

Understanding Frailty in Older Adults and its Relationship with Ageing
Perceptions

Submitted by Krystal Warmoth to the University of Exeter

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Abstract

Frailty in older adults is characterised as a vulnerable state, which predicts a range of health outcomes (e.g., injurious falls, institutionalisation, and mortality). The physiological and practical outcomes of frailty are recognised, but the psychosocial processes are largely unexplored so they were the focus the thesis. The overall aim of the thesis was to advance the understanding of frailty in older adults and its relationship with ageing perceptions. Three studies were conducted to achieve this aim.

The first piece of work was a systematic review that investigated the association between older adults' perceptions of ageing, broadly defined, and their health and functioning. The review showed that negative ageing perceptions were associated with poor health and functioning across a variety of health domains relevant to understanding frailty including: self-rated health; comorbidities; disability; memory; quality of life; mortality. However, conclusions from the review were limited by the quality and cross-sectional nature of the studies.

Consequently, the second piece of work analysed data from a large longitudinal sample to test the relationship between older adults' ageing perceptions and frailty explicitly. Older adults with more negative perceptions of ageing were more likely to be frail after adjusting for age, sex, depression symptoms, and socioeconomic status. However, ageing perceptions were found to be a weak predictor of frailty six years later.

To investigate the mechanisms of the relationship between ageing perceptions and frailty, a qualitative exploration of older adults' understanding of frailty and their beliefs concerning its progression and consequences was conducted as the third piece of work. Twenty-nine participants participated in semi-structured interviews, which were analysed using a Grounded Theory approach. An understanding of frailty as a negative identity and the strategies by which self-identification "as frail" occurs and is resisted were developed. Participants believed that the consequences of self-identifying as frail were poor health and functioning, disengagement from physical and social activities, depressive thoughts, negative affect, stigmatisation, and discrimination. Most participants actively resisted the identity, and they used a variety of resistance strategies.

Collectively, the findings from this project indicate that older adults' ageing perceptions are related to the development and progression of frailty. Ageing perceptions are associated with older adults' health and how they view themselves – whether they identify as frail and the different strategies they may use to resist identification. Whilst additional research is needed, the results of this research suggest an influential psychosocial aspect to frailty. Accordingly, a new model of frailty and its relationship with older adults' ageing perceptions is offered. The model has implications for the way frailty is identified, supported and treated.

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Additionally, I have to thank my friends and fellow students. Without them, I would have never survived the last few years and not enjoyed my experience nearly as much. Thanks for listening to my frustrations and providing me with advice. I am particularly grateful to Megan for reading parts of this thesis and assisting me in my systematic review.

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Statement of the candidate's contribution to co-authored papers

There are three studies in this thesis which have been written up as manuscripts for publication: one of these has been published and the other two are currently under review. As detailed below, the substantial contribution to co-authored papers presented was made by the candidate. All chapters have been written up as manuscripts and are presented in the format requested by the respective journal. Efforts have been made to reduce repetition; however, since each manuscript is meant to stand alone some information may be redundant.

Paper 1: Chapter 4

Warmoth, K., Tarrant, M., Abraham, and Lang, I. (under review). Older adults' perceptions of ageing and their health and functioning: a systematic review of observational studies.

The first manuscript presented in this thesis, in Chapter 4, was submitted to *Psychology, Health & Medicine* in March 2015 and is currently under review. The candidate developed the protocol, screened and selected the articles, collected the data from the included papers, analysed the data, and wrote the manuscript with supervisory advice from Mark Tarrant, Iain Lang, and Charles Abraham. Mark Tarrant also advised in any disagreements during the screening of the articles.

Statement of candidate's contribution to co-authored papers

Paper 2: Chapter 5

Warmoth, K., Lang, I., Abraham, and Tarrant, M. (under review). The relationship between perceptions of ageing and frailty in English older adults

The second manuscript presented in this thesis, in Chapter 5, was submitted to *The Journals of Gerontology Series B: Psychological Sciences* in March 2015 and is currently under review. The candidate developed the methodology, collected and analysed the data, and wrote the manuscript with supervisory advice from Mark Tarrant, Iain Lang, and Charles Abraham.

Paper 3: Chapter 6

Warmoth, K., Lang, I., Phoenix, C., Abraham, C., Andrew, M. K., Hubbard, R. E. and Tarrant, M. (in press 2015). "Thinking you're old and frail": a qualitative study of frailty in older adults. *Ageing & Society*

The third manuscript presented in this thesis in Chapter 6, was submitted to the journal *Ageing & Society* and accepted in March 2015. The candidate developed the study's materials, interviewed the participants, conducted analysis and interpretation of data, and wrote the manuscript. Iain Lang, Charles Abraham, and Mark Tarrant contributed to interpretation of data with the candidate. Cassandra Phoenix assisted the candidate with the

Statement of candidate's contribution to co-authored papers
design and analytic strategy of the data. Melissa K. Andrew and Ruth E.
Hubbard revised the draft critically for important intellectual content.

Chapter 1: Introduction

1.1. Problem statement

With an increasing ageing population (Office for National Statistics, 2011), there will likely be a greater prevalence of frailty. Older adults who are considered frail are particularly vulnerable to harmful or undesirable outcomes including hospitalisation, institutionalisation, injurious falls, or death (Strandberg, Pitkälä, & Tilvis, 2011). As a result, they are often in need of healthcare and social services from the National Health Service (NHS). However, frailty is a complex and poorly understood health condition, and there is currently no universal definition of frailty or standard measure of it (Fried, Ferrucci, Darer, Williamson, & Anderson, 2004; Rodríguez-Mañas et al., 2012). Furthermore, little is known about how frailty develops and progresses. Although the general tendency is for older adults to get worse than to improve (Clegg, Young, Iliffe, Rikkert, & Rockwood, 2013), there is evidence that frailty can be resisted and older people can regain at least some functioning (Gill, Gahbauer, Allore, & Han, 2006; Lee, Lee, & Chan, 2012; Xue, 2011). Such research acknowledges the physical and practical outcomes of frailty, but it is clear that the social and psychological correlates and consequences of becoming frail have been largely unexplored. In particular, there is insufficient research on the psychosocial processes related to frailty in older adults. These processes are the focus of this thesis.

In order to understand frailty, how older adults perceive ageing must also be acknowledged. Historically, frailty was a wide-ranging term for disablement and decline experienced in later life (Gilleard & Higgs, 2011). Only more recently has the term been used by practitioners and researchers to identify those individuals whose multiple bodily systems are impaired and are most at risk for many adverse outcomes (Fried et al., 2001; Rockwood & Mitnitski, 2007). Nevertheless, one of the most widespread and negative stereotypic beliefs is that older people are mentally or physically impaired and dependent (Brewer, Dull, & Lui, 1981; Hummert, 1990, 2011). According to this stereotype, frailty is believed to be a common and inevitable outcome of ageing.

Older adults' beliefs and expectations about getting older may determine their future responses to any physical or social changes they experience (e.g., falling, illness, or dependency). If an individual believes frailty is an inevitable or uncontrollable outcome of old age, he or she may not seek treatment or engage in activities to prevent it (e.g., physical activity). There is evidence that older adults use these beliefs to make sense of, and place into context, their own experiences of health, disability, and ageing (Levy, 2003; Stone, 2013; Westerhof & Tulle, 2007). Therefore, in order to explore the psychosocial processes involved in frailty, a better understanding of ageing perceptions and their relationship with frailty is included in this thesis.

This thesis draws on social psychological theory in order to develop a more comprehensive understanding of frailty. A better understanding of frailty could be valuable in the development of new healthcare interventions for

older people. The dynamic and modifiable nature of frailty suggests that certain actions can be taken to prevent or, in some cases, reverse its progression. Modifying age-related perceptions could have potential benefits for older adults and be an effective change technique (Abraham & Michie, 2008). Effective interventions to prevent frailty, to slow its progress, and to reduce its adverse consequences are of growing importance because they could reduce the likelihood of an individual experiencing the harmful and costly consequences of frailty.

1.2. Overall aim

The overall aim of this project was to advance the understanding of frailty in older adults and its relationship with ageing perceptions.

1.3. Overview of the thesis

Chapter 2, which follows, reviews the literature regarding frailty and ageing and provides the background for the PhD. The chapter introduces the topic of frailty and discusses past research on it. Then a biopsychosocial approach to understanding frailty is offered which asserts that biological, psychological and social factors all play an important role. Recognising the lack of a psychosocial understanding of frailty, the chapter discusses previous work on ageing that has utilised social psychological theories and concepts (including stereotypes, attitudes, and self-perceptions), which informed the heuristic model (Figure 1.1 below) that the empirical work tests in the thesis.

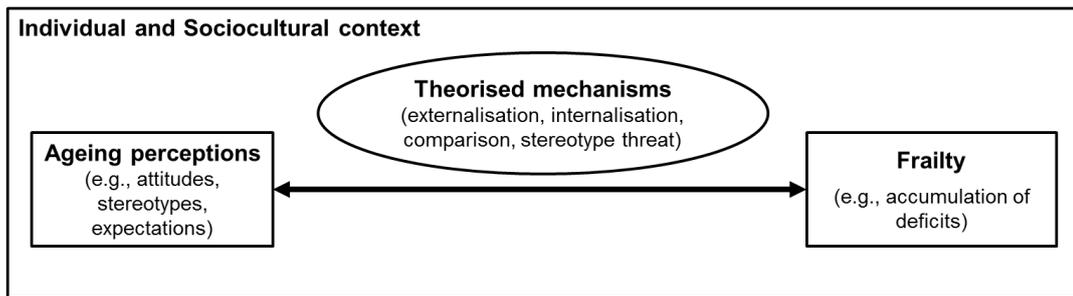


Figure 1.1. Heuristic model of the relationship between older adults' ageing perceptions and frailty

Chapter 3 presents an overview of the empirical work. This chapter describes the research strategy and details the different methodologies used. The chapter describes how the different pieces of work relate to each other, within the context of the proposed model (Figure 1.1), and how they contribute to the overall aim of the PhD.

Chapters 4 to 6 present the empirical phase of this PhD. In Chapter 4, a systematic review of the evidence of the relationship between older adults' perceptions of ageing with their health and functioning is presented. The review's aim was to provide evidence to demonstrate that ageing perceptions relates to a variety of health outcomes and conditions because frailty involves multiple bodily systems and presents in heterogeneous ways. To achieve this aim, this piece of work synthesised past research to determine whether a relationship between ageing perceptions and a range

Chapter 1

of different health domains existed. The review determined whether a relationship between ageing perceptions and frailty could be present.

Chapter 5 investigates the potential association between ageing perceptions and a measure of frailty. The aims of this piece of work were to (1) test whether a relationship between ageing perceptions and a frailty measure existed and (2) examine whether ageing perceptions predicted further health decline (i.e., frailty years later). To address these aims, this study tested the relationship between older adults' perceptions of ageing and frailty by analysing data from a large longitudinal dataset. The secondary analysis extended the findings of the systematic review and corroborated that a relationship between ageing perceptions and frailty existed– but not for everyone.

The final empirical chapter, Chapter 6, presents the findings of a qualitative study of older adults' perceptions about ageing and frailty. This study's aim was to elaborate and contextualise the psychosocial processes related to frailty in order to identify the underlying mechanisms and moderators of the ageing perceptions-frailty relationship. The study explored: (1) older adults' perceptions of frailty; (2) their beliefs concerning its progression and consequences; (3) and the role of ageing perceptions in the context of frailty. The findings from the qualitative study helped explain the findings from the two previous studies and contributed to a revised model of the relationship between ageing perceptions and frailty.

The final chapter, Chapter 7, summarises and integrates the findings from the research programme into a revised psychosocial model of frailty. The possible contributions of the findings to theory and implications for interventions and practice are described. The strengths and weaknesses of the research are addressed, and suggestions for future work are discussed.

Chapter 2: Literature review

2.1. Chapter overview

This chapter reviews past literature on ageing and frailty from biomedical, social, and psychological perspectives. The first section (Section 2.2) introduces the topic of frailty in older adults and its current conceptualisations. Then Section 2.3 presents the biopsychosocial approach to understanding frailty with a focus on the psychosocial processes involved. In this section, a heuristic model of the relationship between ageing perceptions and frailty is offered, which guided the empirical work of the thesis. The chapter ends with a summary of the previous sections and how they relate to the overall aim of this PhD (Section 2.4).

2.2. Introduction to frailty

This section reviews the biomedical and sociological literature on frailty. The section discusses: how ageing and frailty relate; current conceptualisations for understanding and identifying frailty; and the prevalence and projection of frailty in an ageing population. Lastly, how frailty develops, progresses, and can be modifiable is expressed (i.e., the dynamic nature of frailty) and needs to be understood so that effective interventions to prevent and reduce it can be later developed.

2.2.1. Disentangling frailty and ageing

From the biomedical and clinical perspective, frailty is broadly defined as a vulnerable condition in which multiple bodily systems are impaired (Clegg et al., 2013; Rockwood, 2005). With increasing age, there comes some physical and cognitive decline, such as hearing loss, diminished bone density, and poorer memory (Whitbourne, 2002). Frailty differs from the natural course of ageing although its prevalence increases with age.

Frailty is not an inevitable feature of later life. First of all, not every older adult becomes frail even in extreme age (see Section 2.2.3 for more prevalence data). Secondly, compared to other older adults, frail older people display the degradation of many physiological systems that are responsible for healthy adaptation to the physical, social, and psychological demands of life (Lipsitz, 2008). Those older adults considered frail are particularly vulnerable to harmful or undesirable outcomes, such as hospitalisation, institutionalisation, injurious falls, or death (Strandberg et al., 2011). Thus, frailty is a better indicator for those in need of intervention for their health and wellbeing than chronological age (Schuurmans, Steverink, Lindenberg, Frieswijk, & Slaets, 2004). Lastly, at any age, the heterogeneity in health outcomes reflects both the variability of frailty profiles and the factors that predispose an individual to poor health (Rockwood, Hogan, & MacKnight, 2000). For these reasons, frailty is related to, yet also distinct from, natural ageing, represents those adults at the greatest risk of adverse outcomes, and is heterogeneous (Rockwood et al., 2000).

2.2.2. Current conceptualisations of frailty

One of the major challenges of researching frailty in older adults is the conceptualisation and defining of the term, 'frailty'. Frailty is a term used by healthcare professionals, researchers, policymakers, and lay people to describe people in the later stages of life or approaching death. However, their understandings and usages of the term are not the same.

Amongst healthcare professionals, frailty is a classification given to assist in providing the best possible care presently and in the future (Strandberg et al., 2011). Clinical definitions put an emphasis on the quick and efficient screening of patients. These definitions use the presence of chronic disease, hospitalisation, physical functioning measures, and other biologically based measures (e.g., weight loss or walking speed) to identify frailty. Clinicians rely on these objective and measurable components to predict and prevent health outcomes, such as physical disability or mortality (see Sternberg, Schwartz, Karunanathan, Bergman, & Mark Clarfield, 2011). The worse an individual performs on these measures the greater the likelihood of them being classified as frail, and regarded as vulnerable to many adverse outcomes.

While clinicians use a frailty classification to treat and care for older people, ageing researchers identify frailty to gain a better understanding of the ageing process and health experiences of older adults (Lang, Michel, & Zekry, 2009). They separate and compare the different experiences of robust (i.e., not classified as frail) and frail older adults to determine the

different factors involved (e.g., genetic factors and biological systems). By investigating these factors, researchers aim to identify the underlying mechanisms and to develop interventions for prevention, treatment, and rehabilitation of frailty.

Conversely, policymakers are interested in addressing the adverse and costly correlates and consequences of frailty. For policymakers, frailty is a label for someone with complex care needs who could be dependent on policies concerning health and social care services ("Government Response to the House of Lords Select Committee on Public Service and Demographic Change Report of Session 2012-13," ; Kuh & New Dynamics of Ageing Preparatory Network, 2007). Their concerns focus on how to provide long-term sustainable solutions for health promotion and to improve the care of those considered frail. Currently, the term frailty is used in different ways depending on the context.

2.2.2.1. Social conceptions and representation of frailty

Historically, frailty was a catch-all term for disablement and physical decline experienced in later life (Gilleard & Higgs, 2011). Only recently have practitioners and researchers defined the term in order to identify those older people whose multiple bodily systems are impaired and are most at risk for many adverse outcomes (e.g., Fried et al., 2001; Rockwood & Mitnitski, 2007). Alternatively, sociological and gerontological perspectives argue that frailty is socially constructed and influenced by sociocultural forces on healthcare practices and the meanings of the experiences related to frailty (e.g., disability and impairment).

Chapter 2

Due to the biomedicalisation of ageing (Estes & Binney, 1989), frailty is considered a medical problem and so it falls to the healthcare community to identify and treat (Kaufman, 1994; Raphael et al., 1995). The term's increasing use in these clinical and medical contexts is what led Kaufman (1994) to report frailty as socially constructed. Using case studies, she described how frailty is constructed through social interactions in a clinical setting. In these interactions, older adults' lived experiences became lists of health or functioning problems (also known as deficits) and changes they needed to make in their lives. She proposed that frailty was a label imposed upon older people as a result of their interactions with the health care system and society (Kaufman, 1994).

More recently, Gilleard and Higgs (2010; 2011) have suggested that people's beliefs about frailty are shaped by societal and cultural views of health and ageing. They theorised a 'fourth age' resulting from the conflicting cultural views of old age; that is, one view of ageing in which older people live active, disease-free lives (the third age) and one in which they are dependent and have poor health (the fourth age). They suggested that the biomedical perspective views frailty (termed the fourth age) as negative due to its associations with decline and disease. Furthermore, broader society reflects these views by equating terms like 'successful' with 'healthy' ageing. Gilleard and Higgs (2010; 2011) proposed that the term 'frailty' refers to the social representation of a weak old person associated with a marginal and vulnerable population without status in Western society. Frailty, or the fourth age, hence represents the feared and discouraged view of ageing.

Research concerning older people's own conceptualisations of frailty illustrates their beliefs and how these differ from biomedical models and include social views of ageing. By analysing the different definitions of frailty from the Oxford English Dictionary, research literature, and older women's accounts of their lived experiences, Grenier (2007) asserted that discourses and definitions of frailty revealed not only a perceived association with incapacity but also one of powerlessness, with implications of blame, highlighting feared aspects of ageing (such as decrepitude, dependency, and decline). Frailty was discussed as an observable physical state, through the experience of vulnerability and negative social assumptions, and its associations with crisis events (Grenier, 2007).

Supporting Grenier's (2007) findings, Puts and colleagues' (2009) qualitative investigation of Dutch older adults' (both men and women) meanings of frailty showed that frailty was seen as a state of general physical impairment (commonly reflected in appearance and mobility) and disease. However, older adults also described frailty as a condition with delineable social and psychological ill-effects: reduced ability to cope with physical limitations; negative emotions (e.g., fear); impaired cognitive functioning; and poor social interactions. Distinct from Grenier's (2007) investigation, this study included both men and women and found gender differences in descriptions of frailty. Men stressed the physical aspects of frailty (e.g., medical conditions whereas women said more concerning the social and psychological aspects (e.g., loneliness and depression). Furthermore, Puts and colleagues contrasted the meanings if the older

person was considered frail using clinical instruments (i.e., Frailty Index) yet found no differences.

These two qualitative studies (Grenier, 2007; Puts et al., 2009) show that older adults' own understandings of frailty are nuanced. Older people include social and psychological aspects (e.g., negative emotions, poor social interactions, and fear) in their descriptions and discourses of frailty. To them, frailty is not just a physical state related to ageing or physical weakness as some biomedical definitions imply (e.g., phenotype of frailty).

In another qualitative study, Grenier (2006) considered how older women negotiate their own views and experiences of frailty with the biomedical or clinical conceptualisations. By interviewing older women, she found that older women made a strong distinction between *being* and *feeling* frail. *Being frail* was imposed on them from medical or functioning classification, while *feeling frail* was associated with emotional experiences of traumatic events (e.g., loss of a loved one), disability, or physical impairment (e.g. incontinence). None of the women labelled themselves as frail, but they did reflect on moments in their lives when they felt frail. Feeling frail was more accepted because emotions were regarded as temporary states and consequently did not threaten their identity. However, admitting to being frail would require a change in their view of who they were – an identity shift. This work revealed how older adults negotiate this conflict between their self-view with the biomedical label of being frail.

To summarise, frailty, as a social concept, is influenced by social interactions (e.g., in health care context) as well as by societal views about ageing and health (third and fourth ages). These accounts describe the social and personal ideas, beliefs and perceptions of frailty. Frailty relates to the negative view of old age or later life. From the little research that has investigated older people's understanding and experiences of frailty, it is clear that older adults' views can differ from those proposed in biomedical and clinical literature (Grenier, 2007). Older adults' views of frailty incorporate: emotions; relationships; identity; and coping with changes or losses. These views are especially important because they differ from the biomedical perspective, which considers frailty as the consequence of internal factors such as disease (Section 2.2.4).

Older people's perspectives are important to consider however because they could influence their appraisals about their health experiences and how frailty may subsequently develop or progress. In other words, older adults' beliefs and expectations about frailty (and getting older more generally) may determine their future responses to any health changes they experience (Markle-Reid & Browne, 2003; Schulz & Williamson, 1993). For example, if older people believe frailty is an inevitable or uncontrollable outcome of old age, they may not seek treatment or engage in activities to prevent it (e.g., physical activity). There is evidence that older adults use these beliefs to make sense of, and place into context, their own experiences of health, disability, and ageing (Levy, 2003; Stone, 2013; Westerhof & Tulle, 2007). For this reason, older people's perceptions of frailty (especially in relation to ageing) are examined as part of this thesis (Chapter 6).

2.2.2.2. Phenotype versus deficits models of frailty

Within the biomedical discipline, there are two commonly-used conceptual models (phenotype and accumulation of deficits) of frailty, and these are detailed in the following section. Even with the increased application of these two models to the study of frailty, there is little to no agreement about what frailty actually is or how to measure it (Fried, Ferrucci, Darer, Williamson, & Anderson, 2004; Rodríguez-Mañas et al., 2012). The two models conceptualise frailty as a physical syndrome caused by an underlying condition like *sarcopenia* (i.e., loss of skeletal muscle mass), which can be measured by the Fried phenotype (2001) or the FRAIL scale (see Table 2.1.; Abellan van Kan, Rolland, Morley, & Vellas, 2008), and as a risk state secondary to accumulated deficits of illnesses, functional impairments, sensory impairments, and symptoms measured using a Frailty Index (Clegg et al., 2013; Mitnitski, Mogilner, & Rockwood, 2001). Therefore, phenotypic frailty proposes to be distinct of disability and comorbidities, while Frailty Index counts deficits regardless of their nature (see Figure 2.1 for an illustration of the different models). Depending on the conceptual model, frailty is attributed to different sources and includes a variety of factors.

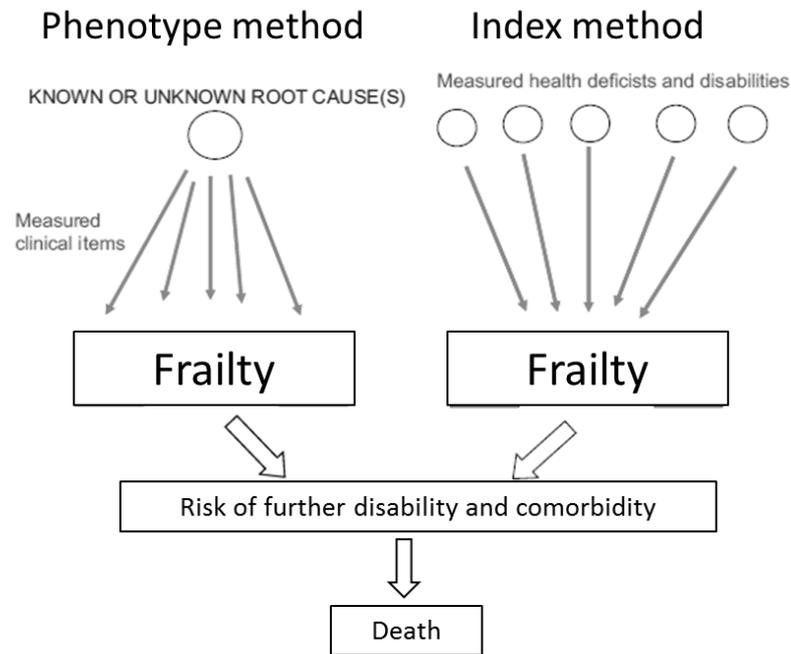


Figure 2.1. Difference between phenotypic frailty and frailty index (adapted from Strandberg et al., 2011).

Fried's 'phenotype of frailty' (2001) is widely used by clinicians and biomedical researchers. It considers frailty to be a clinical syndrome with the following elements: decreased appetite and weight loss; fatigue and weakness; gait disturbance and falling; and declining cognition which are all believed to stem from the same source (Fried et al., 2004; Fried et al., 2001). Individuals are classified into one of three broad categories, robust, pre-frail, or frail, based on their performance in these domains. According to this model, the underlying conditions (e.g., cardiovascular disease or diabetes), weakness, and weight loss must be treated. Interventions which adhere to this model encourage medication for different conditions, strength

training, and nutrition to combat the syndrome and prevent future disability (Strandberg et al., 2011).

Table 2.1.

The FRAIL Scale

Domains
<u>F</u> atigue
<u>R</u> esistance (ability to climb 1 flight of stairs)
<u>A</u> mbulation (ability to walk a short distance)
<u>I</u> llnesses (greater than 5)

Note. Adapted from Abellan van Kan et al. (2008)

Alternatively, frailty can be defined as an accumulation of age-associated deficits that collectively contribute to a vulnerable state (Mitnitski et al., 2001; Rockwood & Mitnitski, 2007). According to this conceptualisation, frailty is determined by using a frailty index (FI; Mitnitski et al., 2001) or the Clinical Frailty Scale (see Table 2.2.; Rockwood et al., 2005). These instruments use multi-dimensional scales that include physical, cognitive, psychological and/or social aspects of functioning. Frailty is determined by the amount of these deficits that the older person possesses. Older people fall onto a continuum of 'fit' to 'severely frail' accordingly. This index allows for a more detailed profile of an individual's specific conditions and

limitations in multiple domains. A Frailty Index is regarded as a useful tool to ascertain the effectiveness of an intervention and to describe the health status trajectories over time (Cesari, Gambassi, Abellan van Kan, & Vellas, 2014).

Table 2.2.

CSHA Clinical Frailty Scale (adapted from Rockwood et al., 2005)

Category	Description
Very fit	Robust, active, energetic, motivated and fit; these people commonly exercise regularly and are in the most fit group for their age
Well	Without active disease, but less fit than people in category 'Very fit'
Managing well	Disease symptoms are well controlled compared with those in 'Apparently vulnerable'
Apparently vulnerable	Although not dependent, these people commonly complain of being 'slowed up' or have disease symptoms
Mildly frail	With limited dependence on others for instrumental activities of daily living
Moderately frail	Help is needed with both instrumental and non-instrumental activities of daily living
Severely frail	Completely dependent on others for the activities of daily living, or terminally ill

Note. CSHA= Canadian Study of Health and Ageing

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These two models differ in several ways. Firstly, the phenotype model supports a more physiological view while the accumulation of deficits model includes environmental factors (e.g., living alone or lack of social resources). Secondly, the phenotypic definition discriminates broad levels of risk (i.e., robust, pre-frailty, and frail) and lends itself to easy clinical classification. The frailty index method more precisely defines possible adverse outcomes, but is difficult for clinical settings and possible interventions because it requires a comprehensive geriatric assessment (Clegg et al., 2013; Rockwood, Andrew, & Mitnitski, 2007). Lastly, the phenotype model was developed from the clinical geriatric perspective and its operationalisation was created to find the cause of comorbidity and disability (Fried et al., 2001). In contrast, the accumulation of deficits model was developed acknowledging the heterogeneous health of older people and for appraising individuals holistically (Mitnitski et al., 2001).

