)</td>
<td>Cross-sectional</td>
<td>312 Undergraduate students and adults from elderly foster grandparents program. (aged under 25 - over 74 years)</td>
<td>Original AAS development study.</td>
<td>NA</td>
<td>Internal Consistency: Overall (.82)</td>
<td>- Content Validity: The initial 84 items were deemed ‘sufficient’ to capture the theoretical construct based on a sorting exercise by three graduate psychology graduates. - Structural Validity: Exploratory Factor Analysis (EFA) was conducted, and only items loading greater than .4 (and that were considered to have good face validity within the emerging factor structure) were retained. Twenty items (from four factors) were retained, which accounted for 50.60% of the total variance. - Hypothesis Testing: The four subscales and total score correlated significantly with Self-Efficacy ($r = - .516$) and Facts on Aging Scale ($r = - .193$).</td>
</tr>
<tr>
<td>Gao (2012)</td>
<td>Taiwan (Chinese)</td>
<td>Cross-sectional</td>
<td>334 Students and volunteers. 176 Young (19-32, $M = 20.6$ years)</td>
<td>Chinese translation (by author) of original AAS by Lasher &amp; Faulkender</td>
<td>Scale modified during validation to 16 items across 4 subscales: Fear of Old People (4 items); Physical Appearance (.71); &amp; Fear of Losses (.69).</td>
<td>Internal Consistency: (of 16-item scale) CTT: Fear of Old People (.88); Psychological</td>
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<tr>
<td>Author(s)</td>
<td>Country (Language)</td>
<td>Study Design</td>
<td>Sample Size</td>
<td>Description</td>
<td>Internal Consistency</td>
<td>Structural Validity</td>
<td>Cross-cultural Validity</td>
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<tr>
<td>Koukouli et al. (2013)</td>
<td>Greece (Greek)</td>
<td>Cross-sectional</td>
<td>320 participants: 147 health care professional 18-65 (Mdn = 36-40 years); 74 students 21-45 (Mdn = 21-25 years); 99 community residents 23-59 (Mdn = 31-35 years)</td>
<td>Greek translation (by authors) of the original AAS by Lasher &amp; Faulkender (1993)</td>
<td>No modifications.</td>
<td>-Structural Validity: CFA of 20-item version was performed. CFA showed unacceptable fit (Model I). Error covariance was identified in item 5 and 17, thus were incorporated in Model II. Due to content overlapped in item 1 and 13 (Model III), the error covariance was also incorporated. Model III was the best fitting model (CFI = .91, RMSEA = .07). No information about amount of variance accounted for provided. -Cross-cultural Validity: Although there was overlapping content, internal consistency values were comparable to original version, and so no changes were made. CFA confirmed original four factor structure.</td>
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<tr>
<td>Mir &amp; Mir (2014)</td>
<td>Iran (Persian)</td>
<td>Cross-sectional</td>
<td>84 undergradua</td>
<td>Persian translation</td>
<td>No modifications.</td>
<td>-Structural Validity: EFA was conducted and produced the original</td>
<td>-Measurement Invariance: IRT of 18 items led to another two items were removed due to differential item functioning between age; young and old groups (items 3 and 17). Measurement invariance across genders was demonstrated.</td>
</tr>
</tbody>
</table>

Elderly (50-84, M = 62.9 years) (1993) Psychological Concerns (4 items); Physical Appearance (3 items); Fear of Losses (5 items).

IRT: Fear of Old People (.86); Psychological Concerns (.71); Physical Appearance (.73); & Fear of Losses (.73).

Structural Validity: EFA was conducted and produced the original
| Sargent-Cox et al., (2014) | Australia (English) | Cross-sectional | 783 Residents of Australian Capital Territory from a private sector agency. | Original AAS by Lasher & Faulkender (1993) | No modifications. | Internal Consistency: Cronbach’s alphas for subscales: Fear of Old People (.80); Psychological Concerns (.80); Physical Appearance (.73); & Fear of Losses (.59). | -Structural Validity: CFA of 20-item version was performed and supported the original first order four-factor structure of the AAS. It was a better model ($x^2=491$, CFI = .911, RMSEA = .050) than second order model ($x^2=509$, CFI = .906, RMSEA = .051). No information about amount of variance accounted for presented. | Measurement Invariance: AAS | Overall (.76). Further test of internal consistency was conducted by excluding item 7 to see if any improvement is attained or not. Overall scale improved to .84 if removing item 7. Cronbach’s alphas for subscales: Fear of Old People (.81); Psychological Concerns (.71) (Improved from .31 if deleting item 7); Physical Appearance (.76); & Fear of Losses (.59). Four-factor solution. The overall model explained 63.31% of the scale variance. | Cross-cultural Validity: CFA not applied and differential item functioning (DIF) not assessed. |
20-97 ($M = 57.3$ years, $SD = 13.66$) & Fear of Losses (.69).

Factor loadings were equal across males and females, except for Fear of Losses domain, where one item (item 17) cross-load onto Psychological concerns in female. AAS factor loadings in mid age showed adequate fit, but a poorer fitted in younger and older age group. For young adults, model fit was enhanced by correlating residual variance of item 8, 12, 14 and 15. For older age group, model fit was improved by cross-loading item 20 from Physical Appearance with Fear of losses. Importantly, invariance across age was only achieved when three items from the Fear of Losses scale (2, 8, and 14) were not constrained, suggesting that loadings for these items were not invariant.

Ornelas et al., (2016) Mexico (Spanish) Cross-sectional 825 university students (Subsample 1: 414 men & Subsample 2: 411 men) Spanish version of AAS by Rivera-Ladesma et al., 2007 Scale modified during validation to 14 items with 4 subscales: Fear of Elderly (5 items); Physical Appearance (4 items); Psychological Concerns (3 items) & Fear of Losses (2 items).

**Internal consistency:**
(of 14-item scale) Subsample 1: Fear of Old People (.86); Psychological Concerns (.70); Physical Appearance (.83); & Fear of Losses (.75).

Subsample 2: Fear of Old People (.86); Psychological Concerns (.70);

- **Structural Validity:** CFA of 20-item version was performed. Model M1 is acceptable but not optimal (Subsample 1: CFI = .91, RMSEA = .064, Variance 57%; Subsample 2: CFI = .89, RMSEA = .073, Variance 59%). Therefore, 6 items were deleted in Model M1B (Items 2, 4,5,6,7 and 16). With the remaining 14 items, this model showed optimal result (Subsample 1: CFI = .98, RMSEA = .044, Variance 68%; Subsample 2: CFI = .95, RMSEA = .064, Variance 68%).

- **Cross-cultural Validity:** CFA showed that the original factor structure was not optimal, but within
RAQ

<table>
<thead>
<tr>
<th>Gething (1994)</th>
<th>Australia (English)</th>
<th>Cross-sectional</th>
<th>531 Health professional. (20-69 years)</th>
<th>Original RAQ development study.</th>
<th>NA</th>
<th>Physical Appearance (.83); &amp; Fear of Losses (.75).</th>
</tr>
</thead>
</table>

**Internal consistency:** Overall for 30 items (.81)

Cronbach’s alphas for subscales (for 27 items):
Anxiety about the Future (.78);
Physical Well-being (.72);
Psychological Well-being (.62);
Denial of ageing (.68);
Isolation (.49) & Activity (.20)

- **Structural Validity:** EFA was conducted on 30 items. Items that did not achieve high loading were excluded. Six factors with 27 items were derived, which accounted for 36.2% of overall variance.

- **Hypothesis Testing:** RAQ showed significant relationship with Ageing Semantic Differential (r = -.26) and the Facts about Ageing Quiz (r = .13).

| Gething et al.,(2004) | Australia, United Kingdom, Sweden (English & Swedish) | Cross-cultural | 467 Health professional. | Swedish translation (by authors); and original 27-item RAQ by Gething (1994) | Scale modified during validation to: Australia: 15 items with 3 subscales: Negativity about Growing Older (8 items); Perceived Personal | Internal consistency: (of 15-item scale for Australia and 16 items for UK and Sweden )
Overall :Australia & Sweden (α = .87); UK (α = .88) |
|----------------------|----------------------------------------------------------|-----------------|-------------------------|---------------------------------|-------------------------------------------------|-------------------------------------------------|

- **Internal consistency:** Overall for 15 items for Australia and 16 items for UK and Sweden

- **Structural Validity:** EFA was conducted in each country. UK: 6 factors were produced that accounted for 57.1% of the variance. Australia: 8 factors explaining 65% overall variance. Sweden: 7 factors accounted for 58.8% variance. Only the first three factors from each country were homogeneous, and so examined in detail. The variances for the three factors were: UK (42.3%); AUS...
Sweden:
(102: aged 15-69 years)

Attributes (3 items); & Positive Aspect of Ageing (4 items).

UK: 16 items with 3 subscales:
Negativity about Growing Older (7 items);
Perceived Personal Attributes (3 items); & Positive Aspect of Ageing (6 items).

Sweden: 16 items with 3 subscales:
Negativity about Growing Older (5 items);
Perceived Personal Attributes (3 items); & Positive Aspect of Ageing (8 items).

(44%) & SWE (41%).

Cross-cultural Validity: 12 items from original version were removed in Australia sample; 11 items were removed in UK and Sweden samples. CFA not applied and DIF not assessed.

Netz et al.,
(2001) Australia
(English) Cross-sectional
381 Middle aged-women Original 27-item RAQ by Gething Subscales content revised during Internal consistency:
Overall (.91)

-Structural Validity: EFA was conducted, and five factors were found, accounted for 47.3% overall
Faudzi et al. (2018). Malaysia Cross-sectional 911 adults aged from 18 – 60 years old. Malay translation (by authors); original 27-item RAQ by Gething (1994); and 8 additional items by authors based on open ended responses about what people think about ageing when they are 65 years old. Scale content revised and modified during validation to: 25 items with 4 subscales: Negative Thoughts about Growing Older (11 items); Perceived Personal Attributes (5 items); Positive Aspect of Ageing (6 items); & Family and Religion (3 items). Internal consistency: Overall for 25 items (.88). Cronbach’s alphas for subscales: Negative Thoughts about Growing Older (.89); Perceived Personal Attributes (.82); Positive Aspect of Ageing (.73); & Family and Religion (.84).

Validation with 5 subscales: Negative thoughts about the future (6 items); Social/Antisocial behavior in old age (3 items); Positive thoughts about the future (8 items); Fear of becoming frail and senile (6 items); & Fear of Death (4 items)

-Structural Validity: EFA was conducted, and 3 subscales similar to Gething et al., (2004) and Netz et al., (2001) were found. One additional factor (Family & Religion) was also identified. The four factors accounted for 40.61% of variance overall.

-Cross-cultural Validity: Nine items from the original version (Gething, 1994) and one new item (from the authors) were removed. CFA was not applied, and DIF not assessed.

-Hypothesis Testing: There was a main effect of age on RAQ scores ($p < .001, \eta^2 = .021$), with higher scores in participants aged 50-60 compared to those aged 18-29 or 30-39 years. There was a main effect of gender ($p = .041, \eta^2 = .005$, with men reporting
### ERA-38

<table>
<thead>
<tr>
<th>Study (Year)</th>
<th>Country (Language)</th>
<th>Design</th>
<th>Sample Size</th>
<th>Age Range</th>
<th>Sample Mean (SD)</th>
<th>Scale</th>
<th>Subscales</th>
<th>Internal Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sparks et al, (2013)</td>
<td>Canada (English)</td>
<td>Cross-sectional</td>
<td>167 Adults</td>
<td>45-74</td>
<td>59.46 (8.18)</td>
<td>Scale modified during validation from 38 items (Sarkisian et al., 2002) to 22 items with six subscales. These six subscales are categorised into two domains: (i) General ageing expectation (GAE) is regarding general aging expectations. (12 items) - Satisfaction/Contentment (4 items); Physical Function (5 items); Cognitive Function (3 items). (ii) Ageing Self-expectation (ASE) is functional health, social health, and sexual function. (10 items)</td>
<td>Internal Consistency: GAE: (of 12-item scale) Overall (.83) Cronbach’s alphas for subscales: Satisfaction/Contentment (.84); Physical Function (.84); Cognitive Function (.88). ASE: (of 10-item scale) Overall (.77); Cronbach’s alphas for subscales: Functional Health (.80); Social Health (.79) &amp; Sexual Function (.78).</td>
<td>Structural Validity: EFA was conducted separately for each domain. GAE: 12 items loaded on three distinct factors which explained 69.7% of the variance. ASE: 10 items produced three distinct factors which explain 67.3% of the total variance.</td>
</tr>
</tbody>
</table>
**ERA-12**

<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Language</th>
<th>Study Type</th>
<th>Sample Size</th>
<th>Age Range</th>
<th>Original Measure</th>
<th>Modifications</th>
<th>Internal Consistency</th>
<th>Structural Validity</th>
<th>Hypothesis Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joshi et al., (2010)</td>
<td>Singapore (English)</td>
<td>Cross-sectional</td>
<td>981 Middle aged participants</td>
<td>41-62 years</td>
<td>Original ERA-12 by Sarkisian et al., (2005)</td>
<td>No modifications.</td>
<td>Internal consistency: Overall ERA-12 &amp; all subscales exceeded .7</td>
<td>Structural Validity: EFA of 12-item version was performed; and three factors (physical health; mental health and cognitive function) explained 64% of the variance.</td>
<td>Hypothesis Testing: Total ERA-12 had a significant positive correlation with self-rated health (SRH, ( r = .13 )) and a negative correlation with Geriatric Depression Scale (GDS-5, ( r = -.25 )).</td>
<td></td>
</tr>
<tr>
<td>Park &amp; Kweon (2014)</td>
<td>Korea (Korean)</td>
<td>Cross-sectional</td>
<td>298 Middle-aged and elderly women</td>
<td>40-75 years ( ( M = 54.3 ) years, ( SD = 8.2 ))</td>
<td>Korean translation (by authors) of original ERA-12 by Sarkisian et al., (2005)</td>
<td>No modifications.</td>
<td>Internal consistency: Overall (.81)</td>
<td>Structural Validity: EFA was performed. Three original factors structure were found, explaining 56% overall variance.</td>
<td>Hypothesis Testing: Total ERA-12</td>
<td></td>
</tr>
</tbody>
</table>
40’s (29.9%); 50’s (39.6%)

Cognitive Function (.73)

(\(r = .33\)); Physical health (\(r = .13\)) and mental health (\(r = .39\)) subscales showed significant positive correlation with Rosenberg Self-Esteem Scale (RSES)

**Cross-cultural Validity:** CFA was not applied and DIF was not assessed.

### PAA Subscale (AOS)

<table>
<thead>
<tr>
<th>Source</th>
<th>Country</th>
<th>Language</th>
<th>Study Design</th>
<th>Participants</th>
<th>PAA Subscale</th>
<th>Internal consistency:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kafer et al., (1980)</td>
<td>USA</td>
<td>English</td>
<td>Cross-sectional</td>
<td>118 Practitioners ((M = 36.8) years, (SD = 14.8)); and 102 students ((M = 21.9) years, (SD = 5.2))</td>
<td>PAA subscale from Kafer et al., (1980).</td>
<td>NA</td>
</tr>
<tr>
<td>Lynch (2000)</td>
<td>USA</td>
<td>English</td>
<td>Cross-sectional</td>
<td>979 adults 538 adults aged 18-39 ((M = 29) years, (SD = 6.06)); 216 adults aged 40-49 years &amp; 225 adults aged 50-64 ((M = 56.32) years, (SD = 4.66))</td>
<td>Seven indicators of Personal Ageing Anxiety Scale drawn from Kafer et al., (1980)</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Structural Validity:** CFA showed the first model with all 7 items loading onto ageing anxiety was acceptable but not impressive (\(X^2\)s ranging from 103 – 130; RMSEAs ranging from .034 - .052), Model 2 (in which the error covariance between physical disability (items 5) and loss of cognitive ability to make decision (item 7) was added was better (\(X^2\)s ranged from 36 – 77). RMSEAs ranged from .019 - .021). Model 3 was better after removal of social loss (\(y6\)) (\(X^2\) ranged from 20-36; RMSEA ranged from .01 - .023). No information about amount of variance accounted for presented.
### Measurement Invariance

The remaining six items tap the same latent dimension between races (White & non-white); and sexes, but there are variations in the meaning of indicators across ages.

### Structural Validity

CFA showed the original model fitted poorly. For the model without correlated residuals ($\chi^2 = 1347$, CFI= .85, RMSEA = .098); and with correlated residuals ($\chi^2 =1109$, CFI=.879, RMSEA = .088). ESEM solution with three factors; and inclusion of correlated residual improved model fit ($\chi^2 = 519$, CFI=.954, RMSEA = .060). No information about amount of variance accounted for presented.

### Measurement Invariance

The three factor ESEM solution was fitted to both mid and older age groups, with the exception of item 13, which varied between groups.

### AAQ


| APQ

| Ingrand et al., (2012) | France (French) | Cross-sectional | 262 Residents from the electoral register. | French translation (by authors) of original APQ by Barker et al., (2007). | No modifications. | Internal consistency: Cronbach’s alphas for subscales: Timeline chronic (.77); Timeline cyclical (.88); Consequences |

### Structural Validity

CFA was performed and the seven subscales model produced an acceptable, but not exact, fit: RMSEA = .069; CFI = .95). No information about amount of variance accounted for presented.

### Cross-cultural Validity

Original factor structure confirmed.

### Measurement Invariance

A second
positive (.75); Consequences negative (.82); Emotional representations (.88); Control positive (.62); Control negative (.59).

Model constraining the factor loadings to be equal in the two age groups lead to larger significant value than the first model, which assumed different parameters in the two age groups (<65) and (>65). Model with constrained factor loadings, although significant worse than one with different parameters, still showed a reasonable level of fit (RMSEA = .071; CFI = .94).

**ATOA subscale (PGMCS)**

| Miche et al., (2014) | Germany (German) | Longitudinal: 12 years. T1 (92/93) T2 (96/97) T3 (04/05) | Middle age: T1 = 501 (M = 43.8 years, SD = 0.9) T2 = 447 (M = 47.6 years, SD = 0.9) T3 = 408 (M = 55.3 years, SD = 1.1) | German translation (by authors) of the 5 items of the original ATOA subscale of the PCGMS (Lawton, 1975) | No modifications. | NA |

| Jung & Siedlecki (2018) | Germany (German) | Cross-sectional | Middle aged (40-60 years old) = 2617 (M = 51.5, SD = 5.65). | German translation of the 5 items of the original ATOA subscale of the PCGMS (Lawton, 1975) drawn from the longitudinal scale modified during validation to 4 items | Internal consistency: Cronbach’s alphas for five items (in total sample): (.75). | - Measurement Invariance: CFA showed the 5 items loaded on one common factor in middle age samples and across all three measurement waves. Items 2 and 4 indicated increasing item difficulties in this age group, therefore showed evidence of lack of measurement invariance across age groups. - Structural Validity: CFA was performed on data for the total sample for a one-factor model with 5 items, but the model fit was below the satisfactory range (χ² = 342.30, df = 5, RMSEA = .107, CFI = .94). The one-factor model with 4-items (excluding useful) showed improved fit model and was the best fitting model (χ² = 51.91, df = 2, RMSEA = .065, CFI = .99). No information about amount of variance accounted...
Young old (61-74) = 2429 (M = 67.97 years, SD = 3.83).
Old-old (75+) = 1045 (M = 79.62 years, SD = 3.37).

German Ageing Survey of the German Centre of Gerontology.

Hypothesis Testing: Age was significantly correlated with ATOA (-.15); Life Satisfaction (LS) (.10); Positive Affect (PA) (-.17); and Negative Affect (NA) (-.13).

Structural models assessing the relationships between the ATOA items and items assessing related constructs of LS, PA and NA showed significant and moderate positive correlations between the ATOA factor and LS (r = .70) and PA (r = .64) factors, and weak negative correlations between the ATOA and NA factors (r = -.30). ATOA items also continued to load significantly on the ATOA factor when paths between ATOA variables and the LS, PA and NA variables were added to the model.

Measurement Invariance:
Configural invariance (structure across groups) ($\chi^2 = 49.19, \text{df} = 6, \text{RMSEA} = .060, \text{CFI} = .99$) and metric invariance (factor loading across group) ($\Delta \chi^2 = 12.00, \Delta \text{df} = 6, \Delta \text{CFI} = .002$) was observed across the three age groups. However, scalar invariance (item intercept across groups) was not observed across groups, suggesting that the observed intercepts are not invariant ($\Delta \chi^2 = 337.40, \Delta \text{df} = 8, \Delta \text{CFI} = .081$). Partial scalar invariance across age groups was attained by allowing the intercept of three items (pep, happy and worse) for presented.
Hypotheses Testing

Cross-cultural Validity

Measurement Invariant

PEA
Steverink et al., (2001)
German
Cross-sectional
4034 Community dwelling

Original PEA development study

NA

Internal consistency:

12 items (following two initial rounds of item reduction) were retained. The total amount of variance explained by three factors adds to 60.5%.

Structural Validity:

10.27, Δdf = 2, ΔCFI = .005). One aspects of structural invariance was also equivalent across age groups.

At-Ageing-VAS
Ligon et al., (2014)
USA
Cross-sectional
198 students (Both T1 & T2)

Original At-Ageing-VAS development study.

Reliability:

ICC: .84, 95% CI (.780, 874) (Time interval: 1 week)

Content Validity:

Operational definitions were submitted to a panel of six content experts (five gerontology experts, one sociologist) for further feedback on the content of the scales. 5/6 agreed that VAS measured the attitudes toward own ageing construct. Reviewers reported concerns regarding the anchor, thus the anchors of the scale were changed.

Hypothesis Testing (with modified anchors): Positive significant relations
between ATOA, YAS, & AAS: Session 1 was .38, and .43 for session 2.
Measurement Properties and Methodology Quality Assessments

Table 3 lists the methodological quality scores for the investigation of each psychometric property in each study. The most commonly assessed properties were structural validity (n=18) and internal consistency (n = 17), followed by cross-cultural validity (n = 8, although seven of these described the translation process only); measurement invariance (n = 7); hypothesis testing (n = 6); content validity (n = 3); and test-retest reliability (n = 1). None of the measures included in our review had had all of its measurement properties assessed. Quality ratings varied from poor to excellent, with ‘fair’ being the most frequent rating across all domains assessed, except for cross-cultural validity, for which seven out of eight studies assessed were rated as being ‘poor’ quality.
### Table 3 Methodological Quality of each Study

<table>
<thead>
<tr>
<th>Study</th>
<th>Internal Consistency</th>
<th>Reliability</th>
<th>Content Validity</th>
<th>Structural Validity</th>
<th>Cross-cultural Validity</th>
<th>Hypotheses Testing</th>
<th>Measurement Invariance</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAS Lasher &amp; Faulkender</td>
<td>Fair</td>
<td>Fair</td>
<td>Fair</td>
<td>Fair</td>
<td>Fair</td>
<td>Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>Gao</td>
<td>Fair (IRT &amp; CTT)</td>
<td>Fair</td>
<td>Fair (IRT &amp; CTT)</td>
<td>Poor*</td>
<td>Poor*</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>Koukouli et al.</td>
<td>Fair</td>
<td>Fair</td>
<td>Poor*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mir &amp; Mir</td>
<td>Fair</td>
<td>Fair</td>
<td>Poor*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sargent-Cox et al.</td>
<td>Fair</td>
<td>Fair</td>
<td>Poor*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ornelas et al.</td>
<td>Fair</td>
<td>Fair</td>
<td>Poor*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAQ Gething</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Poor</td>
<td></td>
<td>Poor</td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Gething et al.</td>
<td>Poor (AUS;UK &amp; SWE)</td>
<td>Poor (AUS;UK &amp; SWE)</td>
<td>Poor (UK &amp; SWE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netz et al.</td>
<td>Poor</td>
<td>Fair</td>
<td>Poor*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faudzi et al.</td>
<td>Good</td>
<td>Good</td>
<td>Fair *</td>
<td>Good</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERA-12 Joshi et al.</td>
<td>Excellent</td>
<td>Good</td>
<td>Fair</td>
<td>Poor (SHR)/</td>
<td>Fair (GDS-5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Park &amp; Kweon</td>
<td>Fair</td>
<td>Poor</td>
<td>Fair</td>
<td>Poor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAA Kafer et al.</td>
<td>Poor</td>
<td></td>
<td>Fair</td>
<td>Poor*</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lynch</td>
<td></td>
<td></td>
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<tr>
<td>ERA-38 Sparks et al.</td>
<td>Fair</td>
<td></td>
<td>Fair</td>
<td></td>
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<tr>
<td>ERA-38 Ingrand et al.</td>
<td>Excellent</td>
<td></td>
<td>Excellent</td>
<td>Poor*</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AAQ Brown et al.</td>
<td>Fair</td>
<td></td>
<td>Fair</td>
<td></td>
<td></td>
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<tr>
<td>ERA-38 Michi et al.</td>
<td>Fair</td>
<td></td>
<td>Fair</td>
<td></td>
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<tr>
<td>Jung &amp; Siedlecki</td>
<td>Fair</td>
<td></td>
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<td></td>
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<tr>
<td>PEA Steverink et al.</td>
<td>Fair</td>
<td></td>
<td>Fair</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>At-O-A-VAS Ligon et al.</td>
<td>Fair</td>
<td></td>
<td>Fair</td>
<td></td>
<td></td>
<td></td>
<td>Good</td>
</tr>
</tbody>
</table>
*Studies that described a translated measure, but for which cross-cultural comparisons had not been performed. For these studies, only items 4 to 11 of the cross-cultural validity box were used to provide a rating of the quality of the translation process only.

a The translation procedures used to inform the quality rating for cross-cultural validity for this study came from Rivera-Ladesma et al (2007).

Data Synthesis

The synthesised results relating to the psychometric properties of the ten measures (and their subscales) are presented in Table 4, and considered in detail below.

Anxiety about Ageing (AAS)

The AAS was designed to assess anxieties about ageing as distinct from other influences on anxiety (e.g., death, see Lasher & Faulkender, 1993). There is moderate positive evidence for internal consistency and structural validity using the total score of the AAS (Table 4). However, only one of the four subscales (the ‘Fear of Old People (FOP) subscale) has the same moderate level of positive evidence for internal consistency, with conflicting evidence for the other three subscales. Limited positive evidence was found for the full scale and all four subscales for hypothesis testing, whereas limited positive evidence of measurement invariance was seen for three of the four subscales only. Conclusions about the cross-cultural validity of the translated versions of the scale or subscales could not be made due to the poor quality of the studies assessing this.