These models do overlap in their ability to identify frailty in older people, helping to provide support for recognition of the condition as a construct (Clegg et al., 2013). When the models were compared, the measures correlated and predicted adverse outcomes (institutionalisation and mortality) regardless of the measure used (Rockwood et al., 2007). The different phenotypic classifications (i.e., robust, pre-frailty, and frail) had distinct cumulative distributions of deficits; while some phenotypic robust older people had high FI scores, few people with phenotypic frailty had low FI scores (Rockwood et al., 2007). Although these models are frequently used to conceptualise frailty and considerable research is devoted to finding a standard instrument to measure or identify frailty, little attention has been

given to the condition in other respects (such as its development, progression, and determinants of changes; Section 2.2.4). This thesis investigated the processes which contribute to its development and progression in older adults. Therefore, the understanding of frailty is advanced beyond the current models.

2.2.3. Prevalence and projection of frailty

As stated above, there is no accepted single definition of frailty, and, because of this, it is difficult to determine accurately the number of frail older people in the population. However, currently, it is estimated that between a quarter and a half of people over 85 years old are frail (Fried et al., 2001; Song, Mitnitski, & Rockwood, 2010). With the numbers of people aged over 80 in the United Kingdom predicted to double in the next 20 years and nearly triple in the next 30 years (Office for National Statistics, 2011), there is likely to be marked increases in the prevalence of frailty and related health care costs.

Recognising these projected increases, the National Institute for Health and Care Excellence (NICE, 2015) is currently developing guidelines that make recommendations for behaviour changes (e.g., encouraging people to stop smoking, become more physically active, reduce their alcohol consumption, and improve their diet and maintain a healthy weight), which are thought to reduce people's risk of frailty in later life (British Geriatrics Society, 2014). Notably, these guidelines recommend further research into the physical and psychosocial risk and protective factors, and the relationships between them and the development of frailty (NICE, 2015). In a review of different

conceptualisations of frailty by Markle-Reid and Browne (2003), it was concluded that most models of frailty overlook the role of contextual factors, subjective perceptions, and interactions from multiple factors.

Understanding the contributing factors and mechanisms of frailty is imperative as the ageing population and the projected number of frail people increases. This thesis intended to identify contributing factors and mechanisms of frailty by advancing the understanding of frailty in older adults. These possible contributors may be modifiable and assist in efforts to encourage people to make behaviour changes that reduce their risk of frailty.

2.2.4. The dynamic nature of frailty

Frailty is not an 'all or nothing phenomena' (Markle-Reid & Browne, 2003, p. 64). There are varying degrees of frailty and it can change due to circumstances. For example, an older adult's health status can change over time (e.g., disease progression or recovery) and under certain conditions (e.g., loss of support or new medications). Some conceptualisations account for the possibility that it is not static and have proposed frailty as a cycle (e.g., Fried et al., 2001), a continuum (e.g., Rockwood, Fox, Stolee, Robertson, & Beattie, 1994), and a dynamic process of adaptation (e.g., Kaufman, 1994). Frailty is a dynamic process (Gill et al., 2006) but the general tendency is for older adults to get worse rather than to improve (Clegg et al., 2013).

In some circumstances, frailty has been shown to be reversible or at least slowed. Longitudinal studies have found that some older adults can become less frail over time (Gill et al., 2006; Xue, 2011). Gill and colleagues' (2006) prospective study was conducted to determine the natural transition rates between frailty states (i.e., not frail, pre-frail, and frail) and to evaluate the influence of the preceding frailty state on subsequent frailty transitions. The study examined 754 people over the age of 70 and measured their frailty using criteria similar to the FRAIL scale (Table 2.1) every 18 months over four and a half years. Gill et al. (2006) found that some of the older adults who were less frail (i.e., met less of the criteria for frailty or classified as pre-frail) regained functioning and resisted becoming frailer.

In a later observational study by Xue and colleagues in 2008, the development of frailty was investigated in 450 women aged 70 to 79 years who were not considered on the phenotype criteria (i.e., weakness, walking speed, low physical activity, weight loss, and low energy). Transitions between differing levels of frailty were tested over the course of seven and a half years. Xue et al. (2008) supported Gill and colleagues' (2006) findings of older people transitioning from frail to non-frail, and they found a higher percentage of older individuals not becoming frail. The study furthered Gill et al.'s findings by exploring the onset of frailty and discovered that weakness (reduced grip strength) often developed first. However, there was heterogeneity in how frailty manifested and its rate of progression with those with low energy and weight loss having a more rapid progression.

These findings suggest that how frailty progresses may vary among older adults and early intervention could delay or stop the development and

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progression of frailty. Indeed, researchers have advocated the use of interventions to prevent or reverse frailty using different treatments including exercise, hormone replacement, nutrition, and physical rehabilitation (e.g., Espinoza & Walston, 2005). In a systematic review of these interventions for frailty, Lee et al. (2012) found mixed results. Exercise programmes were included in the most trials (i.e., six of the eleven trials included in the review) and five of which reported improvement on some indicators of frailty (e.g., grip strength, walking speed, and a functional status questionnaire). However, the durations of these interventions varied, ranging from 15 weeks to 12 months. Moreover, no follow-up data was collected after the intervention had ended. Nonetheless, such interventions do provide evidence that frailty is modifiable and not inescapable.

There is a need for the early signs of frailty to be identified. Early behavioural changes (e.g., engagement in physical activity) in older adults in whom frailty is developing could be important to its progression and improvement (Xue, 2011). Older adults' responses to early cues or challenges (e.g., illness or a fall) may be important precursors to the development of frailty. For example, the use of certain strategies (e.g., social support or mobility aids) may determine if and how frailty develops (Kressig et al., 2001; Peek, Howrey, Ternent, Ray, & Ottenbacher, 2012). Therefore, how older adults assess both internal (e.g., physical impairment or illness) and external (e.g., social isolation or living environment) changes, or challenges, that they experience in daily life could be contributing factors to the progression of frailty (Xue, 2011). Unlike current conceptualisations of frailty, these contributing factors were included in the model of frailty offered

in Section 2.3 and were studied in the empirical work of the thesis (Chapter 4, 5 and 6).

2.2.5. Section summary

Frailty is conceptualised and used in different ways (e.g., to assist in providing the best possible care, study older adults' experiences, and creating policies for those with complex care needs). Frailty is a construct that is related to ageing, that is heterogeneous, and that represents those adults at the greatest risk of adverse health outcomes (including injurious falls, hospitalisation, and death). As a social concept, it is influenced by social interactions and societal views about ageing and health. In the biomedical field, there are multiple definitions of frailty with little agreement in biological, clinical, and ageing research and practice (Fried et al., 2004; Rodríguez-Mañas et al., 2012); critically, however, the two commonly used models view frailty as a phenotype or an accumulation of deficits.

Despite the differing conceptualisations of frailty, its dynamic nature is likely to be of considerable importance to the development of interventions for prevention and treatment. Frailty is not an inevitable outcome of getting older or a stable state. Its trajectory can be unique to an individual depending on their specific needs, circumstances, or environment. Frailty can be reversed or delayed, but how frailty develops and progresses needs further investigation. In particular, the ways that social, psychological, and behavioural factors are connected to the development and progression of frailty in older adults require attention. In short, it can be argued that a biopsychosocial approach to understanding frailty is needed and could be

useful. The subsequent section applies this approach to frailty. This approach is the basis for the three pieces of work conducted as part of this thesis, aiming to better understand frailty in older adults and its relationship with ageing perceptions.

2.3. Biopsychosocial approach to frailty

Section 2.2 looked at frailty from biomedical, clinical and sociocultural perspectives. These perspectives place emphasis on the problem and the context, but investigation into the underlying processes is still needed to understand how frailty develops and progresses. Frailty is commonly explained in terms of an underlying deviation from normal function (such as a virus, gene, or developmental abnormality, or injury), but other influences (e.g., social perceptions, individual experiences, and cultural context) are not considered. In order to fully understand frailty, the interrelationships between biological changes, psychological status, and the sociocultural contextual need to be considered. This thesis therefore takes a biopsychosocial approach to study frailty in order to study these interrelationships.

2.3.1. Applying the biopsychosocial model to frailty

First proposed by George Engel in 1977, the *biopsychosocial* (BPS) approach, or model, asserts that biological, psychological (emotional and cognitive), and social (or environmental) factors all play an important role in health and disease. This approach advocates that the three domains (i.e., the biological, social, and psychological) are interrelated, but they can also

be independent. A major strength of this approach is that it provides a comprehensive and holistic understanding of individuals' experiences of health and disease (Cooper, Stevenson, & Hale, 1996). Over the last few decades, this approach has gained popularity due to its consideration of multiple forms of etiological factors when determining how to most effectively understand and treat individuals for physical and mental illnesses. For this same reason, a BPS approach was utilised to develop a fuller understanding of frailty.

There are several other reasons why applying a BPS approach to frailty would be appropriate and advantageous. Firstly, frailty is not disease-focused but is a comprehensive condition that encompasses multiple bodily systems. Therefore, it fits with the BPS model easily because this model encourages a comprehensive and holistic understanding of health (De Lepeleire, Iliffe, Mann, & Degryse, 2009). Secondly, frailty is multidimensional and multifactorial (Section 2.2.2), and therefore it should be studied using an eclectic method. Thirdly, a BPS approach suggests that there are complex relationships between the three dimensions. That is, each dimension can impact another. For example, an older person may have to be moved to a care home because of their multiple health conditions. In this example, their biological health influenced their social environment (i.e., move to a care home). Current models of frailty neglect these complex relationships between dimensions. By employing a BPS approach, the current thesis aimed to understand these relationships and their association with the development and progression of frailty. The following section outlines the different domains of a BPS model of frailty

(Figure 2.2) and presents the known correlates and consequences to support the involvement of these domains in frailty.

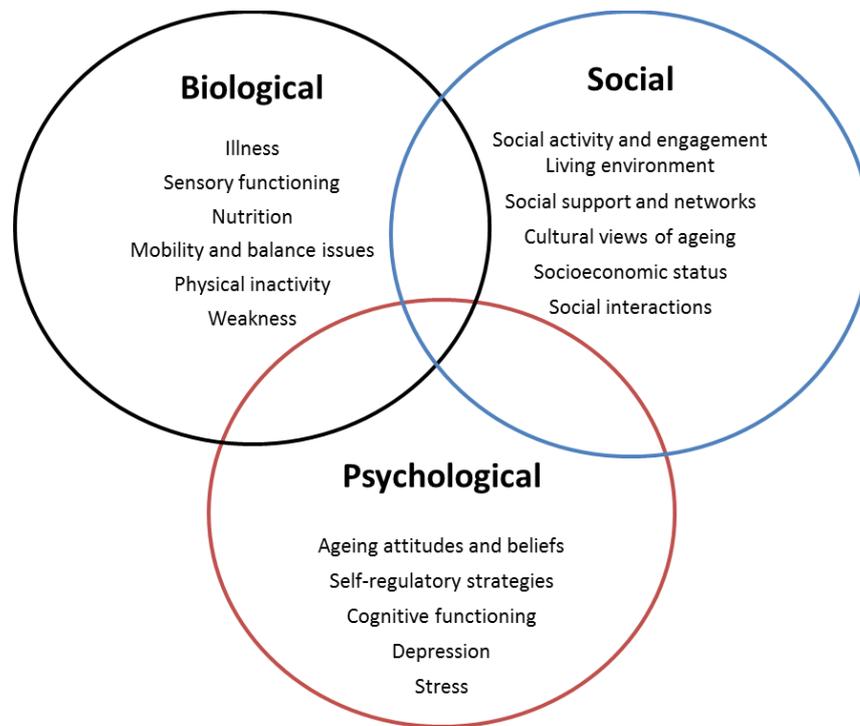


Figure 2.2. Biopsychosocial model outlining the correlates and consequences of frailty

2.3.2. Biological, psychological, and social factors related to frailty

The current thesis used a biopsychosocial approach as a starting point for understanding frailty and as justification for the examination of the interplay between its biological, psychological, and social dimensions. Figure 2.2, above, illustrates the different domains and how they are all interrelated in a

BPS model of frailty. This model of frailty incorporates previous literature on these different domains (detailed in the following sections) and the factors that were studied in the empirical work of this thesis (i.e., ageing attitudes and beliefs).

2.3.2.1. Biological and physical factors

In Figure 2.2, the biological circle demonstrates how frailty is associated with physical, biological, and physiological factors, such as illness, functional impairment and nutrition. This domain is commonly studied in biomedical models of frailty (described in Section 2.2). Accordingly, these classifications of frailty focus on the physical, physiological, and disease-related correlates and consequences of frailty. Using data from large longitudinal studies (Fried et al., 2001; Mitnitski et al., 2001; Rockwood et al., 2005), frailty has been found to be a better predictor of mortality in older adults than chronological age alone, regardless of the measures of frailty used. Such findings support that frailty is a biological construct which is distinct from ageing and have contributed to the current biomedical models of frailty.

Frailty classifications are used to treat and care for older people because it differs from the natural course of ageing and can identify those who are most at risk for adverse health outcomes (see Section 2.2). There is cross-sectional and longitudinal evidence that suggests that frailty has a strong relationship with dependency or need for care, resulting in institutionalisation, and hospitalisation (Fried et al., 2001; Mitnitski et al., 2001; Rockwood & Mitnitski, 2007; Rockwood et al., 2005). Frailty has also

been associated with functional disability, i.e., difficulties in performing daily activities, mobility and falling (Fried et al., 2001; Vries, Peeters, Lips, & Deeg, 2013). Considerable research has investigated the adverse physical and functional consequences of frailty which have been used to establish it as a construct and in the creation of a measure for identification (for review, see Sternberg, Schwartz, Karunanathan, Bergman, & Mark Clarfield, 2011).

2.3.2.2. Psychological and cognitive factors

According to a BPS model of frailty (Figure 2.2), psychological factors also play an important role in an older person's health. Most of the past research concerning the psychological factors related to frailty has focused on cognitive functioning and mental health. The following section outlines this past research on the relationship between psychological factors and frailty in older adults.

Cognitive functioning decline (including cognitive impairment and dementia) is associated with frailty (Auyeung, Lee, Kwok, & Woo, 2011; Bilotta et al., 2010; Jacobs, Cohen, Ein-Mor, Maaravi, & Stessman, 2011; Mitnitski et al., 2001; Robertson, Sawa, & Kenny, 2013). Past research has found that frailty predicts and results from cognitive impairment (for a review, see Robertson et al., 2013). Such findings indicate that frailty and cognition interact. Some conceptual models do include poor cognitive functioning or a diagnosis of dementia into their measures to identify frailty (e.g., Rockwood et al., 2005). Furthermore, some researchers have considered the role of

cognitive functioning in the development of frailty. Auyeung and colleagues (2011) suggested that frailty and cognitive decline in older age may share a similar pathogenesis, or causal mechanism. Robertson et al. (2013) proposed several possible causal pathways: hormones; nutrition; chronic inflammation; cardiovascular disease; and mental health. This research suggested that cognitive and biological factors both influence how frailty develops and progresses. Nevertheless, the influences of other psychological factors have received less attention although they too can influence an older person's physical functioning and health (e.g., Levy, 2003; Mezuk, Edwards, Lohman, Choi, & Lapane, 2011).

The few studies that have investigated other psychological factors in relation to frailty have focused on older adults' mental health and emotional wellbeing (e.g., Bernal-López, Potvin, & Avila-Funes, 2012; Mezuk et al., 2011; Ostir, Ottenbacher, & Markides, 2004). As older people perceive their health to be worsening (becoming frailty), they have more symptoms of depression (Schnittker, 2005). A review of frailty and depression found that a positive and bidirectional relationship exists (Mezuk et al., 2011). With increasing frailty, there is a greater likelihood of depression, and vice versa. Frailty has also been found to be associated with clinical anxiety in older people (Bernal-López et al., 2012). These findings provide further support that cognitive and psychological factors are associated with frailty in older adults and the contribution of psychological factors to the development of frailty should be investigated.

To date, there have been a few studies that have investigated the possible common factors or underlying pathologies in the relationship between

mental health and frailty. Of these studies, positive affect, or emotional wellbeing, was found to be protective against the functional and physical decline associated with frailty (Ostir, Markides, Black, & Goodwin, 2000; Ostir et al., 2004). Individuals who are at risk of frailty (i.e., those who had impaired walking/balance, depression, lower limb disability) were found to have a fear of falling and lack of confidence in their abilities (specifically, controlling their balance), factors which are directly related to depression (Kressig et al., 2001). Additionally, coping with the stress of being frail were also considered an important determinant of enduring adverse outcomes after the onset of frailty (Schulz & Williamson, 1993). For example, health-related stressors and financial strain were associated with increases in frailty over time (Peek et al., 2012). Those who are considered frail are believed to be particularly vulnerable to perceived stress which may lead to more functional decline and other adverse consequences (Schulz & Williamson, 1993). Frailty seems to be not only influenced by psychological distress but also contributes to it. Both distress and negative affect may lead to clinical mental health problems in frail older adults (e.g., Charles, Piazza, Mogle, Sliwinski, & Almeida, 2013).

Despite this research, psychological factors are not included in the current biomedical models used to recognise and measure frailty (e.g., phenotypic frailty). Moreover, they are not considered in the development or progression of frailty. In the BPS model of frailty, presented above, the psychological factors of cognitive functioning and mental health (depression) were included in the psychological domain because they have been found to interact with frailty in older adults. There has been little

empirical work on the relationship between frailty and psychological factors besides those relating to mental health or cognitive functioning. To address this gap in knowledge, the main purpose of this thesis is to explore the relationship between a novel psychosocial factor – ageing perceptions – and frailty in order to further the understanding of its development and progression in older adults (see Section 2.3.3).

2.3.2.3. Social and environmental factors

Regarding the social dimension in the BPS model of frailty (Figure 2.2), there is evidence that the biological and physical consequences of frailty are connected to social events and support. Social losses that can occur in later life (e.g., death of loved ones or isolation) have been associated with older adults' health and functioning (McKee et al., 2005). Additionally, reduced participation in collective social activities was found to increase an older person's risk for institutionalisation and mortality (Pynnönen, Törmäkangas, Heikkinen, Rantanen, & Lyyra, 2012). Only a small number of studies have specifically studied how social (or environmental) factors relate to frailty.

Frailty has been related to socioeconomic status, social activity, and social support. For example, older adults who were living alone, had lower socioeconomic status, and did not have a partner or children were more at risk of becoming frailty (Bilotta et al., 2010; Casale-Martínez, Navarrete-Reyes, & Ávila-Funes, 2012; Woo, Goggins, Sham, & Ho, 2005). Less social support has also been related to frailty (Peek et al., 2012; Woo et al., 2005). Social vulnerability, which is a composite construct that includes a

lack of social support, less social engagement, little sense of mastery/control, and inability for social interaction, has been associated with frailty in older people (Andrew, Mitnitski, & Rockwood, 2008). The two concepts (frailty and social vulnerability) were both found to contribute independently to mortality in older adults (Andrew et al., 2008). Even among the fittest older adults (i.e., those older people who were not frail), increased social vulnerability was found to increase their likelihood of mortality (Andrew, Mitnitski, Kirkland, & Rockwood, 2012). This evidence suggests that social factors can impact the development and progression of frailty and even influence mortality independently, providing further support for a BPS approach.

In the current models of frailty, the relative importance of social factors is debated. The measurement of social factors (e.g., social vulnerability) and their relationship with frailty is controversial (Andrew et al., 2008). Some models do not acknowledge the influence of social factors (e.g., phenotypic frailty). While other models do advocate that social factors are important (e.g., accumulation of deficits model), they do not integrate them in their measurements of frailty or consider how they interact with psychological or biological factors. For that reason, social factors, such as social activity, cultural views of ageing, socioeconomic status, and social interactions, were incorporated into the BPS model of frailty (Figure 2.2). This thesis sought to understand how social factors were related to frailty by studying a psychosocial factor, i.e., ageing perceptions (Chapter 6).

2.3.3. Psychosocial factors related to ageing and their implications for frailty

As described in the previous sections, a BPS approach to frailty in older adults advocates that biological, psychological and social factors all play an important role in an individual's health. Frailty has been found to be related to a variety of adverse biological, psychological, and social events (Figure 2.2). Less research has investigated frailty in the social and psychological domains and how they are interrelated, compared to the biological domain. The current thesis sought to study the psychosocial processes related to frailty to develop a more integrative view of frailty than the current biomedical models. This integrative view furthered our understanding of frailty in older adults, which was the overall thesis goal.

Another important contribution of studying the psychosocial factors related to frailty is that they can possibly explain older adult's health behaviours and outcomes. As was pointed out earlier in this chapter, frailty has important and possibly contributory social and psychological factors yet these factors have not been explored further. In particular, current conceptualisations of frailty do not account for interactions between these factors and their relationship with frailty (Markle-Reid & Browne, 2003). Studying the psychosocial factors (e.g., subjective perceptions) related to frailty could explicate its development and progression. Understanding the contributing factors and mechanisms of frailty are imperative to developing effective interventions to deter its development or further decline in older people (NICE, 2015). Therefore, understanding the psychosocial aspects of frailty could inform prospective interventions.

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Although there are numerous psychosocial factors that warrant investigation, this thesis focused on older adults' ageing perceptions specifically. Older adults' beliefs and expectations about ageing may determine their responses to any physical or social changes they experience (e.g., falling, illness, or dependency). If an individual believes frailty is an inevitable or uncontrollable outcome of ageing, he or she may not engage in activities to prevent it (e.g., physical activity) or seek treatment and consequently become frail.

The following section of this chapter outlines the previous literature on ageing perceptions. There are two important points that should be stated concerning this section. Firstly, this is not an exhaustive review of all the possible mechanisms and concepts. This section presents the literature on ageing perceptions that have been previously associated with older adults' health, functioning, and wellbeing. By focusing on this past research, possible connections to the development and progression of frailty can be proposed for later investigation in this thesis. Secondly, it is important to note that most of the research presented in this section has addressed ageing generally and not frailty specifically. It was not known whether these past findings also apply to frailty and whether their effects transfer. Therefore, the association between ageing perceptions and health (Chapter 4) as well as frailty (Chapter 5 and 6) was researched in this thesis.

2.3.3.1. Overview of ageing beliefs and perceptions

Age is a fundamental characteristic by which people are grouped, or categorised, and, as such, impacts on several aspects of a person's life, such as education, family and work (Ayalon, Doron, Bodner, & Inbar, 2014). Subjective beliefs and perceptions of age have long been investigated (Diehl et al., 2014; Kastenbaum, Derbin, Sabatini, & Artt, 1972), and the study of ageing attitudes and stereotypes in particular have received considerable attention (Madey, 2000). Attitudes and stereotypes are often used interchangeably (R. Bennett & Eckman, 1973; Hess, 2006) and are believed to be linked (Hummert, 2011). However, *attitudes toward ageing* are social and individual attitudes about older adults as a group and the process of ageing (Hess, 2006); whereas, *ageing stereotypes* are considered a subset of age-related beliefs and attitudes that specifically relate to the social category of older people (Chasteen, 2000).

Notably, ageing attitudes and stereotypes are complex and multidimensional (Kite, Stockdale, Whitley, & Johnson, 2005; Kite & Wagner, 2002). A considerable amount of research has found that people (young and old) have multiple stereotypes of ageing (Brewer et al., 1981; Brewer & Lui, 1984; Hummert, 1990; Kornadt & Rothermund, 2011; Kornadt, Voss, & Rothermund, 2013). The multiple stereotypes of old age were investigated by Brewer and colleagues (Brewer et al., 1981; Brewer & Lui, 1984) who developed different stereotypes based on: participants' clustering of photographs of older people; how they assigned behavioural attributes to prototypes of each category; and how they recalled stereotype-associated information. Hummert (1990, 2011) outlined these ageing

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stereotypes and their associated traits, i.e., severely impaired, despondent, shrew/curmudgeon, recluse, golden ager, perfect grandparent, and conservative. These different stereotypes include both positive (e.g., grandparent) and negative traits (e.g., senile and reclusive). Brewer and colleagues (Brewer et al., 1981; Brewer & Lui, 1984) concluded that: (1) the social category of 'older person' incorporates multiple stereotypes of older people; (2) some old age stereotypes reflect negative beliefs about older individuals and others reflect positive beliefs, but that there are more negative stereotypes than positive ones; (3) ageing stereotype content includes beliefs about physical characteristics (e.g., grey haired), personality traits (e.g., wise), social status (e.g., retired), and behavioural tendencies (e.g., complaining); (4) although age stereotypes have a basis in shared beliefs, they exist only as cognitive representations within individuals. Therefore, the structure and content of ageing stereotypes (or perceptions) can vary across different individuals as a function of their own personal experiences.

Among these different views of ageing, one of the most common negative stereotypic beliefs (and the one of particular relevance to the subsequent work in this thesis) is that old age is characterised by mental or physical impairment (Hummert, 1990, 2011). In other words, this stereotype advocates that *to be old is to be ill*. It is common for ill-health, functional limitations and mobility difficulties to be attributed to old age (Stewart, Chipperfield, Perry, & Weiner, 2011). Many older adults expect to become depressed as they age, become more dependent on others, have more aches and pains, have reduced ability to have sexual intercourse, and have

less energy (Sarkisian, Hays, Berry, & Mangione, 2002). These beliefs reinforce the view that ageing is synonymous with poor health and functional impairment. Sneed and Whitbourne (2005) have even referred to this specific ageing belief as the *frailty stereotype*. The current thesis deemed ageing perceptions as probably related to frailty because of this common ageing belief. This presumption was endorsed by the health consequences of ageing perceptions, discussed in the next section.

2.3.3.2. The effects of ageing perceptions on health

Even early research found that perceptions of ageing (i.e., attitudes and stereotypes) were critical to older people's adjustment and survival and contributed to maladaptive behaviour (e.g., unwillingness or inability to seek needed services, health care, or other types of assistance) (R. Bennett & Eckman, 1973). More recent research has found that older adults' ageing perceptions affected cognitive functioning (e.g., Levy, 1996), physiological functioning (e.g., Levy, Hausdorff, Hencke, & Wei, 2000), and behaviour (e.g., Hausdorff, Levy, & Wei, 1999) by simply activating (or priming) stereotypic information about ageing. For example, one study showed that an older adult walked more slowly after exposure to negative stereotype information (Hausdorff et al., 1999). A recent meta-analysis of seven age stereotype priming studies showed that negative ageing stereotypes have consequences for older people's memory, motor skills, and physiological functioning and that they are more influential than positive ageing stereotypes on behaviour (Meisner, 2012). However, most of these experimental studies did not consider differences in individually held ageing perceptions and how their perceptions relate to their personal experiences.

To incorporate how older people's ageing perceptions relate to the individual's evaluations of their experiences, increasing research has correlated self-perceptions of ageing, or attitudes towards one's own ageing, with a variety of behavioural and health outcomes. These studies have found that more negative self-perceptions of ageing were associated with poor health and functioning (e.g., cardiovascular stress response; Levy et al., 2000) and less engagement in healthy behaviours (e.g., Levy & Myers, 2004). These results buttressed the previous findings (R. Bennett & Eckman, 1973) that ageing perceptions are connected to an older person's health and functioning in later life. The conclusions from these studies on self-perceptions of ageing are limited because most of them were conducted cross-sectionally. Consequently, it is difficult to establish causality links (i.e., ageing perceptions causing poor health) from the observed relationships.

Due to the limitations of the designs of the studies, some longitudinal studies have investigated the relationship between self-perceptions of ageing and health. A recent meta-analysis of longitudinal studies examined the influence of subjective ageing (i.e., self-perceptions of ageing and perceived age) on health and survival (Westerhof et al., 2014). Westerhof et al. (2014) found a reliable effect of subjective ageing on health (e.g., physical functioning) and health behaviours (e.g., physical exercise) and a smaller, yet still significant, effect on survival. They concluded that more positive self-perceptions of ageing and younger perceived age predicted better health and greater longevity. This conclusion supported the previous

evidence of the relationship between ageing perceptions and health and suggested that ageing perceptions can influence older people's health.

Such research demonstrated that the physical and biological changes that were assumed to be a natural part of ageing actually can be partially attributed to people's beliefs and perceptions about ageing (e.g., Hausdorff et al., 1999; Levy, 2009; Sargent-Cox, Anstey, & Luszcz, 2012b). These findings provide further support to consider frailty with a biopsychosocial approach (Figure 2.2) and to explicitly investigate the relationship between ageing perceptions and frailty. The next section discusses the proposed mechanisms and pathways through which perceptions of ageing are believed to influence older adults and their health.

2.3.3.3. Theorised mechanisms of the relationship between ageing perceptions and health

There is a wealth of research investigating the possible mechanisms of stereotype effects in general (for reviews, see T. Bennett & Gaines, 2010; Horton, Baker, & Deakin, 2007; Meisner, 2012; Wheeler & Petty, 2001). With regards to ageing stereotypes, the potential processes by which stereotypes influence older people are somewhat different. Unlike other social categories, or groups (such as sex and race), old age is a category that an individual is not born into but becomes a member of over time. The boundaries of the social category of old age are somewhat permeable or deniable unlike race or sex. People are able to negotiate their thinking of their self with views of the social category of old age. Based on this distinction, four hypotheses of how ageing stereotypes are incorporated in

older adults' thinking have been outlined by Bennett and Gaines (2010): (1) stereotype threat, (2) comparison, (3) externalisation, and (4) internationalisation. These different theorised processes are detailed below as well as any evidence of their association with older adult's health.

Stereotype threat proposes that the effects of ageing stereotypes occur due to the accessibility and application of ageing stereotypes (ideomotor processes; e.g., Bargh, Chen, & Burrows, 1996; and self-stereotyping; e.g., Levy, 1996). In other words, stereotypes can automatically influence someone because they are widespread and are easily applied to their self. Claude Steele proposed that the negative effects of stereotypes are caused by anxiety and evaluation apprehension (Steele, 1997). This anxiety and apprehension arises when a stereotype is self-relevant (or when the stereotype could be applied or has significance to them), and an individual may sense that they are being judged in terms of that stereotype or confirming it (Steele, Spencer, & Aronson, 2002). To summarise, the stereotype threat hypothesis advocates that when ageing perceptions are salient and applied to the self they can cause anxiety and evaluation apprehension, resulting in negative effects on older people's behaviour. Evidence supporting this hypothesis originated from experimental studies that primed ageing stereotypes and observed their effects on memory recall (e.g., Levy, 1996). Less work has studied the presence of stereotype threat in other health-related outcomes, and no stereotype threat studies have investigated frailty in older adults.

The comparison (or resilience) hypothesis proposed that older adults reject negative stereotypes as not applicable to themselves, but they may apply them to other older people. This hypothesis is based on *social comparison theory* (Festinger, 1954). According to this theory, the comparisons people make with others about opinions, characteristics, and abilities can influence their cognition, emotions, and behaviours. By comparing one's self to someone who is worse off in some way (e.g., slower walking or in need of a carer), people create a reference point to evaluate their own situation making it not seem as bad (Buunk, Oldersma, & de Dreu, 2001). These *downward comparisons* can make people less dissatisfied with their circumstances, can enhance their self-image, and can help them better regulate emotions (Buunk et al., 2001; Wills, 1981). The comparison hypothesis suggests that older people apply stereotypic views of ageing to others and they evaluate themselves by making comparisons with them. Unlike the other hypotheses, the comparison hypothesis suggests that older people do not directly apply ageing stereotypes to themselves. Instead, older people employ negative ageing perceptions to others in order to improve their own health and wellbeing.

A few studies have found that social comparison can be used to improve the wellbeing of frail older people (Frieswijk, Buunk, Steverink, & Slaets, 2007; Frieswijk, Buunk, Steverink, & Slaets, 2004a, 2004b). However, these studies have important limitations relevant to this thesis. Notably, the studies examined social comparison in the context of different levels of frailty and did not consider that frailty is a dynamic condition (Section 2.2). Additionally, the researchers did not take into account how frailty develops

and progresses because of engaging in social comparison. Put simply, they did not explore how an older person's frailty can improve or worsen as a result of employing social comparison. Therefore, this thesis considered that social comparisons may be a possible mechanism in the relationship between ageing perceptions and the development or progression of frailty in older adults (Chapter 6).

Alternatively, the externalisation hypothesis refers to the expectations about getting older and how they are related to an individual's ageing stereotypes or personal experiences (e.g., health changes). According to this hypothesis, older people perceive their problems to be 'normal' or acceptable due to their age (Rothermund & Brandtstädter, 2003). For example, older people may accept a functional limitation as normal based on their stereotypic views of ageing, which assert that ageing is a time of poor health. This hypothesis also suggests that individually held ageing perceptions can be influenced by an older person's self-views and their experiences. The externalisation hypothesis purports that ageing perceptions and health experiences are interrelated and covary whereas the other hypotheses propose that ageing stereotypes affect the individual's response to health changes and self-view. Supporting this hypothesis, there is some evidence that ageing perceptions and health are interrelated (see Section 2.3.3.2) and some studies have found that older adults' declining health predicted negative self-perceptions of ageing (e.g., Sargent-Cox, Anstey, & Luszcz, 2012a). No study has investigated externalisation as a possible mechanism in the relationship between ageing perceptions and frailty.

Lastly, the internalisation (or contamination) hypothesis suggests that ageing stereotypes promote a *self-fulfilling prophecy* (Jussim, Palumbo, Chatman, Madon, & Smith, 2000; Merton, 1948). That is, positive and negative beliefs can evoke processes (such as, behaviours or cognitions) which make those beliefs come true (Jussim et al., 2000). According to this hypothesis, ageing stereotypes become internalised since the person was young and affect the how they react and respond when they are older. The stereotype embodiment theory proposed by Levy (2003, 2009) is one of the strongest proponents of internalised stereotyping. According to Levy's stereotype embodiment theory (2009), self-perceptions of ageing indicate the extent to which older people have imposed age stereotypes on themselves and internalise the associated beliefs (e.g., to be old is to be ill). Several studies have found a relationship between self-perceptions of ageing and health outcomes (see Section 2.3.3.2), but, yet again, there is no evidence that this process is present for frailty in older adults.

2.3.3.4. Ageing perceptions and frailty: A heuristic model

Drawing on the past research on ageing perceptions and the current gaps in knowledge described in the previous sections, a heuristic model of relationship between ageing perceptions and frailty was developed (see Figure 2.3 below). This model demonstrates the theorised relationship between older adults' ageing perceptions and frailty, and it incorporates the potential mechanisms of action underpinning it (Section 2.3.3.3). In this model, the concept of ageing perceptions is an overarching term referring to the different subjective perceptions of age, e.g., attitudes, stereotypes, expectations, and self-perceptions of ageing (Section 2.3.3.1), and is

represented in the box on the left. The box on the right represents frailty and includes those older adults who are at the greatest risk of adverse health outcomes (e.g., injurious falls, hospitalisation, and death).

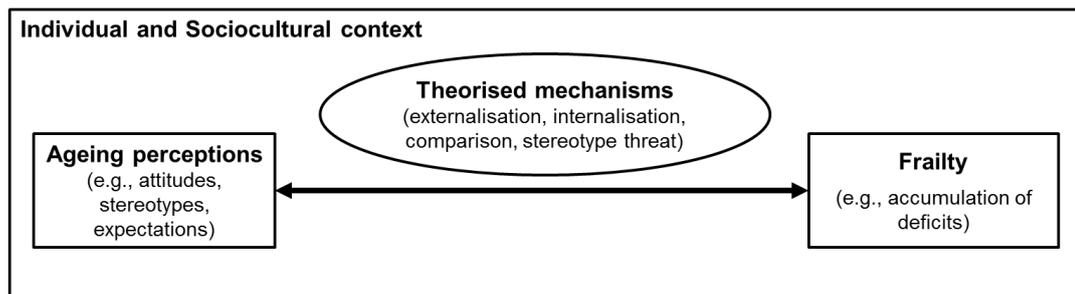


Figure 2.3. Heuristic model of the theorised relationship and pathways between ageing perceptions and frailty

The potential relationship between ageing perceptions and frailty is indicated as a bidirectional arrow in the model (Figure 2.3). This arrow is bidirectional because of the different mechanisms and pathways theorised to explain the relationship between ageing perceptions and health, which are specified in the oval above the arrow. According to some of these theories (e.g., internalisation hypothesis), the relationship between ageing perceptions and health can be unidirectional, and therefore, an older person's perceptions of aging could engender the development of frailty. Conversely, other theories suggest that ageing perceptions and frailty covary or are interrelated (e.g., externalisation hypothesis).

In this heuristic model, the relationship is placed within a larger box which refers to the individual and sociocultural context where it occurs. This box illustrates that the proposed relationship is influenced by context (e.g., cultural views of ageing or an individual's living situation). Personal and social contextual factors may determine whether this relationship and certain theorised mechanisms were present. This model was the focus of the current thesis.

2.4. Chapter summary

Older adults considered frail are particularly vulnerable negative outcomes including hospitalisation, institutionalisation, injurious falls, and death (Strandberg et al., 2011). With the prevalence of frailty expected to increase, interventions targeting frailty are needed. However, there are differing biomedical and social conceptualisations of frailty and no standard conceptual model. Current models lack an understanding of how frailty is dynamic, and little is known about how it develops and progresses. In particular, the trajectory of frailty can be unique to an individual depending on their specific needs, circumstances, or environment. Therefore, research is needed to examine how social, psychological, and behavioural factors contribute to the development and progression of frailty. For this reason, a biopsychosocial (BPS) model of frailty was proposed in order to advance the understanding of frailty in older adults (see Figure 2.2).

The biopsychosocial approach asserts that biological, psychological and social (or environmental) factors all play an important role in health and disease (Engel, 1977). Although there are several known physical, social,

and psychological correlates and consequences of frailty, far less research has studied the social and psychological factors. Current models of frailty (e.g., phenotypic frailty) overlook these domains and their interplay when investigating frailty. Since little is known about these social and psychological factors, it is not clear how they interact with or influence the development and progression of frailty. For this reason, the current thesis concentrated on the psychosocial aspects of frailty.

Common ageing beliefs and perceptions assume that frailty is a feature of old age (Hummert, 2011; Sarkisian, Hays, & Mangione, 2002), and there is evidence supporting that the way older adults perceive ageing can affect their health, wellbeing and survival (R. Bennett & Eckman, 1973; Westerhof et al., 2014). However, older people's perceptions of aging have not been studied in relation to frailty so this relationship was the particular focus of the PhD. Drawing from previous research, a heuristic model of the relationship between ageing perceptions and frailty and its theorised mechanisms was developed to guide the empirical work (see Figure 2.3).

Using this heuristic model as a guide, the empirical research of the current thesis explored the relationship between older adults' ageing perceptions and frailty. Three pieces of work (Chapter 4, 5 and 6) tested and evaluated this heuristic model. The findings of this work contributed to a better understanding frailty in older adults and its relationship with ageing perceptions.

The next chapter (Chapter 3) describes the empirical work conducted and how the different pieces of work relate to each other. It presents the research strategy and details the different methodologies that were used to study the heuristic model of the relationship between ageing perceptions and frailty.

Chapter 3: Overview of empirical work

3.1. Chapter overview

Three pieces of work were conducted to advance the understanding of frailty in older adults and its relationship with ageing perceptions. The current chapter details the research strategy and outlines each study's contribution to the overall aim of the PhD. Included in the chapter is a discussion of the different methodologies used to address the thesis research questions. This chapter begins by introducing the research strategy, and then the empirical methods applied. Each section gives an overview of the method and details the different aims that each piece of work addresses. The chapter concludes by describing the structure of the thesis.

3.2. Research strategy

The current thesis adopted a mixed method approach, combining theory-driven and theory developing work, to gain a better understanding of frailty and its relationship with ageing perceptions. When combined, these methods allowed for different research questions to be answered and the development of a theoretical framework (Yardley & Bishop, 2008).

Therefore, this approach allowed for understanding and corroboration that is both broad and in-depth.

In this thesis, quantitative methods were used to test the theorised relationship between the ageing perceptions with health (Chapter 4) and

frailty (Chapter 5) while qualitative methods provided rich data, allowing for elaboration and contextualisation of the relationship between ageing perceptions and frailty (Chapter 6). Figure 3.1 below illustrates the proposed relationship between ageing perceptions and frailty. This heuristic model was informed by previous research on ageing perceptions and health (Chapter 2) and guided the empirical work conducted in this PhD. The model has been subsequently revised, taking into account the findings from each piece of work to develop a corroborated theory of the relationship between ageing perceptions and frailty.

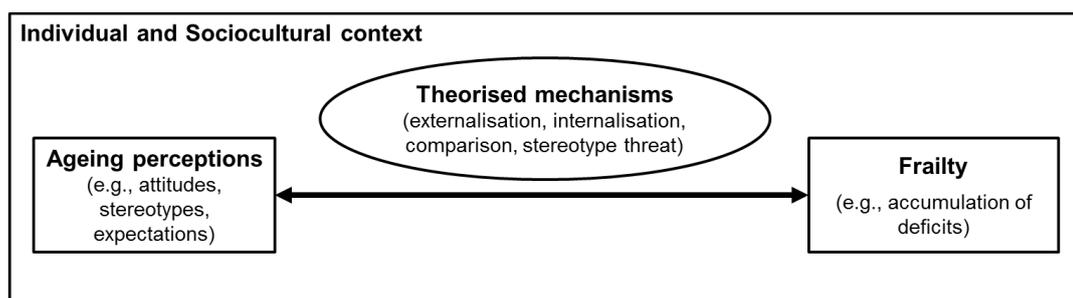


Figure 3.1. Heuristic model of the relationship between ageing perceptions and frailty

Three different research methodologies were employed to address the thesis' overall aim of advancing the understanding of frailty in older adults and its relationship with ageing perceptions. These three studies were: (1) a systematic review of observational research; (2) a secondary analysis of a large longitudinal dataset; and (3) a qualitative study interviewing older

adults. By using these different methods, the relationship between ageing perceptions and frailty was investigated using past research, a large sample of longitudinal data, and older people's own words and expressed beliefs. These studies were therefore complementary and collectively contributed to a better understanding of frailty and its relationship with ageing perceptions. Sections 3.2.1, 3.2.2, and 3.2.4 explain and discuss each piece of work's aims and objectives in relation to this model and the overall thesis goal.

3.2.1. Systematic review (Chapter 4)

A *systematic review* is a literature review that addresses a specific research question; it attempts to identify, select, appraise, and synthesise the research relevant to that question (Higgins & Green, 2011; Petticrew & Roberts, 2006). Unlike traditional literature reviews, systematic reviews use explicit methods to reduce selection bias (i.e., including studies which the researcher is familiar with or which supports their perspective) and allow for replication of the methods to produce reliable findings. The methods are detailed in advance and include: predefined inclusion and exclusion criteria; screening and selection protocols; data extraction procedures; multiple independent reviewers; quality assessment using validated tools; and appropriate synthesis of the data collected (Higgins & Green, 2011).

Systematic reviews have several advantages over traditional narrative literature reviews. The main advantage of this methodology is that it allows for a clear comprehensive representation of the literature rather than a small sample of studies which support a particular viewpoint (Petticrew &

Roberts, 2006). Indeed, it is important to synthesise past research in order to support theories or to test hypotheses and to identify any patterns in the data that have not been noted formerly (Bishop, 2014). Additionally, a systematic review can illustrate the lack of research in an area or the need for high quality evidence regarding a particular topic (Higgins & Green, 2011). Thus, systematic reviews are helpful in establishing evidence of a particular phenomenon or effect and detail the current state of the available research. For these compelling reasons, a systematic review was conducted to study the observed relationship between older adult's perceptions of ageing and their health and functioning.

The broad aim of the systematic review was to investigate the relationship between older adults' ageing perceptions and their health and functioning. This research sought to address the following questions: (1) whether this relationship exists and (2) whether the relationship was present for various health outcomes and conditions. Since frailty is latent and involves multiple bodily systems (as described in Chapter 2, Section 2.2), this review determined that ageing perceptions not only impacted on one domain (e.g., cognitive performance) but several health-related domains. Specifically, the review found that older people with more negative ageing perceptions were more likely to have poor health and functioning. Some of these health and functioning domains were associated with or denoted frailty. By determining that older adults' ageing perceptions relate to their health and functioning, the systematic review enabled the formation of a specific hypothesis to test in the subsequent study: a secondary analysis of longitudinal data.

3.2.2. Secondary data analysis (Chapter 5)

Secondary data refers to data which are not collected by the primary investigator or person performing the analyses. Instead, these data are collected by another individual or research group to answer a different research question or to create databases for others' use. *Secondary analysis* is the analysis of data already collected in a previous study or by a different researcher to address a new research question (Payne & Payne, 2004). Within health and social research, secondary analysis use is increasing due to the availability of data (Payne & Payne, 2004). For example, the World Health Organisation (WHO) and the Organisation for Economic Co-operation and Development (OECD) produce statistics relating to health and social conditions annually which are easily accessible. Many major studies now copy their data to a central archive after performing their analyses, making datasets available to numerous other researchers for their investigations (Payne & Payne, 2004).

There are several advantages to analysing secondary data. One advantage is that it allows prospective analyses often over many years, which wouldn't otherwise be possible (particularly within the constraints of a PhD).

Secondary data analysis is also efficient because it saves time that would otherwise be spent collecting data. It also makes available larger samples that would be unfeasible for any individual researcher to collect on their own. Furthermore, the work needed prior to analysing the data (e.g., item selection, recruitment, and assessment of the measures) has already been performed and hence does not need to be conducted prior to the main

analyses. A secondary analysis was conducted as the second piece of work on account of these advantages.

The systematic review found that a relationship between older adults' ageing perceptions and health existed, and it established that older adults' negative ageing perceptions was related to poor health and functioning. The systematic review however did not find evidence of a direct link between older adults' ageing perceptions and frailty. Therefore, the primary purpose of the secondary analysis was to test whether older adults' ageing perceptions and frailty were associated. The findings from the systematic review provided a testable hypothesis for the study; that is, older adults with more negative ageing perceptions would be more likely to have greater frailty.

The data used for the secondary analysis was from the English Longitudinal Study of Ageing (ELSA). This large dataset was originally created to investigate older English people's health so the participants' frailty could be calculated using items on a Frailty Index easily (Searle, Mitnitski, Gahbauer, Gill, & Rockwood, 2008; Chapter 2). This particular dataset was recently used to test the relationship between frailty and psychological wellbeing (Gale, Cooper, Deary, & Aihie Sayer, 2014; Hubbard, Goodwin, Llewellyn, Warmoth, & Lang, 2014) and, thus, was considered appropriate to investigate the relationship between older adults' ageing perceptions and frailty.

Furthermore, data from the English Longitudinal Study of Ageing was analysed because it had collected health information on older adults over

the course of several years. Due to the availability of longitudinal data, the second aim of this secondary analysis was to investigate whether older adults' negative perceptions of ageing predicted the development and progression of frailty, as some previous research suggests (e.g., stereotype embodiment theory; Levy, 2003; see Chapter 2). The study tested the hypothesis that older adults' who had negative ageing perceptions were more likely to have greater frailty years later.

Findings from the secondary analysis showed that older adults who viewed ageing more negatively were more likely to be frail and become more frail six years later. These results confirmed that a relationship between ageing perceptions and frailty exists and extended the findings from the systematic review study. However, it was clear that simply having negative perceptions of ageing did not inevitably lead to frailty in the future for all older adults. Such a finding suggests that there are important mechanisms or moderators of the relationship between ageing perceptions and frailty, which were not acknowledged or considered in the study and heuristic model (Figure 3.1). The underlying mechanisms and influential variables in the relationship between older adults' ageing perceptions and frailty were examined using qualitative methods in the final study.

3.2.3. Qualitative study (Chapter 6)

The final piece of empirical work was a qualitative study, and this explored older adults' perspectives on frailty. By using qualitative methods, explanations can be developed using an inductive or "bottom-up" approach

(Creswell, 1998). The aim of most qualitative studies is descriptive in the sense that they explore some aspect of human experience in-depth rather than proving or disproving a hypothesis based on previous research or theory. Interviewing and other qualitative techniques give insight into the processes that occur in people's daily lives and can shed light on aspects which previous theory-driven evidence has possibly overlooked or not considered (Yardley & Bishop, 2008). Qualitative research integrated with quantitative methods can be used to provide in-depth knowledge of context, provide an understanding from the people of interest, maximise external validity, and reveal alternative explanations for findings (Yardley & Bishop, 2008).

Depending on the qualitative approach taken, qualitative research can be used to examine social practices and processes, identify barriers and facilitators to change, discover the cause of interventions' success or failures, and investigate meanings or understandings (Starks & Trinidad, 2007). Compared to other qualitative approaches, Grounded Theory (Glaser & Strauss, 1967; Strauss & Corbin, 1998) investigates the social processes, actions, and interactions to identify patterns and relationships in the data so explanatory models are developed from the views of the participants (Creswell, 1998; Starks & Trinidad, 2007). This approach gives prominence to generating concepts that explain behaviour (e.g., identity, experiences, and perceptions) and of describing the context of the research topic (e.g., frailty) without preconceived ideas of what it should mean. The processes of data collection and analysis are also interlinked (Corbin & Strauss 2014); findings from preliminary data analysis guide later

recruitment and interview questions. Data collection and analysis are therefore a continuous cycle throughout the research process (Corbin & Strauss, 2014). Ground Theory is distinct from other qualitative methods because it derives themes and categories from the data and not prior to conducting the study (Glaser & Strauss, 1967; Corbin & Strauss, 2014).

A Grounded Theory approach was chosen for this qualitative study for the following reasons. Firstly, this approach was adopted because the aim of the study was to better understand the underlying mechanisms and influential variables in the relationship between older adults' ageing perceptions and frailty. Secondly, a Grounded theory approach allows for the development an explanatory model of the relationship (Creswell, 1998). Thirdly, this approach is flexible and allows for the changes to be made in order to pursue different opportunities for investigation (e.g., certain populations, novel themes, and altering interview questions) (Corbin & Strauss, 2014). Lastly, this approach was chosen because it has been used in studies of a variety of populations, including frail older adults (Cooney, 2012; Kita & Ito, 2013).

The systematic review observed that negative ageing perceptions were related to poor health and functioning in multiple domains (Chapter 4), signifying a probable relationship between ageing perceptions and frailty. Based on this finding, the relationship between older adults' perceptions of ageing and frailty was tested (secondary analysis in Chapter 5) to verify existence of the relationship proposed in the heuristic model. There was some evidence that older adults' ageing perceptions were associated with

and predicted greater frailty; however, having negative perceptions of ageing did not inevitably lead to frailty for every older adult. This finding did not fully support the theorised mechanisms (e.g., internalisation) of the relationship in the proposed model (Figure 3.1).

Although those two pieces of work found a relationship between older adults' ageing perceptions and their health and frailty, the mechanisms by which ageing perceptions are related to frailty could not be studied.

Therefore, the qualitative study's broad aim was to elaborate and contextualise the relationship between ageing perceptions and frailty so as to identify important factors (moderators) which structure that relationship or carry its effect (mediators). The qualitative study explored: (1) older adults' perceptions of frailty; (2) their beliefs concerning its progression and consequences; (3) and the role of ageing perceptions in the context of frailty.

The qualitative study recognised the presence of many of the theorised mechanisms of the relationship between ageing perceptions and frailty in the heuristic model (Figure 3.1). However, the investigation also found that identification played a role in the relationship between ageing perceptions and frailty. Furthermore, the study revealed the different strategies used by older people to resist identifying as frail. Identification and the use of resistance strategies were used to explain the findings from the previous work. That is, an older adult could have negative ageing perceptions, but he or she does not identify as frail because they use resistance strategies. As a result, frailty and further physical decline does not develop even though the older adult has negative ageing perceptions. The findings from all three

pieces of work were integrated and used to revise the heuristic model of the relationship between ageing perceptions and frailty.

3.3. Structure of the thesis

Collectively, these three studies advanced the understanding of frailty in older adults and its relationship with perceptions of ageing. Building on previous research and theory (Chapter 2), a heuristic model of the relationship between older adults' ageing perceptions and frailty was developed (Figure 3.1). A mixed method approach was employed in order to test and construct a more comprehensive view of the psychosocial factors and processes related to frailty. The empirical Chapters 4, 5 and 6 have been organised to investigate the proposed model and complement each other. In Chapter 7, the findings from all three pieces of work are integrated further and discussed in greater detail with their possible implications for future work, theory, and practice.

The three studies are complementary and contribute to the overall thesis goal but are also stand-alone. Accordingly, each one has been written as a manuscript and submitted to a peer-reviewed academic journal. The manuscript of the qualitative study has been accepted for publication (in *Ageing & Society*), and the other two manuscripts are under review. The studies are presented in the format that was requested by the respective journal with the exception of the addition of chapter numbers and references to appendices. In each chapter, additional background literature is presented to supplement the manuscript prepared for publication, and

conclusions from the study are included to link the findings to the wider context of the thesis.

Chapter 4: A systematic review of the relationship between older adults' perceptions of ageing and their health and functioning

4.1. Chapter overview

This chapter presents the first piece of thesis work employed to advance the understanding of frailty in older adults and its relationship with ageing perceptions. Specifically, a systematic review examined the evidence of the relationship between older adults' age-related perceptions and their health.

4.2. Background to the current research

The current research was the starting point for understanding the psychosocial factors and processes related to frailty. How older adults perceive ageing must be considered in order to understand how ageing perceptions relate to frailty. Previous research (Brewer et al., 1981; Gilleard & Higgs, 2010; Hummert, 1990) provides evidence that there are multiple views and stereotypes associated with older people, as discussed in Chapter 2. Nevertheless, one of the most widespread and negative stereotypic beliefs is that older people are mentally or physically impaired and dependent (Brewer et al., 1981; Hummert, 1990, 2011), and ill-health, functional limitations, and mobility difficulties are commonly attributed to old age (Hummert, 1990; Stewart et al., 2011). Sneed and Whitbourne (2005) referred to this specific ageing belief as the *frailty stereotype*.

This frailty stereotype assumes that 'to be old is to be ill' (Stewart et al., 2011) and that the ageing process is inherently disabling (Stone, 2013).

Therefore, frailty is believed to be an expected part of getting older. Older adults use these beliefs to make sense of, and place into context, their own experiences of health, disability, and ageing (Levy, 2009; Stone, 2013; Westerhof & Tulle, 2007). For example, many older adults expect to have more aches and pains, to become depressed as they age, to become more dependent on others, to have reduced ability to have sexual intercourse, and to have less energy (Sarkisian, Hays, & Mangione, 2002). Furthermore, older people may not consider themselves ageing, or as 'old', unless they are experiencing physical or functional impairment (Stone, 2013). The concepts of ageing and frailty are intertwined in the minds of older people (Hummert, 1990, 2011; Stewart et al., 2011; see Chapter 2). For these reasons, the present study investigated the older adults' ageing perceptions (attitudes, expectations, and stereotypes) in order to gain insight into how they may relate to and possibly influence frailty.

Another reason that ageing perceptions were the focus of this study was because older people's beliefs and expectations about getting older may determine how they cope with any health changes they experience (Wurm, Warner, Ziegelmann, Wolff, & Schüz, 2013) or preventative measures that they take (Kim, 2009; Stewart et al., 2011). If an individual believes frailty is an inevitable or uncontrollable outcome of old age, he or she may not seek treatment or engage in activities to prevent it (e.g., physical activity). Early research on social groups (e.g., categories based on race and gender) proposed that a *self-fulfilling prophecy* can occur when beliefs held about the group can lead to its own fulfilment by group members (Merton, 1948). In other words, positive and negative beliefs can evoke processes (such as,

behaviours or cognitions), which make those beliefs come true (Jussim et al., 2000). There is evidence for a possible self-fulfilling prophecy in older adults from psychological research in which the activation of certain ageing stereotypes elicit cognitive and behavioural changes that match those stereotypes (see Levy, 2003). These past, largely experimental, studies are the basis for the internalisation hypothesis and Levy's stereotype embodiment theory (2009), discussed in Chapter 2.

Conversely, it has been suggested that older adults do not automatically internalise these beliefs and apply them to their selves when they age (Zebrowitz, 2003). Zebrowitz (2003) argues that older people are able to resist internalising the negative stereotypes of ageing because they often do not identify with the social category of 'old'. In other words, simply being older does not mean that individuals automatically apply these stereotypes to themselves. Zebrowitz (2003) proposed that older people use individuating information about themselves (e.g., self-differentiation, Weiss, Sassenberg, & Freund, 2013) and compensatory behaviours (e.g., self-verification; Swann & Ely, 1984) to resist the self-fulfilling prophecy. The possibility of older people resisting these negative stereotypes was overlooked in experimental studies (e.g., Levy, 1996). The present study tested whether a relationship between ageing perceptions and health in older adults existed, using evidence from observational studies.