Reactions to Ageing Questionnaire (RAQ)

The RAQ was designed to assess how individuals anticipate their own personal ageing in future (Gething, 1994). Strong evidence for high internal consistency across the full
scale, and two of the subscales of the original version of the RAQ, was found. Moderate positive evidence for internal consistency of four subscales of the revised version of the RAQ was also found (Table 4). However, differences in the number and content of the factor structures reported and assessed across studies meant that it was not possible to synthesise data relating to the subscales across all studies. Conflicting evidence was reported for structural validity of the whole scale, while insufficient evidence was available to draw conclusions about cross-cultural validity (Gething et al., 2004 version) and hypothesis testing (Gething, 1994 version; Faudzi et al., 2018) of the RAQ.

*Expectations Regarding Ageing-38 (ERA-38)*

The ERA-38 was originally designed to measure older adults’ expectations regarding ageing (Sarkisian et al., 2002), but was validated here in a study involving participants aged over 45 years (Sparks, Meisner & Young, 2013). Limited positive evidence of internal consistency was found for the total score of the ERA-38 (for both Ageing Self-expectation (ASE) & General Ageing Expectation (GAE) subscales); and all subscales of the ERA-38 (Table 4). A similar level of evidence was also found for structural validity of the total score of ERA-38 (for both ASE & GAE subscales).

*Expectations Regarding Ageing-12 (ERA-12)*

The ERA-12 is a short form of the ERA-38 (Sarkisian et al., 2005). Strong evidence for high internal consistency was found for the full scale and two of the three subscales of the ERA-12. Moderate positive evidence for structural validity and hypothesis testing was also found for the full-scale, with more mixed results relating to hypothesis testing.
using the subscales. There was insufficient evidence to draw conclusions about content and cross-cultural validity (Table 4).

**Personal Anxiety toward Ageing (PAA)**

The PAA subscale relates to one’s anxiety, uneasiness, fear, or dread concerning aging (Kafer et al., 1981). There was insufficient evidence available for internal consistency and structural validity; while conflicting evidence was found for the measurement invariance of the PAA (Table 4).

**Attitudes to Ageing Questionnaire (AAQ)**

The AAQ was originally designed to assess the experience and attitudes of older adults with regards to the ageing process (Laidlaw et al., 2007), but was used in a middle-aged sample in Brown et al. (2015). However, there was insufficient evidence to draw conclusions about the structural validity and measurement invariance properties for the AAQ in this sample (Table 4).

**Ageing Perception Questionnaire (APQ)**

The APQ was designed to assess self-perception of ageing (Barker et al., 2007). Strong evidence of high internal consistency was found for five of the seven subscales of the APQ, with strong negative evidence for the other two (Table 4). There was limited positive evidence to show that the total APQ score, which was shown to be invariant across age groups. However, there was insufficient evidence to draw conclusions about assessment of the structural or cross-cultural validity of the total score of the APQ.
Attitudes toward Own Ageing (ATOA)

The ATOA, a subscale of PGCMS, was developed to assess self-perception of ageing (Lawton, 1975). Limited positive evidence was found for the internal consistency and hypothesis testing of this subscale, while measurement invariance for the ATOA subscale indicated the evidence to be conflicting. There was insufficient evidence to draw conclusions about assessment of the structural validity of the ATOA subscale (Table 4).

Personal Experience of Ageing (PEA)

The PEA was designed to measure the personal experience of ageing (Steverink et al., 2001). Limited positive evidence was found for the structural validity of the full-scale, and for the internal consistency of all three subscales (Table 4).

Attitude-Aging-Visual Analogue Scales (At-Ageing-VAS)

The At-Ageing-VAS was a single-item measure specifically designed to capture potential changes in attitudes toward one’s own ageing process (Ligon et al., 2014). A test-retest reliability and content validity were evaluated for this scale, both of which provided limited positive evidence for the strength of these properties. However, moderate negative evidence was found for hypothesis testing of At-Ageing-VAS (Table 4).
### Table 4 Quality of Measurement Properties per Questionnaire

<table>
<thead>
<tr>
<th>Measure (and subscales)</th>
<th>Internal Consistency</th>
<th>Reliability</th>
<th>Content Validity</th>
<th>Structural Validity</th>
<th>Cross-Cultural Validity</th>
<th>Hypothesis Testing</th>
<th>Measurement Invariant</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAS – Total score</td>
<td>++</td>
<td>+</td>
<td>++</td>
<td>?</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Fear Of Old People</td>
<td>++</td>
<td>?</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological Concern</td>
<td>±</td>
<td>?</td>
<td>±</td>
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<td>+++</td>
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<td>- - -</td>
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<td>?</td>
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<tr>
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<td>+ (GAE &amp; ASE)</td>
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<tr>
<td>Satisfaction/ Contentment (GAE)</td>
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<tr>
<td>Cognitive Function (GAE)</td>
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<td>Social Health (ASE)</td>
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| PAA (AOS) – Total score | ? | ? | ± |

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<td>+++</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>Timeline cyclical</td>
<td>+++</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>Consequences positive</td>
<td>+++</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>Consequences negative</td>
<td>+++</td>
<td>?</td>
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<tr>
<td>Emotional representations</td>
<td>+++</td>
<td>?</td>
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<td>Control positive</td>
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<td>?</td>
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<tr>
<td>Control negative</td>
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<p>| ATOA (PGMCS) – Total score | + | ? | + | ± |</p>
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<td>Social Loss</td>
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<th>Strong evidence of positive/negative result. i.e. Consistent findings in multiple studies of ‘good’ methodological quality OR in one study of ‘excellent’ methodological quality;</th>
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<tr>
<td>±</td>
<td>Conflicting evidence. i.e. Conflicting findings</td>
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<tr>
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<td>Unknown; i.e. Only studies of ‘poor’ methodological quality OR lack of relevant information reported.</td>
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Discussion

The aims of the present review were to identify and evaluate the psychometric properties of measures of attitudes to ageing that have been validated in younger adult samples. Twenty-one studies, describing ten measures were identified. These ranged from single-item to multi-scale measures, which were suited to a range of different age groups, and had been translated into nine different languages. However, whilst assessments of structural validity and internal consistency were available for most studies, other psychometric properties were assessed less frequently. The quality of the studies assessing psychometric properties was also rated as fair or poor in many cases, which limits the strength of the conclusions that can be drawn about the psychometric properties of each measure.

The review revealed considerable diversity in terms of the types of measurement tools available, and the populations to which they have been targeted. One key dimension on which the tools differed was the age group for which they had originally been developed. Five measures identified in the present review (AAQ, APQ, ATOA, ERA-12, ERA-38) were initially developed for evaluating attitudes to personal ageing in people aged over 60, but have subsequently been administered to middle aged (40 years and older), but not younger, adults. For example, one measure (the ERA-38), several items had been removed leaving those 22 items that were deemed suitable for middle age participants (Sparks et al., 2013). Given that the meaning and content of attitudes to ageing changes with increased experience of aging (Barret & Montepare, 2015), and that items in some of these measures required participants to reflect on their own ageing
experiences, it is unclear how well these measures would perform in people younger than 40. In contrast, four measures (the AAS; RAQ; PAA; and At-Ageing-VAS) had been developed and validated for adults as young as 18 years old. As items in these measures ask about the general construct of the ageing process, rather than requiring participants to reflect on their own experiences of ageing, they would be more appropriate for researchers who work with wider age ranges.

Another key dimension on which the tools differed was diversity in the number of languages/cultures in which the measures had been evaluated. Seven measures have been validated in Western countries, and just three (AAS, RAQ & ERA-12) in Eastern countries. As the content of attitudes to ageing is believed to differ between Western (more individualistic) and Eastern (more collectivist) cultures (Lockenhoff, Lee, Buckner, Moreira, Mertinez & Sun, 2015), it is unclear how well all seven measures would apply to non-Western populations. This suggests that there is a need for existing measures to be more carefully adapted to particular cultural and linguistic groups to ensure that they fully and accurately capture the attitudes held in these populations.

With regard to the second aim of this study, the measures that received positive ratings for the greatest number of psychometric domains were the ERA-12 and the AAS, although some mixed or negative results were also found for some of the psychometrics of these scales or their composite subscales. The ERA-12 (a tool only validated in adults from middle-age onwards) was associated with strong positive evidence in relation to internal consistency; and two moderate positive ratings for structural validity and hypothesis testing. However, information relating to the content validity, cross-cultural validity, test-rest reliability and measurement invariance was not
available. The AAS (a tool validated for use in a wide range of ages, from 18 – 97) can also be considered a good instrument as it has been evaluated in most of aspect of measurement properties, and received two moderate (internal consistency and structural validity) and two limited (content validity and hypothesis testing) positive evidence ratings. Other questionnaires, including the RAQ and At-Ageing-VAS, also showed mostly positive results, but the evidence is inadequate due to information on measurement properties per questionnaire being lacking, or the poor quality of the studies. This makes it difficult to make conclusive comments about how well the psychometric qualities of the tools compare with one another.

The strength of conclusions relating to the psychometric properties of the measures reviewed was limited by the low quality of many of the studies used to assess them. A common reason for poor quality ratings being given was due to either the percentage of missing data not being reported, or no explanation of how missing items were handled being given. Other common reasons for studies being rated as lower quality were: not reporting the internal consistency for each subscale independently (for assessments of internal consistency); the selection of items using the target populations being inadequately performed (for assessments of content validity); only performing exploratory factor analysis, where confirmatory factor analysis would have been more appropriate (for assessment of structural validity); no information being available on the psychometric properties of the comparator instrument (for assessment of hypothesis testing); and the samples being not similar for characteristics, such as educational background and age groups (for assessment of measurement invariance). Other common methodological issues related specifically to measures that had been translated and/or
validated for use in a different language or cultural group. Seven of these studies were rated as being of ‘poor’, and one study rated as being of ‘fair’, quality in terms of their descriptions of the translation and cross-cultural validation procedures that were adopted. The most common reason for the “poor” rating was that the translated instrument was not pre-tested in the target population before use to review for cultural significance and interpretation of the translation. Another reason for cross-cultural assessment being rated as lower quality was due to a lack of clarity as to whether translators worked independently. Researchers conducting future assessments of the psychometric properties of attitudes to ageing measures should therefore address these issues in order to improve the strength of evidence available.

**Conclusion**

This is the first study to identify and evaluate systematically all available measures of attitudes to ageing that have been validated in younger adult populations. Twenty-one articles, relating to 10 different measures, in ten languages, were identified. These ranged from single-item to multi-subscale measures. There was considerable diversity in terms of the types of measurement tools available, and the populations to which they are best suited; including age groups and language of instruments. Overall, the available evidence on the psychometric properties of the measures is inadequate; hence it is advisable to use them cautiously. Our findings do not mean that the existing measures are poorly developed or inadequate, but indicate that studies of high methodological quality are required for more accurate information on the psychometric properties of the ageing attitudes measures. Future research should target the full range of psychometric
properties of ageing attitudes measures, with special focus on reliability, measurement error, content validity and responsiveness.

**Acknowledgments:** The research was supported by the NIHR Manchester Biomedical Research Centre and NIHR Greater Manchester Patient Safety Translational Research Centre, and a PhD studentship from the Malaysian Ministry of Education awarded to FNMF.

**Declarations of interest:** None
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A., Baum, M. Johnston (Ed.), *Handbook of health psychology* (pp.197-123) London: Psychology Press.


Ornelas, M., Gastélum, G., Jeanette, L-W., & Judith M. R-V. (2016). Composición Factorial de la Escala de Ansiedad ante el Envejecimiento de Lasher y Faulkender en Estudiantes Universitarios Mexicanos Factorial Structure of the
Anxiety Aging Scale of Lasher and Faulkender in Mexican University. Stude, 9, 73–80. http://dx.doi.org/10.4067/S0718 5006201600200008


### Appendix (i) Search strategy (using PsycINFO database)

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<td>tool*</td>
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<td>View*</td>
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135
Correlat*
Statistical correlation/
“item* select*”
“item* reduct*”
“test-retest”
Translat*
Explor*
Statistical regression/
“split-half*”
Cross-cultur* adj3 adapt*
Culture* adj3 adapt*

‘self perception*’
‘Self-stereotyp*’
‘Self stereotyp*’
‘age-stereotyp*’
‘age stereotyp*’

Combine by ‘AND’

ag?ing
“age-stereotyp*” adj4
ag?ing
“age stereotyp*” adj4
ag?ing
CHAPTER FOUR

STUDY TWO:

TRANSLATION AND PSYCHOMETRIC ASSESSMENT

OF THE MALAY ANXIETY ABOUT AGEING SCALE

This manuscript has been submitted to the journal ‘British Journal of Psychology’ for peer review.

The format of British Journal of Psychology manuscript is used in the chapter.
CHAPTER 4

Translation and Psychometric Assessment of the Malay Anxiety about Ageing Scale

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Acknowledgments

The research was supported by the NIHR Manchester Biomedical Research Centre and the NIHR Greater Manchester Patient Safety Translational Research Centre, and a PhD studentship from the Malaysian Ministry of Education awarded to FNMF.
Abstract

Objectives: There is a lack of quantitative tools for measuring anxiety about ageing in Eastern populations. As such, psychometric evaluation and adaptation of translated measures of anxiety about ageing are urgently needed in order to ensure that they provide valid and reliable measures in the target population. The aims of the present study were to translate and assess the psychometric properties of a Malay language version of the Anxiety about Ageing Scale (AAS). Method: The AAS was forwards- and backwards- translated from English to Malay, and administered to 915 employees (396 males, 519 female) aged from 18 to 60 years old (M = 36.36) in 67 organisations in Malaysia. Results: Confirmatory factor analysis revealed that model fit was optimised when some modifications were made to the original four-factor structure of the AAS. Consistent with previous research, younger adults and people with lower levels of education reported greater levels of anxiety about ageing, and female participants reported greater concerns about Physical Appearance compared to males. Conclusion: The modified Malay version of the AAS is a reliable and valid measure of anxiety about ageing that can be used to commence research among populations whose first language is Malay.

Keywords: Cultural adaptation; validation; psychometric properties; ageing anxiety; attitudes to ageing
Introduction

Anxiety about ageing encompasses specific fears about the process of ageing (Lasher & Faulkender, 1993) and growing older (Bodner, Shrira, Bergman, & Cohen-Fridel, 2015). Such negative perceptions of ageing have been associated with numerous adverse outcomes, including dissatisfaction with body image (Lewis-Smith, 2014), psychological distress (Bodner et al., 2015), reduced longevity and determination to live (Levy, Slade, Kunkel & Kasl, 2002), and greater levels of ageism towards older people (Wisdom, Connor, Hogan, & Callahan, 2014). Moreover, negative perceptions of ageing held in earlier life have been shown to predict worse health and well-being outcomes in later years (Levy, Slade & Kasl, 2002; Voss, Kornadt & Rothermund, 2017). Understanding more about the causes and correlates of anxiety about ageing in younger age groups is therefore important for improving current and future levels of health and well-being.

The 20-item Anxiety about Ageing Scale (AAS) developed by Lasher and Faulkender (1993) is a commonly-used measure of anxiety about ageing that is suitable to use in various age ranges. It is a multidimensional scale that comprises four factors: (i) Fear of Old People, which relates to views of older adults (ii) Physical Appearance, which relates to concerns about how one’s physical appearance changes with age; (iii) Fear of Losses, which allows people to articulate what may be taken away or lost in old age; and (iv) Psychological Concerns, which taps into more personal or internal issues that one must face in order to facilitate a positive adjustment to old age (Lasher &
Research using the AAS has revealed inconsistent findings regarding the relationships between anxiety about ageing and key demographic variables, including age, gender, and educational background. Some studies report no relationship between age and AAS score (McConatha, Hayta, Rieser-Danner, McConatha & Polat, 2004; Sargent-Cox, Rippon & Burns 2014; Watkins, Coates & Ferroni 1998; Yun & Lachman, 2006), while others report greater anxieties about ageing in younger than older people (e.g., Abramson & Silverstein, 2006; Lynch, 2000; Yan, Silverstein & Wilber, 2011).

Work using the AAS subscales has shown more nuanced patterns, with younger adults reporting greater anxiety in the sub-domains of Physical Appearance (Brunton & Scott, 2015; Gao, 2012; Lasher & Faulkender, 1993), and older adults reporting stronger Fears of Losses (Brunton & Scott, 2015; Gao, 2012; Yun & Lachman, 2006). Findings for the subscales of Psychological Concerns have been more mixed, with Brunton and Scott (2015) and Gao (2012) reporting higher levels of Psychological Concerns in younger than older adults, but Yun and Lachman (2006) reporting the opposite pattern. Furthermore, whilst most studies report greater Fears of Old People in younger samples (Brunton & Scott, 2015; Gao, 2012; Koukouli, Pattakou-Parasyri & Kalaitzaki, 2013), Yun and Lachman (2006) found that this pattern was true in a Korean population, but that the opposite pattern was seen in an American sample. Taken together, these results therefore suggest that other factors, such as cultural or educational background, might interact with age to determine individual levels of anxiety.
With respect to gender, women tend to report greater concerns about Physical Appearance (Bergman, Bodner & Cohen-Fridell, 2013; Brunton & Scott, 2015; Gao, 2012; Koukouli, et al., 2013; Kropf, Cummings & DeWeaver, 2000; McConatha et al., 2004; McConatha, Schnell, Volkwein, Riley & Leach, 2003; Yun & Lachman, 2006) and Psychological Concerns (Bergman et al., 2013) compared to men. In contrast, men have been found to have higher scores than women for Fear of Old People (Brunton & Scott, 2015; McConatha et al., 2004; Lasher & Faulkender, 1993) and Fear of Losses (Lasher & Faulkender, 1993), whilst Watkins et al. (1998) reported no effect of gender. Relatively little research has investigated relationships between educational background and anxiety about ageing, although better educated persons have been shown to be less anxious about ageing than those with the lowest education level (Kropf et al., 2000), at least among people aged 40 and above (Lynch, 2000).

There is evidence that people from Eastern cultures have greater levels of anxiety about ageing compared to those from Western cultures (McConatha et al., 2004; Yun & Lachman, 2006). However, to date, the majority of research into the correlates, causes and consequences of anxiety about ageing has been conducted in Western, Anglophone populations. One reason that research with non-English-speaking populations has been limited is due to the lack of validated, translated measures of anxiety about ageing. We were able to identify just six studies that had undertaken psychometric evaluations of the AAS in languages other than English: Gao (2012); Koukouli, et al., (2013); Ornelas, Gastelum, Lopez-Walle & Rodriguez-Villalobos (2016); Rivera-Ladesma, Lena, Rangel and Sosa (2007); Mir and Mir (2014) and Vezina
and Langis (2013), who evaluated the AAS in Chinese, Greek, Spanish, Persian and French, respectively. All six studies broadly replicated the original four-factor structure of the AAS. However, some psychometric problems related to highly overlapping content and weak factor loadings were identified. For instance, six items in the Spanish (Ornelas et al., 2016); four items in the Chinese (Gao, 2012), two items in the French (Vezina & Langis, 2013), and one item in the Persian (Mir & Mir, 2014) versions had to be eliminated in order to strengthen the factor structure and ensure good fit indices. The analysis of the AAS Greek version (Koukouli et al., 2013) also showed improved fit when slight modifications were made to the original factorial structure. These results therefore highlight the need for careful psychometric evaluation and adaptation of translated measures in order to ensure that they provide valid and reliable measures of anxiety about ageing in the target population.

Malaysia is a non-Western, multi-ethnic country with Eastern values (Ismail, Tan & Ibrahim, 2009), with 14.4% of the overall population (31.7 million) in Malaysia consisting of people aged 60 years and older (Department of Statistics Malaysia, 2016). Qualitative research with Malay women aged 35-59 has revealed that thoughts about the possible negative experience associated with ageing and being old, such as loneliness; the care of their children when they are old; and physical changes that occur with ageing process, are relatively common (Minhat, Hamizah & Nor Afiah, 2015), indicating a need for greater understanding of the causes and correlates of anxiety about ageing in this population. Given the lack of quantitative tools for measuring anxiety about ageing in Eastern populations, the aim of the present study was to translate, adapt, and validate
the ‘Anxiety about Ageing Scale’ for a Malay population of younger adults. Confirmatory Factor Analysis (CFA) was used to examine the fit of the four factor AAS structure proposed by Lasher and Faulkender (1993). The effects of age, gender, education level on levels of Anxiety about Ageing were then examined.

**Method**

**Participants**

Participants were recruited from October-December 2015 from 67 organisations around Kedah, the Northern region of Peninsular Malaysia. Participants had to meet the inclusion criteria of being: 1) aged 18-60 years old, reflecting the typical working age range in Malaysia; and 2) fluent in the Malay language.

**Measures**

**Demographic Details**- Participants' date of birth, gender, ethnicity, education level, native language, and level of Malay language proficiency were collected. Language proficiency was categorised into five levels, adapted from the Interagency Language Roundtable Scale (ILR, 2016). Only those with level 4 (Full Professional Proficiency) and 5 (Native Proficiency) were included in this study, while those in level 1 (Elementary Proficiency); 2 (Limited Working Proficiency); and 3 (Professional Working Proficiency) were excluded.

**Anxiety about Ageing Scale (AAS)** – A Malay version of the 20-item AAS established by Lasher and Faulkender (1993) was developed for this study. For this, the
original AAS was translated from English to Malay using a back translation process (Ozolins, 2009). The English version of the AAS was first translated into Malay by a professional English translator. This translation was then back-translated into English by an independent linguistic specialist. The two English versions were then compared by the research team, and any differences discussed with the linguistic specialist and amended accordingly. In line with guidance for the cross-cultural adaptation of self-report measures (Beaton, Bombardier, Guillemin & Ferraz (2000), the pre-final version was then piloted in a small sample of target participants (twelve Malaysian participants who had been living in the North West of the United Kingdom for fewer than five years). These participants were purposively sampled to ensure a spread of age groups, gender and ethnicities. They came from the three main ethnic groups in Malaysia, namely Malay (n=8); Chinese (n=3) and Indian (n=1); included 5 males and 7 females; and were aged from 18-30 (n=4); 31-45 (n=6); and 46-60 (n=2).

The pilot participants were asked to follow a think aloud’ procedure (Kaklamanou, Armitage & Jones, 2013) as they completed each questionnaire in order to allow any misinterpretations or difficulties in completing the measures to be identified and addressed. A final set of six participants, comprised of three males and females, aged from 18-30 (n=2); 31-45 (n=3); and 46-60 (n=1) then completed the revised questionnaire also using a ‘think aloud’ procedure, and no further issues with the translation were identified.
The final version of the translated questionnaire is available in the Appendix (i) material. For this, participants were asked to indicate the extent of their agreement with 20 statements on a 5-point Likert scale, ranging from strongly agree to strongly disagree, which was the same to the original version by Lasher and Faulkender (1993). Seven items are reverse scored, such that higher scores always specify greater levels of anxiety about ageing. Possible scores on the scale range from 20-100.

Procedure

Ethical approval was obtained from the University of Manchester Research Ethics Committee 5 (Reference: 15330). Approval to conduct the study was also obtained from the Malaysian Economic Planning Unit (MEPU). This study used a convenience sampling method, where the researcher systematically approached public sector organisations listed by the Ministry of Information, Kedah, including schools, hospitals, water and electricity departments, and religious centres.

A letter asking permission to conduct the study in the organisations was first sent to the manager of each organisation. Managers of organisations that had agreed to participate were then given packs of questionnaires that they were asked to distribute to all eligible employees in organisations. Each questionnaire pack was presented in an opaque envelope and contained the researcher's contact details, a copy of the information sheet, and a statement explaining that involvement in the study was voluntary, and that completion of the questionnaire is taken as an indication of the participant’s consent for their data to be used. The questionnaire pack contained the
Malay version of the AAS, as well as a number of other measures relating to attitudes to ageing, health, self-esteem and well-being, which were part of a larger study. The questionnaire was completed anonymously, although participants were asked to provide the first two letters of their mother's forename and the city they were born in, and the date of their birthday, so that this 'code' could be used to match participants with subsequent rounds of data collection planned for the future. Completed questionnaires were collected by the researcher from the managers.

**Results**

Overall, 1731 questionnaires were distributed to managers across 67 organisations. Of these, 957 questionnaires were returned by participants to their managers. However, 31 of these contained at least one full scale that had not been completed, and so were excluded. An additional five questionnaires were excluded as the participants had not met the inclusion criteria of Malay language proficiency. A further five participants missed one or more items of the AAS, and another had scores that were extreme outliers (more than 3* interquartile ranges from the average), and so were also excluded from the analysis. The final analyses therefore related to data from 915 participants.

**Participant Demographics**

Demographic details of the final sample of 915 participants are provided in Table 1. Note that 10 participants did not provide their year of birth, and so their age could not be calculated. The mean age of the other 905 participants was 36.7 years ($SD = 10.1$). The
proportions of each ethnic group differ slightly from Malay population levels, which are reported as 68.6%, 23.4%, and 7.0% for Malay, Chinese, and Indian respectively (Department of Statistics Malaysia, 2016).