A systematic review was conducted to investigate whether the relationship between older adults' ageing perceptions and their health and functioning existed. A systematic review was chosen for this study because, unlike

traditional literature reviews, they use explicit methods to reduce including only studies which the researcher are familiar with or support their perspective or theory. Systematic reviews address a specific research question and attempts to identify, select, appraise, and synthesise the research relevant to that question (Higgins & Green, 2011; Petticrew & Roberts, 2006). A systematic review therefore provided a comprehensive account of the research on the relationship between older adults' ageing perceptions and health, regardless of theory.

4.2.1. Aims of current research

The general aim of the piece of work was to examine the relationship between older adults' perceptions of ageing and their health and functioning. The study sought to determine (1) whether a relationship between ageing perceptions and health exists and (2) whether the relationship was present for various health outcomes and conditions. This study systematically reviewed the observational research on the relationship between ageing perceptions and health-related variables for the purpose of substantiating the proposed relationship between ageing perceptions and frailty (Figure 2.3 in Chapter 2).

A relationship between ageing perceptions and health needed to be verified in order to support the theorised relationship between ageing perceptions and frailty, see Figure 4.1 below. Additionally, by determining that a relationship existed between older adults' ageing perceptions and their health and functioning, the relationship between ageing perceptions and frailty could be tested in the subsequent piece of work (Chapter 5).

Moreover, the findings of the systematic review would enable the formation of a specific hypothesis about this relationship: older adults who perceive aging more negatively are more likely to have poor health and therefore greater frailty. The hypothesis formed from the review would be tested in subsequent study (Chapter 5).



Figure 4.1. Model of the relationship between older adults' ageing perceptions and frailty investigated in systematic review

It is also important to establish whether ageing perceptions not only impact on one behaviour (e.g., walking speed or memory recall) but are related to a variety of health outcomes and conditions. Evidence that ageing perceptions are associated with various health-related domains would provide further support for the proposed relationship between ageing perceptions and frailty (Figure 4.1). Identifying the scope of the age perception-health relationship has implications for frailty because it involves multiple bodily systems and presents in heterogeneous ways (Clegg et al., 2013; Rockwood et al., 2000). The findings contributed to the model of frailty and its relationship with older adults' ageing perceptions (Figure 2.3 in Chapter 2).

4.3. Older Adults' Perceptions of Ageing and their Health and Functioning: A Systematic Review of Observational Studies¹

4.3.1. Abstract

Objective: Many older people perceive ageing negatively, describing it in terms of poor or declining health and functioning. These perceptions may be related to older adults' health. The aim of this review was to synthesise existing research on the relationship between older adults' perceptions of ageing and their health and functioning.

Methods and Procedure: A systematic search was conducted of five electronic databases (ASSIA, CINAHL, IBSS, MEDLINE, PsycINFO). Citations within identified reports were also searched. Observational studies were included if they included perceptions of ageing and health-related measures involving participants aged 60 years and older. Study selection, data extraction, and quality appraisal were conducted using predefined criteria.

Results: Twenty-eight reports met the criteria for inclusion. Older adults' perceptions of ageing were assessed with a variety of measures. Perceptions were related to health and functioning across seven health domains: memory and cognitive performance, physical and physiological performance, medical conditions and outcomes, disability, care-seeking, self-rated health, quality of life, and death.

¹ Warmoth, K., Tarrant, M., Abraham, and Lang, I. (under review). Older adults' perceptions of ageing and their health and functioning: a systematic review of observational studies. *Psychology, Health & Medicine*

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Conclusions: How ageing is perceived by older adults is related to their health and functioning in multiple domains. However, higher quality and longitudinal studies are needed to further investigate this relationship.

4.3.2. Introduction

People's perceptions about ageing are often negative and frequently relate to poor or declining health and functioning. Ill-health, functional limitations, and mobility difficulties are commonly attributed to old age (Hummert, 1990). Many older adults expect to become depressed as they age, to become more dependent on others, to have more aches and pains, to have reduced ability to have sexual intercourse, and to have less energy (Sarkisian, Hays, & Mangione, 2002). There is evidence that older adults use these beliefs to make sense of, and place into context, their own experiences of health, disability, and ageing (Levy, 2009; Stone, 2013; Westerhof & Tulle, 2007). The present review synthesised the research on the relationship between older adults' perceptions of ageing and their health and functioning.

Little is known about the range of health domains in which age-related perceptions may influence: as shown below, perceptions of ageing are related to poorer cognitive performance (i.e., memory) but it is not known for example whether they also relate to physical activity and quality of life. Knowing the extent of the age perception-health relationship may have implications for the design of interventions aimed at promoting better health in older people, guiding the health focus of these. Indeed, recent research has shown that older adults' ageing perceptions are modifiable and that such modifications have the potential to improve older adults' health (e.g., by encouraging physical activity: Wolff, Warner, Ziegelmann, & Wurm, 2014). However, whether such effects generalise to other health domains is

unclear. The current review started to address this question by exploring the breadth of possible health domains in which age perceptions are related.

The review also sought to take account of differing perspectives on how ageing perceptions are associated with health. Levy (2003, 2009) argued for a causal link between ageing perceptions and health outcomes whereby age stereotypes affect how individuals respond to experiences. This process is reflected in stereotype embodiment theory (Levy, 2009) and is supported by experimental studies on stereotype activation that highlight the behavioural consequences of framing ageing stereotypes in particular ways (see Horton, Baker, Pearce, & Deakin, 2008; Meisner, 2012).

Alternative conceptual models, such as the externalisation hypothesis (Rothermund & Brandtstadter, 2003), advocate that individually-held ageing perceptions are influenced by the elderly person's personal experiences, expectations and self-view. This model suggests that ageing perceptions and health experiences are interrelated and covary: health experiences may be both a determinant and outcome of an older individual's ageing perceptions. Supporting this model, some studies have found that older adults' declining health predicts negative self-perceptions of ageing (e.g., Sargent-Cox, Anstey, & Luszcz, 2012a). Findings like these suggest that there could be multiple pathways by which ageing perceptions relate to health.

The current review deliberately focused on observational research that has examined the relationship between ageing perceptions and health in older adults. While previous reviews have synthesised findings from

experimental research on stereotype activation (e.g., Meisner, 2012), to our knowledge, no systematic reviews have been conducted examining the evidence from observational research. Observational studies capture the natural variation in older adults' ageing perceptions and their wide range of health experiences. By contrast, experimental studies, in which age-related perceptions and stereotypes are systematically controlled by researchers, cannot account for the possibility that older adults could actively resist internalising negative stereotypes or not find them to be self-relevant. Moreover, observational studies can explore actual health changes (e.g., disease or functional impairment) more easily than in a laboratory setting.

The overall aim of this systematic review was to synthesise the existing observational research on the relationship between older adults' ageing perceptions and their health and functioning across a variety of domains. The following two research questions were addressed: (1) what is the relationship between older adults' ageing perceptions and their health and functioning? (2) to which domains of health does this relationship pertain?

4.3.3. Methods

Searching and Identification

Electronic database searches were undertaken along with backwards and forwards citation searches of selected studies. Searches were conducted in March 2014. Endnote X7 reference management software was used to manage information about reports and to aid in their initial screening.

Electronic database searches

The full list of the search terms is shown in Appendix A. The first set of terms includes words related to the population of older adults. The second set relates to perceptions of ageing. The third set includes terms related to aspects of health and functioning. These terms were searched within the titles and abstracts of reports using the electronic databases of CINAHL, MEDLINE, PsycINFO, IBSS, and ASSIA from databases inception. Subject heading terms were used together to identify additional reports that the original database search missed and included subject headings relating to ageing or aged, and attitudes or stereotyping. Searches of related subjects and thesaurus terms were also conducted.

Inclusion and Exclusion criteria

Study participants. After scoping searches showed variability in participants' age in most studies, we chose 60 years of age as a starting point for inclusion because we were interested in older adults' perceptions of ageing. Longitudinal studies were included if the participants were at least 60 years of age at baseline or initial recruitment. Studies were not included if the participants were younger than 60 years (e.g., participants aged 50-65 years).

Ageing perceptions. Studies were included if they measured older adults' attitudes towards ageing, old age stereotypic beliefs, and self-perceptions of ageing.

Health and functioning measures. Included studies had a health status, illness (e.g., presence of illness or comorbidity), or functioning measure (assistance with daily life and physical or cognitive functioning). Both observed (e.g., measured performance on a task) and self-reported measures (e.g., self-rated health) were included.

Exclusion criteria. Studies were excluded if they were:

- Non-human studies
- Not in English
- Qualitative studies
- Randomised controlled trials or other intervention designs
- Studies that did not measure perceptions specifically about ageing (e.g., attitudes towards specific health conditions, physical activity, or life)

Selection and Screening

Figure 4.2 presents a flow diagram of the selection process. The inclusion and exclusion criteria were applied successively to the title, abstract and full text. The first reviewer assessed the titles and abstracts of records retrieved from the search, and a second reviewer independently checked a random sample of 10% of these for inclusion. Both reviewers independently screened the full reports for inclusion in the final analysis. There was 80 percent agreement among the reviewers; disagreements were resolved through discussion.

Data extraction

Data extraction, including authorship, publication year, title, journal, sample details, and summaries of the studies, was performed by the first reviewer.

Quality appraisal

Critical Appraisal Skills Programme (CASP; Public Health Resource Unit, 2006) checklists were used for each different study design in order to assess the methodological quality, presence of bias, degree of uncertainty in the results, and relevance of the findings. The copies of the checklists used to assess the quality of case control and cohort studies in the review can be found in Appendix E and F, respectively. The first reviewer used the checklist to record whether each item (e.g., study aims, recruitment, and findings) had been reported adequately and were appropriate (i.e., present, not present or unclear). Based on these assessments, the first reviewer grouped the studies into high, moderate, or poor quality. A second reviewer used the same checklists and criteria, and they independently categorised the studies by quality (high, moderate, or poor). Upon comparison, there was no disagreement among the researchers on the studies' quality classifications.

Analysis

Due to the heterogeneity of the studies collected, in terms of study design, direction of associations in the data, measures used and data collected, a narrative rather than meta-analytic approach to reviewing the

included studies was adopted. Narrative synthesis adopts a textual approach to the process of synthesising findings (Popay et al., 2006). Using this approach, we were able to explore the relationship between perceptions of ageing and health based on data from a range of measures and designs.

For each study, a short summary of the aims, design, variables, and the results was prepared. Studies were then grouped together according to different study designs, health domains, and measures using a common rubric. These methods allowed for methodological and contextual information to be collected and organised. Further analysis to aggregate the studies meaningfully involved ideas webbing (Clinkenbeard, 1991) and concept mapping (Mulrow, Langhorne, & Grimshaw, 1998).

4.3.4. Results

The searches retrieved 8,006 hits, of which 2,196 duplicates were removed. After screening titles and abstracts, 72 reports were full text screened (see Figure 4.2). Twenty-eight reports were included in this review; two reports were unpublished dissertation theses. Appendix B provides the references for the studies included in the review.

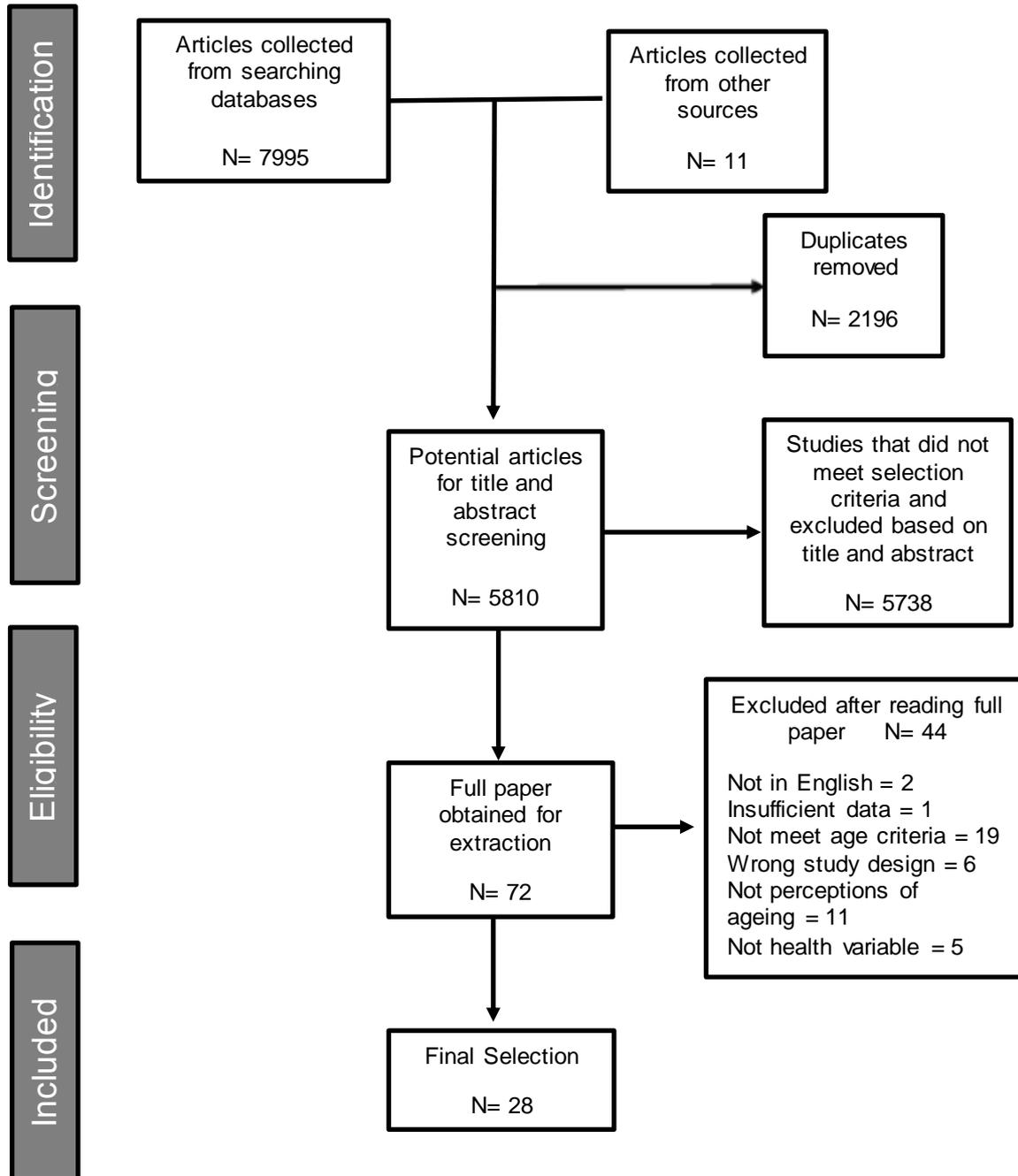


Figure 4.2. Search & study selection PRISMA flow diagram

Study characteristics

Twenty-eight reports with participants from 26 independent datasets were included, with two reports using the same dataset. Three studies used data from the Australian Longitudinal Study of Ageing (ALSA)²⁰⁻²². One report²⁷ included both a case control and cross-sectional study which excluded the controls in the cross-sectional analysis. Most studies were conducted in the United States^{1, 3, 5, 8-12, 15, 19, 23, 24}, but there were also studies from Australia²⁰⁻²², United Kingdom^{27, 28}, Korea^{4, 6}, Germany^{7, 16}, China^{9, 13}, Spain^{14, 18}, Canada²⁵, Switzerland¹⁷, Czech Republic², Turkey²⁶, and Japan⁸. One study compared the relationship between older adults' perceptions of ageing and their health across two cultural contexts (United States & Japan)⁸. One study included only female participants¹ and one only males¹⁵. Four studies involved participants in assisted living^{2, 3, 26} or hospitalised settings¹⁵. Table 1 details each study's characteristics.

Table 4.1.

Study details

Study	Participant details	Study aim/purpose	Perceptions of ageing measure	Health/functioning measure
¹ Freelove, J. (2009)	459 older adults from USA, aged 65-100 (M=78.1) 72.3% women	Examine whether older adults' ageing expectations are related to participation in behaviours associated with healthy aging	Expectations regarding ageing (ERA-38)	Physical activity survey for the elderly (PASE), comorbidities, Health-related quality of life
² Janecková, H., Dragomirecká, E., Holmerová, I., & Vanková, H. (2013)	364 Czech residents of care homes (M _{age} =82) 84% women	Explore the attitudes of older people living in institutions and their caregivers to ageing in Czech Republic	Attitudes to ageing questionnaire (AAQ)	Self-perceived health, Activity (ADL), Quality of life (WHOQOL-BREF)
³ Jang, Y., Bergman, E., Schonfeld, L., & Molinari, V. (2006)	150 older adults living in assisted living facilities in USA, aged 60 and older (M=82.8) 77% women	Assessed the role of physical health and psychological resources in determining depressive symptoms among older adults in assisted living facilities	Attitudes toward ageing (ATOA)	Chronic conditions, functional disability (ADL, IADL, PPS, FHS), subjective health
⁴ Jang, Y., Poon, L. W., Kim, S.-Y.,	291 community dwelling older adults	Explored the determinants of self-	Self-perceptions of aging	Chronic conditions, disability (ADL, IADL,

& Shin, B.-K. (2004)	in Korea, aged 60-90 (M= 69.9) 59.1% women	perceptions of ageing and health	(ATOA)	PPS, FHS), sensory performance, number of sick days, self-perceptions of health (OARS)
⁵ Kim, G., Jang, Y., & Chiriboga, D. A. (2012)	230 Korean American older adults aged 60-92 (M=69.8) 59.1% women	Explore the predictors of personal views of ageing	Attitudes toward own ageing (ATOA)	Chronic conditions, functional disability (PADL, IADL, PPS, FHS) vision and hearing
⁶ Kim, S. H. (2009)	99 Korean older adults aged 61-90 (M=73.78) 81.8% women	Identify the influence of expectation regarding ageing on physical and mental health status, and examine the mediating effects of health-promoting behaviour on the relationship between expectations regarding ageing and physical and mental health	Expectations regarding ageing (ERA-12)	Health-promoting behaviour (HPLP II), physical (PCS-12) and mental (MCS-12) health status
⁷ Kotter-Grühn, D., Kleinspehn-Ammerlah, A., Gerstorf, D., & Smith, J. (2009)	439 older adults in the Berlin Aging Study, aged 70-100 (M= 85.15) 50% women, measured after 4 years	Extend understanding of the relationship between self-perceptions of ageing and mortality by investigating if both level and change in self-perceptions of ageing predict mortality and	Ageing satisfaction (ATOA), subjective age	Mortality

		change with impending death		
⁸ Lewy, B., Ashman, O., & Slade, M. D. (2009)	86 older Americans aged 61-80; 155 older Japanese aged 61-80	Examined whether culture both the tendency to make age attributions and their effect on health	Age attributions (vignettes)	Functional Health Scale
⁹ Lewy, B., & Langer, E. (1994)	15 older adults from American deaf, mainland China, American hearing aged 59-91 (M=70)	Explored whether negative stereotypes about ageing contribute to memory loss in old age in different cultures.	Attitudes toward aging (FAQ, open-ended question)	Memory (combined immediate recall, learned recall, delayed recall, probed recall)
¹⁰ Lewy, B., Slade, M. D., & Gill, T. M. (2006)	546 community dwelling older adults from USA, aged 70-96, (M=77.8) 64.8% women	Examined whether older adults' age stereotypes predict screened hearing over time	Age stereotypes (open-ended question) coded for externality and valence	Screened hearing at baseline and 36 months
¹¹ Lewy, B., Slade, M. D., Kunkel, S. R., & Kasl, S. V. (2002) ¹² STUDY 1	660 older Americans, aged from 50-94 (M=63) 48.8% women, data from the Ohio Longitudinal Study of Ageing and Retirement (OLSAR) over the course of 22	Examine whether self-perceptions of ageing influence longevity and how this process may occur	Self-perceptions of ageing (ATOAs)	Survival

	years			
¹³ Lewy, B. R., Slade, M. D., Murphy, T. E., & Gill, T. M. (2012)	598 older Americans aged 70 and older (M= 79) 63.2% women, drawn from Precipitating Events Project, who had experienced at least 1 month of ADL disability	Tested whether age stereotypes can influence recovery from disability	Age stereotypes (open-ended question and responses were coded for valence)	Recovery (3 ADL improvement) measured every 18 months in 10 years
¹⁴ Li, X., Lv, Q., Li, C., Zhang, H., Li, C., & Jin, J. (2013)	550 Chinese older adults (M _{age} = 66.3) 51.3% women	Examine the level of and factors influencing expectations regarding ageing (ERA) among older Chinese adults, and determine whether leisure activities mediates this relationship between ERA and functional health	Expectations regarding ageing (ERA-12)	Functional health (SF-12); Godin Leisure-time Exercise Questionnaire; physical health condition (IADL)
¹⁵ Louis, E. D., Benito-Leon, J., Bermejo-Pareja, F., & Neurological Disorders in Central Spain Study, G. (2008)	177 older adults Spain with essential tremors (M _{age} = 76.6, 61.0% women) and 531 matched controls (M _{age} = 76.1, 59.7% women) derived from Neurological Disorders in Central	Test if morale is different among older adults with essential tremors	Attitudes toward ageing (ATOA)	Essential tremors (ET)

	Spain study (NEDICES)			
¹⁶ Milligan, W. L., Powell, D. A., Harley, C., & Furchtgott, E. (1984)	3 groups of older male veterans aged 65-85: 40 hospitalised ($M_{age}=72.45$), outpatients ($M_{age}=71.20$), nonpatients ($M_{age}=70.35$) from USA	Study different groups of older men to determine if physical health predicts performance	Semantic differential scale to describe an old man: 3 domains (instrumental/ineffectual, autonomous/dependent, personal acceptability/unacceptability)	Reaction time, serial learning task
¹⁷ Moor, C., Zimprich, D., Schmitt, M., & Kliegel, M. (2006)	362 older Germans aged 60-64 ($M=62.9$) 49.73% women participating in the Interdisciplinary Longitudinal Study on Ageing	Test whether personality predicted subjective health when physician-rated health and depression was controlled	Ageing self-perceptions (ATOA)	Subjective health, physician rated health
¹⁸ Moser, C., Spagnoli, J., & Santos-Eggimann, B. (2011)	1152 older Swiss adults aged 65-70 ($M=69$) 57.4% women from the Lausanne Cohort Lc65+ over 3 years	Evaluate prospectively the relationship between self-perceptions of ageing and vulnerability to adverse outcomes in older adults	Self-perceptions of ageing (ATOA)	Adverse outcomes (1+ falls over the last year, 1+ hospitalizations over the past year, current difficulties in performing ADL)
¹⁹ Palacios, C. S., Torres, M. V. T.,	757 older Spanish adults aged 65 -96	Explored whether there is a relationship between	Negative ageing stereotype assessment questionnaire	Physical activity, frequency of medical

& Mena, M. J. B. (2009)	52.70% women	the level of belief in negative ageing stereotypes in older adults and their results concerning some psychosocial variables	(CENVE)	appointments, subjective health
²⁰ Polverino, A. M. (2010)	242 older Americans age 65-98 M=77.01 71.8% women	Examine the evidence for theoretically predictive effects of identity processing style has on positive ageing; test hypotheses of IPT regarding internalisation of ageist attitudes/self-concept and identity processing styles; explore the potential contributions of internalised ageism and accommodating style in this theoretically predictive process	Attitude toward own ageing (ATOA)	Psychological wellbeing (PWB), health and functioning scale, adherence (MOS)
²¹ Sargent-Cox, K. A., Anstey, K. J., & Luszcz, M. A. (2012a)	1212 older Australians aged over 65 (M= 76.89) 51.8% women from the Australian Longitudinal Study of Ageing over 5 waves	Investigate the directionality of the dynamic relationship between self-perceptions of ageing and physical functioning using dual change score model	Self-perceptions of ageing (ATOA)	Physical performance battery (based from EPESE)

	(up to 16 years)			
²² Sargent-Cox, K. A., Anstey, K. J., & Luszcz, M. A. (2012b)	2087 older Australians aged 65-103 (M= 79.83) 44.4% women from the Australian Longitudinal Study of Ageing over 5 waves (up to 16 years)	Determine how change in health affected change in self-perceptions of ageing and how these relationships may be indirectly affected by psychological resources of expectancy of control and self-esteem	Self-perceptions of ageing (ATOA)	Number of medical conditions (OARS), physical functioning (ADL)
²³ Sargent-Cox, K. A., Anstey, K. J., & Luszcz, M. A. (2013)	1507 older Australians aged 65-103 (M= 79.95) 49.5% women from the Australian Longitudinal Study of Ageing over 5 waves (up to 16 years)	To understand the association between self-perceptions of ageing and mortality in late life	Self-perceptions of ageing (ATOA)	Mortality
²⁴ Sarkisian, C. A., Hays, R. D., & Mangione, C. M. (2002)	429 older adults from USA, aged 65-100 (M=76) 54% women	To measure expectations regarding ageing among older adults; identify characteristics associated with having low expectations regarding ageing; examine whether expectations regarding ageing are associated with healthcare seeking	Expectations regarding ageing (ERA-38)	Beliefs regarding care seeking for age-associated conditions (vignettes)

		beliefs for age-associated conditions.		
²⁵ Sarkisian, C. A., Prohaska, T. R., Wong, M. D., Hirsch, S., & Mangione, C. M. (2005)	636 English- and Spanish- speaking older adults aged 65-100 years ($M_{age}=77.5$) 76.4% women	To examine whether low expectations regarding aging are associated with low physical activity levels among older adults.	Expectations regarding ageing (ERA-38)	Lorig Self-management Behaviour exercise survey
²⁶ Stewart, T. L., Chipperfield, J. G., Perry, R. P., & Weiner, B. (2012)	105 older Canadians aged over 80 derived from the Ageing in Manitoba study (AIM) 2 year follow-up	Examined older adults' beliefs about the causes of chronic illness and tested if attributing the onset of illness to "old age" is associated with negative health outcomes.	Illness attribution to old age	Perceived health symptoms, health maintenance behaviours, mortality
²⁷ Top, M., & Dikmetaş, E. (2012)	120 older Turkish adults living in nursing homes aged 65-90 ($M_{age}=74.02$) 36.66% women	Investigate quality of life (QOL) and attitudes to ageing in Turkish older adults at two nursing homes and to explain relationship between QOL and attitudes to ageing.	Attitudes to ageing questionnaire (AAQ); 3 domains: psychological loss, physical change, psychological growth	WHO Quality of Life Assessment for Older Adults (WHOQOL-OLD)
²⁸ Trigg, R., Watts, S., Jones, R., Tod, A., & Elliman, R.	56 dementia diagnosed older adults aged 60-96 ($M_{age}=78.77$) 46.4%	Explore the attitudes of people with dementia to determine the main factors that predict these	Attitudes to ageing questionnaire (AAQ)	Dementia diagnosis, Quality of life (BASQID)

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(2012)	women	attitudes and any relationship that exists with self-reported QOL.		
	84 without dementia older adults aged 65-95 ($M_{age}=73.04$) 50% women in UK			
²⁹ Witham, M. D., Argo, I. S., Johnston, D. W., Struthers, A. D., & McMurdo, M. E. T. (2006)	82 patients aged over 70 ($M=80.5$) 45% women recruited from a trial of seated exercise training for chronic heart failure over 6 months (measured at 3 and 6 months) in UK	Explore predictors of exercise capacity and daily activity in older heart failure patients.	Attitudes toward own ageing (ATOA)	Exercise capacity (timed walking distance) and daily activity (accelerometer)

Study designs and quality appraisal

The final selection of studies included case-control studies^{14, 27}, cross-sectional studies^{1-6, 8, 9, 13, 15, 16, 18, 19, 23, 24, 26, 27} and cohort studies^{7, 10-12, 17, 20-22, 25, 28}. For the cohort (longitudinal observational) studies, the length of follow-up ranged from three months to multiple waves over the course of 22 years. The quality of reports varied greatly. Sixteen of the 28 reports were judged to be of poor quality using the CASP tools^{1-6, 8-10, 15, 18, 19, 23, 25-27}. Eight reports were judged to be of moderate quality^{12-14, 16, 20, 21, 24, 28} and four were judged to be of high quality^{7, 11, 17, 22}. Study quality varied as a result of: the validation of measures used (e.g., explanation for using a specific measure or testing for validity or reliability); the comprehensiveness in the reporting of the findings (e.g., reporting confidence intervals or conducting sensitivity analysis); strength of the methods used (e.g., how participants were recruited or study design); the size and generalisability of the sample. Table 4.2 details the quality appraisal of the included studies.

Table 4.2.

Quality appraisal of the included studies

Study	Design	Representative sample	Groups Comparable at Baseline	Validated measures (PoA, Health)	Attrition Reported	Appropriate Statistical Analyses	Quality rating
¹ Freelove (2009)	Cross sectional	No	Not reported	Yes, Yes	N/A	Yes	Low
² Janecková et al. (2013)	Cross sectional	No	No	Yes, Yes	N/A	Yes	Low
³ Jang et al. (2006)	Cross sectional	No	Not reported	Yes, Yes	N/A	No	Low
⁴ Jang et al. (2004)	Cross sectional	No	Not reported	Yes, Yes	N/A	Yes	Low
⁵ Kim et al. (2012)	Cross sectional	No	Not reported	Yes, Yes	N/A	Yes	Low
⁶ Kim (2009)	Cross sectional	No	Not reported	Yes, Yes	N/A	Yes	Low
⁷ Kotter-Grühn et al. (2009)	Longitudinal	Yes	Yes	Yes, Yes	Yes	Yes	High
⁸ Levy et al.	Cross	No	Not reported	No, Yes	N/A	Yes	Low

(2009)	sectional							
⁹ Levy & Langer	Cross	No	No	No, No	N/A	No	Low	
(1994)	sectional							
¹⁰ Levy et al.	Longitudinal	No	Not reported	No, Yes	Yes	Yes	Low	
(2006)								
¹¹ Levy et al.	Longitudinal	Yes	Yes	Yes, Yes	Yes	Yes	High	
(2002)								
¹² Levy et al.	Longitudinal	No	Yes	No, Yes	No	Yes	Moderate	
(2012)								
¹³ Li et al. (2013)	Cross	Yes	Not reported	Yes, Yes	N/A	Yes	Moderate	
	sectional							
¹⁴ Louis et al.	Case control	Yes	Yes (matched)	Yes, Yes	N/A	Yes	Moderate	
(2008)								
¹⁵ Milligan et al.	Cross	No	No	No, No	N/A	Yes	Low	
(1984)	sectional							
¹⁶ Moor et al.	Cross	Yes	Not reported	Yes, No	N/A	Yes	Moderate	
(2006)	sectional							
¹⁷ Moser et al.	Longitudinal	Yes	Not reported	Yes, Yes	Yes	Yes	High	
(2011)								
¹⁸ Palacios et al.	Cross	No	Yes	Yes, No	N/A	Yes	Low	
(2009)	sectional							
¹⁹ Polverino	Cross	No	Not reported	Yes, Yes	N/A	Yes	Low	

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(2010)	sectional							
²⁰ Sargent-Cox et al. (2012a)	Longitudinal	Yes	Not reported	Yes, Yes	Yes	Yes	Yes	Moderate
²¹ Sargent-Cox et al. (2012b)	Longitudinal	Yes	Not reported	Yes, Yes	Yes	Yes	Yes	Moderate
²² Sargent-Cox et al. (2013)	Longitudinal	Yes	Yes	Yes, Yes	Yes	Yes	Yes	High
²³ Sarkisian et al. (2002)	Cross sectional	No	Not reported	Yes, No	N/A	Yes	Yes	Low
²⁴ Sarkisian et al. (2005)	Cross sectional	No	Not reported	Yes, Yes	N/A	Yes	Yes	High
²⁵ Stewart et al. (2012)	Longitudinal	No	Yes	No, No	N/A	Yes	Yes	Low
²⁶ Top & Dikmetaş (2012)	Cross sectional	No	Not reported	Yes, Yes	N/A	Yes	Yes	Low
²⁷ Trigg et al. (2012)	Cross sectional & case control	No	No	Yes, Yes	N/A	Yes	Yes	Low
²⁸ Witham et al. (2006)	Longitudinal	No	Not reported	Yes, Yes	Yes	Yes	Yes	High

Note. PoA and health refers to the perceptions of ageing and health or functioning measures used respectively. N/A is not applicable.

Perceptions of ageing measures

The most common validated measure of ageing perceptions was the Attitudes Toward Own Ageing (ATOA), a subscale from the Philadelphia Geriatric Centre Morale Scale (13 studies^{3, 4, 5, 7, 11, 14, 16, 17, 19-22, 28}). Other validated measures were: the Expectations Regarding Ageing (ERA-38; Sarkisian, Hays, Berry, & Mangione, 2002; ERA-12; Sarkisian, Steers, Hays, & Mangione, 2005)^{1, 6, 13, 23, 24}; the Attitudes to Ageing Questionnaire (AAQ; Laidlaw, Power, & Schmidt, 2007)^{2, 26, 27}; the Facts on Ageing Quiz (FAQ; Palmore, 1988)⁹; the Negative Aging Stereotypes Assessment Questionnaire (abbreviated from its Spanish name, CENVE; Blanca Mena, Palacios, & Torres, 2005)¹⁸. These scales assessed the negativity or positivity of participants' ageing perceptions by totalling their responses.

Some of the non-validated measures of ageing perceptions focused on characteristics of a stereotypical old person. Open-ended questions were employed in three studies^{9, 10, 12} with questions like: "When you think of an old person, what are the first five words or phrases that come to mind?" Independent researchers had coded these responses for valence (i.e., negativity) and externality (i.e., whether they related more to appearance than personality traits). In one study¹⁵, participants used a semantic differential scale to describe an elderly individual on three dimensions: instrumental vs. ineffectual, autonomous vs. dependent, personal acceptability vs. unacceptability. Participants' ageing perceptions were determined based on the traits listed in response to the open-ended questions or those traits specified on these different measures.

Other non-validated measures of ageing perceptions focused on the relationship between ageing and health conditions. For these measures, participants who believed illnesses or impairments were the result of old age were categorised as having negative ageing beliefs. Age attributions (i.e., believing impairments are caused by age) were investigated in one study⁸ using vignettes depicting contexts where someone suffered memory loss or had a physical impairment, with participants stating how much the situation was due to age-related versus situational factors. In another study²⁵, participants with a health condition that they considered serious or concerning were asked: “how strongly they agreed that their illness was partly due to old age?”

Health and functioning measures

The various measures of health and functioning were organised into categories to aggregate the studies meaningfully allowing for comparisons to be made within and across the different domains. Ageing perceptions were investigated in seven different health and functioning domains: health status, wellbeing and quality of life; memory and cognitive performance; physical and physiological performance; medical conditions and outcomes; disability; healthy behaviours; and mortality. Table 4.3 details the different measures used in each of these domains.

Table 4.3.

Health and functioning domains and measures

Health and functioning domains	Measures
Health status, wellbeing and quality of life	<ul style="list-style-type: none"> – Self-rated health^{2, 3, 16, 18} – Physician rated health¹⁶ – Perceived health symptoms^{3, 25} – Self-perceptions of health (OARS; Fillenbaum, 1988)⁴ – Physical and mental health status (PCS-12 and MCS-12; Ware, Kosinski, & Keller, 1994)⁶ – Psychological Wellbeing Quotient (composite of CES-D; Bouma, Ranchor, Sanderman, & Van Sonderen, 1995; NCQ; Hoogenhout, Van der Elst, de Groot, van Boxtel, & Jolles, 2010; & the mental composite score of the Medical Outcome Study 36-item Short-Form Health Survey; Ware et al., 1994)¹⁹ – Health-related quality of life (HRQOL; Brown et al., 2003)¹ – World Health Organisation Quality of Life Assessment (QOL–BREF; Dragomirecká & Bartoňová, 2006)² – WHO Quality of Life Assessment for Older Adults (WHOQOL-OLD; Power, Quinn, & Schmidt, 2005)²⁶ – The Bath Assessment of Subjective Quality of Life in Dementia (BASQID; Trigg, Skevington, & Jones, 2007)²⁷
Memory and cognitive performance	<ul style="list-style-type: none"> – Memory recall tasks⁹ – Serial learning tasks (i.e., lists of items are presented and the participant must learn not only each item but their sequence)¹⁵
Physical and physiological performance	<ul style="list-style-type: none"> – Hearing tests^{5, 10} – Accelerometer readings²⁸ – Timed walking distance²⁸ – Physical performance battery (based from EPESE battery; Kaplan, 1987)²⁰ – Physical Activity Survey for the Elderly (PASE; Washburn, Smith, Jette, & Janney, 1993)¹

Disability and functioning	<ul style="list-style-type: none"> – Reaction time¹⁵ – Activities of Daily Life (ADL; Katz, 1983)^{2-5, 12, 17, 21} – Instrumental Activities of Daily Life (IADL; Lawton & Brody, 1969)^{3-5, 13} – Physical Performance Scale (PPS; Nagi, 1976)³⁻⁵ – Functional Health Scale (FHS; Rosow & Breslau, 1966)^{3-5, 8}
Medical conditions and outcomes	<ul style="list-style-type: none"> – Number or presence of chronic conditions^{3, 13} – Presence of essential tremors⁴ – Dementia diagnosis²⁷ – Frequency of falls¹⁷ – Hospitalisations¹⁷ – Medical appointments¹⁸ – Days ill⁴
Healthy behaviours	<ul style="list-style-type: none"> – Intentions to seek care for age-associated conditions (e.g., walking more slowly, having aches in one's joints, and having trouble sleeping)²³ – Physical activity¹⁸ – Exercise capacity²⁸ – Lorig Self-management Behaviour exercise survey (Lorig, Stewart, Ritter, & González, 1996)²⁴ – Medication adherence (MOS; Hays, 1994)¹⁹ – Health maintenance behaviours²⁵ – Health-promoting behaviour (HPLP II; Walker, Sechrist, & Pender, 1995)⁶
Mortality	<ul style="list-style-type: none"> – Death or survival^{7, 11, 22, 25}

Relationship between ageing perceptions and health

Health status, wellbeing and quality of life

All twelve studies in this domain reported a relationship between perceptions of ageing and health status, wellbeing and quality of life (QOL). Positive ageing perceptions were associated with better self-rated health^{2, 3}, psychological wellbeing¹⁹ and health status⁶. Those adults with poorer self-rated and physician-rated health tended to report more negative perceptions of ageing^{4, 16}. Negative ageing stereotypes were held by participants who perceived their own health as being worse than others¹⁸. Attributions of illness to old age were associated with a greater number of perceived ill-health symptoms²⁵. Attitudes towards ageing were related to QOL scores in older adults generally²⁶ and people with dementia specifically²⁷, with more negative attitudes associated with lower QOL. More positive ageing expectations were associated with better health-related QOL¹. Nursing home residents who expressed satisfaction with their QOL had more positive ageing attitudes compared to those less satisfied².

Memory and cognitive performance

Two studies investigated memory and cognitive performance. Positive ageing perceptions were related to better memory performance in a recall task⁹ but were unrelated to performance on a serial learning task where lists of items are presented and participants learn the items and their sequence.

Physical and physiological performance

Ageing perceptions were related to physical and physiological performance in six of the seven studies in this domain. Participants who held more positive beliefs about ageing tended to perform better on vision and hearing tests⁵, were able to walk farther distances at three and six months follow-up²⁸, and had less deterioration in physical performance on the EPESE across a 16-year period²⁰. Older adults who held negative ageing stereotypes at baseline performed worse on a hearing screening test 36 months later¹⁰. Older adults with poorer vision had more negative perceptions of ageing in one study⁴. Performance on a reaction time test (which tested the speed of moving a finger when a specific colour light was illuminated) was unrelated to ageing perceptions¹⁵.

Disability and functioning

Nine studies investigated the relationship between ageing perceptions and disability and functioning. Positive ageing perceptions were associated with less difficulty and a reduced need for help with daily activities^{3,5}. Negative ageing perceptions predicted difficulties in both activities of daily life (ADL) and instrumental activities of daily life (IADL) in all three years of follow-up in one study¹⁷. Positive expectations regarding ageing were found to be associated with higher functional health status³. Attributing impairments to age was associated with worse functional health among a sample of older Americans, but not among Japanese people, in one study⁸. Older adults who held positive stereotypes of ageing had slower rates of ADL decline over ten years, and they were more likely to fully recover from severe disability than those who held negative ageing

stereotypes¹². Older adults with greater dependency on others were observed to have more negative perceptions of ageing^{4,5}. A decrease in physical functioning was an important determinant of an individual's negative self-perceptions of ageing over time²¹.

Medical conditions and outcomes

Seven studies reported the relationship between older adults' ageing perceptions and their medical conditions (e.g., the presence of diseases or illness) and outcomes (e.g., needing medical care or falling). Presence of a single chronic condition (versus absence) did not predict ageing expectations¹³. However, negative attitudes toward ageing were associated with presence of a greater number of medical conditions³. Older adults with essential tremors (i.e., uncontrolled shaking movements not associated with a specific disease like Parkinson's disease) reported more negative attitudes than those without tremors¹⁴. More people with a dementia diagnosis endorsed the negative attitude that aging is characterised by psychosocial loss than those without such a diagnosis²⁷. Negative perceptions of ageing were associated with a greater risk of hospitalisation in the subsequent year¹⁷ and an increased risk of falling during the course of three years¹⁷. Negative health stereotypes were observed in those participants who reported more medical appointments¹⁸, and those reporting more negative perceptions of ageing took more days off work due to illness⁴.

Healthy behaviours

All seven studies in this domain reported a relationship between older adults' ageing perceptions and their performance of healthy behaviours. Participants who held more negative ageing stereotypes and attitudes were less likely to exercise regularly¹⁸ and reported lower capacity for exercise²⁸, compared to those who held more positive stereotypes and attitudes. Three months after a baseline assessment of their physical activity and exercise capacity, participants reporting more positive ageing attitudes walked further and engaged in more daily activity²⁸. Those with negative expectations regarding ageing were more likely to report very low levels of physical activity²⁴ and health-promoting behaviours⁶ than those with more positive age expectations. Older adults with negative attitudes towards their own ageing reported poorer medication adherence¹⁹. Attribution of illness to old age negatively predicted health maintenance behaviours (e.g., eating a nutritious diet, exercising, getting enough sleep/rest, having regular dental check-ups): the more participants endorsed old age as the cause of poor health, the less likely they were to engage in routine health maintenance behaviours²⁵. Older adults with negative expectations regarding ageing were less likely to seek healthcare for age-associated conditions²³.

Mortality

Four cohort studies reported mortality as an outcome. Positive ageing attitudes were related to lower mortality risk^{7, 11, 22}. Positive change in ageing attitudes was related to reduced risk of dying across a four-year follow-up period, while older adults whose attitudes became more negative over this time period were at risk for shorter survival times^{7, 22}. Finally, the

probability of death among older adults who strongly attributed illness to old age was more than double the probability of death among participants who did not attribute illness in this way (36% and 14%, respectively)²⁵.

4.3.5. Discussion

The aim of this review was to synthesise existing observational research on the relationship between older adults' ageing perceptions and their health and functioning. Twenty-eight observational reports, including data from 12 countries, were reviewed. The studies included in these reports used a variety of measures to assess older adults' ageing perceptions. The quality of the included studies varied considerably with regards to the sample, measures, methodology, and comprehensiveness in the reporting, with only four studies categorised as high quality. Nonetheless, across the studies it was clear that older adults' perceptions of ageing were consistently related to their health and functioning. This relationship was observed across seven different domains of health outcome measures: health status, wellbeing and quality of life; memory and cognitive performance; physical and physiological performance; medical conditions and outcomes; disability and functioning; healthy behaviours; and mortality. In each domain, and across all 12 countries sampled in the studies, more negative ageing perceptions were associated with poorer health and functioning.

This review highlights a clear need for more rigorous research to examine the relationship between older adults' perceptions of ageing and their health and functioning. Primarily, since most of the studies in the

review were cross-sectional, it is not possible to draw any conclusions about the directionality of the effects and make statements about causality. Some studies found that negative ageing perceptions predicted future poor health, functional impairment, and mortality, complementing experimental work on the effects of stereotype activation (e.g., Meisner, 2012) and supporting stereotype embodiment theory (Levy, 2009). At the same time, there was evidence to suggest that health experiences may influence older adults' perceptions of ageing (Sargent-Cox, 2012a; Louis, 2008), which supported the externalisation hypothesis (Rothermund & Brandtstadter, 2003). The findings therefore provided some support for both conceptual models. It is likely that the relationship between ageing perceptions and health and functioning is bi-directional, with ageing perceptions being both a determinant and outcome of health and functioning. Future research should seek to test causal paths systematically (e.g., Sargent-Cox, Anstey, & Luszcz, 2012b) to further advance the understanding of how ageing perceptions are related to older adults' health.

By understanding the causal pathways, it can be determined whether initiatives to modify age-related perceptions should be included in health-promoting interventions for people in later life. Further work is needed to assess the impact of modifying older people's ageing perceptions on different health and functioning outcomes. In this regard, the approach taken by Wolff and colleagues (2014) may prove fruitful in clarifying the potentially health-promoting effects of improving ageing perceptions. Wolff et al.'s study found that an intervention which included a component that promoted positive views about ageing resulted in more physical activity than

one with several effective behaviour change techniques (i.e., goal-setting, self-monitoring, using cues and action planning, and information about the benefits of physical activity; see, Abraham & Michie, 2008). Other behaviour change interventions for older adults could benefit from including initiatives that promote positive ageing perceptions or modify the negative perceptions.

Two limitations of this review should be noted. First, the generally poor quality of the studies included limits the strength of conclusions that can be drawn about the relationship between ageing perceptions and health. While it is notable that a consistent relationship between ageing perceptions and health was observed across both poorer and higher quality studies, there is nonetheless a clear need for more high quality research. Second, although two unpublished dissertations were included in the review, and two published studies reported a non-significant relationship between ageing perceptions and health, the possibility of publication bias remains.

Notwithstanding these limitations, by synthesising the results of 28 studies, involving more than 10,000 older adult participants from 12 different countries, this review presents a comprehensive account of the observed relationship between older adults' ageing perceptions and their health. Further high quality work is needed to confirm this relationship and to tease out causal paths to inform a conceptual model and the development of new interventions encouraging positive perceptions of ageing in later life.

4.4. Conclusions from the systematic review

The aim of the systematic review was to examine the relationship between older adults' perceptions of ageing and their health. The findings provided evidence that ageing perceptions are associated with a variety of health-related outcomes and conditions. In particular, older people who had more negative ageing perceptions were more likely to have poor health and functioning. The findings provided support for the theorised relationship between ageing perceptions and frailty (Figure 4.1).

Upon closer inspection, it was found that many of the articles were not published in psychology journals (see Appendix C for journal details), and many lacked psychological theories or models to justify testing the relationship (see Appendix D). Seven studies referred to the possible internalisation of ageing stereotypes or stereotype embodiment theory, and three articles only referenced Levy's work (e.g., Levy, Slade, Kunkel & Kasl, 2002; Levy & Meyer, 2004) without explaining the theoretical underpinnings or mechanisms. Only two other ageing stereotype mechanisms were mentioned: stereotype threat and social comparison. Several alternative theories from different disciplines were also referenced, including learned helplessness (Abraham, Garber, & Seligman, 1980), attributional theory (Wiener, 1985), cognitive social theory (Bandura, 1997), health belief model (Rosenstock, 1974), and five-factor model of personality (Marshall, Wortman, Vickers, Kusulas, & Hervig, 1992; Smith & Williams, 1992). One study developed its own model of the relationship between expectations regarding ageing and physical activity to examine (Kim, 2009). However,

eight of the articles did not include a specific theory at all. From this evidence, it is clear that the underlying mechanisms or underpinnings are underdeveloped and undetermined. This finding provides further support for developing a model of the relationship between older adults' ageing perceptions and frailty.

The findings of the review suggested that an older person's perceptions of ageing may be an important contributing factor of frailty. Furthermore, some of the health-related outcomes and conditions which were found to be associated with ageing perceptions are those known to be associated with frailty (e.g., disability, medical conditions and death). Thus, frailty was explicitly studied in the subsequent piece of work (Chapter 5) to further confirm the existence of the proposed relationship between ageing perceptions and frailty. Based on the findings from this review, it was anticipated that older adults' perceptions of ageing are associated with frailty. Specifically, older adults who had more negative ageing perceptions were expected to have higher scores on a measure of frailty.

The limitations of the systematic review, described in Section 4.3.5, are also worth reiterating in the context of the overall aim of the thesis. The majority of the research in the review was cross-sectional and most of the research was not high quality so more high quality, longitudinal research is needed. Consequently, the following study in Chapter 5 aimed to address these limitations by analysing data from a large longitudinal dataset. Using longitudinal data allowed for the study to determine whether ageing perceptions predicted later decline in frailty. In other words, the study tested

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whether ageing perceptions contributed to the development and progression of frailty on older adults.

Chapter 5: Perceptions of ageing and frailty among older adults: a secondary analysis of the English Longitudinal Study of Ageing

5.1. Chapter overview

This chapter presents the second piece of work that was conducted as part of this thesis. The chapter describes the secondary data used and discusses the preliminary analysis of the previously unused perceptions of ageing measure from this dataset. Then the secondary data analysis is presented, which sought to test whether older adults' perceptions of ageing were related to frailty.

5.2. Background to current research

In Chapter 4, a systematic review provided evidence of a relationship between older adults' ageing perceptions (including stereotypical beliefs, attitudes, and expectations) and their health and functioning. Ageing perceptions were found to be related to a variety of health-related outcomes and behaviours. Such a finding provided support for the proposed relationship between ageing perceptions and frailty because frailty encompasses multiple bodily systems, is measured as an accumulation of multiple deficits, and presents in heterogeneous ways (Clegg et al., 2013; Rockwood et al., 2000). Moreover, some of these domains are known to be consequences of and are used to identify frailty in older people. However, the relationship between ageing perceptions and frailty has not been explicitly studied. Therefore, the current study conducted a secondary data

analysis to establish whether perceptions of ageing are directly related to frailty.

Although the directionality of the relationship between older adults' ageing perceptions and their health was not determined from the systematic review, previous theoretical evidence suggests older people's perceptions of ageing affect their health in later life. For example, Levy (2003, 2009) proposed that ageing perceptions are informed by stereotypes that have been internalised throughout someone's life and, when they are older, these affect the how they react and respond (i.e., stereotype embodiment theory). According to this theory, perceptions of ageing influence older adults' health and functioning (e.g., Levy et al., 2000; Levy, Slade, & Kasl, 2002) through various pathways. These pathways include physiological processes (e.g., Levy et al., 2000), behaviour (e.g., Levy & Myers, 2004), and psychological mechanisms (e.g., Levy, Slade, & Kasl, 2002). For example, perceptions of ageing predict health outcomes through their influence on engagement in healthy behaviours, such as physical activity (Levy & Myers, 2004). If people with negative perceptions of ageing consider their functional decline as an inevitable part of the getting older, they are more likely to consider health-promoting behaviours as ineffective. Therefore, people with positive ageing perceptions engage in more healthy behaviours (e.g., being physically active) than those with negative views of ageing.

In addition to the theorising, there is also empirical evidence which substantiates that older people's perceptions of ageing affect their health in later life. In a study by Sargent-Cox et al. (2012b), the directionality of the

relationship between self-perceptions of aging and physical functioning was empirically tested. Sargent-Cox et al. (2012b) compared the different possible models (i.e., the bi-directional model and two unidirectional models) with Bivariate Dual Change Score Models. They measured the changes in 1,212 older adults' self-perceptions of ageing and their changes in physical functioning over sixteen years to determine the directionality of the relationship and infer causality. The study determined the model which best explained the changes observed in the participants was the unidirectional model in which self-perceptions of aging predicted physical functioning. This strong evidence supports the internalisation hypothesis and stereotype embodiment theory by confirming that older people's perceptions of ageing influence their health. Based on the theoretical and empirical evidence, the present study treated older adults' ageing perceptions as a probable predictor of frailty.

5.2.1. Aims of current research

The previous piece of work (the systematic review in Chapter 4) demonstrated that a relationship between older adults' ageing perceptions and their health and functioning existed. More negative ageing perceptions were related to poor health and functioning across different health-related domains. However, further evidence was still needed to confirm an association between ageing perceptions and frailty specifically. Therefore, the first aim of the current study was to test whether older adults' ageing perceptions were related to frailty (Figure 5.1 below). Based on the findings of the systematic review, it was hypothesised that negative perceptions of aging would be associated with higher frailty scores.

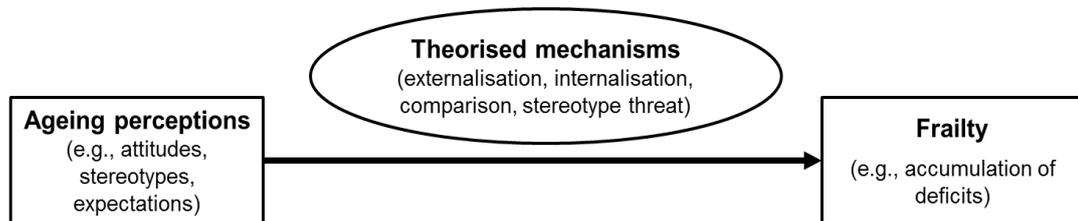


Figure 5.1. Hypothetical relationship between older adults' ageing perceptions and frailty investigated in secondary analysis

The second aim was to examine whether ageing perceptions predicted later frailty (depicted as an arrow in Figure 5.1). Namely, the secondary analysis would verify whether more negative ageing perceptions predicted greater frailty years later. Theoretical mechanisms (presented in the oval in Figure 5.1) and past empirical evidence (Sargent-Cox et al., 2012b) suggest that older adults' ageing perceptions contribute to the development of frailty and further decline. By using data from a large longitudinal dataset, this study aimed to test whether ageing perceptions were not only related to frailty but contributed to frailty's onset and progression in older adults.

5.3. Preliminary analysis of the English Longitudinal Study of Ageing (not included in the submitted manuscript)

This study analysed data from the English Longitudinal Study of Ageing (ELSA) to investigate the relationship between older adults' ageing perceptions and frailty. This particular dataset was selected and analysed for the following reasons. Firstly, ELSA was originally generated to investigate older English people's health, and each wave of ELSA included several items measuring the participant's health and functioning. Consequently, participants' frailty was easily calculated and analysed for the purpose of the current study. See Appendix I for the full list of items on the frailty measure. Secondly, this dataset was utilised because the ELSA researchers developed and included a 'perceptions of ageing' measure in one of the previous waves. This measure aimed to explore how ageing was perceived by older adults as a process and old age as a stage in life by incorporating their beliefs, experiences and attitudes (Demakakos, Hacker, & Gjonça, 2006).

A disadvantage of secondary data analysis is its reliance on the quality of the original research and the measures used. If measures in the datasets are previously untested or not validated then there may be some concerns regarding their use in other investigations. In this dataset (ELSA), the 12-item scale on 'perceptions of ageing' developed by the ELSA researchers had not been used in any previous reports and have not been subjected to a psychometric assessment for validity and reliability (Demakakos et al., 2006). To address concerns about using this measure in the current study, preliminary assessments of it were performed prior to the main analyses

with frailty data. What follows is a description of the findings from the assessments conducted on the responses to the perceptions of ageing items.

5.3.1. Perceptions of ageing measure in ELSA

Preliminary analysis was performed on the measure of 'perceptions of ageing' used in the ELSA (Appendix G). The 12 items included on the measure were generated by the ELSA researchers (Demakakos et al., 2006). Before using the scale in the main analyses, the validity and reliability of the measure was evaluated because responses on these items were not used in any previous reports and have not been subjected to a psychometric assessment. After being prompted to think of old age and their own ageing experience, respondents were asked to report the extent to which they agree or disagree with each of the 12 statements. The response scale was a 5-point Likert scales ranging from strongly agree to strongly disagree. See Table 5.1 below for the list of items on the measure.

Table 5.1.