Table 1. Demographic Details of Participants

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>All (n=915) (%)</th>
<th>18-29 (n=245) (%)</th>
<th>30-39 (n=356) (%)</th>
<th>40-49 (n=162) (%)</th>
<th>50-60 (n=142) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>396 (43.3)</td>
<td>92 (10.1)</td>
<td>136 (14.9)</td>
<td>77 (8.4)</td>
<td>88 (9.6)</td>
</tr>
<tr>
<td>Female</td>
<td>519 (56.7)</td>
<td>153 (16.7)</td>
<td>220 (24.0)</td>
<td>85 (9.3)</td>
<td>54 (5.9)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>855 (93.4)</td>
<td>234 (25.6)</td>
<td>341 (37.3)</td>
<td>149 (16.3)</td>
<td>121 (13.2)</td>
</tr>
<tr>
<td>Chinese</td>
<td>30 (3.3)</td>
<td>5 (0.5)</td>
<td>7 (0.8)</td>
<td>8 (0.9)</td>
<td>10 (1.1)</td>
</tr>
<tr>
<td>Indian</td>
<td>19 (2.1)</td>
<td>2 (0.2)</td>
<td>5 (0.5)</td>
<td>1 (0.1)</td>
<td>11 (1.2)</td>
</tr>
<tr>
<td>Other</td>
<td>11 (1.2)</td>
<td>4 (0.4)</td>
<td>3 (0.3)</td>
<td>4 (0.4)</td>
<td>0</td>
</tr>
<tr>
<td>Educational Level*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>570 (62.3)</td>
<td>152 (16.6)</td>
<td>238 (26.0)</td>
<td>87 (9.5)</td>
<td>85 (9.3)</td>
</tr>
<tr>
<td>Higher</td>
<td>345 (37.7)</td>
<td>93 (10.2)</td>
<td>118 (12.9)</td>
<td>75 (8.2)</td>
<td>57 (6.2)</td>
</tr>
</tbody>
</table>

*Lower education level = (High school OR certificate/diploma holders)
Higher education level = (Undergraduate OR postgraduate holders)

**Factorial Structure of the AAS**

A confirmatory factor analysis was conducted to determine whether the Malay AAS adequately reflected the original four subscales identified by Lasher and Faulkender (1993). As shown in Table 2, the results of the initial four-factor model suggested a poor fit to the data, meaning that some modification was needed. In the initial model, items 4 (Physical Appearance: *I have never lied about my age in order to appear younger*) and 5 (Psychological Concern: *I fear it will be very hard for me to find contentment in old age*) showed weak factor loadings, of .23 and .24 respectively, suggesting a need for deletion from the scale. Also, whilst item 5 was specified as loading on the Psychological Concerns factor, modification indices showed a cross loading on the Fear of Losses...
factor. A review of the Modification Indices (MI) for the regression weights for item 5 revealed parameters indicative of cross-loading with the highest value ($MI = 250.632$), which stands apart from other possible cross-loading misspecifications. After deletion of item 4 and modification of item 5 to the Fear of Losses factor, goodness-of-fit indices in Model 2 showed further drop in the chi-square value, indicating better fit, and improvement with respect to the CFI (The Comparative Fit Index) and NFI (Normed Fit Index) (See Table 2).

There were also problems with item 20 of the Physical Appearance factor (When I look in the mirror, it bothers me to see how my looks have changed with age). As with item 5, this item showed cross loading with the Fear of Losses factor, with a high regression weight value ($MI = 92.536$). Therefore, Model 3 included a modification of item 20 to the Fear of Losses (Refer to Table 2). Although both item 5 and 20 were considered by Lasher and Faulkender (1993) to measure a sense of Psychological Concerns and Physical Appearance respectively, it seems logical that both items also tap into Fear of Losses and indicate individual fear concerning loss of contentment and physical changes. Model 3, in which item 4 is deleted, and items 5 and 20 are modified as described, was therefore deemed the most appropriate for the Malay version.

Table 2. Fit Indices of Measurement Models

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CMIN/D</th>
<th>RMR</th>
<th>SRMR</th>
<th>NFI</th>
<th>CFI</th>
<th>GFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial</td>
<td>1112.81</td>
<td>164</td>
<td>6.785</td>
<td>.078</td>
<td>.087</td>
<td>.79</td>
<td>.81</td>
<td>.89</td>
<td>.080</td>
</tr>
<tr>
<td>Model 2</td>
<td>647.59</td>
<td>146</td>
<td>4.436</td>
<td>.049</td>
<td>.060</td>
<td>.87</td>
<td>.90</td>
<td>.93</td>
<td>.061</td>
</tr>
<tr>
<td>Model 3</td>
<td>508.50</td>
<td>144</td>
<td>3.531</td>
<td>.033</td>
<td>.055</td>
<td>.90</td>
<td>.93</td>
<td>.94</td>
<td>.053</td>
</tr>
</tbody>
</table>
Model 3 generally produced acceptable indices of goodness of fit, meeting the criteria of having an RMSEA value ≤.06, and a SRMR (standardised root mean square residual) ≤ .08, (Hu & Bentler, 1999). The NFI of .90 also indicates an acceptable fit (Schermelleh-Engel, Mossbrugger & Muller, 2003). The CFI does not quite meet the desired criterion of being ≥ .95 (Hu & Bentler, 1999). Nevertheless Model 3 represents the final best fitting and most parsimonious model for our data. Table 3 therefore shows the factor loadings of this revised factorial structure.
Table 3. Factor Loadings for Model 3 of the Anxiety about Ageing Scale

<table>
<thead>
<tr>
<th>Items</th>
<th>Fear of Old People</th>
<th>Subscales</th>
<th>Physical Appearance</th>
<th>Fear of Losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoy being around old people</td>
<td>.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like to go to visit my older relatives</td>
<td>.65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I enjoy talking with old people</td>
<td>.79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel very comfortable when I am around an old person</td>
<td>.66</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I enjoy doing things for old people</td>
<td>.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will have plenty to occupy my time when I am old</td>
<td>.39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I expect to feel good about life when I am old</td>
<td>.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that I will still be able to do most things for myself when I am old</td>
<td>.44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I expect to feel good about myself when I am old</td>
<td>.62</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It doesn’t bother me at all to imagine myself as being old</td>
<td>.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have never dreaded the day I would look in the mirror and see gray hairs</td>
<td>.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have never dreaded looking old</td>
<td>.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I fear that when I am old my friends will be gone</td>
<td>.64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I fear it will be very hard for me to find contentment in old age</td>
<td>.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The older I become, the more I worry about my health</td>
<td>.44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I get nervous when I think about someone else making decisions for me when I am old</td>
<td>.53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry that people will ignore me when I am old</td>
<td>.68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am afraid that there will be no meaning in life when I am old</td>
<td>.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When I look in the mirror, it bothers me to see how my looks have changed with age</td>
<td>.59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Cronbach’s alpha scores for the sub-scales of this revised factorial structure were also found to be higher, and closer to those from Lasher and Faulkender’s (1993) original scale, than when scored using the original factorial structure (See Table 4). This modified factorial structure was therefore used to calculate the total scores for anxiety about ageing and subscale scores for the subsequent analyses.

Table 4. Cronbach Alpha Reliabilities for the Subscales of the Malay Anxiety about Ageing Scale

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of Old People</td>
<td>.78</td>
<td>.81</td>
<td>.81</td>
</tr>
<tr>
<td>Psychological Concerns</td>
<td>.74</td>
<td>.55</td>
<td>.64</td>
</tr>
<tr>
<td>Physical Appearance</td>
<td>.71</td>
<td>.70</td>
<td>.75</td>
</tr>
<tr>
<td>Fear of Losses</td>
<td>.69</td>
<td>.71</td>
<td>.79</td>
</tr>
</tbody>
</table>

**Demographic Relationships with Anxiety about Ageing**

The validity of the AAS was explored using a 4 (age) × 2 (gender) × 2 (education level) analysis of variance (ANOVA). For this, ages were grouped into bands spanning 10 years, consistent with Lasher and Faulkender’s (1993) original study. In order to prevent sample sizes in each cell being too small (Cohen, 1988) education levels were grouped into two categories: those respondents with just a high school or certificate/diploma level of education were categorised into lower educational background, whilst those with undergraduate and postgraduate levels of education were categorised into higher educational background. There was a significant main effect of age, $F(3, 889) = 13.78$, $p < .001$, $\eta^2 = .044$. Post hoc Scheffe tests revealed that anxiety about ageing was significantly lower in older age groups (50-60 and 40-49) compared to the younger age
groups (18-29 and 30-39). However, there were no differences in scores between the 40-49 and 50-60 year age groups, or between the 18-28 and 30-39 year age groups (Figure 1). There was no significant main effect of gender, $F(1, 889) = 1.45$, $p=.23$, $\eta^2_p = .006$, but there was a significant main effect of educational background, $F(1, 889) = 5.40$, $p < .05$, $\eta^2_p = .006$, with participants with lower levels of education ($M = 48.94$, $SD = 0.37$) reporting greater anxiety about ageing compared to those with higher levels ($M = 47.52$, $SD = 0.48$). There were no significant interactions. Mean scores for all levels of each factor are presented in Table 5.

Table 5. Means and Standard Deviations for Scores on the Total AAS and Each Subscales. Scores for each subscale have been presented as the mean score per item (i.e. total subscale score divided by the number of items in the subscale).

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total AAS</th>
<th>Fear of Old People</th>
<th>Physical Appearance</th>
<th>Fear of Losses</th>
<th>Psychological Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>50.67 (0.54)$^{a,b}$</td>
<td>2.30 (0.04)$^{a,b}$</td>
<td>2.68 (0.05)$^{a,b}$</td>
<td>3.07 (0.05)$^a$</td>
<td>2.41 (0.04)$^{ab}$</td>
</tr>
<tr>
<td>30-39</td>
<td>49.56 (0.46)$^{a,b}$</td>
<td>2.29 (0.03)$^{a,b}$</td>
<td>2.59 (0.04)$^a$</td>
<td>3.01 (0.04)$^a$</td>
<td>2.32 (0.03)$^a$</td>
</tr>
<tr>
<td>40-49</td>
<td>47.48 (0.64)$^{c,d}$</td>
<td>2.10 (0.04)$^{c,d}$</td>
<td>2.49 (0.06)</td>
<td>2.95 (0.05)</td>
<td>2.21 (0.04)</td>
</tr>
<tr>
<td>50-60</td>
<td>45.22 (0.76)$^{c,d}$</td>
<td>2.00 (0.05)$^{c,d}$</td>
<td>2.30 (0.07)</td>
<td>2.85 (0.06)</td>
<td>2.10 (0.05)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total AAS</th>
<th>Fear of Old People</th>
<th>Physical Appearance</th>
<th>Fear of Losses</th>
<th>Psychological Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>47.86 (0.42)</td>
<td>2.15 (0.03)</td>
<td>2.43 (0.04)$^e$</td>
<td>2.95 (0.04)</td>
<td>2.29 (0.03)</td>
</tr>
<tr>
<td>Women</td>
<td>48.60 (0.44)</td>
<td>2.19 (0.03)</td>
<td>2.61 (0.04)$^e$</td>
<td>2.98 (0.04)</td>
<td>2.23 (0.03)</td>
</tr>
</tbody>
</table>

Education Levels
<table>
<thead>
<tr>
<th>Education</th>
<th>Age Group</th>
<th>Mean (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower</td>
<td>18-29</td>
<td>48.94 (0.37)&lt;sup&gt;f&lt;/sup&gt;</td>
</tr>
<tr>
<td>Higher</td>
<td>18-29</td>
<td>47.52 (0.48)&lt;sup&gt;f&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Interaction (Age × Education)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Higher Education</th>
<th>Mean (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>2.38 (0.05)&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>2.34 (0.05)&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>2.15 (0.06)&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>50-60</td>
<td>1.99 (0.07)&lt;sup&gt;c,d,f&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Lower Education</th>
<th>Mean (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>2.44 (0.04)</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>2.30 (0.03)</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>2.29 (0.06)</td>
<td></td>
</tr>
<tr>
<td>50-60</td>
<td>2.29 (0.06)&lt;sup&gt;f&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Significantly different from 50-60 group; <sup>b</sup>Significantly different from 40-49 group; <sup>c</sup>Significantly different from 30-39 group; <sup>d</sup>Significantly different from 18-29 group; <sup>e</sup>Significantly different between genders; <sup>f</sup>Significantly different between education levels.
Figure 1. Mean Scores for Total Anxiety about Ageing Scores

**Anxiety about Ageing Subscales**

Three way univariate ANOVAs, with the same factors of age, gender and educational levels, were conducted for each of the Malay AAS subscales. To enable comparison between subscales with different numbers of items in mean score for each subscale are reported per item (i.e. out of a maximum of 5).
Fear of Old People

For Fear of Old People, there was a significant main effect of age, $F (3, 889) = 13.18, p < .001, \eta_p^2 = .043$. Post-hoc Scheffe tests showed that fear of old people was significantly higher in the youngest age groups (18-29 and 30-39) compared to the older age groups (40-49 and 50-60). There were no significant differences in scores between the two younger age groups or the two older age groups (Figure 2). There was no significant effect of gender, $F (1, 889) = 1.22, p = .27, \eta_p^2 = .001$, but there was a significant effect of education background, $F (1, 889) = 6.87, p < .05, \eta_p^2 = .008$, with higher fear of the elderly scores in those with lower levels of education ($M = 2.22, SD = 0.02$) than those with higher educational levels ($M = 2.12, SD = 0.03$). No interactions were found for this subscale.

Physical Appearance

For Physical Appearance, there was also a significant main effect of age, $F (3, 889) = 6.68, p < .001, \eta_p^2 = .022$, with significantly lower scores for people aged 50-60 compared to younger people in the 18-29 and 30-39 groups, and for people aged 40-49 compared to people aged 18-29 (Figure 2). No other age groups differed from one another. There was also a significant main effect of gender $F (1, 889) = 9.414, p < .05, \eta_p^2 = .010$, with women scoring higher on this subscale ($M = 2.61, SD = 0.04$) than men ($M = 2.43, SD = 0.04$). However, there was no significant effect of education level, $F (1, 889) = 0.66, p = .42, \eta_p^2 = .001$, and no interactions.
Fear of Losses

For Fear of Losses, there was a main effect of age, $F(3, 889) = 2.896, p < .05, \eta^2 = .010$, with scores significantly lower in people aged 50-60 compared to younger age groups (18-29 and 30-39) (Figure 2). There were no other significant differences between age groups. There were no main effects of gender $F(1, 889) = 0.31, p = .58, \eta^2 = .000$; or education $F(1, 889) = 1.76, p = .19, \eta^2 = .002$, and no interactions between factors.

Figure 2. Mean Scores for Items on Each of the Anxiety about Ageing Subscales
Psychological Concerns

For Psychological Concerns, there was a significant main effect of age, $F(3, 889) = 10.44, p < .001, \eta_p^2 = .034$, with significantly higher scores for people aged 18-29 compared to the older groups (40-49 and 50-60), and for people aged 30-39 compared to the 50-60 age group (Figure 2). No other differences between age groups were found. There was no significant effect of gender, $F(3, 889) = 1.97, p > .05, \eta_p^2 = .002$, but there was a significant effect of education background, $F(1, 889) = 12.80, p < .001, \eta_p^2 = .014$, with people with a lower education background ($M = 2.33, SD = 0.02$) reporting more Psychological Concern than those with a higher level of education ($M = 2.19, SD = 0.03$).

There was also a significant interaction between age and education $F(3, 889) = 4.23, p < .05, \eta_p^2 = .014$ (Figure 3). Simple effects analysis showed a significant effect of education in the people aged 50-60 years old $F(1, 897) = 11.78, p < .001$, whereby Psychological Concerns were higher in the lower education group, but no effect of education in any other age groups. Significant effects of age were found for both the lower education, $F(3, 897) = 2.95, p < .05$, and higher education group, $F(3, 897) = 9.14, p < .001$. Scheffe tests showed that, in the more highly educated group, young people aged 18-29 had a significantly higher level of psychological concerns compared to people aged 40-49 and 50-60, while people aged 30-39 had significantly greater level of Psychological Concerns than people aged 50-60. However, in the lower education group, none of the pairwise comparisons reached significance, showing that the effects of age seem to be more pronounced in the higher education group.
Discussion

The aims of the present study were to examine the psychometric properties of a Malay-language version of the AAS, and to investigate how scores on the AAS subscales vary by age, gender, and level of education. Confirmatory factor analysis of responses to the translated measure largely replicated the original four factor dimensions by Lasher and Faulkender (1993), although some modifications were required to achieve an acceptable model fit. The effects of demographic variables on AAS scores were broadly consistent with previous literature, indicating that the revised AAS provides a valid measure of
anxiety about ageing. In addition, the effects of age, gender, and educational background were found to vary across the different subscales of the AAS.

As with the French (Vezina & Langis, 2013) version, modification of the AAS resulted in changes to the Psychological Concerns, Physical Appearances and Fear of Losses subscales, but not to the Fear of Old People subscale. Problems with the Fear of Losses subscale have previously been reported for the original (English) version of the scale (Lasher & Faulkender, 1993; Sargent-Cox et al., 2014), as well as the Chinese (Gao, 2012), French (Vezina et al., 2013); Spanish (Ornelas et al., 2016) and Greek (Koukouli et al., 2013) versions, and so it is not surprising that some modification of this subscale was needed in the current study. The Fear of Old People subscale appears to be robust across languages, and so may represent a subscale that is universally applicable. In contrast, the other subscales may require modification to particular linguistic or cultural groups. Of note, the changes made to these subscales in the Malay version were most similar to those made for the Chinese version, suggesting that measurement of the anxiety about ageing construct may differ between Eastern and Western regions.

Certain items did not appear to work well in the Malay population. Item 4 (I have never lied about my age in order to appear younger), for example, showed a very low loading, and was omitted. Similar findings of a weak loading in the Chinese (Gao, 2012); Spanish (Ornelas et al., 2016) and French (Vezina et al., 2013) versions suggest that this item is not universally appropriate. As with the Chinese version (Gao, 2012),
item 5 (*I fear it will be very hard for me to find contentment in old age*) was modified to the Fear of Losses subscale, indicating that, in Eastern populations, this item is more relevant to expressing fears of loss than psychological concerns. Item 20 (*When I look in the mirror, it bothers me to see how my looks have changed with age*) was also modified from the Physical Appearance factor to the Fear of Losses factor. This item was removed from Chinese (Gao, 2012) and French (Vezina et al., 2013), indicating that the cross-cultural consistency of this item is questionable.

Another contribution of this study was to investigate relationships between scores on the AAS and subscales with key demographic variables. A general pattern of lower levels of anxiety about ageing among older people compared with younger people was found for all four subscales in this study. The findings of lower levels of anxiety about ageing among older people is consistent with much previous research, in which the levels of Fear of Old People (Brunton & Scott, 2015; Gao, 2012; Koukouli et al., 2013) and Physical Appearance (Brunton et al., 2015; Gao, 2012; Lasher & Faulkender, 1993) have been shown to be greater in younger compared to older adults. Findings for Psychological concerns have been more mixed with some studies (Brunton & Scott, 2015; Gao, 2012) finding higher levels in younger than older people, whereas Yun and Lachman (2006) found the opposite pattern. Our finding that the effect of age interacts with education for this factor, with more pronounced effects of age seen in those with higher education, could provide an potential explanation for the more mixed results that have previously been reported. This explanation is also consistent with Lynch (2000),
who showed that an effect of education on overall ageing anxiety was only observed among older adults.

Unlike previous studies (Bergman et al., 2013; Brunton & Scott, 2015; Gao, 2012 & Yun & Lachman, 2006), we found that scores on the Fear of Losses scales were higher in younger than older people. One explanation for this pattern is that concerns about losses may be influenced by witnessing more serious declines in older family members (Barretts & Robbins, 2008). As with most Eastern countries, Malaysian culture still emphasises the importance of traditional caregiving systems (Teh, Tey & Ng, 2014), with more than 70% of older Malaysians are living with their adult children (Kooshiar, Yahaya, Hamid, Abu Samah & Sedaghat, 2012) and providing care and support to their parents when they are old (Teh, Ng, Tey & Siti Norlasiah, 2013). Consequently, children are more likely to experience the mental and physical decline of older relatives in their home. As such, the increased Fear of Losses seen in younger participants might be related to their personal experience of caregiving (Minhat et al., 2015), in which young people may foresee their own future destiny through this traditional role.

Anxiety about ageing was also associated with gender, but the relationship was only observed in the Physical Appearance subscale, with women found to be more concerned about the physical effects of ageing than men. The same results have also been documented by other authors, such as Bergman et al. (2013); Brunton and Scott (2015); Gao (2012); Koukouli et al. (2013); McConatha et al. (2004) and Yun and
Lachman (2006), reflecting a greater emphasis on physical signs of youth in women than men that is found in many countries (Bai, 2014). However, no effects of gender were found in other subscales, despite previous literature having reported that gender also has an effect on Fear of Old People (Brunton & Scott, 2015; Lasher & Faulkender, 1993; McConatha et al., 2004) and Fear of Losses (Lasher & Faulkender, 1993), with men expressing more concerns about these factors than women. Less exposure to older adults has previously been associated with higher levels of ageism due to misconceptions about ageing (Wisdom et al., 2014), while better quality of contact was related to more positive attitudes towards old people (Bousfield & Hutchison, 2010). As such, the lack of gender effect for these subscales in our study could relate to the men having less contact with older people, compared to women, who have, historically, been more involved in caregiving activities (Brodolini, 2011).

The present study also revealed that participants with lower education levels had higher levels of overall ageing anxiety, Fear of Old People and Psychological Concerns. Our finding corroborates the work of Kounkoulli et al. (2013), except they did not find any relation between education levels and Fear of Old People. Our findings could be due to those with lower education levels being less likely to access accurate information about ageing, and therefore having more misconceptions and negative stereotypes of older people (Kropf et al., 2000). This is consistent with work by Neikrug (1998), who reported that education and being well-informed about ageing are important for reducing anxiety about the future. Importantly, our findings suggest that participants with lower education are more likely to suffer from the negative consequences that have been
associated with higher levels of anxiety about ageing, and so should be prioritised for interventions that aim to reduce these anxiety levels.

There were some limitations of the present work. First, although our sample was large, it consisted primarily of government employees, and contained a relatively low number of minority ethnic group members (e.g., Chinese and Indian), which limits the generalizability of our findings. Future work should therefore examine the applicability of the Malay AAS to more diverse samples. Finally, the cross sectional nature of the data mean that it is not possible to establish whether differences between age groups truly represented the effects of age, and not generational differences.

Conclusion

In conclusion, this study addresses the need for measures of ageing anxiety for Eastern populations by providing valuable information on the psychometric properties of a Malay version of the AAS. The required modifications to the scale also suggest that there may be cultural differences in the measurement and conceptualisation of anxiety about ageing that need to be considered when selecting suitable measures. Finally, the study added to our knowledge of demographic differences in levels of anxiety about ageing, and provided potential explanations for some of the conflicting results that have previously been reported.
References


Appendix (i) The Malay Version of Anxiety about Ageing Questionnaire.

Soalan dibawah ini berkenaan tentang pendapat anda berkaitan penuaan. Sila TANDAKAN (√) satu jawapan yang paling hampir dengan perasaan anda.

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<td>1  Saya gemar bergaul dengan orang tua.</td>
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<td>2  Saya takut apabila saya tua, semua rakan-rakan akan meninggalkan saya.</td>
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<td>3  Saya suka melawat saudara-mara yang sudah berumur.</td>
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<td>4  Saya tidak pernah menipu tentang umur saya untuk kelihatan lebih muda.</td>
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<td>5  Saya takut saya akan sukar mendapat kepuasan hati di usia tua.</td>
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<td>6  Semakin berumur, semakin saya risau tentang kesehatan saya.</td>
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<td>7  Saya akan membuat banyak perkara untuk memenuhi masa lapang apabila saya tua.</td>
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<td>8  Saya rasa gelisah apabila memikirkan orang lain membuat keputusan untuk saya apabila saya tua.</td>
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<td>9  Saya langsung tidak terganggu apabila membayangkan diri saya menjadi tua.</td>
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<td>10 Saya suka berbual-bual dengan orang tua.</td>
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<td>11 Saya jangka berasa baik tentang kehidupan semasa tua.</td>
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<td>12 Saya tidak pernah berasa takut apabila melihat diri di cermin dan nampak uban di kepala.</td>
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<td>13 Saya berasa sangat selesa apabila berada dalam kalangan orang tua.</td>
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<td>14 Saya risau orang akan tidak mempedulikan saya apabila tua.</td>
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<td>15 Saya tidak pernah berasa takut kelihatan tua.</td>
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<td>16 Saya percaya saya masih akan mampu melakukan hampir semua perkara untuk diri sendiri apabila saya tua.</td>
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<td>17 Saya takut hidup saya tidak akan bermakna lagi apabila tua.</td>
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<td>18 Saya jangka berasa baik tentang diri sendiri apabila tua.</td>
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<td>19 Saya suka melakukan sesuatu untuk orang tua.</td>
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<td>20 Apabila saya melihat diri di cermin, saya berasa terganggu melihat rupa saya telah berubah disebabkan umur.</td>
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CHAPTER FIVE

STUDY THREE:

CULTURAL ADAPTATIONS TO THE ATTITUDES TO AGEING: PSYCHOMETRIC ASSESSMENT OF THE MALAY REACTION TO AGEING QUESTIONNAIRE

This manuscript has been accepted for publication in the journal Assessment.

The format of Assessment manuscripts is used in the chapter.


Doi:10.1177/1073191118766400
CHAPTER 5

Cultural Adaptations to the Measurement of Attitudes to Ageing: Psychometric Assessment of the Malay Reactions to Ageing Questionnaire

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Acknowledgments

We thank the study participants and the managers of the participating organisations for their contribution to this study.
Abstract

The aims of this study were to culturally-adapt the Reactions to Ageing Questionnaire (RAQ) for a non-Western (Malay) population, and explore attitudes to ageing in relation to age, gender and education. Eight new culturally-relevant items were generated by asking Malay-speaking participants about their reactions to ageing. A Malay version of the extended 35-item RAQ was then administered to 911 Malaysian participants aged 18-60 years. Exploratory factor analysis revealed four factors. Three of the factors were similar to those identified in the original RAQ, whilst ‘Family and Religion’ emerged as a new factor. More negative attitudes to ageing were observed in younger and women respondents. There were no effects of education. This culturally-adapted RAQ exhibits robust psychometric properties, and could be used to assess attitudes to ageing in Malaysia and other Southeast Asian countries. Moreover, we have identified a “core set” of RAQ items with that could be applicable worldwide.

Key words: Validation, Reliability, Attitudes to Ageing, Self-Perception, Personal Ageing
Introduction

Attitudes to ageing are defined as feelings, cognitions and behaviours related to the process of ageing as a personal experience (Hess, 2006), including the views, interpretations, experiences, expectations and concerns that an individual holds about their own ageing (Janeckova, Dragomirecka, Holmerova & Vankova, 2013; Levy, 2003; Steverink, Westerhof, Bode & Dittmann-Kohli, 2001). Attitudes to ageing can be held both by people who have already experienced ageing (e.g. those over 60 years of age: United Nation, 2013), and by those who are younger (Kornadt & Rothermund, 2015). However, the nature and determinants of these attitudes are understood to differ in some important ways. In particular, as people get older, their attitudes may be informed by their personal experiences of age-related changes (O’Hanlon & Coleman, 2008), such as to their appearance (e.g., wrinkled skin and graying hair), functioning (e.g., reduced stamina) or health (Diehl, Brothers, Wahl & Miche, 2015). In contrast, attitudes to ageing held in younger life are more likely to be informed by observations of other people’s ageing (Gilbert & Ricketts, 2008), or from cultural stereotypes of old age (Levy, 2009), and thus are comprised of expectations, hopes, and fears about how the self and life will be in later life (Kornadt, Voss & Rothermund, 2015).

Empirical studies have shown that negative attitudes to ageing held by adults in younger life can have important consequences for future health and well-being. For example, Klusmann, Sproesser, Wolff and Renner (2017) showed that positive attitudes to ageing at baseline predicted healthier eating patterns over a one-year follow-up period in both middle-aged (36-64 years) and younger (18-35 years) adults, even after
controlling for participants’ gender and baseline eating behaviour, health, and body mass index (BMI). More positive attitudes to ageing in middle-aged adults of good health have also been shown to be positively associated with levels of sporting activity six years later (Wurm, Tomasik & Tesch-Romer, 2010). Such associations between attitudes to ageing and engagement in health behaviours highlight the importance of understanding the content and valence of attitudes to ageing held by people before they reach later life.

There is evidence that attitudes to ageing held before old age can be influenced by a range of demographic variables, including age, gender, and education level. For instance, previous studies have demonstrated that attitudes tend to be more negative at younger ages (Abraham & Silverstein, 2006; Draper, Gething, Fethney & Winfield, 1999; Golden, Gammonley, Hunt, Olsen, & Issenberg, 2013; Mosher-Ashley & Ball, 1999; Usworth, McKee & Mulligan, 2001) and among women (Abraham & Silverstein, 2006; Barret & Von Rohr, 2008; Cumming & Kropf & DeWeaver, 2000; Draper et al., 1999; Golden et al., 2013). These findings are consistent with the notion that anxiety towards an anticipated event (in this case ageing) is greater than when that event is actually experienced (Yan, Silverstein & Wilber, 2011), and that the anticipation of ageing may be more negative for women due to cultural preferences for youthfulness (Armitage, 2016) and physical appearance (Barret & Von Rohr, 2008). The influence of education in adults younger than 60 years is less clear: although studies with middle-aged participants have shown higher levels of education to be associated with more positive attitudes to ageing (Joshi, Malhotra, Lim, Ostbye & Wong, 2010), studies with a broader range of younger participants (e.g. aged 15 – 69 years) have found no effects
of education on attitudes to ageing (Gething, 1994; Gething, Fethney, Mckee, Goff, Churchward & Matthews, 2002; Gething et al., 2004). One reason for this discrepancy in the effects of education could be that the younger populations in the studies by Gething (1994) and Gething et al. (2002; 2004) were healthcare workers, who are more likely than the general population to have higher levels of education.

Despite the importance of measuring attitudes to ageing in younger populations, most of the commonly-used measures have been specifically developed for use with older adults (i.e., those aged over 60). For instance, the Attitudes to Ageing Questionnaire (AAQ: Laidlaw, Wang, Coelho & Power, 2007) and the Aging Perceptions Questionnaire (APQ; Barker, O'Hanlon, McGee, Hickey & Conroy, 2007) ask older participants to reflect on their own experiences of ageing, and so are not suitable for younger individuals who have yet to experience the ageing process. The Reactions to Ageing Questionnaire (RAQ) is one of the few measures of attitudes to ageing that has been designed to be administered to people aged under 70 (Gething, 1994), and operationalises attitudes to personal ageing in terms of an individual’s anticipations of their future characteristics when they are old (Koder & Helmes, 2008a). The RAQ was first developed from open-ended responses about how nurses felt about ageing, and then validated using a sample of 531 health care specialists and a general population sample aged 15-69 years. Psychometric analysis of this original 27-item version revealed six factors: Anxiety about the Future; Physical Well-being; Psychological Well-being; Denial of Ageing; Isolation; and Activity (Gething, 1994).

The RAQ has been validated for use in Australia (Koder & Helmes, 2006; 2008a; 2008b; Netz, Guthrie, Garamszegi & Dennerstein, 2001; Gething et al., 2004),
Canada (Helmes & Pachana (2015), the UK (Gething et al., 2004; Unsworth et al., 2001) and Sweden (Gething et al., 2004). However, there are inconsistencies in the numbers and content of the factors extracted, with some studies extracting as few as three factors (Koder & Helmes, 2006; 2008a; Gething et al., 2004; Wells, Foreman, Gething & Petralia, 2004), and others identifying four (Koder & Helmes, 2008b) or five factors (Netz et. al., 2001; Unsworth et al., 2001). Some items have also shown low factor loadings (Gething, 1994; Netz et al., 2001), and have been removed (Gething et al., 2004; Unsworth et al., 2001). Taken together, these inconsistencies in factor structure and weak factor loadings, suggest that more validation work is needed to refine the content of the scale.

To develop a full understanding of how attitudes to aging form, develop, and influence future outcomes, it is important to look beyond Western populations (e.g. those in North America, Australasia, and Europe). It is therefore notable that the RAQ has not yet been tested in a non-Western country. Given that the original RAQ items were generated by Western participants, the content of the RAQ is also likely to be biased towards a Western understanding of ageing. This omission is important because research to date suggests that there may be key differences between Western and non-Western societies in the ways they perceive ageing and older people (Lockenhoff, Lee, Buckner, Moreira, Mertinez & Sun, 2015). For instance, Western populations, with more individualistic values, tend to value older adults less highly and attach greater importance to self-fulfilment, freedom and individuality (Wang & Mallinckrodt, 2006). In contrast, Eastern populations (e.g., Southeast Asian and Middle Eastern) tend to hold more collectivistic values that play important roles in guiding intergenerational
relations, in which adults are expected to be considerate, respectful and supportive towards their parents (Kim, Cheng, Zarit & Fingerman, 2015).

Malaysia can be considered representative of Southeast Asia, a region that has a land mass of 4.5 million km$^2$ (10.5% of Asia), is home to 641.8 million people, and includes countries such as Singapore, Thailand and Indonesia as well as Malaysia (World Population Prospect, 2017). Malaysia is typical of this region in terms of gross domestic product per capita ($26,141 versus mean $22,777 for the Southeast Asian region: International Monetary Fund, 2017) and subjective well-being ($M = 7.13$ versus $M = 7.21$ for other Southeast Asian countries: World Values Survey, 2017).

Moreover, consistent with the idea of “Eastern values”, compared with “Western values”, Malaysian citizens strongly endorse collectivistic values (Kunhen et al., 2001), routinely practice values of filial piety (Damulak, Minhat & Rahman, 2015), engage in high levels of caregiving (Minhat, Hamizah & Nor Afiah, 2015a), show high levels of family support (Teh, Tey & Ng, 2014), and a high proportion of them live with elderly relatives (Kooshiar, Yahaya, Hamid, Abu Samah & Jou, 2012). Malaysian people are also more likely to hold conservative values, and are keener to teach values of thrift and hard work in their offspring, compared to people in the West (Bomhoff & Gu, 2012).

Given the cultural differences between Eastern and Western cultures, simple translation of the RAQ from English is unlikely to capture sufficiently the content of the attitudes held by a non-Western population (Schellingerhout, Heymans, Verhagen, de Vet, Koes & Terwee, 2011). Instead, measures of attitudes to ageing will likely require some cultural adaptation to ensure that they fully capture the attitudes held by the
population of interest. For this reason, the aims of the present study were to culturally-adapt and validate a Malay version of the RAQ, and then explore the effects of key demographic variables (age, gender, and education, which are among the most frequently explored variables in Western populations) on attitudes to ageing. In order to achieve this aim, we first generated potential new items for the RAQ by asking Malay participants to report their thoughts and feelings about their own ageing. A Malay-language version of this culturally-adapted scale was then administered to a large sample of Malay participants aged 18-60 years of age. Given the known relationships between attitudes to ageing and age and gender (Draper et al., 1999; Golden et al, 2013), we expected that older participants and men would have more positive attitudes to ageing. The effect of education was also explored.

Method

Participants

Participants in the present study were employees of public sector organisations around Kedah, the Northern region of Peninsular Malaysia. Public rather than private sector organisations were approached because the Ministry of Information was able to supply a list of all such organisations, making it possible to approach all organisations, and minimise the risk of selection bias. According to the Department of Statistics, Malaysia (2016), about 1.65 million people (12.2%) work in this sector out of 13.5 million employees in Malaysia. Inclusion criteria for the present study were: 1) to be an employee aged 18 to 60 years old, and 2) to be fluent in the Malay language, with self-
reported language proficiency at either level 4 (full professional proficiency) or 5 (native proficiency) (Interagency Language Roundtable, 2016).

Materials

- Cultural-Adaptation of the RAQ

The original 27-item RAQ (Gething et al., 2004) was first translated into the Malay language using an English-Malay-English back translation procedure (Ozolins, 2009). Members of the research team compared the original and the back-translated English versions to identify any differences in the meanings of the items. Any problems were then resolved through discussions between a Malay-English bilingual linguistics scholar and members of the research team. As a final check for clarity, this revised translated version was then administered to 18 Malay-speaking participants living in the North West of the UK. These participants were purposively recruited to ensure approximately equal numbers of women \( (n = 10) \) and men \( (n = 8) \); and a spread of age ranges \( (18-29 \ (n = 6), \ 30-39 \ (n = 7), \ 40-49 \ (n = 3) \) and \( 50-60 \ (n = 2) \) \) and ethnicities (Malay \( n = 14 \), Chinese \( n = 3 \) and Indian \( n = 1 \)). All participants were native Malay speakers who were born in Malaysia and had spent fewer than five years in the UK.

Participants were asked to ‘think aloud’ (Kaklamanou, Armitage & Jones, 2013) when completing the questionnaire. This required the participants to complete the questionnaire whilst telling the researcher everything they were thinking as they did so. Any ambiguities or misunderstandings about the items arising from this procedure were then addressed through discussion within the research team.
Candidate new items for inclusion in the culturally-adapted version of the Malay RAQ were identified by asking the same 18 participants to respond to an item in the Malay language that asked them to: “Imagine that you are over the age of 65. Tell me how you feel about your own ageing”. This open-ended question was based on that used by Gething (1994) when developing the original version of the RAQ. Although the precise question used to elicit participants’ responses was not reported, Gething (1994, p.77) states that participants ‘were asked to write open-ended responses about how they felt about their own ageing’. This task was presented before participants completed the Malay translated RAQ in order to prevent their responses from being influenced by the contents of the RAQ.

- Content Analysis of Open-Ended Responses

In line with the concept mapping of open-ended responses procedure described by Jackson and Trochim (2002), each response to the open-ended question was first split into single concept phrases. These phrases were then sorted into groups of similar statements (themes), and the frequency of responses within each theme calculated. This procedure produced eight themes relating to attitudes to ageing (Appendix (i)). The content of the themes was then compared to the existing items of the RAQ to identify any topics that were not sufficiently covered by the existing items, so that candidate new items could be developed, where necessary.

The content of one of these themes (death) was already represented in the original version of the RAQ (e.g: Item 7- *I worry about dying and leaving behind those I love*), and so no new items related to this theme were generated. An additional four themes (themes 2-5) were already covered in the original RAQ, but the existing items
did not capture the full breadth of participants’ responses. For example, although the physical appearance (theme 2) theme was partly covered in the original RAQ (item 21: *I won’t like growing old*), the item did not refer to physical appearance, and so a new item was generated to capture this (*I won’t like looking old*). Theme 3 (health), was covered by a number of items in the original RAQ (e.g.: Item 2- *I worry that I might become senile and lose my mind*; Item 17- *I worry about becoming frail*), but none of these items related to the more general health worries reported by our participants, and so a new item was generated to capture this (*I worry about my health getting worse*). For theme 4 (ability to do desirable things), item 25 of the original RAQ, ‘*there is a lot to look forward to in regard to being old*’ was relevant, but very general, and did not specifically mention being able to undertake desirable activities. Therefore, a more specific new item (‘*I will have more time to do things that I enjoy*’) was generated. Two new items were also developed to capture the content of theme 5 (family relationships). This is because participants’ responses to this theme mainly focused on family or parent-child relationships, whereas existing relationship items in the RAQ were more general, and seemed to refer more to relationships with partners (e.g: item 16 ‘*I look forward to growing old with someone I love*’). The final three themes (6-8: religion; acceptance of ageing; and financial concerns) were not represented in the original version of the RAQ, and so new items relating to these themes were generated to capture the meaning of participants’ responses. The results of content analyses, participants’ responses, and the candidate new items generated are presented in the Appendix (i).
The final translated and adapted questionnaire therefore comprised 27 translated items from the original RAQ and eight new generated items (see Appendix (ii)). Participants were asked to indicate how much they agreed or disagreed with each statement in relation to how they might feel when they are over the age of 65. Responses were given on a 5-point Likert-type scale ranging from strongly disagree (1)-strongly agree (5). This response scale differed slightly from the 6-point scale (1 = disagree very much to 6 = agree very much) used by Gething (1994) in the original version. This was because the RAQ was administered as part of a larger battery of questionnaires, and a consistent response style between questionnaires was used to minimise the potential for confusion. Eighteen of the 35 items (2, 4, 7, 8, 9, 11, 13, 17, 18, 19, 20, 21, 23, 26, 27, 29, 30 & 31) were reverse scored so that a higher score always indicated more positive attitudes. Total scores on the RAQ could therefore range from 35 to 175, with higher scores on all items indicating more positive attitudes to ageing.

Procedure

The study was approved by the University of Manchester Research Ethics Committee (Reference: 15330) and the Malaysian Economic Planning Unit (MEPU). The data were collected between October and December 2015. Letters asking permission to conduct the study were sent to 68 organisations listed by the Ministry of Information, Kedah, including schools, the immigration department and religious centres. Sixty seven of these organisations agreed to be involved with the study. The researcher then provided packs of questionnaires to the managers of each of these organisations. Managers were asked to distribute the questionnaires to all employees in their organisation, and ask
them to complete and return them within the next two weeks. This approach was taken as using legitimate authority, such as management support, has been found to increase participant response rates, particularly in Asian countries (Krishnan & Poulase, 2016).

Each questionnaire pack contained a participant information sheet, the culturally-adapted Malay RAQ, demographic questions (date of birth, gender, language proficiency, and levels of education, for which participants indicated which of four categories (high school; certificate/diploma; undergraduate; or postgraduate) best represented their highest level of education), plus a number of other measures of attitudes, health, and well-being that were collected as part of a larger study. The questionnaires were completed anonymously and the participants were asked to seal the opaque envelope provided after the completion of the questionnaire to ensure confidentiality. The researcher subsequently collected the envelopes from the manager.

**Data Analysis**

The analyses were carried out using IBM SPSS 23. We first used Exploratory Factor Analysis to examine the basic structure of the culturally-adapted RAQ, and to identify items with low factor loadings. Cronbach’s alpha coefficients were then calculated to evaluate internal consistency. The interactions between socio-demographic variables (age, gender, level of education) and the subscales of the RAQ were tested using an alpha value of .05 (i.e., \( p < .05 \)), using analysis of variance (ANOVA). To maximise comparability with the original RAQ validation by Gething (1994), four age groups (18-29, 30-39, 40-49, 50-60) were used for these analyses. To minimise the number of small sample sizes within each cell of the factorial design (Tabachnick & Fidell, 1996), the
four educational background categories were collapsed into two broader categories of lower (high school and certificate/diploma) and higher (undergraduate/postgraduate) education.

Results

Participant Characteristics

Overall, 1731 questionnaire packs were distributed to the managers of the 67 participating organisations. Of these, employees returned 957 questionnaires to their managers. Thirty-one questionnaires contained at least one full scale that had not been completed, and so were excluded from subsequent analyses. Data from an additional nine participants were excluded because they had missed one or more items of the RAQ, and from one participant who was an extreme outlier (more than 3 interquartile ranges from the rest of the scores). The data from a further five participants were excluded for not meeting language inclusion criteria (i.e. indicating that their Malay proficiency was lower than full professional proficiency). The final sample therefore comprised 911 participants (Table 1). The sample size was considered appropriate on the basis of meeting the recommendation by Hair, Black, Babin and Anderson (2014) of achieving a minimum participant: item ratio of 1:20 (i.e. 700 participants for a 35-item measure), and being close to the 1000 participant level that is considered “excellent” (Comree & Lee, 1992). Ten of these participants did not provide their year of birth. Data for these participants was included in the factor analysis, but not in the analyses involving age.
Table 1. Demographic Information

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>All</th>
<th>18-29</th>
<th>30-39</th>
<th>40-49</th>
<th>50-60</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n= 911 (%)</td>
<td>n = 247 (%)</td>
<td>n =356 (%)</td>
<td>n =158 (%)</td>
<td>n=140 (%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>395 (43.3)</td>
<td>94 (10.3)</td>
<td>137 (15.04)</td>
<td>76 (8.3)</td>
<td>85 (9.3)</td>
</tr>
<tr>
<td>Women</td>
<td>516 (56.6)</td>
<td>153 (16.8)</td>
<td>219 (24.0)</td>
<td>82 (9.0)</td>
<td>55 (6.0)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>852 (93.5)</td>
<td>236 (25.9)</td>
<td>341 (37.4)</td>
<td>146 (16.0)</td>
<td>119 (13.1)</td>
</tr>
<tr>
<td>Chinese</td>
<td>30 (3.3)</td>
<td>5 (0.5)</td>
<td>7 (0.8)</td>
<td>8 (0.9)</td>
<td>10 (1.1)</td>
</tr>
<tr>
<td>Indian</td>
<td>18 (2.0)</td>
<td>2 (0.2)</td>
<td>5 (0.5)</td>
<td>0</td>
<td>11 (1.2)</td>
</tr>
<tr>
<td>Other</td>
<td>11 (1.2)</td>
<td>4 (0.4)</td>
<td>3 (0.3)</td>
<td>4 (0.4)</td>
<td>0</td>
</tr>
<tr>
<td>Educational Levela</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>567 (62.2)</td>
<td>154 (16.9)</td>
<td>238 (26.1)</td>
<td>84 (9.2)</td>
<td>83 (9.1)</td>
</tr>
<tr>
<td>Higher</td>
<td>344 (37.8)</td>
<td>93 (10.2)</td>
<td>118 (13.0)</td>
<td>74 (8.1)</td>
<td>57 (6.3)</td>
</tr>
<tr>
<td>Occupational Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managers</td>
<td>13 (1.4)</td>
<td>1 (0.1)</td>
<td>7 (0.8)</td>
<td>3 (0.3)</td>
<td>2 (0.2)</td>
</tr>
<tr>
<td>Professionals</td>
<td>208 (22.8)</td>
<td>38 (4.2)</td>
<td>50 (5.5)</td>
<td>58 (6.4)</td>
<td>61 (7.0)</td>
</tr>
<tr>
<td>Technicians &amp;</td>
<td>157 (17.2)</td>
<td>44 (4.8)</td>
<td>60 (6.6)</td>
<td>34 (3.7)</td>
<td>16 (1.8)</td>
</tr>
<tr>
<td>Associate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professionals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clerical Support</td>
<td>449 (49.3)</td>
<td>134 (14.7)</td>
<td>206 (22.6)</td>
<td>51 (5.6)</td>
<td>52 (5.7)</td>
</tr>
<tr>
<td>Service and Sales</td>
<td>38 (4.2)</td>
<td>14 (1.5)</td>
<td>15 (1.6)</td>
<td>5 (0.5)</td>
<td>4 (0.4)</td>
</tr>
<tr>
<td>Skilled,</td>
<td>32 (3.5)</td>
<td>12 (1.3)</td>
<td>14 (1.5)</td>
<td>2 (0.2)</td>
<td>4 (0.4)</td>
</tr>
<tr>
<td>Agricultural,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forestry &amp; Fishery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
More women \((n = 516)\) than men \((n = 395)\) participated in the research (Table 1), whereas national census data indicate that there are 0.84 million men and 0.81 million women employed in the public sector (Department of Malaysia Statistics, 2016). In the present study, the majority of participants (94%) were of Malay ethnicity, followed by Chinese (3.3%), Indian (2.0%) and others (1.2%). These proportions differ slightly from Malaysian population levels, which are reported as 68.6%, 23.4%, 7.0% and 1.0% for Malay, Chinese, Indian and others respectively (Department of Statistics Malaysia, 2016). In terms of education levels, more participants had lower \((n = 567)\) than higher levels of education \((n = 344)\). Job types were classified into nine categories, as specified by the Malaysian Standard Classification of Occupations (2008). Almost half of the respondents (49.3%) were categorised as being clerical support workers (e.g., clerks or secretaries), 22.8% as professionals (e.g., lecturers or engineers), with technicians and associate professionals (e.g., nurses or laboratory assistants) making up the remaining

<table>
<thead>
<tr>
<th>Plant, Machine Operators &amp; Assemblers</th>
<th>11 (1.2)</th>
<th>1 (0.1)</th>
<th>4 (0.4)</th>
<th>5 (0.5)</th>
<th>1 (0.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary Occupations</td>
<td>1 (0.1)</td>
<td>1 (0.1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Craft &amp; Trade Workers</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Missing</td>
<td>2 (0.2)</td>
<td>2 (0.2)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* Lower education level = (High school OR certificate/diploma holders)

Higher education level = (Undergraduate OR postgraduate holders)
17.2%. The present sample differed from the general Malaysian population, with those in lower-level occupations (e.g., cleaner, street vendor, machine operators) being under-represented (Ministry of Human Resources, 2015).

**Factorial Structure of the RAQ**

An exploratory factor analysis was conducted on participants’ responses to the 35 items of the Malay RAQ. The coefficient value of the Kaiser-Meyer-Olkin (KMO) test revealed an excellent level of sampling adequacy = .91, indicating that the sample was adequate for factor analysis (Field, 2005). The KMO is a measure of sampling adequacy to test the proportion of variance among the items that might be common; values closer to 1 are desirable for a factor analysis, as this value means that there are lower proportion of common variance among items (Kaiser, 1974). Moreover, the value of Bartlett’s Test of Sphericity was statistically significant ($p < .05$). This significant value means that the correlation matrix is not an identity matrix, suggesting that there are some correlations between the variables, and that the data are suitable for factor analysis (Tabachnick & Fidell, 1996). The exploratory factor analysis produced six components with eigenvalues greater than one. However, the scree plot showed a sharp decrease after the fifth factor, suggesting that a four-factor model was more appropriate. This was confirmed by a Monte Carlo Parallel Analysis (MCPA: Ladesma & Valero – Mora, 2007), which showed that random ordered eigenvalues were below the actual eigenvalues for only four factors.

As the data were normally distributed, and there are possible correlations among the factors tested, Maximum likelihood (ML) extraction and oblique rotation methods
were used (Costello & Osborne, 2005). These methods are consistent with previous analyses of the RAQ (Gething, 1994; Gething et al., 2004). In order to identify items that most clearly represent the four extracted factors, any items loading less than .45 were excluded. Comrey and Lee (1992) recommend this cut-off on the grounds that only items loading above this value can be considered to be fair descriptors of the underlying construct. Ten items were excluded using this criterion, only one of which was one of the new items generated for the present study (item 32: *I will accept the fact that I am old*). The other seven new items were retained, indicating a broader relevance of the new items to participants’ attitudes to ageing. The final culturally-adapted scale therefore comprised 25 items as shown in Table 2: eleven for ‘Negative Thoughts about Growing Older’; three for ‘Family and Religion’; six for ‘Positive Aspects of Ageing’; and five for the ‘Perceived Personal Attributes’ factor. Appendix (iii) provides results for the full 35-items.

As shown in Table 2, the first, third and fourth factors were similar to those found by Gething et al., (2004), Netz et al. (2001), Koder and Helmes (2006, 2008a; 2008b) and Unsworth et al. (2001), namely ‘Negative Thoughts about Growing Older’ (Factor 1); ‘Positive Aspects of Ageing’ (Factor 3) and ‘Perceived Personal Attributes’ (Factor 4). In particular, 14 of the original items loaded onto the same factors as in previous work, thus representing a possible ‘core set’ of items that may work well across cultures (Table 2). The second factor represented a novel dimension of attitudes to ageing, namely, ‘Family and Religion’, which comprised solely of new items generated by Malay participants.
Table 2. Eigenvalues and Factor Loadings of the 25 Items Retained in the RAQ.

<table>
<thead>
<tr>
<th>Items/ Factors</th>
<th>Negative Though about Growing Older</th>
<th>Family &amp; Religion</th>
<th>Positive Aspect Ageing</th>
<th>Perceived Personal Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>I worry that I might become senile and lose my mind&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.736</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry about my health getting worse&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.707</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry about becoming frail&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.703</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry about loss of independence</td>
<td>.678</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am concerned about who will care for me if I become frail&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.675</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It worries me that I won’t enjoy life as much as I do now&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.610</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry about the loss of loved ones around me</td>
<td>.599</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry about dying and leaving behind those I love</td>
<td>.513</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry about having less money to live on&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.497</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I won’t feel as safe on my own as I do now&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.493</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will be more lonely than I am now&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.455</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will enjoy having my family around me&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.900</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am happy that my family will take care of me&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.843</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will be happy that I can devote more time to my religion&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.711</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is a lot to look forward to in regard to being old&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.684</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Variance of Factors (Total = 40.61%): 20.66% 11.07% 6.05% 2.83%
In my old age I will be as enthusiastic about life as I am now\textsuperscript{a}.

I do not feel there is much to be scared about becoming an older person\textsuperscript{a}.

Old age will brings satisfactions which are not available to the young\textsuperscript{a}.

I will have more time to do the things that I enjoy\textsuperscript{b}.

Old age will be an enjoyable time of life\textsuperscript{a}.

I will become more irritable and grouchy than I am now\textsuperscript{a}.

I will be more set in my ways and reluctant to change\textsuperscript{a}.

Others may find me difficult to get along with\textsuperscript{a}.