Perceptions of Ageing measure from ELSA

Item
We can learn a lot from old people.
As I get older I expect to become more lonely.
Old age is a time of ill health.
As I grow older, I become more tolerant.
Old age is a time of loneliness.
As I get older I expect to be able to do things I've always done.
When I think of old people, I think of them as grumpy and miserable.
I worry that my health will get worse as I grow older.
I don't think of myself as old.
Old people don't get respect in society.
Retirement is a time of leisure.
Growing older doesn't bother me.

Note. Items in bold were reversed-scored.

5.3.2. Scale construction

The items on the measure were generated by ELSA researchers using answers that the ELSA respondents gave to two open-ended questions that were included in a pilot study (Demakakos et al., 2006). The open-ended questions were the following: (a) 'what would you say are the most positive things about growing older?' and (b) 'what would you say are the most

negative things about growing older?’ The researchers included the respondents’ responses as items for the measure (Demakakos et al., 2006).

For the purpose of the current analysis, the measure was modified so the responses could be treated as a continuous variable and be quantified as more or less negative perceptions of ageing. Previously, the responses to the items were reported individually and had not been analysed as a scale (see Demakakos et al., 2006). Six of the 12 items were reverse-scored so higher scores indicated more negative views of ageing; these items are indicated in bold in Table 5.1. The possible summed scores ranged from 12 to 60.

A factor analysis of the perceptions of ageing measure was also conducted to determine any items that were redundant or pertained to a particular variable. Due to the poor reliability of the different factors, the measure was treated as a single dimension in the main analysis. See Appendix H for full details of the findings of the factor analysis.

5.3.3. Validity assessment

The measure was assessed for content, face and concurrent validity. A scale which is valid denotes that the items on the scale seem to measure what is proposed (Field, 2009). Face validity assesses whether the scale "looks valid" or seems to represent the construct it is proposing to measure. Face validity of the perceptions of ageing measure was established by reviewing the items and comparing them to items on similar measures (i.e., attitudes towards own ageing, or ATOA, and expectations regarding ageing,

ERA-12). These measures were the most frequently used in the studies from the systematic review (Chapter 4) and had been validated previously (Lawton, 1975; Sarkisian, Steers, Hays, & Mangione, 2005). For these reasons, they were selected for comparison with the ELSA perceptions of ageing measure. After comparison, the items on the ELSA measure were deemed valid or appeared to measure perceptions of ageing.

A scale that has content validity represents all facets of a given construct (Field, 2009). In terms of the perceptions of ageing measure, the items had to represent a range of possible items referring to older people's positive and negative views about ageing. Content validity of the perceptions of ageing measure was established by reviewing the construction of the items and comparing the items to validated measures (i.e., the same measures used to establish face validity above). There was some evidence of content validity from how the items were developed. It was learned from correspondence with the ELSA researchers who developed the measure that they had included all the pilot study's respondents' responses to the open-ended questions as an item (i.e., a statement about ageing) on the measure. Moreover, content validity was corroborated by observing a similar range of items on validated measures as those on the scale. For example, all the measures included items concerning health, happiness, and respect/dignity. Consequently, the scale was regarded as valid.

Concurrent validity tests how well the measure correlates with measure assessing a similar construct that has been measured at the same time. For the perceptions of ageing measure, concurrent validity was evaluated by comparing (i.e., correlating) the measure with the ELSA ageing experience

item that asked whether, on the whole, growing older has been a negative or a positive experience. The ageing experience item used a 5-point Likert scale ranging from very positive to very negative for participants to describe their experience. Responses on the perceptions of ageing were hypothesised to be positively correlated with ageing experiences because perceptions of ageing are believed to incorporate ageing experiences with stereotypical views and expectations of ageing (Demakakos et al., 2006; Diehl et al., 2014). Indeed, the two measures were significantly positively correlated; more positive ageing experiences were associated with more positive perceptions of ageing, $r = .42$, $p < .001$. On the basis of these measurements, the perceptions of ageing measure was considered valid.

5.3.4. Reliability assessment

The perceptions of ageing measure was also tested for reliability. Reliability refers to the consistency of the measure. In other words, it is the ability for the measure to reproduce the same findings under the same conditions (Field, 2009). The most common and easily performed measure of reliability is Cronbach's alpha, α (Field, 2009). An adequate value of a Cronbach's α for psychological constructs is approximately .7 (Kline, 1999). The internal consistency of the scale approached this value when treated as a single dimension to measure the negativity of perceptions of ageing, Cronbach's $\alpha = .66$. The scale's reliability was not improved further by removing any one of the items, see Appendix K.

5.3.5. Conclusions from the preliminary analyses

The items were assessed for validity and reliability because the measure had never used or tested previously. The measure's face, content, and concurrent validity was assessed and considered valid. The scale was also tested for reliability and was acceptable for a psychological construct (Kline, 1999). Based on these assessments, the measure was deemed suitable for use in the analyses to test whether older adults' perceptions of ageing are associated with frailty.

5.4. The relationship between perceptions of ageing and frailty in English older adults²

5.4.1. Abstract

Objectives: The aim of this study was to explore the relationship between perceptions of ageing and frailty. Frailty is used to identify those who are particularly vulnerable to harmful or undesirable health outcomes and associated with several negative conditions (e.g., depression, clinical anxiety, and poor quality of life).

Method: Data used were from the English Longitudinal Study of Ageing (ELSA) Waves 2 and 5. A perceptions of ageing score was based on participants' agreement with 12 statements using a 5-point Likert scale, and a Frailty Index (FI) score was calculated for each participant for both waves. Multiple linear regression models were conducted to assess the relationship between frailty and perceptions of ageing cross-sectionally and longitudinally in models controlled for age, sex, depression symptoms, and socioeconomic status.

Results: In cross-sectional analyses, older adults with more negative perceptions of ageing ($\beta=.12$, $p<.001$) had greater frailty when adjusting for age, sex, depression symptoms, and socioeconomic status. Negative perceptions of ageing ($\beta= .03$, $p<.05$) made a statistically significant contribution to predicting greater frailty six years later.

² Warmoth, K., Lang, I., Abraham, and Tarrant, M. (under review). The relationship between perceptions of ageing and frailty in English older adults. *The Journals of Gerontology Series B: Psychological Sciences*

Discussion: Negative perceptions of ageing were associated with greater frailty but were weak predictors of frailty six years later. Future work regarding the mechanisms of this relationship is needed in order to identify ways of intervening to improve health outcomes.

5.4.2. Introduction

The relationship between ageing and older adults' health goes beyond chronological age and should be considered with regard to an individual's perceptions and experiences. Increasing evidence shows that some of the physical and mental decline associated with ageing can be attributed to non-biological factors (e.g., ageing stereotypes and self-perceptions of ageing; Levy, 2003, 2009). Older adults' expectations and beliefs about ageing are often negative and emphasise declining health and functioning (Hummert, Garstka, Shaner, & Strahm, 1994; Sarkisian, Hays, & Mangione, 2002). Research shows that these beliefs about ageing are related to older adult's health and functioning.

Negative perceptions of ageing have been related a variety of health outcomes: poor memory performance (Levy & Langer, 1994); worse mobility (Witham, Argo, Johnston, Struthers, & McMurdo, 2006); poorer functional health (Levy, Slade, & Kasl, 2002; Sargent-Cox et al., 2012b); more disability and comorbidity (Jang, Bergman, Schonfeld, & Molinari, 2006); an increased risk of falling and greater risk of hospitalisations (Moser, Spagnoli, & Santos-Eggimann, 2011); and poorer quality of life (Top & Dikmetaş, 2012). Negative perceptions of ageing were also found to lessen life by seven and a half years (Levy, Slade, Kunkel, & Kasl, 2002). While negative perceptions of ageing have been related to poor health and functioning in older adults, positive perceptions may benefit their health. For instance, older adults who held more positive stereotypes regarding old age were more likely to recover from severe disability (Levy, Slade, Murphy, &

Gill, 2012). Those with more positive attitudes toward ageing engage in more healthy behaviours, such as physical activity (Levy & Myers, 2004; Witham et al., 2006). Furthermore, having more positive perceptions of ageing may help older individuals psychologically cope with physical or functional health changes. Among older adults who recently experienced a serious health event, those with more positive perceptions of ageing employed a greater number of adaptive self-regulation strategies than those with negative perceptions (Wurm et al., 2013). Thus, older adults with positive perceptions of ageing may respond differently (possibly, by engaging in healthy behaviours or using adaptive coping strategies) to health changes than those with negative perceptions and this response may result in less adverse outcomes.

To explain these relationships between perceptions of ageing and health outcomes, the stereotype internalisation hypothesis posited that ageing stereotypes and beliefs are internalised into an older adults' self-perceptions of ageing, or views about their own ageing (Levy, 2009). According to this hypothesis, self-perceptions of ageing influence an individual's health through both behavioural (e.g., engagement in healthy behaviours; Levy & Myers, 2004) and psychological processes (e.g., less will-to-live; Levy, Slade, & Kasl, 2002). Recent research (Emile, Chalabaev, Stephan, Corrion, & d'Arripe-Longueville, 2014) found that a direct relationship between the endorsement of ageing stereotypes and physical activity still exists even after controlling for self-perceptions of ageing. That is, simply endorsing negative ageing stereotypes and beliefs can have health consequences for an older person.

A further study (Emile, d'Arripe-Longueville, Cheval, Amato, & Chalabaev, 2014) found that endorsing negative ageing stereotypes predicted poorer health independent of internalisation into the self. Emile, d'Arripe-Longueville and colleagues (2014) postulated that since negative stereotypes are stressors and affect self-regulation (stereotypes threat; Schmader, Johns, & Forbes, 2008), they can result in ego depletion (i.e., lack of energy for regulating one's behaviour). This proposal suggested that an older adult's perceptions of ageing could influence them using multiple pathways and internalisation into the self may not be essential. These different mechanisms are not necessarily independent of each other, as indicated by the link between self-regulation and self-perceptions of ageing: negative self-perceptions of ageing inhibit, or impair, self-regulation strategies, i.e., selection, optimisation, and compensation (Wurm et al., 2013). Together, these findings suggest older people, who endorse ageing stereotypes and have negative self-perceptions of ageing, can have less energy for regulating their behaviour and use fewer self-regulatory strategies, which make it more difficult to lead a healthy lifestyle and lead to worse health.

Although older adults' perceptions of ageing have been connected to several different health outcomes, no studies have investigated the association between perceptions of ageing and frailty. Greater frailty identifies those older adults who are particularly vulnerable to harmful or undesirable health outcomes (like injurious falls, institutionalisation, or disability) and is a stronger predictor of mortality than chronological age (Mitnitski et al., 2001; Rockwood et al., 2005). Frailty also has been linked

to cognitive impairment (Robertson et al., 2013), depression (Mezuk et al., 2011), clinical anxiety (Bernal-López et al., 2012), low self-esteem (Guerrero-Escobedo, Tamez-Rivera, Amieva, & Avila-Funes, 2014), poor quality of life (Kanauchi, Kubo, Kanauchi, & Saito, 2008) and negative psychological wellbeing (Hubbard et al., 2014). Due to frailty's embodiment of multiple systems and association with an assortment of negative conditions, its use has increased in the planning and delivery of health and social care of older adults (Clegg et al., 2013). Frailty, which can be used to improve treatment decisions, may be amenable to interventions to prevent or reverse it (Cameron et al., 2013; Lee et al., 2012).

It is estimated that between a quarter to half of older adults over 85 are frail (Fried et al., 2001; Song et al., 2010). The prevalence is difficult to determine accurately because there is no standard definition of frailty currently accepted (Rodríguez-Mañas et al., 2012). One approach by which frailty is commonly conceptualised is as a risk state of accumulated deficits of illnesses, functional impairments, and other symptoms on a Frailty Index (Mitnitski et al., 2001). The accumulation of deficits approach was developed acknowledging the heterogeneous health of older people and for appraising individuals holistically (Mitnitski et al., 2001). A Frailty Index, therefore, allows for a more detailed profile of an individual's specific conditions and limitations in multiple domains and is regarded as a useful tool for determining the effectiveness of an intervention and to describe the health status trajectories over time (Cesari et al., 2014). For these reasons, a Frailty Index approach was adopted in the present study.

Older adult's ageing perceptions may be a contributing factor to the development and progression of frailty based on previous work, which has shown a relationship between ageing perceptions and several health-related outcomes (e.g., Levy, Slade, & Kasl, 2002; Sargent-Cox et al., 2012b; Witham et al., 2006). Much of this previous work asserted that internalisation into the self was needed for perceptions of ageing to influence health. However, recent research found that it may not be necessary (Emile, Chalabaev, et al., 2014) and additional pathways exist (Emile, d'Arripe-Longueville, et al., 2014). Based on these findings, the perceptions of ageing measure used in the present study was not limited to attitudes towards one's own ageing but incorporated both self-perceptions of ageing and endorsement of general negative views of old age. This combination would capture the multiple pathways (e.g., internalisation and ego depletion) by which perceptions of ageing may be related to frailty.

The overall aim of the present study was to explore the relationship between older adults' perceptions of ageing and frailty. Using participants from the English Longitudinal Study of Ageing (ELSA), a large population-based longitudinal study of older adults, this study investigated how perceptions of ageing are related to frailty status cross-sectionally and longitudinally. The current study therefore investigated whether ageing perceptions were associated with current frailty status and whether they predicted frailty six years follow-up. It was hypothesised that negative perceptions of aging would be associated with higher frailty scores. More specifically, older adults who had more negative perceptions of ageing

would more likely be frail and these perceptions would predict frailty years later.

5.4.3. Methods

Participants

Data came from Wave 2 (2004-2005) and Wave 5 (2010-2011) of the English Longitudinal Study of Ageing (ELSA), a large study representative of community-dwelling adults aged 50 and older in England. Participants were people over 50 years old recruited from households involved in the Health Survey for England (HSE), an annual government-sponsored cross-sectional survey, in 1998, 1999, and 2001 (Steptoe, Breeze, Banks, & Nazroo, 2013). Ethical approval was obtained from the Multicentre Research and Ethics Committee and participants gave written informed consent.

Measures

Perceptions of ageing. Participants were asked to think about old age and their own ageing experience and reported how much they agreed with 12 statements about ageing (e.g., “Old age is a time of ill-health”) using a five-point Likert scale (“1” strongly agree to “5” strongly disagree) in Wave 2 of the ELSA (see Appendix G). The statements were generated by ELSA researchers using answers the respondents gave to two open-ended questions included in the pilot study of Wave 2: (a) “what would you say are the most positive things about growing older?” and (b) “what would you say are the most negative things about growing older?” The most common responses to these questions were used to generate the 12 items featured

in the full ELSA study and used here. More information about this measure was reported in the ELSA Wave 2 report (Demakakos et al., 2006).

Prior to the main analysis, the authors was assessed the measure for validity and reliability because the measure had never used or tested previously. The measure's face, content, and concurrent validity was assessed by comparing the items and scores with similar measures (i.e., subjective experience of ageing and attitudes towards own ageing, see Lawton, 1975) and was considered valid for use. The scale was treated as one dimension with summed possible scores ranging from 12 to 60. Six items were reverse-scored so larger scores indicated more negative views of ageing. The scale was also tested for reliability (Cronbach's $\alpha = .66$) and was acceptable as a psychological construct (Kline, 1999).

Frailty index. The multi-dimensional risk state approach to frailty was used and a Frailty Index (FI) calculated as a continuous variable following the methodology reported by Searle et al. (2008). Included on the index were variables or "deficits" representing conditions that accumulate with age and are associated with adverse outcomes ranging in severity from death (e.g., cancer) to discomfort or disability (e.g., difficulty hearing) (Searle et al., 2008; Rockwood et al., 2007). Fifty-four possible variables were included on the FI. The deficits on the FI were sensory and functional impairments, comorbidities, falls, poor or fair self-rated health, and low scores on cognitive function testing. Frailty was calculated for participants who completed all 54 items on the index at baseline and follow-up. Each individual's deficit points were summed and divided by the total number of

possible deficits to create a FI with range of 0 to 1, with higher values indicating a greater proportion of deficits and therefore greater frailty. See Appendix I for the list of items on the Frailty Index.

Control variables. Participant's age, sex, depression symptoms, and socioeconomic status were used as covariates and considered same household sampling. Socioeconomic status was approximated using the full method of the National Statistics Socio-economic Classification (NS-SEC; Chandola & Jenkinson, 2000). NS-SEC uses information about employment relations and the conditions of occupations and sorts into different 16 levels with the higher numbers assigned indicating lower status (Appendix J). Depression symptoms scores were generated using responses to the eight-item version of the Centre for Epidemiologic Studies Depression Scale (CES-D; Steffick & the HRS Health Working Group, 2000) at baseline. We derived a CES-D total score by summing responses to all eight dichotomous questions; higher scores indicated more depressive symptoms.

Analytical Sample

The total number of ELSA participants enrolled at Wave 2 was 9,432 and of those 7,666 completed the nurse visit. After the nurse visit, participants were given the self-completion questionnaire containing the perceptions of ageing measure. Of these, 7,178 participants had completed the perceptions of ageing items on the questionnaire, and frailty scores were calculated for 4,190. Two participants were missing socioeconomic information and 25 participants were missing CES-D scores so were

excluded from analysis making the baseline total 4,163 participants. Between Waves 2 and 5, 706 participants were known to have died, and 1,037 were not included due to incomplete frailty data. Two participants' data were missing. The follow-up total was 2,418 participants.

Participants who were not included in the final analysis were examined for significant differences on the baseline variables. The participants who were not included for follow-up were significantly older, $p < .001$. Participants who were included for the follow-up reported fewer depression symptoms, $p < .01$. Participants who were not included had lower socioeconomic status, $p < .001$ and higher levels of frailty at baseline, $p < .001$. The participants who were not included in the follow-up sample had slightly more negative perceptions of ageing, $p < .05$. However, these differences' effect sizes were considered small (Cohen, 1988); that is, their average scores differed by less than .3 standard deviations. There were not significantly different proportion of men and women in the missing sample than in the sample analysed.

Statistical analyses

Perceptions of ageing were assessed at baseline (Wave 2). Frailty index scores were calculated for both baseline and follow-up (Wave 5). Multiple linear regression analysis was conducted to investigate the association between perceptions of ageing and frailty cross-sectionally and longitudinally. All models were adjusted for age, sex, socioeconomic status, and depression symptoms. Analyses were weighted using probability weights to correct for differences in response rates across subgroups and

the complex design of the survey (Steptoe et al., 2013). Descriptions of these weights and their calculation can be found in the ELSA technical reports, which are available at www.ifs.org.uk/elsa. Analysis was conducted using STATA 13.

5.4.4. Results

Descriptive analyses

Descriptive statistics for the sample at baseline and follow-up are shown in Table 5.2. No significant relationship was found between the participant's age and their perceptions of ageing in the baseline sample or the follow-up sample. Participant's age was not significantly correlated with socioeconomic status in the baseline and follow-up sample. Higher FI scores were associated with older age in the baseline and the follow-up samples, $r = .30$, $p < .001$ and $r = .29$, $p < .001$, respectively.

The baseline sample included 2,291 women (55.03%) and the follow-up sample included 1,348 women (56.07%). There was no significant difference between men and women's ages in the baseline and follow-up sample. In the baseline sample, men were found to have better socioeconomic status ($M = 7.98$, $SD = 3.78$) than women ($M = 8.86$, $SD = 3.46$), $t(4186) = -7.86$, $p < .001$, $d = -.24$, and in the follow-up sample, men had better socioeconomic status ($M = 7.59$, $SD = 3.74$) than women ($M = 8.58$, $SD = 3.43$), $t(2416) = -6.7496$, $p < .001$, $d = -.28$. Men were found to have lower frailty ($M = .18$, $SD = .09$; $M = .18$, $SD = .08$) than women ($M = .20$, $SD = .10$; $M = .20$, $SD = .09$) in both the baseline and follow-up samples, $t(4161) =$

-5.98, $p < .001$, $d = -.19$; $t(2402) = -5.14$, $p < .001$, $d = -.21$, respectively. Lastly, men were found to have slightly more negative views of ageing ($M = 32.05$, $SD = 5.95$; $M = 31.77$, $SD = 5.81$) than women ($M = 31.14$, $SD = 6.18$; $M = 31.00$, $SD = 6.22$) in the baseline and follow-up sample, $t(4161) = 4.79$, $p < .001$, $d = .15$; $t(2402) = 3.20$, $p < .01$, $d = .13$, respectively.

Table 5.2.

Descriptives of participants at baseline and follow-up

	Baseline (N= 4,163)		Follow-up (N= 2,418)	
	M	SD	M	SD
Age	69.99	7.45	68.27	6.21
Socioeconomic status	8.46	3.63		
Depression symptoms	3.04	1.31		
Perceptions of ageing	31.55	6.09		
Frailty	.19	.09	.20	.09

Note. M = mean; SD = standard deviation

Association between perceptions of ageing and frailty

Greater age, more depression symptoms, and lower socioeconomic status were significantly associated with greater frailty, $R^2 = .26$, $F(4, 4158) = 252.00$, $p < .001$ (Model I; see Table 5.3). There was not a significant association with sex. With perceptions of ageing in the model, significantly

more variance was explained than the previous model, $F(1, 4157) = 67.91$, $p < .001$ (Model II; Table 5.3). Perceptions of ageing was associated with frailty level when age, sex, depression symptoms, and socioeconomic status were included in the model, $R^2 = .27$, $F(5, 4163) = 226.71$, $p < .001$. The older adults who perceived ageing more negatively were likely to be frailer ($\beta = .12$, $p < .001$).

To examine the predictive power of perceptions of ageing, the participant's frailty after six years was analysed. Greater age, lower socioeconomic status, more depression symptoms, and higher frailty at baseline significantly predicted greater frailty, but sex was found not to be significantly associated, $R^2 = .57$, $F(5, 2398) = 637.24$, $p < .001$ (Model I; see Table 5.4). Perceptions of ageing significantly contributed to the model, $F(1, 2397) = 5.16$, $p = .02$. In this model, perceptions of ageing were associated with frailty adjusting for age, sex, socioeconomic status, and baseline frailty, $R^2 = .57$, $F(6, 2397) = 532.81$, $p < .001$ (Table 5.4; Model II). The older adults who perceived ageing more negatively were more likely to be frailer after six years ($\beta = .03$, $p < .05$).

Table 5.3.

Multivariate linear regression analysis of associations between frailty, age, sex, socioeconomic status, and negative perceptions of ageing at baseline (N= 4,163)

	Model I, age, sex, depression symptoms, and socioeconomic status adjusted			Model II, sex, age, socioeconomic status, depression symptoms, and perceptions of ageing adjusted		
	<i>b</i> (95% CI)	β	<i>t</i>	<i>b</i> (95% CI)	β	<i>t</i>
Age	.0031 (.0027, .0035)	.2607	16.42**	.0031 (.0028, .0035)	.2609	16.80**
Sex (Female)	.0042 (-.0011, .0095)	.0213	1.53	.0069 (.0016, .0122)	.0360	2.55*
Socioeconomic status	.0033 (.0026, .0041)	.1267	9.10**	.0033 (.0026, .0040)	.1250	9.06**
Depression symptoms	.0261 (.0236, .0286)	.3642	20.31**	.0235 (.0209, .0264)	.3271	17.80**
Perceptions of ageing				.0019 (.0015, .0024)	.1239	8.24**
Constant	-.1396 (-.1668, -.1125)		-10.10**	-.1967 (-.2260, -.1674)		-13.15**
ΔR^2				.0139		
R^2	.2581			.2720		

Note. * $p < .05$; ** $p < .001$; *b* = unstandardised regression coefficients; β = standardised regression coefficients; CIs = confidence intervals.

Table 5.4.

Multivariate linear regression analysis of associations between frailty, age, sex, socioeconomic status, and negative perceptions of ageing after six years follow-up (N= 2,418)

	Model I, age, sex, socioeconomic status, depression symptoms, and baseline frailty adjusted			Model II, sex, age, socioeconomic status, depression symptoms, baseline frailty and perceptions of ageing adjusted		
	<i>b</i> (95% CI)	β	t	<i>b</i> (95% CI)	β	t
Age	.0020 (.0016, .0024)	.1390	10.13***	.0020 (.0016, .0024)	.1406	10.24***
Sex (female)	.0040 (-.0007, .0088)	.0225	1.66	.0047 (-.0001, .0095)	.0261	1.90
Socioeconomic status	.0010 (.0003, .0016)	.0388	2.81*	.0010 (.0003, .0016)	.0391	2.84**
Depression symptoms	.0057 (.0036, .0079)	.0777	5.29***	.0052 (.0030, .0074)	.0705	4.70***
Frailty (baseline)	.7250 (.6928, .7571)	.6669	44.21***	.7199 (.6874, .7523)	.6622	43.53***
Perceptions of ageing				.0004 (.00006, .0009)	.0320	2.27*
Constant	-.0977 (-.1250, -.0704)		-7.02***	-.1125 (-.1426, -.0824)		-7.33***
ΔR^2				.0009		
R^2	.5706			.5715		

Note. * $p < .01$. ** $p < .01$; *** $p < .001$; *b* = unstandardised regression coefficients; β = standardised regression coefficients; CIs = confidence intervals.

5.4.5. Discussion

The present study's aim was to explore the relationship between older adults' perceptions of ageing and frailty. Supporting previous research, which has found an association between perceptions of ageing and older adults' health and functioning (e.g., Jang et al., 2006; Moser et al., 2011; Sargent-Cox et al., 2012b), negative perceptions of ageing were associated with greater frailty as hypothesised. By including perceptions of ageing in the model with age, sex, depression symptoms, and socioeconomic status, more variance was explained in the cross-sectional model. Perceptions of ageing also contributed to the model which predicted frailty six years follow-up. More negative perceptions predicted greater frailty when controlling for age, sex, socioeconomic status, and frailty measured at baseline. Older adults' perceptions of ageing were not as strongly associated with later frailty as they were with existing frailty status. In the cross-sectional model, perceptions of ageing had a greater impact on frailty than the other covariates, with the exception of age and depression symptoms. Conversely, in the longitudinal model, perceptions of ageing had the weakest impact on frailty than any of the significant covariates.

It is important to note that much of the previous research on the relationship between older adults' perceptions of ageing and health outcomes focused on self-perceptions of ageing, i.e., ageing stereotypes internalised by older adults into their self-evaluations (e.g., Moser et al., 2011; Sargent-Cox et al., 2012b). Recent research has proposed that older adults' ageing perceptions impact their health in multiple ways and

internalisation into the self may not be always required (Emile, Chalabaev, et al., 2014; Emile, d'Arripe-Longueville, et al., 2014). The present study's perceptions of ageing measure did not distinguish between self-perceptions and general perceptions of old age in order to capture the various pathways (such as internalisation and ego depletion) that an older person's view of ageing related to frailty. These different mechanisms may work concurrently, as indicated by the link between self-regulation strategies and self-perceptions of ageing (Wurm et al., 2013). The present study did not directly address these mechanisms, and so additional research is needed to investigate how ageing perceptions influence older adults in order to identify older people who are at risk of the adverse health-related outcomes associated with negative ageing perceptions.

The present study adds to the growing literature on how psychological factors are linked to an individual's health and wellbeing. Some of the physical and mental decline associated with old age can be attributed to psychological factors like ageing stereotypes and self-perceptions of ageing (Levy, 2003, 2009). Frailty, which identifies those older adults who are particularly vulnerable to harmful and undesirable health outcomes (e.g., injurious falls, institutionalisation, disability, and mortality), has been associated with other psychological factors including stress (Peek et al., 2012), self-esteem (Guerrero-Escobedo et al., 2014), depression (Mezuk et al., 2011), and affect (Ostir et al., 2004). To authors' knowledge, this is the first study to examine and corroborate the association between ageing perceptions and frailty. The present research is a starting point from which further investigations into how psychological factors (e.g.,

ageing perceptions) are related to the onset and trajectory of frailty in older adults.

Understanding the contributing factors and determinants of frailty is needed if anything is to be done to deter its development or further decline in older people. Although some age-related changes are not modifiable (e.g., dementia), having or maintaining positive ageing perceptions may provide a way to possibly prevent or cope with health and functioning decline. In a recent study (Wolff, Warner, Ziegelmann, & Wurm, 2014) researchers attempted to influence physical activity in older adults by affecting their “views-on-ageing”. When this component was added to the physical activity intervention, the participants improved their perceptions of ageing and increased their physical activity. Such findings suggest there is potential for interventions to promote positive perceptions or change negative perceptions of ageing that could delay or prevent frailty in older adults. Further work is needed to investigate if these interventions are effective and identify for whom these interventions would be the most beneficial.