I won’t like growing old.

I won’t like looking old\textsuperscript{b}.

\textsuperscript{a} Items that loaded onto the same factors as in work done in Western populations (Gething et al., 2004; Netz et al., 2001), and that thus represent a possible ‘core set’ of items that could work across cultural settings.

\textsuperscript{b} New items added

**Internal Consistency**

Overall, the revised Malay version of the RAQ had an internal reliability of $\alpha = .88$. The reliabilities of each subscale ranged from $\alpha = .73$ to $\alpha = .89$ (Table 3), indicating good internal consistency (Field, 2005). The ‘Negative Thoughts about Growing Older’ factor
and the ‘Perceived Personal Attitudes’ factor were strongly correlated with the total RAQ score ($r = .87$ and $.77$, respectively), while the ‘Positive Aspects of Ageing’ factor showed a moderate correlation ($r = .55$). The ‘Family and Religion’ factor correlated less strongly with total RAQ scores ($r = .21$). This is probably due to the smaller number of items in this factor, and indicates that the factors may be best considered as separate variables that together form a meaningful construct, rather than interchangeable dimensions (Mokkink et al., 2012).

Table 3. Internal Consistency and Correlation Matrix of the Malay Version of the RAQ.

<table>
<thead>
<tr>
<th>Negative Thoughts about Growing Older</th>
<th>Family &amp; Religion</th>
<th>Positive Aspects of Ageing</th>
<th>Perceived Personal Attributes</th>
<th>Total RAQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>$(M = 2.71, SD = 0.66)$</td>
<td>$(M = 4.28, SD = 0.60)$</td>
<td>$(M = 3.47, SD = 0.52)$</td>
<td>$(M = 3.36, SD = 0.70)$</td>
<td>$(M = 3.21, SD = 0.45)$</td>
</tr>
<tr>
<td>Reliabilities ($\alpha$)</td>
<td>.89</td>
<td>.84</td>
<td>.73</td>
<td>.82</td>
</tr>
<tr>
<td>Negative Thoughts about Growing Older</td>
<td>-.120**</td>
<td>.215**</td>
<td>.544**</td>
<td>.868**</td>
</tr>
<tr>
<td>Family &amp; Religion</td>
<td></td>
<td>.261**</td>
<td>.181**</td>
<td>.214**</td>
</tr>
<tr>
<td>Positive Aspects of Ageing</td>
<td></td>
<td></td>
<td>.258**</td>
<td>.546**</td>
</tr>
<tr>
<td>Perceived Personal Attributes</td>
<td></td>
<td></td>
<td></td>
<td>.773**</td>
</tr>
</tbody>
</table>

**$p \leq .001$**

Note: Higher scores in all factors indicate more positive attitudes to ageing.
Demographic Differences in Total Reactions to Ageing Scores

The effects of demographic variables on overall RAQ scores were analysed using a 4 (age group: 18-29 vs. 30-39 vs. 40-49 vs. 50-60) × 2 (gender: women vs. men) × 2 (education level: low vs. high) analysis of variance (ANOVA). There was a significant main effect of age group, $F(3, 885) = 6.413, p < .001, \eta^2_p = .021$. Post hoc Scheffe tests revealed that attitudes to ageing were significantly ($p < .05$) more positive in the oldest age group (50-60: $M = 83.97, SD = 1.04$) compared to the two younger age groups (18-29: $M = 78.53, SD = 0.74, d = 6.03$; 30-39: $M = 79.85, SD = 0.64, d = 4.77$). However, there were no differences in scores between the 40-49 ($M = 80.91, SD = 0.89$) and 50-60-year age groups, or between the 18-29 and 30-39 year age groups. There was also a significant main effect of gender, $F(1, 885) = 4.192, p = .041, \eta^2_p = .005$, with men reporting more positive attitudes ($M = 81.67, SD = 0.58$) than women ($M = 79.95, SD = 0.61$). There was no significant main effect of education levels, $F(1, 885) = 1.421, p = .234, \eta^2_p = .002$, and no significant interactions. Mean scores for all levels of each factor are presented in Table 4.
Table 4. Means and Standard Deviations for Scores on the Total RAQ and Each Subscale. To facilitate comparison of scores across the subscales (which differ in the number of items they contain), scores for each subscale have been reported as the mean score per item (i.e. total subscale score divided by the number of items in the subscale). Superscript letters indicate significant differences between specific levels of each factor.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total RAQ</th>
<th>Negative</th>
<th>Positive</th>
<th>Perceived</th>
<th>Family &amp; Religion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thoughts about Growing Older</td>
<td>Aspects of Ageing</td>
<td>Personal Attributes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-29</td>
<td>78.53 (0.74)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.66 (0.04)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.35 (0.04)&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>3.29 (0.05)</td>
<td>4.22 (0.04)</td>
</tr>
<tr>
<td>30-39</td>
<td>79.85 (0.64)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.68 (0.04)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.45 (0.03)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.35 (0.04)</td>
<td>4.30 (0.04)</td>
</tr>
<tr>
<td>40-49</td>
<td>80.91 (0.89)</td>
<td>2.72 (0.05)</td>
<td>3.54 (0.04)&lt;sup&gt;d&lt;/sup&gt;</td>
<td>3.39 (0.06)</td>
<td>4.25 (0.03)</td>
</tr>
<tr>
<td>50-60</td>
<td>83.97 (1.04)&lt;sup&gt;c,d&lt;/sup&gt;</td>
<td>2.92 (0.06)&lt;sup&gt;c,d&lt;/sup&gt;</td>
<td>3.60 (0.05)&lt;sup&gt;c,d&lt;/sup&gt;</td>
<td>3.47 (0.07)</td>
<td>4.28 (0.03)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total RAQ</th>
<th>Negative</th>
<th>Positive</th>
<th>Perceived</th>
<th>Family &amp; Religion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thoughts about Growing Older</td>
<td>Aspects of Ageing</td>
<td>Personal Attributes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>81.67 (0.58)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>2.81 (0.03)</td>
<td>3.52 (0.03)</td>
<td>3.39 (0.04)</td>
<td>4.23 (0.03)</td>
</tr>
<tr>
<td>Women</td>
<td>79.95 (0.61)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>2.68 (0.04)</td>
<td>3.45 (0.03)</td>
<td>3.37 (0.04)</td>
<td>4.30 (0.03)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education Levels</th>
<th>Total RAQ</th>
<th>Negative</th>
<th>Positive</th>
<th>Perceived</th>
<th>Family &amp; Religion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thoughts about Growing Older</td>
<td>Aspects of Ageing</td>
<td>Personal Attributes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>80.31 (0.52)</td>
<td>2.71 (0.03)</td>
<td>3.48 (0.02)</td>
<td>3.36 (0.03)</td>
<td>4.29 (0.03)</td>
</tr>
<tr>
<td>Higher</td>
<td>81.31 (0.66)</td>
<td>2.79 (0.04)</td>
<td>3.49 (0.03)</td>
<td>3.40 (0.04)</td>
<td>4.24 (0.04)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Significantly different from 50-60 group; <sup>b</sup>Significantly different from 40-49 group; <sup>c</sup>Significantly different from 30-39 group; <sup>d</sup>Significantly different from 18-29 group; <sup>e</sup>Significantly different between genders.
Reactions to Ageing Subscales

A three-way univariate ANOVA was conducted for each of the four subscales of the Malay RAQ, in order to observe the effects of age, gender and education levels. To facilitate comparison between subscales with different numbers of items, mean scores for each subscale were calculated per item (i.e., out of a maximum of 5). Note that higher scores for each subscale indicate more positive attitudes to ageing.

Negative Thoughts about Growing Older

With regards to negative thoughts about growing older, there was a significant main effect of age group, \( F(3, 885) = 4.540, p = .004, \eta^2_p = .015 \). Post-hoc Scheffe tests showed that scores in the oldest group (50-60: \( M = 2.92, SD = 0.06 \)) were significantly higher (reflecting more positive attitudes to ageing) than the youngest two age groups (18-29: \( M = 2.66, SD = 0.04, d = 5.10 \); 30-39: \( M = 2.68, SD = 0.04, d = 4.71 \)). There was also a significant main effect of gender, \( F(1, 885) = 6.429, p = .011, \eta^2_p = .007 \), with higher scores on this subscale in men (\( M = 2.81, SD = 0.03 \)) compared to women (\( M = 2.68, SD = 0.04 \)) (Table 4). There was no main effect of education levels, \( F(1, 885) = 2.860, p = .091, \eta^2_p = .003 \), and no significant interactions between variables.

Positive Aspects of Ageing

For positive aspects of ageing, there was a significant main effect of age group \( F(3, 885) = 7.695, p < .001, \eta^2_p = .025 \). Scheffe tests showed that, as with the Negative Thoughts about Growing Older factor, positive aspects of ageing scores were significantly higher (indicating more positive attitudes to ageing) in the oldest group (50-60: \( M = 3.60, SD = 0.05 \)) compared to people in the 18-29 (\( M = 3.35, SD = 0.04, d = \))
5.52) and 30-39 (M = 3.45, SD = 0.03, d = 3.31) groups. Scores were also significantly higher in people aged 40-49 (M = 3.54, SD = 0.04) compared to people aged 18-29 (d = 4.75) (Table 4). No other groups were significantly different from one another. There were no significant main effects of gender, F (1, 885) = 3.006, p = .083, η² = .003; or education levels, F (1, 885) = 0.024, p = .876, η² = .001, and no significant interactions.

Perceived Personal Attributes

For the Perceived Personal Attributes domain, there were no main effects of age group F (3, 885) = 1.603, p = .187, η² = .005; gender F (1, 885) = 0.130, p = .719, η² = .001; or education F (1, 885) = 0.557, p = .456, η² = .001; and no significant interactions between them.

Family and Religion

For the Family and Religion factor, there were no significant main effects of age group F (3, 885) = 0.757, p = .518, η² = .003; gender, F (3, 885) = 1.804, p = .180, η² = .002; or education levels, F (1, 885) = 1.466, p = .226, η² = .002; and no interactions between these variables.

Discussion

The aims of this study were to develop a culturally adapted Malay version of the RAQ, and to explore the effects of key demographic variables on RAQ scores in adults younger than 60 years of age. An exploratory factor analysis revealed four factors, including a ‘Family and Religion’ factor that has not been identified in Western versions of the RAQ. Items with low factor loadings were deleted, resulting in high levels of
internal consistency across the remaining scale and subscales. Overall, the total Malay RAQ scores were significantly affected by age and gender, in that men and older people had more positive attitudes to their ageing. Age and gender effects were also observed for some of the sub-scales, but no effects of education were seen for any subscale. Together, these results suggest that this culturally-adapted Malay version of the RAQ provides a reliable measure of attitude to ageing that is differentially sensitive to age and gender.

Three of the four factors identified (Negative Thoughts about Growing Older; Perceived Personal Attributes and Positive Aspect of Ageing) were conceptually similar to those found by Gething et al. (2004); Koder and Helmes (2006; 2008a; 2008b); Netz et al. (2001) and Unsworth et al. (2001) in Australian, British and Swedish samples, although the precise contents of the scales differed for some factors. In particular, six items were identified in this study as loading on the ‘Perceived Personal Attributes’ factor, whereas Gething et al. (2004); and Netz et al. (2004) only found three items, whilst Unsworth et al. (2001) found four items. Moreover, two of the six items that loaded onto the ‘Perceived Personal Attributes’ factor in the current study (‘I find the thought of growing older is depressing’; and ‘I won’t like growing old’) loaded onto the ‘Negative Thoughts about Growing Older’ by Gething et al. (2004) and Netz et al. (2004). Items loading on the ‘Positive Aspects of Ageing’ factor were generally consistent with the findings from Gething et al. (2004); Netz et al. (2001) and Unsworth et al. (2001). The content of the ‘Negative Thoughts about Growing Older’ factor was also similar to that reported by Gething et al. (2004), although it contained items that made up two different scales (Negative Thoughts about Growing Older and Fear of
Becoming Frail) in data from Netz et al. (2001). In addition, of the nine original RAQ items that were removed in the current study, four of these (items 6, 15, 16 and 22) were also removed due to their low factor loadings in validations with Australian, Swedish and British participants (Gething et al., 2004), whilst a further five of the items were shown to load poorly onto factors in at least one other Western population (Gething et al., 2004; Unsworth et al., 2001). Taken together, these findings suggest that at least some of the original items of the RAQ show consistency across Eastern and Western populations, and that could be investigated as a potential “core set” of RAQ items that are applicable worldwide.

A new dimension of ‘Family and Religion’ was identified in this culturally-adapted scale. This factor reflects the concept of a strong family relationship that is traditionally embraced by Eastern cultural groups (Lockenhoff et al., 2015). Filial-piety, for example, has become a basic principle of the family system in Malaysia (Ismail, Jo-Pei & Ibrahim, 2009), where adults are expected to be attentive to, respectful towards, and supportive of, their parents (Kim et. al., 2015). People in Malaysia also still emphasise the importance of family relationships (Minhat et al., 2015a; Teh et al., 2014). Consistent with this, Kooshiar et al. (2012) reported that about 70% of older Malaysians live with their adult children, providing companionship for the older people, and enabling interaction and contact across generations. Additionally, this factor reflects the significant role that religion plays in the Malaysian population (Abu Bakar, 2013), which is believed to facilitate adjustment to the ageing process (Jianbin & Mehta, 2003). The link between religious practice and family is also supported by the close relationships between them that often occur in day-to-day life. For instance, individuals
often pray for a happy and healthy family, and for the wellbeing of their descendants (Tohit, Browning & Radermacher, 2012). Elders in the family also play a central role in transmitting religious beliefs to their offspring, such as informing their children about religious rituals and traditions (Mehta, 1997).

Another contribution of the present study was the examination of the relationships between RAQ scores and demographic variables. The results are broadly in line with previous findings into the relationship between age and RAQ scores in Western populations (Draper, et al., 1999; Golden et al., 2013; Unsworth et al., 2001), which indicate that attitudes to ageing are more positive among older people. In the current study, these effects of age were only seen in two of the four RAQ subscales (Negative Thoughts about Growing Older; Positive Aspects of Ageing), with attitudes towards ‘Perceived Personal Attributes’ and the ‘Family and Religion’ aspects of ageing being more consistent across age groups. This is consistent with previous findings suggesting that the effects of age may be limited to certain aspects of attitudes to ageing (Unsworth et al., 2001), and that younger people in Malaysia express concerns about being old that manifest as declining physical ability, health, and changes in physical appearances, as well as being more sensitive (Minhat et al., 2015b). The lack of age effect in the Family and Religion factor may be due to the traditional cultural beliefs around filial piety (Damulak et al., 2015) and religion in Malaysia that are emphasised and transmitted in childhood, and reinforced in adulthood (Mehta, 1997), making the positive roles of family and religion similarly salient to people of different age groups.

Consistent with previous studies that have explored the RAQ (e.g., Draper et al., 1999; Golden et al, 2013), attitudes to ageing were also linked to gender in the present
study, with men, overall, reporting more positive attitudes compared to women. However, in the current study, gender effects were only seen in the ‘Negative Thoughts about Growing Older’ subscale, which focuses on age-related changes in cognitive and physical functioning, such as health status, frailty, safety, mortality, and independence. This is consistent with work reporting that men have fewer anxieties about declining cognitive and physical abilities than women (Barrett & Von Rohr, 2008).

Similarly, women may find it more challenging to overcome the negative attitudes held about their ageing due to the increased emphasis that is placed on beauty and youth for women: a so-called ‘double standard of ageing’ (Halliwell & Dittmar, 2003). Women may also have greater exposure to negative aspects of ageing due to their increased levels of experience in dealing with disabled older parents (Hequembourg & Brallier, 2005). Indeed, in Malaysia, women are traditionally more involved in caring for elderly parents (Alavi & Sail, 2010), and are highly concerned about their physical changes (Minhat et al., 2015a; 2015b). This may help to explain why Malaysian women may feel more anxious about their personal ageing, and have more negative expectancies about their personal ageing process, compared to men. The finding that gender effects were limited to just one of the four RAQ sub-scales also highlights the importance of measuring attitudes at this more focused level of description. Education levels did not influence RAQ scores, which chimes with a broader picture of a lack of association between education and RAQ scores in other populations (Gething, 1994; Gething et al., 2002; Gething et al., 2004).
Although the present research takes the literature on attitudes to ageing forward in important respects, some limitations need to be acknowledged. First, the new items generated and added to the scale were based on responses from a relatively small number of participants, who were currently living in the UK, and so may not fully reflect attitudes to ageing held by people in Malaysia. However, these participants were purposefully sampled to be demographically diverse, ensuring at least some variety in the views expressed. Other limitations relate to the sample used to validate the Malay RAQ. For one thing, whilst asking managers of the organisations to distribute the surveys will likely have increased the response rate (Krishnan & Poulose, 2016), it may also have introduced some sampling or response biases, for instance due to managers purposefully targeting or avoiding certain employees.

Furthermore, although the sample was large, it consisted almost exclusively of government employees, who were predominantly ethnically Malay. Although this homogeneity made it easier to determine the effects of age, gender and education, it also limits the generalizability of our findings to other ethnicities, or to unemployed or self-employed individuals. In particular, as government employees in Malaysia have to achieve a minimum level of education of high school in order to take on these positions (Malaysia Public Service Department, 2017), participants with very low levels of formal education were not included, and so the full effect of education levels could not be examined. Our use of a categorical measure of education, rather than a continuous one, such as years of education, will also have reduced the sensitivity of our analyses involving educational level. The cross sectional nature of the data also means that it is not possible to establish the extent to which differences between age groups truly
represent the effects of age, rather than generational differences. This is particularly important given that longitudinal studies assessing participants’ reflections on their experiences of ageing show a trend towards more negative attitudes to ageing with increasing age (Miche, Elsasser, Schilling, & Wahl, 2014), suggesting that similar effects could be present when assessing participants’ attitudes to their future ageing.

Finally, the present study only investigated some of the factors that may be related to attitudes to ageing. Future studies that examine whether such responses are also dependent on other factors, such as personality or health, would now be beneficial in order to gain a more complete understanding of the factors that relate to attitudes to ageing in those aged under 60.

**Conclusion**

The present study identified an additional element of attitudes to ageing not currently captured in Western measures, namely, ‘Family and Religion’ and demonstrated that the culturally-adapted Malay RAQ had good levels of reliability and validity among Malay adults aged under 60. In addition, the present study provides evidence that, as seen in other cultures, attitudes to ageing are influenced by age and gender, but that levels of education seem to be unrelated to attitudes to ageing in adults aged under 60. Perhaps more importantly, we identified a “core set” of RAQ items that seem to work across cultural settings and would be amenable to testing worldwide.
Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The research was supported by the NIHR Manchester Biomedical Research Centre and the NIHR Greater Manchester Patient Safety Translational Research Centre, and a PhD studentship from the Malaysian Ministry of Education awarded to FNMF.
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Malaysia Public Service Department (2017). *Scheme of service and position*. Retrieved


Appendix (i) Results of the Content Analysis of Open-Ended Responses Used to Generate Candidate New Items.

<table>
<thead>
<tr>
<th>No</th>
<th>Themes</th>
<th>Content of Respondents’ Responses (number of respondents reporting each)</th>
<th>Total Number of Respondents</th>
<th>Candidate New Items Developed</th>
</tr>
</thead>
</table>
| 1  | Death                      | - Scared of death (1)  
- Prepare for emergency departure (1)                                                                                                   | 2                          | Not Applicable                                    |
| 2  | Physical appearance        | - Looking old (2)  
- Wrinkled skin (2)  
- Knee pain (1)  
- Hair loss (1)                                                                                                                                  | 6                          | - I won’t like looking old                        |
| 3  | Health                     | - Hoping to be well and healthy, even though ageing is associated with loss (2)  
- Worry my health will be worse (6)  
- My ability to do something becomes slow compared to young age (2)  
- Feeling tired (1)  
- Weak physical ability (2)  
- Frail (2)  
- Being careful with my food intake and daily activity in order to ensure that my health is good (1) | 16                         | - I worry about my health getting worse            |
| 4  | Ability to do              | - Travel to favourite places (3)  
- Able to do everything on my own (2)  
- Able to work and contribute to society (2)  
- Rest at home (2)  
- More time for myself (1)                                                                                                                    | 10                         | - I will have more time to do the things that I enjoy. |
<table>
<thead>
<tr>
<th></th>
<th>Family relationships</th>
<th></th>
<th>Financial Concerns</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>-Having more time to spend with my family (2)</td>
<td>18</td>
<td>-Using pension money for the rest of my life (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Hoping that my children are happy with their own family (1)</td>
<td></td>
<td>-No income / financially unstable, so I am worried about finances after retirement (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-People that I love are still happy and are together with me (5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Getting more attention from society and children as I grow older (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Children are busy with their own life (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Worried that the time with my family is short as I may die (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Feeling lonely as my children already have their own family and are living on their own without me (3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Need help from my children/family to do something (4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Religion</td>
<td>6</td>
<td>I will be happy that I can devote more time to my religion.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Spend more time worshipping God (3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Doing good things (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Being grateful to God (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Acceptance of ageing</td>
<td>4</td>
<td>I will accept the fact that I am old.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Accept that I am already old (3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Accept the ageing process (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Financial Concerns</td>
<td>4</td>
<td>I worry about having less money to live on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Using pension money for the rest of my life (1)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>-No income / financially unstable, so I am worried about finances after retirement (3)</td>
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</tbody>
</table>
Appendix (ii) The Malay Version of the RAQ

Berikut adalah penyataan tentang perasaan seseorang apabila mengalami perubahan usia. Bayangkan apa yang akan anda rasa apabila ANDA BERUSIA LEBIH 65 TAHUN. Nyatakan sejauh mana anda bersetuju/tidak bersetuju terhadap pernyataan berikut dengan menanda (✔) satu jawapan yang paling hampir dengan perasaan anda.

<table>
<thead>
<tr>
<th>PENYATAAN</th>
<th>Sangat Tidak Setuju</th>
<th>Tidak Setuju</th>
<th>Neutral</th>
<th>Setuju</th>
<th>Sangat Setuju</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Usia tua akan menjadi masa yang menyeronokkan dalam hidup</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2  Saya bimbang saya akan menjadi nyanyuk dan hilang keupayaan berfikir</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3  Saya berharap saya akan dapat mengenang kembali kehidupan lalu dengan perasaan bangga</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4  Saya akan menjadi lebih sunyi berbanding sekarang</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5  Usia tua membawa kepuasan yang tidak dapat dinikmati ketika muda</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6  Menjadi uzur jarang sekali menjadi isu yang membimbangkan saya</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>7  Saya bimbang tentang kematian dan meninggalkan mereka yang saya sayang</td>
<td></td>
<td></td>
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<tr>
<td>8  Saya risau tidak akan menikmati kehidupan seperti yang saya rasai sekarang</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>9  Saya dapat pemikiran tentang penambahan usia amat menyediakan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Kehidupan boleh menjadi lebih baik apabila anda melepasi umur pertengahan.</td>
<td></td>
<td></td>
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<tr>
<td>11 Saya akan menyesali kehilangan kekuatan dan daya tarikan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 Saya rasa tidak perlu ditakutkan sangat tentang menjadi orang tua</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 Saya bimbang hilang kebergantungan kepada diri sendiri</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>14 Saya jangka untuk menjadi penyayang dan prihatin</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15 Saya akan dapat menerima kematian rakan-rakan dan orang yang disayangi sebagai proses semula jadi dalam kehidupan.</td>
<td></td>
<td></td>
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<tr>
<td>16 Saya ternanti-nanti untuk menjadi tua dengan seseorang yang saya cintai</td>
<td></td>
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<tr>
<td>17 Saya bimbang menjadi uzur.</td>
<td></td>
<td></td>
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<tr>
<td>18 Saya akan menjadi lebih cepat marah dan perengus berbanding sekarang.</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>19 Orang lain mungkin sukai untuk bergaul dengan saya</td>
<td></td>
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</tr>
<tr>
<td>20 Saya akan menjadi lebih terikat dengan cara</td>
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<tr>
<td>saya dan keberatan untuk berubah</td>
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<tr>
<td>21</td>
<td>Saya tidak akan suka menjadi tua.</td>
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<tr>
<td>22</td>
<td>Saya tidak risau apabila terfikir menjadi nyanyuk dan hilang keupayaan berfikir</td>
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<tr>
<td>23</td>
<td>Saya akan bimbang tentang kehilangan orang yang disayangi di sekeliling saya</td>
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<tr>
<td>24</td>
<td>Saya akan menjadi bersemangat terhadap kehidupan pada usia tua sama seperti yang saya alami sekarang</td>
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<tr>
<td>25</td>
<td>Banyak perkara yang dinanti-nantikan apabila menjadi tua</td>
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<td>26</td>
<td>Saya tidak akan rasa selamat bersendirian seperti yang saya rasai sekarang</td>
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<tr>
<td>27</td>
<td>Saya risau tentang siapa yang akan menjaga saya jika uzur.</td>
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<tr>
<td>28</td>
<td>Saya akan mempunyai banyak masa untuk melakukan perkara yang saya suka.</td>
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<td>Saya tidak akan suka kelihatan tua</td>
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<tr>
<td>30</td>
<td>Saya risau tentang kekurangan wang untuk terus hidup</td>
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<tr>
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<td>Saya risau kesihatan saya akan bertambah buruk</td>
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</tr>
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<td>32</td>
<td>Saya akan menerima seadaanya kenyataan yang saya telah tua.</td>
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</tr>
<tr>
<td>33</td>
<td>Saya akan berasa seronok mempunyai keluarga di sekeliling saya.</td>
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</tr>
<tr>
<td>34</td>
<td>Saya gembira keluarga saya akan menjaga saya.</td>
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</tr>
<tr>
<td>35</td>
<td>Saya akan berasa gembira dapat meluangkan lebih banyak masa untuk agama dan melakukan amal ibadat.</td>
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</table>

* Items in bold are those that were retained in the final version of the questionnaire
Appendix (iii) Factor Loadings for the Four Factor Model of the RAQ with 35 Items

<table>
<thead>
<tr>
<th>Items</th>
<th>Factors</th>
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<tbody>
<tr>
<td></td>
<td>Negative Thought about Growing Older</td>
</tr>
<tr>
<td>I worry that I might become senile and lose my mind</td>
<td>.736</td>
</tr>
<tr>
<td>I worry about my health getting worse</td>
<td>.707</td>
</tr>
<tr>
<td>I worry about becoming frail</td>
<td>.703</td>
</tr>
<tr>
<td>I worry about loss of independence</td>
<td>.678</td>
</tr>
<tr>
<td>I am concerned about who will care for me if I become frail</td>
<td>.675</td>
</tr>
<tr>
<td>It worries me that I won’t enjoy life as much as I do now</td>
<td>.610</td>
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<tr>
<td>I worry about the loss of loved ones around me</td>
<td>.599</td>
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<tr>
<td>I worry about dying and leaving behind those I love</td>
<td>.513</td>
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<tr>
<td>I worry about having less money to live on</td>
<td>.497</td>
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<tr>
<td>I won’t feel as safe on my own as I do now</td>
<td>.493</td>
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<tr>
<td>I will be more lonely than I am now</td>
<td>.455</td>
</tr>
<tr>
<td>I will regret the loss of strength and attractiveness</td>
<td>.416</td>
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<tr>
<td>I do not worry about the thought of becoming senile and losing my mind</td>
<td>.404</td>
</tr>
<tr>
<td>I will enjoy having my family around me</td>
<td>.043</td>
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<tr>
<td>I am happy that my family will take care of me</td>
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</tr>
<tr>
<td>I will be happy that I can devote more time to my religion</td>
<td>.048</td>
</tr>
<tr>
<td>I will accept the fact that I am old</td>
<td>-.078</td>
</tr>
<tr>
<td>There is a lot to look forward to in regard to being old</td>
<td>-.060</td>
</tr>
<tr>
<td>In my old age I will be as</td>
<td>.052</td>
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</table>
enthusiastic about life as I am now. I do not feel there is much to be scared about becoming an older person.

Old age will bring satisfactions which are not available to the young. I will have more time to do the things that I enjoy.

Old age will be an enjoyable time of life. I will be able to accept the death of friends and loved ones as a natural part of life.

Life can get better once you pass middle age. Becoming frail is rarely an issue which concerns me.

I look forward to growing old with someone I love. I expect to be a loving, caring person.

I hope that I might look back on my life with a sense of pride. I will become more irritable and grouchy than I am now.

I will be more set in my ways and reluctant to change. Others may find me difficult to get along with.

I won’t like growing old. I won’t like looking old.

I find the thought of growing old depressing.

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor Loadings</th>
<th>Cross Loadings</th>
<th>Interpretation</th>
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<td>12</td>
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<td>-.031</td>
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<tr>
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<td>-.090</td>
<td>-.012</td>
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<td>.022</td>
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<td>19</td>
<td>.121</td>
<td>.060</td>
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<td>.165</td>
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<td>29</td>
<td>.249</td>
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<td>.149</td>
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<tr>
<td>9</td>
<td>.345</td>
<td>.035</td>
<td>.060</td>
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</tbody>
</table>

*a New items added

*b Item loading < .45 (Items omitted)

*Factor loadings and cross loadings of all 35 items on the four-factor model of the RAQ. Figures in bold text represent the highest loading for each item.
CHAPTER SIX

STUDY FOUR:

MODERATING EFFECTS OF AGE ON

RELATIONSHIPS BETWEEN ATTITUDES TO AGEING AND

WELL-BEING AND LIFE SATISFACTION

This manuscript has been submitted to the journal ‘Quality of Life Research’ for peer review.

The format of Quality of Life Research manuscripts is used in the chapter.
CHAPTER 6

Moderating effects of age on relationships between attitudes to ageing and well-being and life satisfaction

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Acknowledgments: The research was supported by the NIHR Manchester Biomedical Research Centre and NIHR Greater Manchester Patient Safety Translational Research Centre.

Declaration of Conflicting Interests: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding: The work was funding by a PhD studentship from the Malaysian Ministry of Education awarded to FNMF.
Abstract

Purpose: Little is known about the factors that might influence the relationship between attitudes to ageing and psychological health. The present study examines whether chronological age, and the way in which attitudes to ageing are conceptualised, affects the relationships between attitudes to ageing, and well-being and life satisfaction.

Methods: In a cross-sectional survey, adults aged from 18 to 60 years (mean age = 36.63; N = 911) from 67 public agencies in Malaysia completed measures of current concerns about growing older (Malay Anxiety about Ageing Scale (M-AAS)), anticipated reactions to being aged older than 65 (Malay Reactions about Ageing Questionnaire (M-RAQ)), wellbeing (the Warwick-Edinburgh Mental Well-being Scale (WEMWBS)) and life satisfaction (The Satisfaction with Life Scale (SWLS)).

Results: More negative attitudes to ageing were associated with lower levels of well-being (d for M-AAS = .86; d for M-RAQ = .65) and life satisfaction (d for M-AAS = .61, d for M-RAQ = .49). Current concerns about ageing (M-AAS) were more strongly related to well-being and life satisfaction among younger (d well-being = .66; d life satisfaction = .44) compared to older participants (d well-being = .41; d life satisfaction = .28). Age did not moderate the relationship between anticipated reactions to ageing (M-RAQ) and well-being and life satisfaction.

Conclusions: The present study provides valuable new information to inform interventions that address attitudes to ageing. Specifically, tackling current concerns about growing older among the young may be the best way to improve future health and well-being outcomes.

Keywords: Self-perception, ageing attitudes, age-stereotypes, mental health, satisfaction of life.
**Introduction**

There is now considerable evidence that attitudes to ageing in adults over 60 years of age are associated with health and well-being outcomes [1-3]. There is also emerging evidence that similar patterns can be found in adults younger than 60 years old. For instance, Thorpe, Pearson, Schluter, Spittlehouse and Joyce [4] reported correlations between attitudes to ageing and chronic physical and mental health in a sample of participants from New Zealand aged 49-51, whilst Joshi, Malhotra, Lim, Ostbye and Wong [5] reported correlations between attitudes to ageing and wellbeing outcomes in a sample of English-speaking participants, aged over 42, from Singapore. Longitudinal studies have also shown that positive attitudes to ageing at baseline predict healthier eating patterns over a one-year follow-up period in both middle-aged (36-64 years) and younger (18-35 years) adults, even after controlling for participants’ gender, baseline eating behaviour, health, and body mass index (BMI) [6]. Similarly, more positive attitudes to ageing among middle aged adults (40-64 years) predicted an increase in sporting activity six years later [7]. Such associations between attitudes to ageing and engagement in health behaviours highlight the importance of understanding the content and valence of attitudes to ageing held by people before they reach later life, with a view to developing interventions to ensure people’s attitudes to ageing are healthy.

Attitudes to ageing can be defined as affective, cognitive or behavioural representations of one’s own ageing [8], or affective, cognitive or behavioural reactions to ageing as a more general construct [9]. Whereas the attitudes of older adults to their own ageing and to ageing as a general construct are largely informed by their personal
experiences of age-related changes [10], the attitudes of younger adults are informed both by observations of other people’s ageing [11], and by cultural stereotypes of old age [12]. Thus, younger people’s attitudes to ageing can be conceptualised as both expectations of what their life and self will be like at a future older age [13], as well as current concerns during the process of getting older [14]. Important in terms of intervention development is the fact that younger people’s attitudes to ageing may be more amenable to change than those of older people, whose attitudes are based on prior experience and are likely to be stronger [15].

Although the relationships between attitudes to ageing and well-being have been examined in a range of different younger age groups, the extent to which age moderates these relationships has not been tested. This is important because a better understanding of the moderating effect of age on these relationships would help with intervention development by identifying the point(s) in the life cycle at which people’s attitudes to ageing are most closely associated with well-being and life satisfaction, as well as providing insights into the mechanisms that underlie these relationships.

The aim of the present study was therefore to examine the relationship between attitudes to ageing and well-being outcomes across a broad range of younger adults, aged under 60 years, to explore the moderating effect of age on these relationships. As attitudes to ageing in younger people have been conceptualised by anticipated ageing at future old age [13] and current concerns about getting older [14], we used two different measures that focussed on participants’ anticipated reactions to being over the age of 65 [16] and their current fears and anxieties about growing older and older people [14]. In line with previous research involving people under 60, we predicted that positive
attitudes to ageing would be associated with positive well-being and life satisfaction, after controlling for relevant sociodemographic and health variables (age, gender, education, and self-rated health). In order to examine the extent to which these relationships differ by age, the moderating effect of age on these relationships was also examined for each attitude measure.

Method

Participants

Participants were 1731 employees of 68 public agencies (e.g., schools, hospitals, welfare community departments) in Kedah, Malaysia. In order to be eligible to take part in the study, participants had to be aged between 18-60 years old and be literate in the Malay language. Recruiting non-English speaking participants from a non-Western country was considered important, given that previous work exploring relationships between attitudes to ageing and health outcomes in younger populations has been conducted either in Western countries [4,6-7], or with English-speaking participants in a non-Western country [5]. There are known differences in the ways that people from Western and Eastern cultures perceive ageing and older adults [17], meaning that insights about the relationships gathered from Western populations cannot necessarily be generalised to non-Western cultures. Malaysia is an Asian country with an Eastern, collectivist orientation [18], practicing traditional values such as filial piety [19], and with a high proportion of older Malaysians living with [20], and receiving care from their adult children [21].
Instruments

**Attitudes to Ageing**- We used Malay versions of two different measures of attitudes to ageing that have been validated for use in people aged under 60: the Reactions to Ageing Questionnaire (RAQ) [16], which focuses on participants’ anticipated reactions to being over the age of 65; and the Anxiety about Ageing Scale (AAS) [14], which focuses on participants’ current fears and anxieties about growing older and older people. The Malay version of the Reactions to Ageing Questionnaire (M-RAQ) [22] is an adapted Malay version of the original RAQ developed by Gething [16]. It comprises 25 items (18 items from original RAQ; and seven generated new items), each of which is a statement describing positive or negative dimensions related to expectations of what life will be like when aged over 65 years. Example items include ‘Old age will be an enjoyable time of life’ and ‘I will be more lonely than I am now’. Participants are requested to specify their agreement with each statement using a five-point scale ranging from 1 (disagree very much) to 5 (agree very much), which varied slightly from the original point scale used by Gething (1994), which was a six point-scale (1 = disagree very much to 6 = agree very much). The five-point scale was used to retain a consistency with other measures of attitudes to ageing. Scores of the M-RAQ can range from 25 to 125, with 18 items reverse-scored such that greater scores indicate more positive attitudes towards ageing. This adapted scale has high internal consistency, with a Cronbach’s alpha value of .88 in the present study.

The Malay version of the Anxiety about Ageing Scale (M-AAS) [23] is an adapted Malay version of the original AAS that was developed by Lasher and Faulkender [14]. This scale emphasises current feelings or fear about growing older, or
willingness to be together with and help the elderly. The same response scale by Laher and Faulkender (1993) was used, with participants asked to rate the extent of their agreement with 19 statements (e.g., *I like to go visit my older relatives; When I look in the mirror, it bothers me to see how my looks have changed with age.*) on a 5-point Likert scale, ranging from strongly agree to strongly disagree. Seven items are reverse scored, so that higher scores always specify greater levels of anxiety about ageing. Scores can range from 19 to 95. The alpha coefficient for this scale in the current study was .83, indicating good internal consistency.

An Exploratory Factor Analysis of participants’ responses to the M-AAS and M-RAQ (Appendix i) revealed eight factors that corresponded well to the four factors that have previously been shown to be measured by each of the two instruments [22, 23], with correlation coefficients between the subscales of each scale ranging from .008 (Family & Religion; & Fear of Losses) to .653 (Negative Thought about Growing Older & Fear of Losses), supporting the notion that the instruments measure different constructs.

**Well-being-** The Warwick- Edinburgh Mental Well-being Scale (WEMWBS) was established by Tennant et al., [24] and consists of 14 items covering both hedonic and eudemonic well-being. Hedonic well-being is associated with the concept of subjective well-being, which is usually interpreted as the balance between negative and positive effect, as well as overall satisfaction with life [25], whilst eudemonic well-being represents aspects of psychological well-being [26], such as personal control, self-acceptance and purpose in life [27]. This scale has been widely used and validated in more than ten languages, including Asian languages such as Chinese, Japanese and
Hindi [28]. Participants are asked to indicate their agreement on statements that best describes their experience over the past two week on 5-point Likert scale (1 = none of the time) to 5 = all of the time). These response scales are the same as the original version by Tennant et al., [24]. Ranging from 14 to 70, higher scores of the WEMWBS represents higher levels of mental well-being [24]. The Cronbach’s alpha for this scale was .90 in the current study, indicating a high level of reliability.

The Satisfaction with Life Scale (SWLS) is developed by Diener, Emmons, Larsen and Griffin [29] to assess cognitive judgements of one’s life satisfaction. A large body of research has also examined the psychometric properties of the SWLS in many different Asian settings [30-32]. Participants indicate their degree of agreement on five items, such as “The conditions of my life are excellent; In most ways my life is close to my ideal” using a 7-point scale with responses range from 1 (strongly disagree) to 7 (strongly agree), which was the same as the original version. Scores for this scale ranges from 5 to 35, with higher values indicate greater levels of life satisfaction. In the present study, the Cronbach’s alpha score for this scale was .85.

Since there were no Malay versions of the WEMWBS or SWLS, each was translated into Malay using a back-translation procedure [33]. The original and the back-translated English versions were then compared to identify any differences in the meaning of the items, and amended accordingly. As a final check for clarity, the revised translated version of each was then administered to 18 Malay-speaking participants living in the UK using a ‘think aloud’ procedure [34], with minor ambiguities amended (e.g., simplify sentences in Malay; changing few Malay words for clarity) until no new issues arose.
**Health** - The self-report single item asks participants to respond to the phrase, “*In general, how would you describe your health?*” with one of a five-point scale, where 1 reflects poor and 5 reflects excellent [35]. This instrument has been found to be predictive of morbidity and mortality [36], indicating its validity as a measure of health.

**Procedure**

Data for the present study were collected between October and December 2015. Before collecting the data, approval was acquired from the University Research Ethics Committee 5 (Reference: 15330) and the Malaysian Economic Planning Unit. The researcher then approached organisations (e.g., school, hospitals, community center) listed by the Ministry of Information, Kedah. A letter asking for permission to conduct the study was then sent to the managers of 68 selected agencies. The researcher distributed questionnaire packs to each manager, who was asked to distribute them to their employees. Employees were then asked to complete the questionnaires within the next two weeks, and return them in an opaque envelope into a box that was provided by the researcher. Each questionnaire pack contained a participant information sheet, a brief demographic questionnaire assessing age, gender, and a single-item measure of self-rated health, and multiple questionnaires relating to the variables of interest. Additional measures of self-esteem were collected as part of a larger study.

**Data Analysis**

Statistical Package for Social Sciences version 23 was used in this study to perform all analyses. Four hierarchical multiple regression analyses were performed to assess the effects of attitudes to, and anxiety about, ageing on well-being and life satisfaction as
dependent variables. The independent variables were entered into blocks; with demographic and health control variables (gender, education and health) added in block 1 as control variables. The total score of M-AAS or M-RAQ, and age, were then added in block 2 as predictors. The interaction of age and the M-AAS or M-RAQ score were then entered into block 3. The variables were centered by subtracting the sample mean from all individual variable scores [37]. Significant age × M-AAS/M-RAQ interactions were further investigated using the PROCESS function by Hayes [38] with age as a linear variable.

Results

Participant Characteristics

Overall, 1731 questionnaires were distributed to 68 organisations. However, the manager of one organisation was unable to distribute the questionnaires because most of their employees were predominantly based outside of the main office. A total of 957 completed questionnaires were returned from the other 67 organisations. Based on the Interagency Language Roundtable Scale [39], five questionnaires were excluded as the participants did not meet the inclusion criterion of Malay language proficiency (for those in level 1 (Elementary Proficiency); 2 (Limited Working Proficiency); and 3 (Professional Working Proficiency); and one further participant had scores that were extreme outliers (more than 3* interquartile ranges from the average). A further 40 participants were excluded due to having high levels (more than 5%) of overall missing items. Mean substitutions were used to replace missing data in other 21 cases (2.3 % of total data), in which less than 5% of the data were missing.
The final analyses were therefore performed on data from 911 participants. The age of the sample ranged from 18 and 60 years, with a mean age of 36.63 years ($SD = 10.03$). The majority of participants were of Malay ethnicity (93.4%). The proportion of female participants was higher than male (517 female; 394 male). Approximately, 38% were educated to undergraduate or postgraduate level. Mean scores were significantly above the midpoint for the M-RAQ ($M = 80.19/125$, $SD = 11.15$) and below the midpoint for the M-AAS ($M = 49.11/95$, $SD = 8.16$), signifying a tendency towards more positive attitudes. The levels of well-being and life satisfaction were also statistically significantly different to the midpoint, indicating generally positive scores (WEMWBS: $M = 54.97/70$, $SD = 6.68$; SWLS: $M = 24.40/35$, $SD = 5.36$). Moreover, health was rated as being “good” with a mean score of 3.34 ($SD = 0.69$), where 3 is considered “good” and 4 is considered “very good” health. Table 1 displays descriptive statistics for the study variables.

Table 1 Participants Characteristics

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>MEAN (SD)</th>
<th>N (All = 911)</th>
<th>%</th>
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<tr>
<td>M-RAQ (score/125)</td>
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<tr>
<td>M-AAS (score/95)</td>
<td>49.11 (8.16)</td>
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<tr>
<td>WEMWBS (score/70)</td>
<td>54.97 (6.68)</td>
<td></td>
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</tr>
<tr>
<td>SWLS (score/35)</td>
<td>24.40 (5.36)</td>
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</tr>
<tr>
<td>Health (score/5)</td>
<td>3.34 (0.69)</td>
<td></td>
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<tr>
<td>Age (years)</td>
<td>36.63 (10.03)</td>
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</tr>
<tr>
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Hierarchical Multiple Regression Analysis

M-AAS and Well-being

For M-AAS, the first block of demographic variables significantly predicted well-being, explaining 10.7% of the variance (table 2). Adding the second block of predictors (age and M-AAS score) significantly increased the proportion of the variance explained to 22.8%. When the interaction of age and M-AAS was added in block 3, the variance explained in the model significantly increased to 23.7%. Better health, older age, and M-AAS score were independent predictors of well-being. The interaction between age and M-AAS also significantly predicted well-being ($p \leq .001$), indicating that age functioned as moderator of the relationships between anxiety about ageing and well-being (table 2).

Moderation analyses using PROCESS confirmed the direct effect of age ($b = .008$, 95% CI [.003, .12], $t = 3.19$, $p \leq .001$) and well-being. At higher ages the significant negative association between M-AAS and well-being was weaker ($b = -.206$, 95% CI [-.271, -.140], $t = -6.19$, $p < .001$) than at younger age ($b = -.354$, 95% CI [-.424, -.284], $t = -9.93$, $p < .001$). This interaction is illustrated in Figure 1.

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<tbody>
<tr>
<td>Chinese</td>
<td>30</td>
<td>3.3</td>
</tr>
<tr>
<td>Indian</td>
<td>19</td>
<td>2.1</td>
</tr>
<tr>
<td>Others</td>
<td>11</td>
<td>1.2</td>
</tr>
</tbody>
</table>

*Lower education level = (High school OR certificate/diploma holders)
Higher education level = (Undergraduate OR postgraduate holders)
Table 2 Hierarchical Multiple Regressions Analyses of Malay-Anxiety about Ageing Predicting Well-Being and Life Satisfaction

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>Well-being</th>
<th>Life Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Malay-Anxiety about Ageing (M-AAS)</td>
<td></td>
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</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.4290</td>
<td>.3470</td>
<td>.0400</td>
</tr>
<tr>
<td>.7700</td>
<td>.4350</td>
<td>.0560</td>
</tr>
<tr>
<td>3.1310</td>
<td>.3150</td>
<td>.313**</td>
</tr>
<tr>
<td>.0430</td>
<td>.0200</td>
<td>.065**</td>
</tr>
<tr>
<td>-.2740</td>
<td>.0250</td>
<td>-.336**</td>
</tr>
<tr>
<td>Age × M-AAS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.0070</td>
<td>.0020</td>
<td>.095**</td>
</tr>
<tr>
<td>R²</td>
<td>.107**</td>
<td></td>
</tr>
<tr>
<td>R² change</td>
<td>.121**</td>
<td>.009**</td>
</tr>
</tbody>
</table>

Note: Values in italics indicate significance at the .05 level. Values in bold indicate significance at the .01 level.
Age × M-AAS

R²   .073** .150** .154*

R² change .077** .004*

*p ≤ .05/ **p≤.001;

Dummy coded a 0 = male, 1 = female/

Dummy code b 0 = lower education (High school OR certificate/diploma holders), 1 = higher education (Undergraduate OR postgraduate holders).

Figure 1  Moderation Effect of Age on the Relations between Anxiety about Ageing and Well-being
**M-AAS and Life Satisfaction**

The demographic variables (block 1) explained 7.3% of the variance in life satisfaction (Table 2). The addition of M-AAS score and age in the second block significantly increased the amount of variance explained to 15.0% Moreover, adding the third block (interaction of M-AAS and age) in the model led to a further significant increase to 15.4% of variance explained. Female gender; better health; older age; and lower AAS score contributed independently to life satisfaction. Further, the interaction term between age and M-AAS also significantly predicted life satisfaction ($p<.05$), indicating that age functioned as moderator of the relationships between anxiety about ageing and life satisfaction (table 2).

The PROCESS analysis confirmed that age moderated the relationship between M-AAS and life satisfaction, ($b = .004$, 95% CI [.0002, .008], $t = 2.076$, $p = .038$). The direction was the same as for well-being, with a stronger relationship between M-AAS and life satisfaction in younger age ($b = -.197$, 95% CI [-.256, -.139], $t = -6.66$, $p <.001$) compared to older age ($b = -.117$, 95% CI [-.171, -.062], $t = -4.20$, $p <.001$). This is illustrated in Figure 2.
Figure 2 Moderation Effect of Age on the Relations between Anxiety about Ageing and Life Satisfaction

**M-RAQ and Well-being**

For the M-RAQ scores, the first block of demographic variables significantly predicted well-being explaining 10.7% of the variance (Table 3). Adding the second block of predictors (age and M-RAQ score) explained a further 17.7% of the variance in well-being. Adding the second block of predictors significantly increased the predictive ability of the model, but no further increase was found when adding the interaction of age and M-RAQ score in the third block. Better health, older age and higher M-RAQ score were the only variables that predict a unique contribution to well-being (Table 3). As there was no significant age and M-RAQ score interaction, no moderation analysis using PROCESS was conducted.
Table 3 Hierarchical Multiple Regressions Analyses of Malay-Reactions to Ageing Predicting Well-Being and Life Satisfaction

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>Well-being</th>
<th>Life Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malay Reactions to Ageing (M- RAQ)</td>
<td>Step 1</td>
<td>Step 2</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Gendera</td>
<td>-.006</td>
<td>.414</td>
</tr>
<tr>
<td>Educationb</td>
<td>.705</td>
<td>.418</td>
</tr>
<tr>
<td>Health</td>
<td>2.710</td>
<td>.309</td>
</tr>
<tr>
<td>Age</td>
<td>.066</td>
<td>.021</td>
</tr>
<tr>
<td>M-RAQ</td>
<td>.143</td>
<td>.019</td>
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<tr>
<td>Age × M-RAQ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R² change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gendera</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educationb</td>
<td></td>
<td></td>
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<tr>
<td>Health</td>
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<tr>
<td>Age</td>
<td></td>
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<tr>
<td>M-RAQ</td>
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<tr>
<td>Age × M-RAQ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
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<td></td>
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<tr>
<td>R² change</td>
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</tr>
</tbody>
</table>
*p ≤ .05/ **p≤.001;

Dummy coded \( a \) 0 = male, 1 = female;

Dummy coded \( b \) 0 = lower education, 1 = higher education

M-RAQ and Life Satisfaction

The first block of demographic variables significantly explained 7.3% of the variance in life satisfaction (Table 3). The addition of predictors (M-RAQ score and age) in the second block significantly increased the amount of variance explained to 12.9 %. However, the addition of the third block (interaction of M-RAQ and age) did not significantly increase the variance explained by the model. Female gender, better health, older age and higher RAQ score again each made a unique contribution to predicting life satisfaction (Table 3). There was no significant interaction between age and M-RAQ, thus no moderation analysis was explored.

Discussion

The aim of this study was to examine whether current concerns and anticipated reactions to ageing were associated with wellbeing in a young, Malay population, and the extent to which these relationships were moderated by age. As expected, attitudes to ageing (using two measures: the M-AAS and M-RAQ) were associated with both wellbeing and life satisfaction, and these associations remained after controlling for sociodemographic variables and self-health rated. When attitudes were measured using the M-AAS, both of these associations were moderated by age, such that stronger associations were found in younger age compared to older adults. However, no
moderating effects of age were found for these relationships when measuring attitudes with the M-RAQ.

Overall, the present study found that more positive attitudes to aging (both M-AAS & M-RAQ) in a young Malaysian sample were associated with well-being and life satisfaction. This is consistent with previous studies showing similar relationships when examining attitudes to ageing that reflect older participants' experiences of the ageing process [1-3]. The findings are also in line with previous studies that have shown relationship between attitudes towards future ageing and health behaviours in younger populations in Western countries [4, 6-7]. They also extend the findings of Joshi et al., [5] to show that such relationships in non-Western participants are present when examining a wider age range of younger people, and when assessing attitudes to ageing using non-English language measures. Taken together, these findings suggest that such relationships are present in both younger and older adults, and in both Eastern and Western cultures, and when measuring both experiences of own ageing and attitudes towards future ageing.

The relationships between the M-AAS and wellbeing outcomes were moderated by age, with stronger relationships found in younger rather than older participants. However, no such moderating effects were found when using the M-RAQ. This difference in the moderating effect of age between measures was unexpected, and suggests that the two attitudinal constructs captured by these two measures operate in different ways. In particular, as the M-AAS is much more related to current fears and anxieties about growing older, including fear of older people [14] than the M-RAQ,
these findings suggest that it might specifically be the emotional/anxiety component of attitudes that differentially affects wellbeing in different age groups.