The findings of this cohort study must be interpreted with caution considering its limitations. Firstly, the measure used for perceptions of ageing is not an established measure. Before any analysis was conducted, the researchers assessed the measure for face, content and concurrent validity and tested for reliability. Although the measure was found to be acceptable for use it has not been established beyond this in any way. Additionally, perceptions of ageing were only assessed in the Wave 2 of the

ELSA and as such any changes in perceptions were not able to be considered. However, baseline perceptions of ageing were stronger predictors of future mortality than trajectories of older adults' perceptions (Sargent-Cox, Anstey, & Luszcz, 2013). Finally, the attrition rate of participants between baseline and follow-up was sizeable (i.e., 42.25% of the participants were not included in the follow-up). These participants were older and frailer, and mortality accounted for 49.3% of the participants not included.

Despite these limitations, the present research highlights the role older adults' perceptions of ageing can play in their health and functioning – specifically, frailty. The study's findings support previous work which has found negative perceptions are associated with and can lead to poor health. Further work is still needed to understand this relationship along with its underlying mechanisms. By understanding this relationship better, interventions that promote positive or improve perceptions of ageing could be beneficial for some older adults.

5.5. Conclusions from the secondary analysis

By this stage of the thesis, the hypothesised model of the relationship between ageing perceptions and frailty (Figure 2.3 in Chapter 2) has undergone two empirical tests. Firstly, the systematic review (Chapter 4) found evidence that ageing perceptions were associated with a variety of health-related outcomes and conditions. These findings suggested that older adults' negative perceptions of ageing would be associated with greater frailty. Secondly, in the current study, a secondary analysis tested this hypothesis using data from a longitudinal dataset. Based on theorised mechanisms (T. Bennett & Gaines, 2010; Levy, 2009) and previous research (Sargent-Cox et al., 2012b), it was hypothesised that negative ageing perceptions would predict frailty years later (Figure 5.1). This study aimed to (1) test whether older adults' ageing perceptions were related to frailty and (2) examine if ageing perceptions predicted decline (i.e., frailty six years later).

In each model tested, variables known to be linked to frailty - age, sex, gender, and depressive symptoms – were all controlled in the analysis. For example, women are more likely to be frail than men (e.g., Gale, Cooper, Deary, & Aihie Sayer, 2014), an older person with lower socioeconomic status is at greater risk of frailty (Lang, Hubbard, Andrew, Llewellyn, Melzer, & Rockwood, 2009), and frailty and depression have been found to correlate (Mezuk et al., 2011, see Chapter 2). By controlling for these influences, the independent contribution of ageing perceptions could be better ascertained.

Using a Frailty Index, this study found an association between older adults' ageing perceptions and frailty, extending the findings of the systematic review. Namely, older adults with more negative perceptions were more likely to have higher frailty scores. However, as was described in Section 5.4.5, perceptions of ageing were a weaker predictor of frailty years later and had the weakest impact on frailty than any of the significant covariates (i.e., age, socioeconomic status, and frailty at baseline). Put simply, there was weak support overall for older adults' perceptions of ageing predicting the onset and progression of frailty. Negative ageing perceptions did not increase the likelihood of developing frailty for every older person.

It is possible that there may be important factors which could influence the strength of the association between ageing perceptions and frailty or explain how ageing perceptions may increase a person's risk of frailty. Two lines of evidence point to this possibility. First, stereotype embodiment theory (Levy, 2009) argues that negative stereotypes of ageing influence older people when they are incorporated into evaluations about their self. In contrast, the effects of stereotype threat are thought to be due to anxiety and evaluation apprehension (Schmader et al., 2008; Steele, 1997).

Detailed descriptions of these theorised mechanisms of ageing stereotypes and perceptions are provided in Chapter 2. The present study was unable to address whether these different mechanisms affected the relationship between ageing perceptions and frailty. Further research is needed to determine the processes by which older adults' ageing perceptions can influence their health and functioning and result in frailty.

Chapter 5

To determine how older adults' ageing perceptions can result in frailty, the subsequent study's broad aim was to elaborate and contextualise these psychosocial processes related to frailty. This study explored the views and discourse of older adults in order to gain a better understanding of frailty and their beliefs concerning its progression. The purpose of the study was to identify underlying mechanisms and influential variables in the relationship and by doing so help to explain the findings of the previous two pieces of work (Chapter 4 and 5). The findings from the study would also be used to revise the proposed model of the relationship between ageing perceptions and frailty (Figure 2.3).

Chapter 6: A qualitative exploration of the relationship between older adults' perceptions of ageing and frailty

6.1. Chapter overview

This chapter contains the final study of this thesis, a qualitative exploration of older adults' subjective understanding of frailty and their beliefs concerning its progression. This study aimed to elaborate and contextualise the underlying processes of the relationship between older adults' perceptions of ageing and frailty.

6.2. Background to the current research

6.2.1. Older adults' perceptions of frailty

Frailty is perceived as the most negative or undesired aspect of later life and often associated with wasting, decrepitude, dependency, and functional decline. Gillearn and Higgs (2010) suggested that frailty is the "counterpart to successful ageing" (p. 121) and feared by older adults. The fear of frailty was related to an individual feeling as though they are beyond any possible agency, intimacy, and social interaction (Gillearn & Higgs, 2010). Moreover, Grenier (2007) asserted that discourses and definitions of frailty revealed not only an association with capacity but also one of powerlessness and implications of blame. Older adults' understandings of frailty support these negative views, which include social and psychological aspects like negative emotions, poor social interactions, and fear (Grenier, 2006; Puts et al., 2009). These descriptions consider frailty an inherently negative and socially devalued condition. From this evidence, it is clear that frailty is not

just a physical state related to ageing or physical weakness as some biomedical definitions imply (e.g., phenotypic frailty; Fried et al., 2001). More information about these differences and social views is described in Chapter 2.

There is however a noticeable lack of empirical research exploring this area of how frailty is perceived. With the exception of Puts and colleagues' study (2009), most of research exploring how frailty is perceived was conducted by Grenier (2005, 2006, 2007). In these studies, Grenier investigated: contextual and social experiences of disability and decline (2005); how older women negotiate their emotions and experiences of frailty with the biomedical or clinical classification (2006); and use of frailty in language, care, and lived experiences (2007). However, these studies used predominantly the discourses of older women from Canada. If the relationship between ageing perceptions and frailty is to be understood, there is a need for studies that include men's perspective and different geographical locations. The current study adds to this literature and furthers the understanding of how frailty is perceived by older people, including those considered frail using biomedical classifications (e.g., Clinical Frailty Scale; Rockwood et al. 2005).

As stated above, little research has investigated what frailty means to older adults, and even less has investigated how people understand its development and progression. Only the qualitative study by Puts and colleagues (2009) asked older people whether they believed frailty was preventable and, if so, how. People who were not classified as frail on a

Frailty Index (similar to the one used in the secondary analysis in Chapter 5) reported that it could be prevented by taking actions, such as maintaining a healthy lifestyle (eating a nutritious diet and exercising). Conversely, persons considered frail stated that it was something that happened to someone with age, and it very much depended on one's health. Although people who were classified as frail admitted that having a healthy lifestyle would be beneficial, they said that due to their own limited health they were unable to perform the actions for the prevention of frailty (e.g., exercise). Some people who were considered frail even attributed frailty to luck and saying, "only a lucky few age successfully and that most people become frail" (Puts et al., 2009, p. 264). Due to the small amount of research into this area, older adults' perceptions of frailty and their understanding of its development, progression and consequences are studied in the subsequent study.

Puts and colleagues' (2009) study provided some insights into how older people perceive that frailty develops (i.e., if and how frailty is preventable), but there was one major drawback of the qualitative study. The term frailty does not exist in the Dutch language. The researchers consequently had to equate the term with vulnerability and fragility for the participants. No previous study has investigated how older people understand the development of frailty in an English-speaking population. The current study was thus conducted with English-speaking older people residing in England in order to understand how they view frailty and their beliefs about its development and progression. Furthermore, by using an English sample,

the results of the secondary analysis of data from the English Longitudinal Study of Ageing could be expounded.

6.2.2. The relationship between ageing perceptions and frailty

Although the two previous pieces of work found a relationship between older adults' ageing perceptions and their health (systematic review in Chapter 4) and frailty (secondary analysis in Chapter 5), the mechanisms by which ageing perceptions are related to frailty have not been studied (described in Chapter 2). The previous study of this thesis investigated the relationship between older adults' ageing perceptions and frailty, and while more negative perceptions were associated with higher frailty scores, the predictive power of ageing perceptions was weak. That is, the findings did not strongly support the previous psychosocial theories (e.g., stereotype embodiment theory; Levy, 2009), which suggest that negative perceptions of ageing should impair health and functioning in later life. These results suggest that the link between negative ageing perceptions and frailty may not be present for everyone and there might be important factors which determine the strength of the relationship or explain the effect. For this reason, the current study was interested in the processes by which ageing perceptions do result in frailty and further health deterioration.

Previous literature on ageing attitudes, stereotypes, and self-perceptions (reviewed in Chapter 2, Section 2.3.3) propose several possible mechanisms by which they are formed and can influence older adults: internalisation of stereotypes (Levy, 2009); stereotype threat (Steele, 1997);

social comparison (Pinquart, 2002); and externalisation (Rothermund & Brandtstädter, 2003), shown in Figure 6.1 below. Far less research has investigated how older adults can resist these widespread negative views (Zebrowitz, 2003). As the previous study found (Chapter 5), not all older adults who have negative perceptions of ageing resulted in frailty and further decline in the future. Therefore, the following qualitative study explored not only the processes by which ageing perceptions lead to frailty but how older people use or challenge these negative ageing perceptions to not become frail.

It has been recognised that the effects of priming ageing stereotypes are influenced by how strongly the older adult identified with their age group, or as an older person (Kang & Chasteen, 2009). Kang and Chasteen (2009) found that those who strongly identified with their age group were more likely to perform worse on a memory task than those who did not strongly identify. They proposed that older adults are able to differentiate their selves from negative perceptions of ageing because the underlying mechanism is social identification. *Social identification* is the act of deriving one's sense of self from their social group, or category, memberships (e.g., gender, age, nationality, profession, and sports teams) (Tajfel & Turner, 1979; Turner, Hogg, Oakes, & Reicher, 1987). In other words, older adults may not identify with the 'old age' social category, and therefore may resist the health effects of ageing perceptions (Chapter 4). Social identification could therefore explain the findings from the previous work in this thesis (Chapter 5). Namely, an older person could have negative ageing perceptions (e.g.,

believe that old age is a time of ill health) yet not develop frailty because they do not identify with an older person or frailty.

6.2.3. Aims of the current research

The systematic review in Chapter 4 and secondary analysis in Chapter 5 ascertained that there is a link between ageing perceptions and negative health outcomes (indicated as an arrow in the Figure 6.1 below), but it seemed that this link may not be present in everyone. Accordingly, it is possible that there might be other important factors which structure that relationship or carry its effect. This qualitative study's aim was to elaborate and contextualise the underlying processes in the relationship between ageing perceptions and frailty (i.e., the arrow and the theorised mechanisms in the model). The views and experiences of older adults were explored with the purposes of fully understanding the relationship between ageing perceptions and frailty and explaining the findings of the previous two studies. The current qualitative study explored: (1) older adults' perceptions of frailty; (2) their beliefs concerning its progression and consequences; (3) and the role of ageing perceptions in the context of frailty.

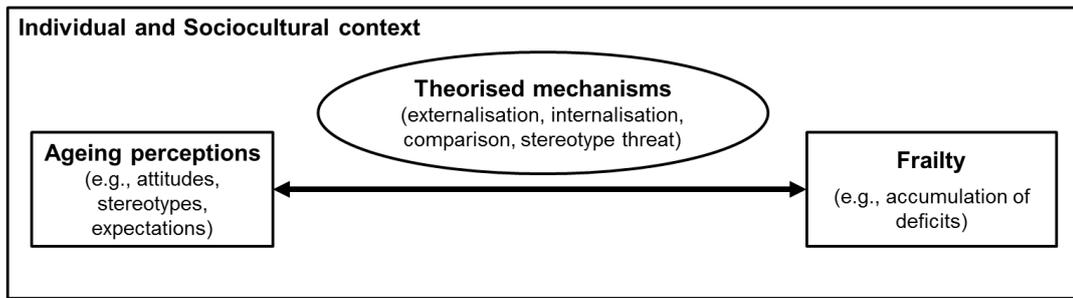


Figure 6.1. Proposed model of the relationship between older adults' ageing perceptions and frailty explored in the qualitative study

This study was exploratory and interpretative in nature. By using qualitative methods, explanations were developed using an inductive approach (Creswell, 1998). That is, patterns observed in participants' responses formed an explanatory model. The explanatory model developed based on the observations in the study (see Figure 6.2) was used to revise the heuristic model of the relationship between older adult's perceptions of ageing and frailty based on past research (Figure 2.3).

6.3. “Thinking you’re old and frail”: A qualitative study of frailty in older adults³

6.3.1. Abstract

Many older adults experience what is clinically recognised as frailty but little is known about the perceptions of, and attitudes regarding, being frail. This qualitative study explored adults’ perceptions of frailty and their beliefs concerning its progression and consequences. Twenty-nine participants aged 66 to 98 with varying degrees of frailty, residing either in their homes or institutional settings, participated in semi-structured interviews. Verbatim transcripts were analysed using a Grounded Theory approach. Self-identifying “as frail” was perceived by participants to be strongly related to their own levels of health and engagement in social and physical activity. Being labelled by others as “old and frail” contributed to the development of a frailty identity by encouraging attitudinal and behavioural confirmation of it, including a loss of interest in participating in social and physical activities, poor physical health, and increased stigmatisation. Using both individual and social context, different strategies were used to resist self-identification. The study provides insights into older adults’ perceptions and attitudes regarding frailty, including the development of a frailty identity and its relationship with activity levels and health. The implications of these findings for future research and practice are discussed.

³ Warmoth, K., Lang, I., Phoenix, C., Abraham, C., Andrew, M. K., Hubbard, R. E. and Tarrant, M. (in press). “Thinking you’re old and frail”: a qualitative study of frailty in older adults. *Ageing & Society*

6.3.2. Introduction

The term “frailty” has been increasingly used to refer to the health conditions of many older adults (e.g., Borges & Menezes 2011; Heuberger, 2011). In biomedical research the term is used to classify physical aspects of ageing. However, its conceptualisation is debated — as a physical syndrome caused by sarcopenia which can be measured by the Fried phenotype or the FRAIL scale (Morley, Perry, & Miller 2002), or as a risk state secondary to accumulated deficits of illnesses, functional impairments, sensory impairments, and symptoms (Clegg et al. 2013). It is estimated between 25-50 per cent of people who are 85 years or older experience what is clinically recognised as frailty (Clegg et al. 2013). However, older adults’ understanding is not often acknowledged and reflected in these conceptualisations. The aim of this qualitative study was to gain a more detailed understanding of older adults’ perceptions of frailty and their beliefs concerning its progression and consequences.

Definitions of frailty are important because they can guide treatment decisions in clinical contexts (Borges & Menezes 2011). However, it is also important to consider how older people themselves perceive frailty because perceptions regarding health can play an important role in determining the progression of illness (Petrie, Jago, & Devcich 2007). To this end, the current research explored the discourses of frailty used by older people. Few studies have examined people’s perceptions regarding being frail but those done highlight the complex and nuanced nature of this condition. For example, Dutch older adults in Puts and colleagues’ (2009) study described

frailty both as a state of general physical impairment and disease, and as a condition with delineable social and psychological ill-effects. Participants highlighted reduced ability to cope with their physical limitations, negative emotions (e.g., fear), impaired cognitive functioning, and poor social interactions. Consistent with this multidimensional conceptualisation of frailty, older women in Grenier's (2005, 2006) research described frailty in relation to emotional responses and in the context of their functional limitations and physical changes. Other discourses of frailty describe not only an association with physical capacity but also one of powerlessness, dependency, and cognitive decline, reflecting feared aspects of ageing (Grenier 2007).

The current research considered the interaction between people's beliefs about frailty with their general self-perceptions and identities. Theories of identity management in later life (e.g., Coleman 1999) indicate identity is negotiated in response to life experiences and particular changes in personal circumstances. Fillit and Butler (2009) suggested physical impairment resulting from the loss of independence or control of one's body can lead people to self-identify *as old*. Predominantly negative, reflecting common old age stereotypes (impaired, despondent, or recluse; Hummert 2011), self-identifying as old can have implications for health and wellbeing. Indeed, people showing symptoms of frailty often concurrently report low levels of wellbeing, suggesting defining oneself in terms of a "frailty identity" (*as frail*) might play an important role in determining the health outcomes of older adults (Andrew, Fisk, & Rockwood 2012). The present study

considered the perceptions of the self and others with one's understanding of frailty.

In addition to exploring older people's perceptions and understandings of frailty, the current research explored whether frailty as an identity is something older people perceive as an inevitable consequence of ageing, or whether it is something actively managed or resisted. Suggesting identity change is not necessarily an inevitable part of ageing; some studies show older people play an active role in the construction of their own identities (Cotter & Gonzalez 2009). While recognising their physical symptoms of frailty, many older people in Grenier's (2006) study simultaneously rejected the frailty label and distinguished between "being frail" and "feeling frail". "Being frail" was viewed as an imposed medical or functioning classification, while "feeling frail" reflected the emotional consequences of traumatic events (e.g., loss of a loved one), disability, or physical impairment. Similar findings were reported by Puts and colleagues (Puts et al. 2009) whose participants did not identify as "frail" even when they met the classification criteria on a standardised measure (Puts, Lips, & Deeg 2005). Resisting a frailty identity may be one such negotiation strategy that some older people employ in order to maintain a positive self in response to age-related changes or ill-health experiences. Thus, by resisting the frailty identity, an "identity crisis" may be avoided (Fillit & Butler 2009).

The above review indicates older adults' understanding and experience of frailty is nuanced, and not just a physical state related to ageing or physical weakness. It also suggests self-identifying as frail, while

potentially damaging to health and wellbeing, might not be an inevitable, or automatic, consequence of age-related change. However, while a distinction can be drawn between “being frail” and “feeling frail”, very little is known about how older people make this distinction or how it relates to their health and wellbeing. The current study sought to explore these processes further. Specifically, the aim of the study was to qualitatively examine older adults’ perceptions of frailty and their beliefs concerning its progression and health consequences.

6.3.3. Methods

A Grounded Theory approach was adopted because its methodology is a well-established and flexible approach to construct theory from data (Charmaz 2006). Using this approach, participants’ own perspectives can be explored and an explanatory theory developed (Glaser & Strauss 1967).

Data collection

Open purposive sampling (Strauss & Corbin 1998) was undertaken through a network of research contacts and community organisations (including Age UK, the local Senior Voice organisation, and patient and public involvement contacts at the first author’s institution). These organisations and contacts acted as gatekeepers and were sent a recruitment poster with details about the study (e.g., project aims, eligibility criteria, time commitment). See Appendix M and N for copies of the letter sent to the different organisations and recruitment poster, respectively. Respondents were included in the study if they were over the age of 65

years old and excluded if they were unable to consent independently (e.g., due to severe cognitive impairment). Posters were displayed in each gatekeeper's work environment and copies were distributed to interested individuals. Appendix O includes a copy of the letter sent to potential participants. Once eligibility had been confirmed, participants were provided with an information pack (Appendix P) and asked to provide informed consent before being interviewed (Appendix Q). In later interviews, recruitment to the study became more selective and employed theoretical sampling (a technique for seeking pertinent data from relevant sources to develop the emerging theory: Charmaz 2006). Data collection ended when no further theoretical insights were obtained from the data, or theoretical saturation was reached (Charmaz 2006). The study was approved by the first author's institutional ethics committee (Appendix L).

Semi-structured interviews were conducted in participants' homes or a private meeting room on the university campus of the first author. A topic guide was used to direct the interviews, which included key themes of health, daily life, experiences of getting older, and participants' understanding of frailty. Participants were encouraged to use their own words to explain their experiences of ageing and attitudes towards frailty. Open-ended questions and probing for further clarification was used to facilitate this process as necessary. Recurring themes and emerging common issues were included in subsequent interviews to facilitate theory development. Memos were made throughout the recruitment and analysis processes in order to identify areas of interest, explore participants'

perceptions, describe experiences during the interview and in relation to existing knowledge, and to provide richer data (Strauss & Corbin 1998).

Participants completed a modified version of an established frailty index at the end of the interview (Romero-Ortuno & Kenny 2012; Searle et al. 2008). See Appendix R for a copy of the questionnaire. This index was used for the purpose of describing characteristics of the sample recruited and to guide future sampling. The index included self-reported questions about the need for assistance in daily life, existing medical conditions, subjective health, and physical activity. Binary variables were coded as per Romero-Ortuno and Kenny (2012), with “0” indicating the absence of the deficit and “1” indicating the presence of a deficit. Ordinal variables were scored using a scale of 0 (no deficit) to 1 (deficit is maximally expressed). For example, the ordinal points for the subjective health item were: Poor = 1, Fair = 0.75, Good = 0.5, Very good = 0.25, Excellent = 0. Scores on the index were related to the clinical descriptors on the Clinical Frailty Scale (CFS: Rockwood et al. 2005).

The majority of participants interviewed in the early part of the research were comparatively young (less than 70 years of age) and in good health (very fit and well according to the CFS). To increase the likelihood of the final sample including a broad range of frailty experiences, potential participants in later interviews were asked about their health (e.g., “Do you have any health conditions?”) during the initial contact with the researcher. Those who stated they did not have any health conditions were not interviewed. Therefore, participants in the later interviews were

comparatively older (greater than 70 years of age) with higher CFS scores (e.g., mildly and moderately frail). Interviews lasted between 40-180 minutes and were audio recorded for subsequent transcription.

Sample characteristics

Thirty-five older adults initially expressed interest in participating in the study. Six individuals either did not fulfil the inclusion criteria, did not express further interest after receiving additional information about the study, or (later in the recruitment process) were not interviewed because they were younger and in good health. This left a final sample of 29 participants aged 66-98 years. All participants lived in the South West of England and the sample included both community dwellers and care home residents. Based on their Frailty Index scores, the frailty status of participants varied from “very fit” to “moderately frail”, and “previously frail”. Participants were not directly asked about their life history, although many disclosed personal details pertaining to this. Marital status was disclosed by 25 participants (18 married; 4 widowed; 4 single; 3 divorced). The majority of the participants were retired. Table 6.1 details the characteristics of the sample.

Data Analysis⁴

Initial coding involved naming data line-by-line. Focused coding assigned conceptual labels to the initial themes and these were refined through repeated inspection. Axial coding involved an examination of the

⁴ See Appendix S for a worked example of coding and theme identification.

relationships between concepts in order to develop the emerging theory. Data collection and analysis were performed iteratively so themes and concepts were revised when novel or conflicting data were gathered. Constant comparison and reflection was performed at each stage of the research, along with scrutiny of sampling procedures, interview conduct, code creation, and theory development.

Interviews were transcribed verbatim, with pseudonyms used for participants to ensure anonymity. Coding and memo-writing were performed using NVivo 10 software (QSR International 2012) to assist with the management and organisation of the data. The first author performed the primary analysis of the findings through prolonged and persistent engagement with the data. Interpretation of data was discussed between authors and these discussions facilitated the identification of salient themes, concept refinement, and theory development. Finally, lay summaries of the findings were sent to the contacts and organisations who had aided recruitment for comment: responses received were confirmatory and positive, supporting the credibility of the analysis (see Appendix T).

Table 6.1.

Characteristics of participants

Name	Sex	Age	Identify as frail	Frailty Measure	Marital status	Profession
Betty	F	82	No, blame it on the system	Well	Widowed	Undisclosed
Beth	F	84	Yes	Managing well	Undisclosed	Office worker until married
Caitlyn	F	78	Only mobility	Moderately frail	Divorced	Professor
Don	M	77	Only a little bit	Managing well	Married	Navy
Diana	F	79	No I fight against it	Moderately frail	Married	Doctor
Garth	M	86	No because I am not	Apparently vulnerable	Married	Solicitor
Gemma	F	70	No	Very fit	Married	Physiotherapist
Gail	F	70	No	Managing well	Widowed	School counsellor
Ida	F	65	Not at the moment	Managing well	Single	Nurse
Jack	M	88	No	Managing well	Married	Civil servant
Jacob	M	69	No	Managing well	Married	Veterinarian
Josh	M	66	No	Apparently vulnerable	Married	Researcher
Joanna	F	66	Not particularly	Very fit	Widowed	Dietician
Laura	F	68	Not at the moment	Well	Married	Social worker
Lonnie	F	98	Yes	Mildly frail	Widowed	Nurse
Mae	F	69	Not at the moment no	Very fit	Married	Machinist
Mary	F	83	Not quite, most of the time I am fine	Well	Widowed	Housewife
Maggie	F	83	No, well in other ways	Apparently vulnerable	Undisclosed	Office worker
Molly	F	70	I don't feel like that at the moment	Well	Married	Nurse
Mandy	F	79	No	Managing well	Divorced	Undisclosed

Chapter 6

Nick	M	73	I do not identify with it	Managing well	Married	Healthcare educator
Patricia	F	83	Legs are only frail part	Moderately frail	Undisclosed	Housewife
Robert	M	79	Yes	Mildly frail	Married	Civil servant
Sarah	F	77	No, still have my independence	Mildly frail	Undisclosed	Researcher
Thomas	M	67	not at the moment	Very fit	Married	Business owner
Ted	M	70	Limitations due to past injury	Temp frail	Married	Teacher
Theo	M	68	I don't consider myself at all	Managing well	Married	Navy/care home manager
Todd	M	75	problems getting out and about	Moderately frail	Single	Train operator
Walter	M	83	No	Managing well	Married	Engineer

6.3.4. Results

Analysis revealed three categories: (1) views on physical and psychological frailty; (2) the process of self-identifying as frail; (3) strategies used to resist identification. Older adults' perceptions of frailty included the interacted concepts of "being frail" and identifying as frail. Identifying as frail was not only informed by health but also was a believed determinant. The adoption of a frailty identity depended on resistance strategies and aspects of self-identifying (see Figure 6.2). The process and strategies were informed by both individual and social context. Direct quotes from participants are used in the following sections to illustrate themes within each category.

Views on physical and psychological frailty

This category included participants' conceptualisations of frailty, both in terms of what it comprised and what it implied about the affected individual. Participants described how one could be physically and psychologically frail, showing outward symptoms or cues of frailty. Describing frail individuals, they depicted them as hunched over, grey-haired, wobbly, and slow (physically and mentally). The physical characterisations referenced poor health, mobility issues (e.g., use of canes or walking frames), and other functional impairments (e.g., hearing aids). Physical decline towards dependency and death were expressed. Psychological aspects of frailty referenced negative thoughts and attitudes (e.g., thinking "you weren't good enough to do something"), feelings of trepidation and vulnerability, inability to cope with age-related changes, and mental functioning (e.g., memory loss). These conceptualisations reflected common negative old age stereotypes and beliefs about ageing.

However, the presence of these physical or psychological symptoms or cues did not necessarily indicate the individual actually considered themselves as frail: participants distinguished between "being frail" and identifying as frail. "Being frail" was related to the objective classifications of frailty and the clinical symptoms of having poor health and functional limitations, but identifying as frail incorporated the negative, and feared, views about older people as feeble, dependent, and vulnerable.

Self-identifying as frail was seen as an important determinant of health outcomes above and beyond the effects of showing clinical

symptoms of frailty. Participants referenced a “cycle of decline”, whereby frail people become progressively more inactive over time. Jacob, 69, explains this process:

“they get a bit old age in the joints maybe a knee gets a bit sore then that's I mean pain is a big, big a cause of frailty isn't it? You begin to wonder whether you can actually walk anymore ... and you think I can't do it and you get depressed and you become frail and it's a kind of on-going cycle of decline”

Jacob described how an awareness of a physical change (e.g., sore knee) was exacerbated by thoughts about his abilities and a growing acceptance that he was physically unable. As a result, this led to depression and further physical decline. Consequences of seeing oneself as frail would become physical manifestations that furthered decline. Moreover, participants described how identifying as frail led not only to frailty but other health problems and ultimately death.