One explanation for the presence of a moderating effect of age on the M-AAS and wellbeing relationships is that people get better at dealing with anxiety (including age-related anxiety) with increasing age. That is, through experience and maturation, people develop more effective coping strategies [40], especially for emotional regulation and problem solving [41], and more fully-developed repertoires of coping strategies [42]. Such effective coping may therefore help to reduce the impact of anxieties about future ageing on current well-being. Younger people have also been shown to use more confrontive coping responses (i.e. active, problem-focused approaches) as opposed to distancing coping (e.g., passive, emotion-focused approaches) than older adults [43], which may increase levels of anxiety in response to age-related stressors. Younger adults are more likely to make affective forecasting errors than older adults [44, 45], with these overestimates of the negative impact of their future ageing potentially having a greater impact on their current wellbeing.

Some limitations of the current study need to be acknowledged. First, the current data are cross-sectional in nature. As well as making it impossible to establish directional links between the constructs of interest, it is also not possible to distinguish the effects of age from cohort effects. Longitudinal studies are therefore necessary in order to better establish the temporal dynamics of these relationships in a single cohort. This would also make it easier to establish, for instance, the extent to which wellbeing is
an outcome of, and/or a contributing factor towards, one's attitudes to ageing. Another limitation of the present study is that it includes only persons working in the public sector, and therefore is not representative of others within this age group, such as students or unemployed persons. Finally, this study includes individuals in relatively good health since they were able to work, and therefore the relationships between ageing attitudes and well-being and life satisfaction may not be representative of those experiencing significant health problems.

**Conclusions**

These findings add to the growing body of literature that links attitudes to ageing with health and well-being outcomes in participants of different ages. Moreover, our study found that relationships specifically focusing on the anxiety components of attitudes to ageing are stronger in younger compared to older participants. As such, interventions aiming at the promotion of wellbeing, or on coping with aging-related anxieties, might be better focused on younger adults, who may be less able to respond effectively to the anxieties they experience. The different patterns of results seen for the two measures of attitudes to ageing also highlight the need for greater clarity about the conceptual similarities and differences between alternative attitudes to ageing constructs. A better understanding of how these two measures function with regard to different outcome variables will assist in improving these measurement instruments in the future.
References


## Appendix (i)  Factorial analysis of the M-RAQ and M-AAS

<table>
<thead>
<tr>
<th>Items</th>
<th>Negative Thought about Growing Older (RAQ-1)</th>
<th>Fear of Old People (AAS-1)</th>
<th>Perceived Personal Attributes (RAQ-2)</th>
<th>Positive Aspect of Ageing (RAQ-3)</th>
<th>Family &amp; Religion (RAQ-4)</th>
<th>Fear of Losses (AAS-2)</th>
<th>Physical Appearance (AAS-3)</th>
<th>Psychological Concerns (AAS-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAQ 31</td>
<td>I worry about my health getting worse .729</td>
<td></td>
<td></td>
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<tr>
<td>RAQ 27</td>
<td>I am concerned about who will care for me if I become frail .698</td>
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<tr>
<td>RAQ 2</td>
<td>I worry that I might become senile and lose my mind .674</td>
<td></td>
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<tr>
<td>RAQ 17</td>
<td>I worry about becoming frail .666</td>
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<tr>
<td>RAQ 13</td>
<td>I worry about loss of independence .641</td>
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<tr>
<td>RAQ 23</td>
<td>I will worry about the loss of loved ones around me .620</td>
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<td>RAQ 8</td>
<td>It worries me that I won’t enjoy life as much as I do now .613</td>
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<tr>
<td>RAQ 30</td>
<td>I worry about having less money to live on .545</td>
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<tr>
<td>RAQ 7</td>
<td>I worry about dying and leaving behind those I love .538</td>
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<tr>
<td>RAQ 26</td>
<td>I won’t feel as safe on my own as I do now .525</td>
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<tr>
<td>AAS 6</td>
<td>The older I become, the more I worry about my health .a .492</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>RAQ 4</td>
<td>I will be more lonely than I am now .469</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
AAS 10 I enjoy talking with old people. .754
AAS 1 I enjoy being around old people .740
AAS 3 I like to go visit my older relatives .651
AAS 13 I feel very comfortable when I am around an old person .575
AAS 19 I enjoy doing things for old people .518
RAQ 18 I will become more irritable and grouchy than I am now .683
RAQ 19 Others may find me difficult to get along with .674
RAQ 20 I will be more set in my ways and reluctant to change .641
RAQ 21 I won’t like growing old .561
RAQ 25 There is a lot to look forward to in regard to being old .763
RAQ 24 In my old age I will be as enthusiastic about life as I am now .666
RAQ 28 I will have more time to do the things that I enjoy .424
RAQ 5 Old age brings satisfactions which are not available to the young .392
RAQ 12 I do not feel there is much to be scared about becoming an older person .390
RAQ 1 Old age will be an enjoyable time of life .390
I will enjoy having my family around me.

I am happy that my family will take care of me.

I will be happy that I can devote more time to my religion.

I fear it will be very hard for me to find contentment in old age.

I fear that when I am old all my friends will be gone.

I worry that people will ignore me when I am old.

I get nervous when I think about someone else making decisions for me when I am old.

I am afraid that there will be no meaning in life when I am old.

I have never dreaded looking old.

I have never dreaded the day I would look in the mirror and see gray hairs.

I won’t like looking old.

When I look in the mirror, it bothers me to see how my looks have changed with age.

It doesn’t bother me at all to imagine myself as being old.

I expect to feel good about life when I am old.

I expect to feel good about myself when I am old.
I believe that I will still be able to do most things for myself when I am old.

I will have plenty to occupy my time when I am old.

a This item was originally from ‘Fear of Losses’ (M-AAS)

b This item was originally from ‘Perceive Personal Attributes’ (M-RAQ).

c This item was originally located in ‘Fear of Losses’ (M-AAS), but in the current analysis, it located in ‘Physical Appearance’ domain that is similar to original Lasher & Faulkender (1993).
CHAPTER SEVEN

GENERAL DISCUSSION
CHAPTER 7

GENERAL DISCUSSION

7.0 Overview

This thesis centres on methodological considerations in relation to attitudes to ageing measures, and the relationships between attitudes to ageing, well-being and life satisfaction in young adults in an Eastern (Malay) population. Specifically, the aims of this thesis were to: 1) systematically identify and assess the psychometric properties of attitudes to ageing measures in people younger than 60 years of age; 2) translate and culturally adapt two prominent measures of attitudes to ageing for a young Malay population; 3) identify correlates of attitudes to ageing in an Eastern (Malay) population; and 4) assess how the potential relationships between attitudes to ageing and well-being outcomes in a Malay population are moderated by age. These aims were pursued through four studies: a systematic review of the psychometric properties of self-report measures of attitudes to ageing (Chapter 3); a translation and psychometric assessment of the Malay Anxiety about Ageing Scale (Chapter 4); a translation, cultural adaptation, and psychometric assessment of the Malay Reactions to Ageing Questionnaire (Chapter 5); and an examination of the moderating effects of age on the relationships between attitudes to ageing and well-being and life satisfaction (Chapter 6).

In addressing these aims, the thesis makes contributions to the literature in four major areas. First, this thesis provides insights into the nature and psychometric properties of available measures of attitudes to ageing that have been validated for use with people under 60 years old. In doing so, it reveals considerable diversity in the way that attitudes to ageing have been conceptualised in these measures, as well
as a relative lack of measures that have been validated for use in Eastern populations. Second, the thesis contributes new translations, cultural adaptation, and psychometric evaluations of two measures for assessing attitudes to ageing in a young Malaysian sample. Through this process, a new dimension of attitudes to ageing (Family and Religion) that was relevant to this population was identified. Third, this thesis contributes new knowledge about the correlates (age, gender and education levels) of attitudes to ageing in an Eastern (Malay) population. More specifically, it highlights that older people (50-60 years), men, and people with higher education levels mostly have more positive attitudes to ageing than their younger, female, and less educate counterparts. Finally, this thesis provides new insights into the moderating effect of age on the association between attitudes to ageing and well-being outcomes. Specifically, concerns about growing older were found to be more strongly related to well-being and life satisfaction among younger participants compared to older people. However, no moderating effect of age was present when using an attitudinal measure assessing anticipations of future ageing, suggesting that different components of attitudes to ageing influence wellbeing outcomes in different ways. Each of these areas of contribution is discussed in detail in section 7.1.

7.1 Summary and Synthesis of Findings

The following paragraphs situate the key findings and contributions of this this within the context of the broader literature on attitudes to ageing.
7.1.1 Available Measures of Attitudes to Ageing for Adults Younger than 60 Years

The first study in this thesis (Chapter 3) revealed there to be at least ten measurement tools available for assessing attitudes to ageing in adults under 60 years of age. Whilst other instruments might be available, they are not included in this review because their psychometric properties were not assessed in this demographic group. The systematic review also showed a relative lack of attitudes to ageing measures that are adequately adapted for different linguistic or cultural groups. For instance, before the review was updated to include work from this thesis, only four questionnaires (AAS, RAQ; ERA-12, and APQ) had been translated into other languages, and only two of these (AAS & ERA-12) had been translated into non-Western languages. In addition, all seven of the corresponding validation studies in other languages were rated as ‘poor’ for cross-cultural validity. This was often due to failures to pre-test the translated version in the target populations, and a lack of clarity as to whether translators worked independently. For these reasons, studies 2 and 3 in this thesis (chapters 4 and 5) focused on adapting existing measures of attitudes to ageing for use in a non-Western (Malay) culture, and followed specific procedures, such as back-translation and think-aloud protocols to ensure the accuracy and appropriateness of the translated measures.

The review also highlighted key ways in which the various measures differed from one another, which was useful when selecting which measures would be most suitable for assessing attitudes to ageing in a younger, non-Western (Malay) population. One important way in which the measures could be differentiated related to whether the items probed an individual’s actual experiences of ageing, or whether
they captured their concerns and anticipations about ageing. Six of the measures identified (ERA-38; ERA-12; APQ; AAQ; ATOA; and PEA) captured actual experiences of ageing, for example; ‘I go through phases of viewing myself as being old’ (APQ); ‘I am as happy now as when I was younger’ (ATOA); and ‘I don’t feel involved in society now that I am older’ (AAQ). Although all these measures were originally developed for older adults, the review in Chapter 3 found that eight studies had validated these measures among middle-aged samples (older than 40 years old). For example, two studies validated the ERA-12 (Joshi et al., 2010; Park et al., 2014) and ATOA (Miche et al., 2014; Jung & Siedlecki (2018), while four other instruments were validated in one study each (ERA-38 (Sparks et al., 2013); AAQ (Brown et al., 2015); APQ (Ingrand et al., 2012); & PEA (Steverink et al., 2001)).

These studies suggest that measures assessing experiences of ageing are also appropriate to use in middle-aged groups, who would not yet be considered ‘old’, but for whom ageing may be becoming salient. Indeed, middle-age has been indicated as a stage in life, during which age starts to become salient (Dorner, Mickler & Staudinger, 2005), with an increased awareness of physical appearance changes (Whitbourne 2001), cognitive decline (Singh-Manoux et al., 2012), or increasing health problems (Spiro, 2001). None of these measures had been validated in participants younger than middle-age; probably because the majority of items would not be relevant to younger people, who have not experienced any obvious signs of ageing yet.

As measures that assess more general views or concerns about ageing had been validated in, and are more suited to, a broader range of ages, they were considered more appropriate tools for studies exploring attitudes across the lifespan, and so were deemed most suitable for subsequent adaptation to a Malay population.
Of the four instruments identified in the systematic review that assess more general views or concerns about ageing (AAS; RAQ; PAA; At-Ageing-VAS), a further distinction could be made between those that assess projected anticipations about how an individual will be in old age (Kornadt, Voss & Rothermund, 2015) versus those that reflect current concerns about ageing and growing older (Lasher & Faulkender, 1993). For example, the RAQ, which was developed to assess anticipations of future aging, requires participants to imagine themselves as a person aged 65, and respond to items about how they will think, feel, or behave at that time (e.g., “I will worry about the loss of loved ones around me; I will be more set in my ways and reluctant to change”). In contrast, both the AAS and the PAA include items that ask about the individual’s current concerns and thoughts on the process of ageing (e.g. ‘I have never dreaded looking old’ (AAS); ‘I dread the days when I can no longer get around on my own’ (PAA). As both of these constructs have relevance to younger adults, the measure of each that received the most positive ratings in the greatest number of psychometric domains evaluated (the RAQ and AAS) were selected for use the in the rest of the thesis. The meaningfulness of the conceptual distinction between these two types of measure was highlighted in study 4 (Chapter 6), which showed that age moderated attitude-wellbeing relationships when using a measure of current concerns about ageing (the AAS) but not when using a measure of projected anticipations of future ageing (the RAQ).

7.1.2 Cultural Adaptation and Validation of Attitudes to Ageing Measures

The systematic review in Chapter 3 showed that most of the available measures (except the PEA, which was developed in Germany: Steverink et al., 2001) were developed in the English language, for use in English speaking populations,
indicating a need for measures tailored for use in non-English speaking countries. In particular, as attitudes to ageing in Western and Eastern cultures have been found to differ (Lockenhoff et al., 2009; Yun & Lachman, 2006), there is need for measures that have been adapted for non-Western populations. In order to meet that need, studies 2 and 3 (chapters 4 and 5) focussed on the translation, cultural adaptation and validation of two measures of attitudes to ageing (the AAS and the RAQ).

With respect to the two measures that were translated into Malay for this thesis, Study 1 (chapter 3) showed that the AAS had already been tested in a number of countries worldwide, including two Eastern countries (Taiwan & Iran). Study 1 had also shown that the same four domains emerged across both Western and Eastern countries. Despite this, Study 1 (Chapter 3) showed that the contents/items of the domains differed slightly across cultures, suggesting that some items may not tap into the same underlying dimensions between Western-Eastern populations. For instance, a different number of items were retained in an Eastern country (16 items in Chinese version) and in a Western country (14 items in Spanish version). Therefore, whilst extensive cultural adaptation was not considered necessary for this scale, a careful examination of the factor structure was considered necessary so that any appropriate factor modifications could be made.

In contrast to the AAS, the RAQ had previously only been validated in Western countries, such as Australia, Sweden and the United Kingdom, but never in a non-Western language. Despite this, there was also a lack of clear structural validity, with discrepancies in the factorial structure of this measure found in Western populations, even when using the same English version of the scale, or when testing the same population. For example, the original scale by Gething (1994) in Australia had 6 factors, but was dissimilar to the factorial structural found in other
validation studies in Australia. Some studies, for example, extracted three (Koder & Helmes, 2006; 2008a; Gething et al., 2004; Wells, Foreman, Gething & Petralia, 2004), four (Koder & Helmes, 2008b), or five factors (Netz et. al., 2001). Similarly, the factorial structures of the RAQ and the UK sample were also found to be different, with three (Gething et al., 2004) and five factors (Unsworth et al., 2001), respectively.

Moreover, although 27 items were established in the original RAQ scale in Australia (Gething, 1994), but only 15 and 16 items were retained in the Australian and UK samples in Gething et al., (2004), which suggests a clear need for more development work, when using in other cultures. Moreover, the content and structure of the translation version of the RAQ questionnaire into Swedish had also been shown to differ from the original version by Gething (1994), suggesting a need for improvement of the content of this measure when used with new population. Therefore, a simple translation and confirmatory factor analysis of this questionnaire was not considered sufficient, and additional work deemed necessary to ensure the accuracy and cultural relevance of the items. For these reasons, the cultural adaptation of this measure involved an additional step of item generation to ensure that all relevant aspects of the attitude were captured. The item generation and validation process of the RAQ were presented in Chapter 5.

These two chapters provided evidence that some modification of the original structure of both the AAS and the RAQ was needed before they were suitable for use in the Malay population. Some of these modifications reflected those that had been made when using the scale with with other, both Eastern and Western, cultural groups. Chapter 4, for example, showed that, whilst the basic four-domain structure of the original version of the AAS by Lasher and Faulkender (1993), and confirmed
in other validation studies in different cultures (Sargent-Cox et al., 2014; Gao, 2012; Koukouli et al., 2013; Mir & Mir, 2014; Ornelas et al., 2016), was also seen in the Malay language version, some modifications to the factor loadings that had been made in other language versions (both Eastern and Western) were also required for the Malay version of the AAS (M-AAS). For example, the contents of the ‘Physical Appearance’ domain in the M-AAS are also similar to the Chinese (Gao, 2012) and French versions (Vezina & Langis, 2013), all of which only retained three items in this domain. Another two items in the Physical Appearance domain (item 4 & 20) were either deleted or modified to other domains. For example, Item 4 (*I have never lied about my age in order to appear younger*) was not universally appropriate for either Eastern or Western cultures, as this item was omitted in the Malay, Chinese, French, and Spanish versions (Ornelas et al., 2016), due to weak factor loadings.

Some modification made to the M-AAS seemed more specific to Eastern cultures. The modification of item 5 (*I fear it will be very hard for me to find contentment in old age*) from the the ‘Psychological Concerns’ domain of the original version to the ‘Fear of Losses’ domain was also made for the Chinese version of the scale (Gao, 2012), suggesting that this item is more relevant to expressing fears of loss than psychological concerns in Eastern cultures. Indeed, ‘contentment’ in Eastern cultures has been shown to represent satisfaction towards life overall, including a peaceful life, physical health, material richness, or other qualities in life such as the sense of harmony achieved through social interaction with others, and the whole cosmos through spiritual practices (Lu, Gilmour & Kao, 2001). It is therefore appropriate to be linked to fear of losses in the Eastern culture. However, this same item was removed from the Spanish version (Ornelas et al. 2016), indicating that the suitability and reliability of this item is questionable in
Western cultures. Taken together, this suggests the importance of checking, and revising if necessary, the structure of attitudinal measures that have been developed for a Western culture before using them in an Eastern culture, because some content could bring a different meaning in other cultures, as well as providing evidence for a common structure might be suited across Eastern countries.

Whilst some modifications appeared to apply to a broader range of Eastern cultures, some modifications were more specific to the Malay version. For instance, item 20 (When I look in the mirror, it bothers me to see how my looks have changed with age), which was originally placed in the “Physical Appearance” domain, was assigned under the “Fear of Losses” domain in the M-AAS, but was removed from the Chinese and French versions, raising an issue of the consistency of this item cross-culturally. The differences in the fit of this item across cultural groups’ shows that more subtle modification to be made for specific linguistic/cultural groups within the broader ‘Eastern’ cultural division.

Despite some inconsistency in the content and items of the AAS between Eastern-Western cultures, cross-cultural consistencies in its content were also found between East-Western populations. For example, the domain of ‘Fear of Old People’ seems to be relatively universal factor across cultures, with all five items loading on to this factor in a way that was comparable to the original English-language version of the AAS in all other language versions (including the M-AAS), except for the C-AAS, for which only four items loaded onto this factor. Taken together, the validation of the M-AAS in the Malaysian sample provides evidence that there are many similarities between other Eastern and Western countries in the current concerns the people have about ageing. Nonetheless, important differences also exist, particularly when considering Eastern versus Western cultures.
Unlike the AAS, more major differences were seen when comparing the Malay version of the RAQ to the previous versions developed or adapted for use in Western countries. That is, whilst chapter 5 of the present thesis showed that three domains of the M-RAQ (Negative Thought about Growing Older; Positive Aspect of Ageing; and Perceived Personal Attributes) were comparable to those found in Western countries (Gething et al., 2004; Koder & Helmes, 2006; 2008a; 2008b; Netz et al. 2001; & Unsworth et al., 2001), one additional domain (Family & Religion) was identified that had not been observed in other language versions.

As this is the first study that has assessed the psychometric properties of the RAQ in a non-Western country, it is not clear whether this represents a factor that is applicable to other Eastern cultures, or whether it is peculiar to just a subset of cultures, or even just to Malaysia. For example, while the aspect of family might be deemed important to the majority of Eastern cultures (Raymo, Park, Xie & Yeung, 2015), including people in Southeast Asia (e.g., Thailand, Indonesia), where they need to maintain the traditional value of family loyalty and harmonious relationship with the elderly (Pho & Mulvey, 2003), the religion aspect is possibly not as important for people in other Eastern countries as it is for those in Southeast Asia. For example, there is evidence that Malaysian people with religious beliefs have higher personal well-being (Achour, Grine, Mohd Nor & Mohd Yusoff, 2014) and are less likely to experience loneliness (Teh et al., 2014) compared to those with less religious beliefs. Similarly, people with religious belief in Singapore also tended to have better adjustment to the well-being at old age (Jianbin & Mehta, 2003). However, in other Eastern countries, stronger beliefs on religious or spiritual practices were linked with poorer health in China (Zeng, Gu & George, 2011), whilst in Japan, the prominences of religion in the relations to emotional support are more
likely benefit to men, and not for women (Krause, Ingersoll-Dayton, Liang & Sugisawa, 1999), suggesting that religion may not have broader relevance to some people in Eastern cultures. As such, the applicability of this factor to similar or other cultures with different family and religious practices should be treated cautiously for now. Therefore, further studies to assess the applicability of this factor to a wider range of Eastern cultures are required.

As with the AAS, some of the modifications made to the Malay version of the M-RAQ were similar to those that had been made to Western versions. For instance, four of the nine items from original RAQ that were omitted due to low reliabilities in the M-RAQ were also omitted in Western versions (Gething et al., 2004). In addition, of the 18 original RAQ items, 14 showed consistency across Eastern and Western populations (e.g., Gething et al., 2004), with 5 items in the respective ‘Negative Though about Growing Older’ and ‘Positive Aspect of Ageing’ factors; and 4 items in the ‘Perceived Personal Attributes’ factor. As with the AAS, the results of chapter 5 therefore show that, whilst some cultural adaptations are needed when applying measures of anticipations about future ageing to different cultures, there is also a possible ‘core set’ that seem to work well across cultures.

To summarise, the findings of Chapter 4 and 5 highlight the importance of using scales that are adequately translated, and which are appropriate for the cultural group to which they are to be applied. In particular, whilst some items or sub-scales might be applicable across cultural and linguistic groups, others may be specific to certain groups. Furthermore, both the M-AAS and M-RAQ showed robust psychometric properties when used in a Malay population, and thus, may be promising for use in other Southeast Asian countries, such as Brunei, Indonesia,
Singapore and certain parts of Thailand, who also speak the ‘Malay’ language (Huang & Tanangkingsing, 2005).

7.1.3 The Correlates of Attitudes to Ageing in an Eastern (Malay) Population

Chapters 4 and 5 in the thesis identified some key demographic correlates of attitudes to ageing in a Malay population. For example, clear effects of age were seen for both the M-AAS (Chapter 4) and the M-RAQ (Chapter 5), with younger age groups reporting more negative attitudes to ageing compared to older age groups (50-60) across a broad range of domains: age differences were apparent in the total score of the M-AAS and all four subscales (Chapter 4), and the total score of the M-RAQ and its two subscales (Negative Thoughts about Growing Older and Positive Aspects of Ageing) (Chapter 5). The findings of the present studies are consistent with those conducted with younger samples from Western populations (Abraham & Silverstein, 2006; Cumming et al., 2000; Draper et al., 1999; Golden et al., 2013; Laditka et al., 2004; Lynch, 2000; Mosher-Ashley & Ball, 1999; Usworth et al., 2001), indicating cross-cultural consistency of these age patterns. One explanation for these patterns is that people, who are close to retirement age, are happy to relieve themselves of the burden of work roles or family responsibilities, making the positive aspects of ageing more salient to them. For example, there is evidence that those who are planning to retire have lower stress levels and tend to exercise more regularly compared to those who are not retiring, although they are in the similar age range (e.g., 60-66 years) (Midanik, Soghikian, Ransom & Tekawa, 1995). This is believed to be because the retirement transition involves an adjustment process to one’s life that can encourage positive well-being for retired people (Wang, 2007).
Despite the general consistency across studies in the pattern of attitudes across age, previous work has reported that the ‘Fear of Losses’ subscale of the AAS shows the opposite pattern of results: with more negative attitudes to ageing seen among older compared to younger participants (Bergman et al., 2013; Brunton & Scott, 2015; Gao, 2012 & Yun & Lachman, 2006). However, the opposite pattern of results was observed in chapter 4: with younger Malay participants reporting more negative attitudes in this domain that older participants. As explained in the discussion section of Chapter 4, this finding could be attributed to the fact that many younger adults in Malaysia stay with (Kooshiar et al., 2012) and provide care to their older parents (Teh et al., 2013). Thus, through this traditional role, younger people may foresee their future losses. A broader implication of this finding is that it highlights the importance of considering the specific sub-components of attitudes to ageing (i.e. the scale factors), rather focusing just on the overall full-scale measure of attitudes to ageing.

Effects of gender are also evident in both Chapters 4 and 5. When considering the total scale of both measures, the effect of gender was only apparent in the M-RAQ, with men having more positive attitudes to ageing compared to women. In contrast, no gender effect on the total score of the M-AAS was found. However, effects of gender were seen in the ‘Physical Appearance’ subscale of the M-AAS, and in the ‘Negative though about Ageing’ subscale of the M-RAQ, with both showing that women had more negative attitudes to ageing compared to men. This is consistent with previous evidence from Western (Abraham & Silverstein, 2006; Barret & Robbins, 2008; Cumming & Kropf & DeWeaver, 2000; Draper et al., 1999; Golden et al, 2013; Lynch, 2000; Kalfoos, 2016; Koukouli et al., 2013) and Eastern studies (Yun & Lachman, 2006; McConatha et al., 2004; Gao, 2012).
This finding indicates that women are generally less positive towards ageing than men, perhaps due to the apparent “double standard of aging” (Wilcox, 1997), such that greater value is placed on physical attractiveness (Barret & Vohn Rohr, 2008) and youthfulness (Armitage, 2016) among women than men. Again, the presence of gender effects in just some of the sub-scales of these measures indicates the utility of exploring attitudes at the component level.

This thesis also found evidence for correlations between education levels and attitudes to ageing, since individuals with lower levels of education reported more negative attitudes to ageing in the total score of the AAS, as well as the subscales of ‘Fear of Old People’ and ‘Psychological Concerns’ (Chapter 4). However, those with high and low education background did not differ with regards to the RAQ total score or any of its subscales (Chapter 5), again highlighting important conceptual differences between these two scales. Previous studies that involved participants older than 60 (Jang et al., 2004; Rashid et al., 2014) and middle-aged people (Joshi et al. 2010; Rim & Ok, 2013; Yan et al., 2011) also found greater effects of negative attitudes to ageing in people with a lower education background. The fact that the effects of education are observed when using the AAS but not the RAQ suggests that individuals with a lower education background may have more misconceptions about ageing due to limited access to information about ageing, which results in greater anxiety about the ageing process. This explanation is supported by findings from Harris and Dollinger (2001), who reported that people with lower levels of education exhibited less knowledge about ageing that led to greater anxiety about ageing. Moreover, the non significant effect of education using the RAQ is consistent with previous studies using the same measure (Gething, 1994; Gething,
Fethney, Mckee, Goff, Churchward & Matthews, 2002; Gething et al., 2004), confirmed that education levels do not affect one’s anticipation of future ageing.

7.1.4 The Moderating Effect of Age on the Association between Attitudes to Ageing and Well-being outcomes.

Another notable contribution of the thesis relates to new insights into the links between attitudes to ageing and wellbeing in Eastern populations, and how these are moderated by age. Analyses presented in chapter 6 revealed that more positive attitudes to ageing in respondents under 60 years old were related to higher levels of well-being and life satisfaction, regardless of whether attitudes were measured using the M-AAS or the M-RAQ. These associations are consistent with what has been reported in Western populations involving middle aged (Thorpe et al., 2014) and older adults (Bryant et al., 2012; Shenkin et al., 2014). They also extend the findings of research in non-Western cultures (Joshi et al., 2010; Kim, 2009; Jang et. al., 2009), by showing that these patterns can be found in a wider age range of younger people. Establishing these consistent patterns using the newly translated and adapted M-AAS and the M-RAQ, also further support the validity of these measures of attitudes to ageing.

As well as establishing the existence of associations between attitudes to ageing and wellbeing outcomes in a wider range of ages, Study 4 (Chapter 6) also explored the moderating effect of age on these relationships. The study showed that, with decreasing age, concerns and anxieties about growing older (by using the M-AAS) were more strongly associated with well-being and life satisfaction. However, no moderating effects of age were seen when using the M-RAQ measure of anticipations of future ageing. Interestingly, a similarly mixed pattern of findings of the moderating effects of age has been found in research exploring similar
relationships. For example, one study that followed participants aged 50 years and older for a period of 18 years found that the relationship between attitudes to ageing and functional health got stronger over time (Levy, Slade & Kasl, 2002). This effect was attributed to the increasing self-relevance of attitudes and stereotypes about aging with increasing age (Levy, 2009). Cross-sectional studies, on the other hand, had revealed no moderating effects of age on relationships between attitudes to ageing and physical functioning or life satisfaction (Brothers, Miche, Wahl & Diehl, 2017) in participants ranging from mid-adulthood to later life. Although these studies were using measures that tapped into the specific experience of ageing in older adults (e.g., ATOA), it is difficult to establish whether or not the strength of attitudes to ageing and developmental outcomes relationship are affected by age. It is therefore important that when involving participants who are not yet older, measures that can specifically capture their attitudes to ageing is important.

Since our exploration of the moderation of age on the relations between attitudes to ageing and well-being outcomes was conducted with a sample of participants from an Eastern country, it is unclear whether the same patterns would be found in Western populations. For example, compared to typical Western cultures, young people in Malaysia are more likely to be expected to look after and live with their older parents (Kooshiar et al., 2012; Alavi & Sail, 2010), and such experiences with older members of family are more likely to increase their concerns about ageing (Allan & Johnson, 2008) because they are worried about their own health and future abilities by experiencing the frailty of their elderly parents (Moen, Robison & Dempster-McClain, 1995). Therefore, more research is needed to compare these moderating effects in different cultures.
In summary, the findings about the moderating effect of age emphasise the importance of promoting positive views on ageing among younger adults. The discrepancy of the moderating effects of age between the AAS and the RAQ, and also with previous research that has measured the experience of ageing in older adults, also reinforces the assertion that these two measures capture distinct aspects of attitudes to ageing, and highlights the importance of recognising the qualitative differences between various measures of attitudes to ageing.

7.2 Strengths and Limitations of the Research

A major strength of this thesis is that, unlike much work that has examined attitudes to ageing, the participants spanned a broad age range, from eighteen years old to late fifties, which covered almost the entire age range of younger adults. This provides insight into understanding the attitudes to ageing during different life phase before becoming older. Moreover, findings are further strengthened by the use of large data sets with involvement of more than 900 participants, providing good levels of statistical power when analysing patterns. Further, this thesis provides insight into the understanding of attitudes to ageing in an under-studied Eastern country, which is extension of the previous findings from Western countries.

Despite these strengths, some limitations and shortcomings of this thesis need to be acknowledged too. First, although the culturally-adapted measures described in Chapter 5 were pre-tested in a sample of Malay-speaking participants, this pre-testing was only done with 18 participants, which is lower than the 30 to 40-person sample size recommended by Beaton et al. (2000). Pre-testing the measures on more people may have uncovered additional issues, or identified additional new constructs of attitudes to ageing. Moreover, all participants involved in this pre-
testing were living in the UK at the time of testing, and so they may have differed in important ways from people living in Malaysia. It is also possible that they hold different attitudes from the people living in Malaysia, especially those residing with elderly family members. As this same sample was also used to generate new items for the M-RAQ, this means that the adapted measures may fail to fully capture the attitudes of those living in Malaysia.

Second, whilst the translation of the wellbeing (WEMWBS) and life satisfaction (SWLS) measures used in this work were subject to the same back-translation and pre-testing procedures as the M-AAS and the M-RAQ, no specific cultural adaptation or validation was undertaken for these measures. This is because, unlike the AAS and the RAQ, both of these well-being and life satisfaction measures have previously been validated in a wide range of cultural groups, including Eastern countries (Taggart, Weich, Clarke, Johnson & Stewart-Brown, 2013; Ye, 2007). Indeed, the SWLS has previously been validated in a Malay sample (Swami & Chamorro-Premuzic, 2009). Although this thesis did not use the SWLS version by Swami and Chamorro-Premuzic (2009), as it was developed only for participants of Malay and Chinese ethnicity, but not Indian ethnic background, the two versions are comparable. Moreover, the translated versions of both the WEMWBS and the SWLS scales had high levels of internal consistency (>.7), indicating the reliability of these scales in the Malaysian population.

Another limitation of this study is that, whilst we have relied on existing literature to draw comparisons about how various findings of our studies differ from other Eastern and Western populations, Western participants were not included in any of the studies. Hence, it is not possible to determine the extent to which any of the differences identified stem from methodological differences between studies,
such as the sampling and recruitment methods, rather than from actual cultural
differences. Similarly, the cross-sectional nature of all the data used in this thesis
limits ability to recognise the true nature of the relationship being examined.
Therefore, it is difficult to determine the extent to which the age-related patterns
truly reflect age rather than generational differences.

Finally, although this thesis aimed to address the relative lack of non-
Western research in this area, all of the findings in this thesis relied on datasets with
Malaysian participants, thus limiting the cross-cultural generalisability of the
findings. Although Malaysia can be considered a typical example of Eastern culture
in many ways (Mahmud, Amat, Rahman & Mohd Ishak, 2010), such as in terms of
longevity (WHO, 2015) or gross domestic per capita (The World Factbook, 2018),
there is also much diversity in the dimensions of economy, language, culture,
religion, political system and income within and between the countries and cultures
that are considered Eastern. For instance, the political system in Malaysia differs
from other Asian countries in that it is based on a unique constitutional monarchy,
nominally headed by the nine hereditary kings who are elected among themselves
for 5-year terms (Abdul Hamid & Ismail, 2012). Moreover, outside of Malaysia, the
Malay language is limited to countries such as Brunei, Indonesia, Singapore and
Thailand (Huang & Tanangkingsing, 2005), and the language used may hinder the
generalisability of our findings to other Asian countries.
7.3 Future Directions

Apart from making new contributions to the literature, the studies presented in this thesis also give rise to new directions for future research. First and foremost, the focus of future studies should be on the psychometric properties of the Malay version of the instruments used in the present studies. For example, given that the current structure of the M-RAQ was determined using exploratory factor analysis, and in a single (Malay) population, the next step should be to confirm the factor structure and psychometric properties of this scale with a new and larger sample from a different population to observe how well this revised scale performs in other cultures, including Western ones. Moreover, as the new ‘Family and Religion’ subscale of the M-RAQ had fewer items than the other sub-scales, and lower correlations with the total M-RAQ score, future work may be needed to enhance this subscale by adding new items.

Second, given the exclusive focus of the current studies on Eastern populations, there is a need to directly compare the attitudes to ageing between Western and non-Western populations, in order to develop a comprehensive understanding of the differences between these broad cultural groups. This is especially important given that previous studies that have directly compared East-West differences of attitudes to ageing have been done among older adults (Laidlaw et al., 2010), or have used measures of concerns about growing older (McConatha et al., 2004; Yun & Lachman, 2006). Direct comparisons between anticipations of future ageing have not yet been made between Western and non-Western populations, and so presents a promising avenue for future research.
Third, despite the existence of research on attitudes to ageing and well-being in younger adults, the majority of studies (including those in the current thesis) are correlational, and so is uninformative about the directions of associations between these variables. Therefore, the next steps required with using the RAQ and AAS involve longitudinal measurement in order to investigate changes in attitudes to ageing over time, as well as experimental methods that explore the impact of changes in attitudes on wellbeing outcomes.

Another interesting line of research concerns the need to further test the differences between the attitudinal constructs of attitudes to ageing in younger age that have been discussed in this thesis, and specifically the distinction between current concerns about growing older versus anticipations about future ageing. Empirical research on these different constructs of ageing is necessary to gain more insight into the acquisition of differentiated attitudes to ageing during the early life span. This is especially required given that recent findings have shown that individuals with negative perceptions of ageing, but nevertheless optimism about their future, turn out to have better physical functioning and lower levels of depressive symptoms over three years (Wurm & Benyamini, 2014). With this in mind, it is possible that anticipation about future ageing (optimistic outlook towards the future) might represent a promising mediator or moderator in the links inducing developmental consequences between anxiety about ageing and well-being outcomes. A study that can replicate this finding, therefore, seems warranted in the future in order to better understand the potential interplay between these two constructs. Moreover, future studies should consider testing the proposed explanations of the effect of age on the AAS and well-being outcomes that can have an indirect influence on these relationships (e.g., by measuring coping skills between
different age groups as a mediator). They could then lead to a better understanding of the reasons why stronger effects on these associations were reported among younger adults, instead of older adults as hypothesised by the SET theory (Levy, 2009).

An additional agenda for future research comprises the need for interventions that can effectively challenge negative age stereotypes and enhance positive attitudes to ageing, specifically among younger adults. These changes may enhance their well-being and promote successful ageing. This could include education programs providing information about the positive aspects of aging or increasing an individual’s knowledge and awareness of positive age-related changes. Such programs are needed to promote old age as time for opportunities and growth (Kotter-Gruhn, 2015). It is also necessary to increase awareness of the issues surrounding negative attitudes to ageing among authorities who provide health-related programs and services of care to older people. It should be clarified that the stereotypes of ageing are not exclusive to older adults, but also concern those who are not ageing yet. The goal in this context is to motivate younger adults to increase positive attitudes in order to reduce biased interaction with, and decision involving older adults.

CONCLUSIONS

This thesis contributes to the advancement of the research on the attitudes to ageing in several ways. First, it presents a first systematic review of studies evaluating the psychometric properties of measurements of attitudes to ageing that have been used in adults younger than 60 years. This revealed considerable diversity in the way that attitudes to ageing have been conceptualised, and also a relative lack of measures validated for use in non-Western cultures. As a result of this review, two
measures (the AAS and RAQ) were identified as being the most suitable for capturing two separable attitudes to ageing constructs in a broad range of ages. The AAS is an instrument to assess current concerns/ anxiety about growing older, and which had previously been validated in Eastern countries. The RAQ was developed for assessing future anticipations about being older, and had not been used previously in any Eastern countries. Second, this thesis reports the cultural adaptation and psychometric evaluation of these two measures in a young Malay sample. With respect to the AAS, our findings confirm the presence of four factors, but indicate the need for some modifications of the items for this cultural group. With regards to the RAQ, cultural adaptations resulted in the identification of an additional ‘Family and Religion’ factor. Both measures showed good internal consistency and were able to reveal clear demographic differences in Malay participants’ attitudes to ageing. This thesis further established the presence of relationships between attitudes to ageing and well-being in a non-Western (Malay) population, and showed that some of these relationships are moderated by age. Such information could assist in identifying those people who are at greater risk from maladaptive perceptions towards the process of ageing. Finally the present series of studies highlights the importance of developing a more specific approach to the conceptualisation and measurement of attitudes to ageing, showing that differences in the level of the nature of the conceptualisation can have important implications for the patterns of results observed.
REFERENCES


APPENDICES

Appendix A

QUESTIONNAIRE (MALAY VERSION)

SOAL SELIDIK (VERSI MELAYU)

Penuaan dan Kesejahteraan


Anda mungkin akan dihubungi sekali lagi pada tahun hadapan bagi kajian susulan. Oleh itu, bagi membolehkan pengkaji mengenalpasti anda tanpa melanggar kerahsiaan diri, anda diminta untuk menjawab soalan khusus berkaitan diri anda di bawah ini. Jawapan ini hanya akan diketahui oleh diri anda sahaja, dan ianya digunakan sebagai kod unik diri anda. Kod tersebut adalah seperti berikut:

DUA HURUF PERTAMA NAMA IBU ANDA

TARIKH ANDA DILAHIRKAN

(Tarikh sahaja, antara 1 – 31 haribulan)

DUA HURUF PERTAMA BANDAR/ TEMPAT

ANDA DILAHIRKAN
Kesemua maklumat berkaitan diri dan jawapan anda adalah rahsia dan sulit. Oleh itu, tiada sebarang maklumat seperti nama atau alamat anda dalam soal selidik ini.

**BAHAGIAN 1**

**MAKLUMAT PERIBADI**

Sila jawab soalan-soalan berikut berkaitan diri anda. Tandakan (✔) dalam [] dan isi jawapan anda dalam tempat kosong yang disediakan.

1) **Tarikh Lahir** : __________________________________

2) **Pekerjaan** : __________________________________

3) **Jantina** : [ ] Lelaki [ ] Perempuan

4) **Etnik** : [ ] Melayu [ ] Cina [ ] India [ ] Lain-lain

5) **Pendidikan Tertinggi** :
   - [ ] Sekolah Menengah
   - [ ] Sijil/ Diploma
   - [ ] Ijazah
   - [ ] Lepasan Ijazah (Master/Phd)

6) **Apakah bahasa pertama anda?** : __________________
   *(Teruskan ke soalan 8 sekiranya bahasa pertama anda ialah Bahasa Melayu)*

7) Sekiranya Bahasa Melayu **BUKAN** bahasa pertama anda, nyatakan tahap kefasihan anda berbahasa Melayu.
   - [ ] Tahap 1: Saya boleh menggunakan bahasa yang asas seperti memesan makanan atau bertanya arah.
   - [ ] Tahap 2: Saya boleh menggunakan bahasa yang terhad dalam kehidupan sosial seperti bercerita tentang isi semasa atau diri sendiri
   - [ ] Tahap 3 : Saya dapat berbincang mengenai pelbagai topik dengan mudah dan memahami hampir kesemua perbincangan yang diperkatakan oleh orang lain.
   - [ ] Tahap 4 : Saya boleh terlibat dalam perbualan dengan mudah, dan hanya melakukan sedikit kesalahan tatabahasa.
   - [ ] Tahap 5 : Saya fasih menggunakan bahasa Melayu seperti bahasa pertama.
### BAHAGIAN 2

**PENUAAN**

Soalan dibawah ini berkenaan tentang pendapat anda berkaitan penuaan. Sila TANDAKAN (✔) satu jawapan yang paling hampir dengan perasaan anda.

<table>
<thead>
<tr>
<th>PERNYATAAN</th>
<th>Sangat Tidak Setuju</th>
<th>Tidak Setuju</th>
<th>Neutral</th>
<th>Setuju</th>
<th>Sangat Setuju</th>
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<tbody>
<tr>
<td>1 Saya gemar bergaul dengan orang tua.</td>
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<tr>
<td>2 Saya takut apabila saya tua, semua rakan-rakan akan meninggalkan saya.</td>
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<td>3 Saya suka melawat saudara-mara yang sudah berumur.</td>
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<td>4 Saya tidak pernah menipu tentang umur saya untuk kelihatan lebih muda.</td>
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<tr>
<td>5 Saya takut saya akan sukar mendapat kepuasan hati di usia tua.</td>
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<tr>
<td>6 Semakin berumur, semakin saya risau tentang kesihatan saya.</td>
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<td>7 Saya akan membuat banyak perkara untuk memenuhi masa lapang apabila saya tua.</td>
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<td>8 Saya rasa gelisah apabila memikirkan orang lain membuat keputusan untuk saya apabila saya tua.</td>
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<td>9 Saya langsung tidak terganggu apabila membayangkan diri saya menjadi tua.</td>
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<td>10 Saya suka berbual-bual dengan orang tua.</td>
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<td>11 Saya jangka berasa baik tentang kehidupan semasa tua.</td>
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<td>12 Saya tidak pernah berasa takut apabila melihat diri di cermin dan nampak uban di kepala.</td>
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<td>13 Saya berasa sangat selesa apabila berada dalam kalangan orang tua.</td>
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<td>14 Saya risau orang akan tidak mempedulikan saya apabila tua.</td>
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<td>15 Saya tidak pernah berasa takut kelihatan tua.</td>
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<td>16 Saya percaya saya masih akan mampu melakukan hampir semua perkara untuk diri sendiri apabila saya tua.</td>
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<td>17 Saya takut hidup saya tidak akan bermakna lagi apabila tua.</td>
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<td>18 Saya jangka berasa baik tentang diri sendiri apabila tua.</td>
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<td>19 Saya suka melakukan sesuatu untuk orang tua.</td>
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<tr>
<td>20 Apabila saya melihat diri di cermin, saya berasa terganggu melihat rupa saya telah berubah disebabkan umur.</td>
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</table>
Berikut adalah penyataan tentang perasaan seseorang apabila mengalami perubahan usia. Bayangkan apa yang akan anda rasa apabila ANDA BERUSIA LEBIH 65 TAHUN. Nyatakan sejauh mana anda bersetuju/tidak bersetuju terhadap pernyataan berikut dengan menanda (✔) satu jawapan yang paling hampir dengan perasaan anda.

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<tr>
<th>PENYATAAN</th>
<th>Sangat Tidak Setuju</th>
<th>Tidak Setuju</th>
<th>Neutral</th>
<th>Setuju</th>
<th>Sangat Setuju</th>
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<tr>
<td>1  Usia tua akan menjadi masa yang menyeronokkan dalam hidup</td>
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<td>5  Usia tua membawa kepuasan yang tidak dapat dinikmati ketika muda.</td>
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<td>6  Menjadi uzur jarang sekali menjadi isu yang membimbangkan saya</td>
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<td>8  Saya risau tidak akan menikmati kehidupan seperti yang saya rasai sekarang.</td>
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<td>9  Saya dapat memikir tentang penambahan usia amat menyedihkan.</td>
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<td>10 Kehidupan boleh menjadi lebih baik apabila anda melepasi umur pertengahan.</td>
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<td>11 Saya akan menyesali kehilangan kekuatan dan daya tarikan</td>
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<td>12 Saya rasa tidak perlu ditakutkan sangat tentang menjadi orang tua</td>
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<td>13 Saya bimbang hilang kebergantungan kepada diri sendiri.</td>
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<td>14 Saya jangka untuk menjadi penyayang dan prihatin</td>
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<td>15 Saya akan dapat menerima kematian rakan-rakan dan orang yang disayangi sebagai proses semula jadi dalam kehidupan.</td>
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<td>16 Saya ternanti-nanti untuk menjadi tua dengan seseorang yang saya cintai</td>
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<td>17 Saya bimbang menjadi uzur.</td>
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<tr>
<td>18 Saya akan menjadi lebih cepat marah dan perengus berbanding sekarang.</td>
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<td>19 Orang lain mungkin sukar untuk bergaul dengan saya</td>
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<td>20 Saya akan menjadi lebih terikat dengan cara saya dan keberatan untuk berubah</td>
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<td>21 Saya tidak akan suka menjadi tua.</td>
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<td>PENYATAAN</td>
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<td>Saya tidak risau apabila terfikir menjadi nyanyuk dan hilang keupayaan berfikir</td>
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<td>23</td>
<td>Saya akan bimbang tentang kehilangan orang yang disayangi di sekeliling saya</td>
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<td>24</td>
<td>Saya akan menjadi bersemangat terhadap kehidupan pada usia tua sama seperti yang saya alami sekarang</td>
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<td>25</td>
<td>Banyak perkara yang dinanti-nantikan apabila menjadi tua</td>
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<td>26</td>
<td>Saya tidak akan rasa selamat bersendirian seperti yang saya rasai sekarang</td>
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<td>27</td>
<td>Saya risau tentang siapa yang akan menjaga saya jika uzur.</td>
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<td>Saya akan mempunyai banyak masa untuk melakukan perkara yang saya suka.</td>
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<td>Saya akan menerima seadaanya kenyataan yang saya telah tua.</td>
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<td>Saya akan berasa seronok mempunyai keluarga di sekeliling saya.</td>
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<td>Saya gembira keluarga saya akan menjaga saya.</td>
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<td>35</td>
<td>Saya akan berasa gembira dapat meluangkan lebih banyak masa untuk agama dan melakukan amal ibadat.</td>
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</table>
Berikut merupakan LIMA pernyataan tentang hidup anda. Sila TANDA (✔) pada jawapan yang paling dekat dengan perasaan anda.

<table>
<thead>
<tr>
<th>PENYATAAN</th>
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<th>Agak Setuju</th>
<th>Setuju</th>
<th>Sangat Setuju</th>
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<tr>
<td>1 Secara umumnya, kehidupan saya adalah sempurna.</td>
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<td>2 Keadaan kehidupan saya adalah tersangat baik.</td>
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<td>3 Saya puas hati dengan kehidupan saya.</td>
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<td>4 Setakat ini, saya telah mencapai perkara-perkara penting yang saya inginkan dalam kehidupan saya.</td>
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<td>5 Jika saya boleh memulakan kehidupan saya semula, saya tidak akan mengubah apa-apa. akan mengubah apa-apa pun</td>
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Dibawah ini merupakan pernyataan tentang perasaan yang anda rasa kebelakangan ini Sila **BULATKAN** nombor yang paling hampir dengan **PENGALAMAN ANDA PADA DUA MINGGU YANG LEPAS SEHINGGA KINI**.

<table>
<thead>
<tr>
<th></th>
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<th>JARANG-JARANG</th>
<th>KADANG-KADANG</th>
<th>SELALU</th>
<th>SETIAP MASA</th>
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<td>1</td>
<td>Saya berfikiran positif tentang masa depan</td>
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<td>4</td>
<td>Saya rasa ingin tahu tentang orang lain</td>
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<td>6</td>
<td>Saya menguruskan masalah dengan baik</td>
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<td>7</td>
<td>Saya berfikir dengan waras.</td>
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<td>8</td>
<td>Saya berasa positif tentang diri sendiri</td>
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<td>Saya rasa yakin</td>
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<td>11</td>
<td>Saya dapat membuat keputusan sendiri tentang beberapa perkara.</td>
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<td>Saya rasa ceria</td>
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Sila baca soalan di bawah. **BULATKAN SATU NOMBOR** yang paling hampir dengan diri anda.

1. **Umumnya, bagaimanakah anda menerangkan tentang tahap kesihatan anda?**

   - Tidak baik……………………1
   - Kurang baik……………………2
   - Baik……………………………3
   - Sangat baik……………………4
   - Terbaik………………………..5

**TAMAT. TERIMA KASIH**
Appendix B

EXAMPLE OF LETTER TO CONDUCT A STUDY IN ORGANISATION

Dear,

 XXXXXXX,

Director/ Manager XXXXXXX,

Permission Request to Conduct a Study in your institution.

I am Farah Nadia, a PhD student in Psychology at the University of Manchester, United Kingdom. I am currently running a research project on how people in Malaysia feel about their own ageing as they grow older, and how this can affect their self-esteem, health and well-being. I hope this research will help to find ways to improve the health and happiness of people in Malaysia after they retire. This research has been approved by the Malaysian Economic Planning Unit (reference: UPE 40/200/19/3242). Please refer to the document attached.

In order to run this project successfully, I need to find Malaysian employees who are aged between 18 and 60 years old, and able to read and understand the Malay language. I am writing to you now to ask whether you would be able to help with this project, by giving the permission for me to distribute the copies of a questionnaire pack to your employees in few departments.
who meet these criteria. I plan to give out questionnaires to several organisations all over the Kedah region between October and December 2015.

The questionnaire pack will contain of nine Malay language questionnaires that measure the following things: attitudes to ageing; well-being; life satisfaction; and self-perceived health. It is expected that it will take 30 minutes for the questionnaires to be completed. A copy of all of the questionnaires is provided below.

Please be assured that this research is not investigating the effect of individual organisations, and we will not include the names of the organisations taking part in the project in our reports. We are simply recruiting through organisations in order to gain as large as number of participants as possible. The responses that your employees give on the questionnaire will be anonymous, so that the names of the people who fill them in cannot be used in this study.

If you think that you would be able to help, then I will arrange a suitable time to come to your organisation to deliver an **APPROPRIATE NUMBER** of questionnaire packs to the departments you have permitted. I will also provide the departments with some collection boxes for your employees to return their completed questionnaire packs to. I would then come back to your organisation a week or so later to collect the boxes and questionnaires.

I would be very grateful for your permission to carry out this study in your organisation. If you think you might be able to help, or would like some more information, then please contact me at farah.mohdfaudzi@postgrad.manchester.ac.uk, or telephone me at: xxxxxxxxxxx. Thank you for taking the time to read this letter, and I look forward to hearing from you.

Yours sincerely,

____________________
Farah Nadia Mohd Faudzi
PhD student,
School of Psychological Sciences, The University of Manchester,
Room H27, Coupland 1 Building,
Manchester, M13 9PL.