While most participants' characterisations of frailty were negative and highlighted its damage on health and wellbeing, participants also relayed experiences with older adults who willingly identified as frail, who “wallowed” in it, or exaggerated their limitations. This process was described by Jack:

“They are probably a bit frail but ...some people say they wallow in it but I mean there are those sort of people really. They want you to feel sorry

for them and they feel sorry for themselves but maybe they feel better if you...feel sorry for them”

These individuals were said to even act in a “frail manner” in order to secure support from other people. Perhaps, “wallowing” is a way for people to cope with feelings or experiences of frailty.

The process of self-identifying as frail

The three participants who identified as frail believed that frailty was due to factors beyond their personal control, including age, functional limitations, and health conditions. One participant described how she had accepted that she was frail due to age; Lonnie stated that, at 98 years of age, she simply accepted that she was frail. Her objective health status was not mentioned. For the other participants who identified as frail (Robert and Beth), recognition and acknowledgement of their limitations and impairments resulted in the adoption of a frailty identity. Robert, 79, had multiple health conditions and functional limitations; for him, these determined his identity as frail. When he was asked why he considered himself frail, he said:

“Oh, because I can't, can't. I'm frail in every sense of the word because of my incapacity, my lack of balance, my inability to walk, to stand up, um no, no, I'm frail because I am”

He described himself as a prototype of frailty and perceived that he could not deny his obvious limitations or attribute them to other causes (e.g., a stroke or specific disease). According to these individuals, identifying as frail

was something inevitable or uncontrollable that occurred with old age. These participants expected physical decline with increased age and self-identification as frail was an acceptance of this natural process.

Conversely, for the majority of participants, the presence of health conditions or physical decline did not result in self-identifying as frail. Some participants did not view their limitations or health conditions as serious enough to warrant the label “frail.” Indeed, according to biomedical definitions, they were not classified as frail. However, most of those who had multiple health deficits or classified as frail on the CFS did not identify as frail — despite readily acknowledging their health-related impairments. One clear example of participants exhibiting resistance to a frailty identity came from Diana, 79, who had cancer and Parkinson’s disease and needed daily care. When asked if she considered herself frail, she responded by laughing and stating, “no.” She then explained why she did not identify as frail.

“because I fight against it um I mean if I let myself go and didn't arrange things and didn't do anything I could become more frail, but I have the stimulus of people around”

In this quote, Diana states how she resists identifying as frail (or “fights against it”) and even alludes to the consequences of identifying as frail. She describes resisting frailty through her individual actions and with help from others.

Most participants described the process of identifying as frail as transitional and a condition of particular circumstances. They had control

over how they thought about being frail (their impairments and limitations) and how they act (e.g., “fights against it”). According to them, the key determinant of whether an individual adopted a frailty identity was disengagement — socially or physically – and not their physical impairments or poor health. Participants described how frail people disengage or “give up” previously enjoyed activities. Sarah, 77, was describing her understanding of what it meant to identify as frail when she said:

“easily broken which means possibly if you've almost given up and it wouldn't take much to make you give up”

Patricia, 83, reiterated Sarah's conceptualisation of the identity when she talked to frail people in her care home.

“They give up. They've got one or two here that just give up. They just don't want to know. They wonder why they're on this earth. And you do try to talk to them but don't want to know.”

Disengagement from physical and social activities was thought to be a stronger indication that someone self-identified as frail than health and functioning impairments alone. Ted, who was 70 years old and recently undergone surgery to regain some functioning, distinguished between being regarded as frail and being in “frailty mode”. He was categorised as frail on the self-reported measure (CFS) before surgery, but stated he was not in “frailty mode”, which he described as “sitting down” and “wasting time”. For Ted, it was disengagement behaviours that characterised a frailty identity,

distinct from health and functioning. Furthermore, disengagement accompanied (and possibly preceded) negative psychological affect. Participants described a negative state accompanied by a sense of fear, depression, and vulnerability.

Other participants described the influence of factors external to the self — labelling and stigmatisation. Jack, aged 88, had significant hearing loss and was slow to speak and walk, but had no major health conditions. He felt external social factors can encourage the adoption of a frailty identity — and lead to physical decline and death:

“I think once you're sort of labelled frail... there is a tendency to get worse but I don't know whether that's ... due to psychology or not but I tend to think that there are pressures on people who are frail that they the majority tend to get worse and therefore they eventually pass away I suppose or depart this life”

Diana (79, who had Parkinson's disease and a history of cancer) discussed the effects of the stigma of being frail. She said:

“If you say you're frail, people will treat you differently ... if you say that you are going to see such and such a person she's now very frail. They're afraid of involving them ...yes, I think people then treat them differently. Attitude is we shan't ask you to do things”

Not only was it believed that people who self-identified as frail disengaged (or withdrew) from participation in social activities, but when

others considered them frail, they were avoided and excluded from social activities. Social isolation could occur by the person being excluded because of others and their assumptions made about the older person (i.e., that they were frail and unable to participate). Diana believed the social consequence of being excluded was very damaging, reducing their motivation for social participation and increasing their risk of further exclusion.

The above examples highlight the effects of labelling for people who already acknowledge some of the symptoms of advancing age — who are perhaps aware of their progression towards frailty. However, other participants were clear that labelling can have important influences on health even in those not showing symptoms. Several participants described situations when they had not taken notice of their own age-related conditions until other people commented on them and mentioned their age. If an individual was treated in terms of an age-related stereotype, they might take on a frailty identity. Activating ageing stereotypes could lead an individual to see their health symptoms differently —resulting in self-identification as frail. When Theo, 68, was asked if others treated him like he was frail, he said:

“I don't think you should label people as being frail um no, no I wouldn't, wouldn't want to stigmatise people by saying ya know I think you're frail um know you are getting older and you can't do as much as you perhaps would like to do”

Theo acknowledged labelling does occur but strongly opposed the assumption that older adults by definition were unable to do certain things or needed help. Frustration with such ageist attitudes was a common experience: participants described the tendency of others to perceive ageing in stereotypical terms rather than acknowledging its dynamic process with considerable individual variation. Beyond assumptions made about them because of their age, participants discussed how being labelled as frail was negative and led to identification — which, in turn, could be harmful to health. Caitlyn, 78, described some of these consequences of labelling:

“I think some people feel very self-conscious about it, the fact that they would seem to be frail. Some people would regard that as a, um, I think the main fear probably if you are regarding yourself as frail is you can see there lies the path to lack, a loss of independence”

Self-identifying as frail was perceived as a potential outcome of the labelling process and related to the consequences of frailty that she had described earlier in the interview: “losing your independence.” Her understanding was that the consequences of self-identifying as frail could also occur as a result of being labelled. Notably, the path from being labelled as frail to self-identifying as frail was not regarded as inevitable: as is discussed in the following section, there was considerable resistance.

Strategies to resist identification

Most participants did not self-identify as frail suggesting people may have the ability to resist this process, even in the presence of influences encouraging self-perceptions as frail. From the interviews with participants who did not consider themselves frail, different methods of resistance were explored. Three main strategies to resist a frailty identity were identified. First, being active (physically, mentally, or socially) even at lower levels than previously, was seen as important. This strategy was not only employed by participants who had fewer health conditions or functional impairments, but by those in a more negative state of health and who could objectively be classified as frail. Common amongst the latter participants was an emphasis on current abilities and activities. Josh had multiple health conditions but did not identify as frail. He explained:

“No um I am more limited than I used to be but I can still walk and cycle and swim and dig um and you ask my wife and she'll tell you I can talk the hind leg off a donkey”

Being physically able and engaging in social activity were ways to resist identifying as frail. “Doing things” was a strategy used by several participants to “fight against frailty.” These participants believed engaging in social activities would deter the onset or progression of frailty.

A second strategy reported by participants was relating their experiences to a particular limitation, part of the body, or attributing it to a specific, isolated, event — rather than to a more general, chronic state of ill-

health. Sarah experienced functional limitations with balance and the right side of her body as a result of a stroke but did not self-identify as frail. Directive attributions like this were made by other participants who could be classified as frail: drawing subtle distinctions between frailty and their particular health experiences allowed acknowledgement of the reality of their illnesses or impairments while simultaneously resisting the frail identity.

The third strategy employed by participants to avoid self-identifying as frail was social comparisons with others they considered to be frailer. These participants focused on things they could still do that others could not. Such downward comparisons allowed participants to view themselves more positively and distinguish themselves from who perceived to be “worse off”. Patricia, 83, used a wheelchair and was considered frail on the CFS. When asked about her limitations, she replied:

“sometimes I wish I was a bit more able body than I am but then I got me hands and me arms and I've got me sight.... I got me hearing whereas some poor old souls ain't got that”

She described her limitations but simultaneously emphasised she is not one of the “poor old souls.” She used social context (other care home residents) to resist identifying as frail.

While most participants currently resisted a frailty identity and employed strategies to avoid it, there was also an acknowledgement of the perceived inevitability of adopting the identity in the future. This view was

present amongst the younger participants who had comparatively better health. Such participants highlighted the preventative actions they take to delay frailty, including following a healthy diet, exercising and “staying active.” Mae, 69, reported no health issues, but when asked if she considered herself frail said, “not at the moment, no.” She went on to express how she was thankful not to be frail and stated it was possible in the future she might be.

“Not to say in years to come but um we’ll cross that bridge when we come to it and we won’t, we won’t sit around waiting for it to come.”

In short, participants recognised a frailty identity might be a future aspect of the self, but failed to let that prospect change their positive approach to day-to-day living.

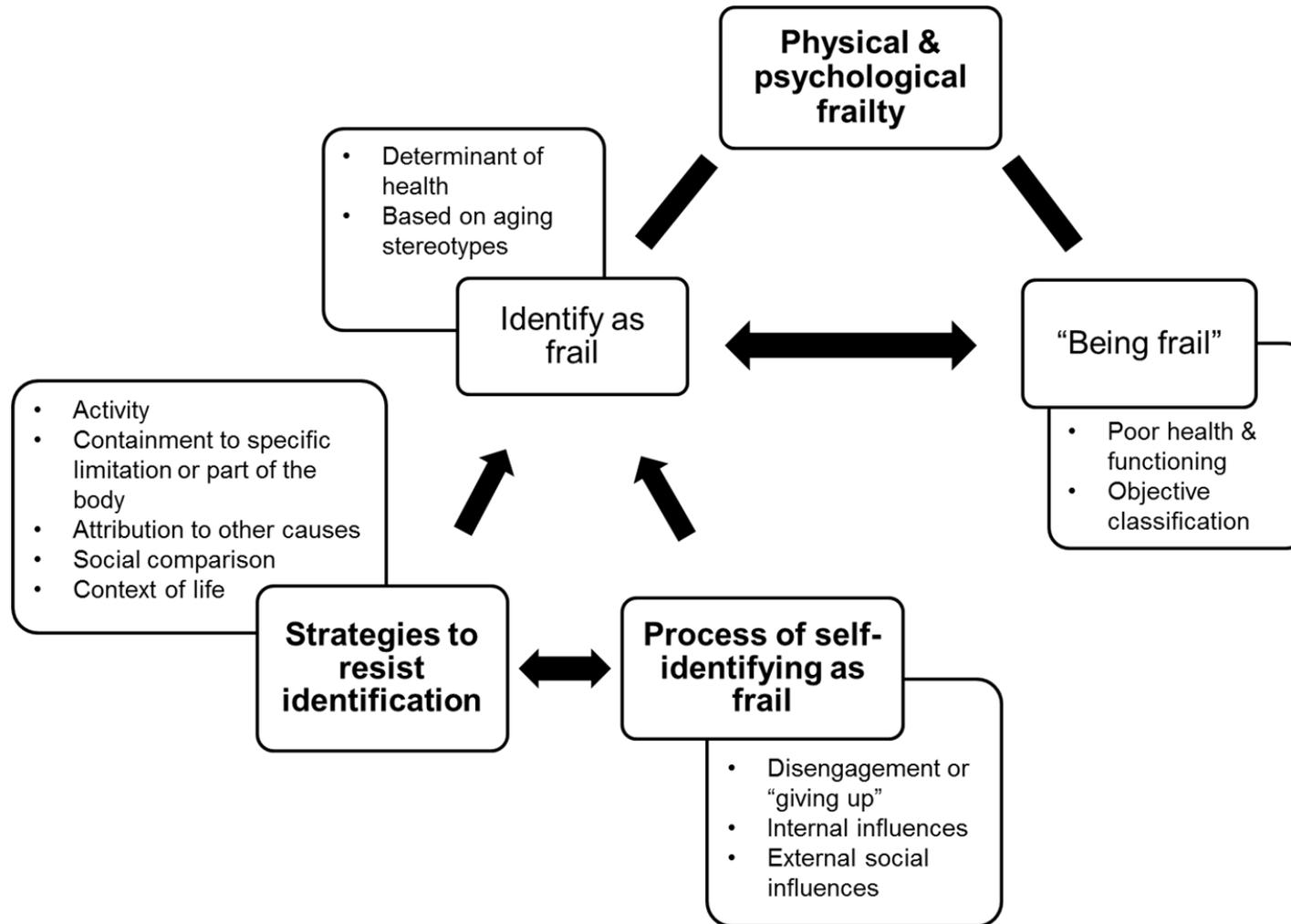


Figure 6.2. Model of frailty identity in older adults

6.3.1. Discussion

The aim of this qualitative study was to explore adults' perceptions of frailty and their beliefs concerning its progression and consequences. Reflecting earlier research (Grenier 2007; Puts et al. 2009) older adults in this study described frailty as a negative physical and psychological condition. The presence of illness and impairment (an objective classification of frailty) did not always coincide with participants' feelings of frailty or identifying as frail (Grenier 2006; Puts et al. 2009). Adopting a frailty identity was not regarded as an inevitable consequence of frailty-related symptoms. Identification as a frail person occurred when one: (1) embodied the assumed characteristics and behaviours of the identity, such as advanced age, physical limitations, and disengagement; (2) willingly assumed that label; (3) accepted a label imposed by others. Consequences of identifying as frail were highlighted by participants, including poor health and functioning, disengagement from physical and social activities, depressive thoughts, negative affect, stigmatisation, and discrimination.

For participants who did self-identify as frail, they did so because of something out of their control (i.e., age or physical limitations), and they could not deny that they were frail. While for them, physical decline led to self-identification as frail, for others it did not and triggered resistance and positive adaptation. Most participants actively resisted the identity, even those who could be classified as frail using objective criteria. They described a frailty identity as transitional and as a condition of specific circumstances (e.g., labelling and treatment from others). They used a

variety of resistance strategies: (1) emphasising abilities and activity; (2) attribution to particular cause, part of the body, or event; (3) social comparisons (see Figure 6.2).

The conceptualisation of frailty varied between older adults and differed with that used in clinical contexts. The classification of frailty is often used to identify patients who are more likely to suffer adverse outcomes or unintended side effects of interventions or medications (Clegg et al. 2013); a classification can be helpful for care-planning. However, the current interviews highlighted a discrepancy between the way frailty is operationalised in clinical settings and older adults' personal understanding. Older adults' views of frailty reflected common old age stereotypes (see Hummert 2011) and were similarly negative (e.g., Grenier 2006; Puts et al. 2009), including psychological (thoughts of giving up and feelings of vulnerability), behavioural (disengagement), and social (stigmatisation) components. Furthermore, participants in this study discussed frailty and disablement interchangeably, in contrast to the clinical conceptualisation of it as a vulnerable state that could lead to adverse health outcomes like disability (Fried et al. 2004). Although this previous research has investigated older adults' descriptions of old age and frailty, this work explored how older adults interact with this representation and its possible effects. Psychologically identifying as *frail* was regarded by older adults to have deleterious consequences for health and wellbeing. Specifically, self-identifying as frail stemmed from and could lead to disengagement from physical or social activities which, in turn, would lead to reduced physical functioning and further decline. In short, older adults in this study perceived

frailty in terms of a “cycle of decline” in which health changes can both be a cause and an outcome of self-identifying as frail. This study was the first to provide evidence of this relationship between older adults’ beliefs regarding frailty and their health; that is, identifying as frail was not only informed by health but also was a believed determinant of it.

Furthermore, the discrepancy between the clinical understanding of frailty and the way people perceive frailty has important implications for older people’s wellbeing (especially, when receiving care or support). While frailty classifications can be useful in guiding clinical care, our findings suggest it is also important to take account of how individuals and others perceive and respond to their experiences of frailty. As participants in this study expressed, labelled as frail — particularly against one’s will — was seen as damaging to health, because it may lead to behavioural confirmation of the label. In other words, treating people as if they are frail may increase the likelihood they will self-identify as frail. When labelling occurs, unless people possess strategies to resist, their health and wellbeing may be compromised. When treating or caring for older adults, one must be aware of how their actions may impact them or how the older adult may perceive them. Further work is needed to identify which behaviours or sources may be the most harmful by encouraging older adults to self-identity as frail. For example, the act of offering assistance from a particular individual (e.g., a young stranger) may indicate to the older adult that they are viewed by them in a stereotypical way such as unable or even frail.

In many ways, older adults' experiences reflected those of members of other socially stigmatised groups, such as racial minorities or people with obesity (Major, Mendes, & Dovidio 2013). The current participants described the readiness of others to label them as frail, often on the basis of isolated events or temporary impairments. Given the negativity of the frailty identity and its believed consequences, it was unsurprising that most participants resisted self-identifying as frail. These resistance strategies were a way to "protect" the individual self — to affirm an individual identity (distinct from the negative frailty identity) or to articulate a preferred identity. For example, older adults' dissociation from their age group has led to better psychological wellbeing (Weiss & Lang 2009). This study explored the possible ways older adults resisted this identity and has proposed a few strategies by older adults in different conditions and contexts. However, future work exploring the ways older adults can be encouraged to employ these resistance strategies is warranted. Using this knowledge, the harmful consequences from self-identify as frail may be avoided because older adults would have positive responses to age-related changes or ill-health.

While resistance to frailty featured heavily in the discourse of participants, resistance is unlikely to be the response of everyone. Several participants described people they knew who readily adopted a frailty identity and used this identity to gain attention and assistance from others ("wallowing" in frailty). Readily adopting a frailty identity could damage health as suggested earlier; however, it is possible that assuming a frailty identity could be beneficial to that individual. Previous research has found that individuals with chronic illnesses change or assume identities (e.g., "the

patient” or “ill”) to receive financial resources and support from others (Charmaz 1995). Disengaging from activities and showing inability may be ways of performing this identity to receive some benefits. Indeed, frailty stereotypes have been invoked for the purposes of collective action and can feature in political agendas: Grenier and Hanley (2007) showed how a frail identity can be used to challenge preconceptions about ageing and improve care and services. Therefore, if an older adult identifies and acts “frail”, they may be more likely to attract attention, get support from the people around them, or gain access to services. Further investigation is needed into the reasons and situations where an older person may benefit from assuming a frail identity.

A limitation of the current research is the sample did not include any participants classified as severely frail on the CFS, or older adults with significant cognitive impairments. If such individuals were included, then different perceptions of frailty may have emerged. While the sample included individuals with diverse experiences with frailty, a large age range, varied backgrounds, and a range of living situations, sampling occurred in a relatively small geographical area. Older adults with different demographics may report different experiences and understandings of frailty.

To conclude, this qualitative study examined older adults’ perceptions of frailty and their beliefs concerning its progression and health consequences. From the findings an understanding of frailty as a self-relevant identity as well as the process by which self-identification occurs and is resisted, is offered. Understanding the experiences and development of a frailty identity may inform the approaches taken to address the health

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and activity levels of older adults. Older adults' perceptions must be acknowledged and reflected in their care.

6.4. Conclusions from the qualitative study

The main purpose of this qualitative work was to elaborate and contextualise the underlying processes in the relationship between ageing perceptions and frailty in order to understand these processes better and explain the findings of the previous work. The findings from the systematic review (Chapter 4) and secondary analysis (Chapter 5) supported a relationship between ageing perceptions and negative health outcomes (frailty), but it was not present in everyone. Namely, an older person who perceives ageing negatively did not become frail, as the theorised model (Figure 6.1) and previous research (e.g., Levy, 2009) proposed. Therefore, the relationship between ageing perceptions and frailty was examined to identify any factors that were possibly overlooked or not considered.

By exploring the views and understandings of older adults, the qualitative study elaborated the processes involved in the relationship between ageing perceptions and frailty and on how these processes occur in their daily lives. The ways that ageing perceptions were formed by health and influenced older adults varied. There was evidence of the participants using many of the theorised mechanisms (i.e., stereotype threat, comparison, externalisation, and internationalisation; see Figure 6.1) through which ageing stereotypes and perceptions can impact older people (T. Bennett & Gaines, 2010). For example, stereotype threat (Steele, 1997; Steele et al., 2002), or the apprehension when a stereotype is self-relevant and an individual may sense that they are being judged in terms of that stereotype, was present in the discussions about being labelled as frail (e.g., Caitlyn's quote in Section 6.3.4). Externalisation (i.e., normative expectations about

ageing and how they can be revised in response to personal experiences) was another example of a theorised mechanism in participants' responses. This mechanism was evident among the participants who considered themselves frail in their acceptance of frailty due to their age or health conditions (see Lonnie's quote in Section 6.3.4). They expected to be frail because they were older and had multiple health conditions and impairment. This evidence supported the multiple pathways by which ageing perceptions can influence older people that are hypothesised in previous literature (T. Bennett & Gaines, 2010; Chapter 2, Section 2.3.3). From these cases, it is clear that negative views of ageing can influence older adults, and there is not one causal pathway.

From this qualitative exploration, identification was also found to be a contributing factor in the relationship between ageing perceptions and frailty. This study showed how identification played a role in older adults' ageing perceptions as well as the ensuing cognitions and behaviours. Participants in the study reiterated that self-identifying as frail had negative consequences, including poor health and functioning, disengagement from physical and social activities, depressive thoughts, negative affect, stigmatisation, and discrimination. Specifically, self-identifying as frail stemmed from and could lead to disengagement from physical or social activities which, in turn, would lead to reduced physical functioning and further decline: a 'cycle of decline' described in Section 6.3.4. Identification could potentially explain the findings of the previous study (secondary analysis in Chapter 5). That is, not all the older adults who had negative perceptions of ageing predicted frailty and further decline in the future. In

some cases, negative ageing perceptions did not result in frailty because they did not identify as frail. Accordingly, the older person did not have the health-related consequences associated with identifying as frail, and they do not become frail even though they have negative ageing perceptions.

For a few participants, self-identifying as frail reflected an acceptance of their multiple limitations and was undeniable. Conversely, for the majority of participants, identifying as frail was not determined by their functional limitations or health, and they did not identify as frail. Other researchers have similarly found that older adults do not refer to themselves as frail (Becker, 1994; Grenier, 2006; Grenier & Hanley, 2007). In the current study, the participants who did not self-identify as frail described how they had control over how they thought about being frail and how they acted in response to health changes (e.g., 'fight against it'; Diana's quote in Section 6.3.4). The resistance strategies found in this study showed the different ways older people cope with negative ageing perceptions or changes in health – particularly, the cognitive or physical limitations related to frailty.

This study revealed that the initiation or use of these resistance strategies (e.g., social comparison or engaging in social activities) influenced the extent to which an older person self-identified as frail. For that reason, the use of resistance strategies could also be used to explain the findings of the previous study (Chapter 5). An older adult may endorse negative ageing stereotypes yet not identify as frail because they attributed their functional limitations to a particular event (e.g., a stroke) and not old age or frailty. By using this resistance strategy, the older person did not self-identify as frail and therefore did not disengage from physical activity or have depressive

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thoughts. Subsequently, the older person did not become frailty or physically declined further. In this example, the older adult had negative ageing perceptions, but frailty did not develop because they employed a resistance strategy.

Chapter 7: General Discussion

7.1. Chapter overview

In Section 7.2 of this final chapter, the aims of the thesis and each piece of the empirical work conducted are revisited. The findings of the three pieces of work are summarised and discussed in relation to previous literature in Section 7.3, and Section 7.4 discusses the theoretical contributions of the overall findings of the thesis. Next, in Section 7.5, the implications of the research (e.g., for intervention development and practice) are considered followed by a discussion of the strengths and limitations of this thesis (in Section 7.6). Section 7.7 outlines suggestions for future research directions. The chapter ends with overall conclusions from the thesis in Section 7.8.

7.2. Review the thesis aims and empirical work

The overall aim of this PhD was to advance the understanding of frailty in older adults and its relationship with ageing perceptions. Previous research into frailty has mainly drawn on a biomedical model to consider internal factors such as disease (Chapter 2, Section 2.2). However, this thesis uniquely adopted a biopsychosocial approach to frailty as a basis by which to investigate the relationship to ageing perceptions (Chapter 2, Section 2.3). Drawing from previous research (Chapter 2, Section 2.3.3), the thesis investigated the role of ageing stereotypes, attitudes, and self-perceptions in the development and progression of frailty. A model (Figure 7.1 below)

was developed to depict the hypothetical relationships between older people's ageing perceptions and frailty in the empirical work.

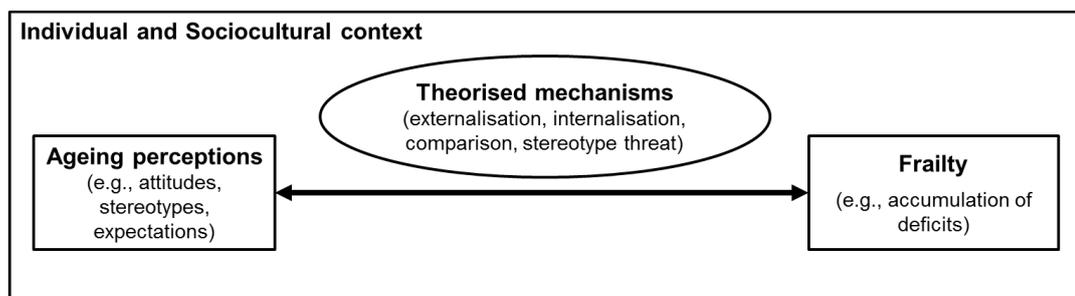


Figure 7.1. Proposed model of the relationship between older adults' ageing perceptions and frailty investigated

Three pieces of empirical work were conducted to study the theorised relationship between older adults' ageing perceptions and frailty (arrow in Figure 7.1). Chapter 4 presented a systematic review of the evidence of the relationship between older adults' perceptions of ageing with their health and functioning. Since frailty involves several bodily systems and presents in heterogeneous ways (as described in Chapter 2, Section 2.2), the review's aim was to test whether ageing perceptions related to different health outcomes and conditions, including those associated with frailty. To achieve this aim, this piece of work synthesised past observational research.

Chapter 5 investigated the association between ageing perceptions and a frailty measure using data from a large longitudinal dataset. This work extended the findings of the review by examining frailty directly and examined whether negative ageing perceptions predicted further decline (i.e., frailty years later).

Although the two previous pieces of work found a relationship between older adults' ageing perceptions and their health (Chapter 4) and frailty (Chapter 5), the mechanisms by which ageing perceptions are related to frailty have not been studied (Chapter 2). The final study (Chapter 6) investigated the relationship between ageing perceptions and frailty, using qualitative methods. This study's broad aim was to elaborate and contextualise the relationship between ageing perceptions and frailty (shown in Figure 7.1) in order to understand underlying processes better and explain the findings of the previous work. The study explored: (1) older adults' perceptions of frailty; (2) their beliefs concerning its progression and consequences; (3) and the role of ageing perceptions in the context of frailty.

7.3. Summary of the main findings

Collectively, the three pieces of research reported here showed that older adults' ageing perceptions are related to the development and progression of frailty. Furthermore, ageing perceptions were associated with older adults' health and how they viewed themselves – whether they identify as frail and the different strategies they may use to resist identification. The following three sections briefly summarise the main findings of each piece

of empirical work. Finally, a revised model of the relationship between ageing perceptions and frailty, developed from the combined findings of the three pieces of work, is presented in Section 7.3.4.

7.3.1. Ageing perceptions and health

Previous research suggests that how individuals perceive older people and the process of ageing can impact their thoughts and behaviours (Levy & Myers, 2004; Levy, Slade, Kunkel, & Kasl, 2002; reviewed in Chapter 2). Since older people are commonly stereotyped as mentally or physically impaired and dependent (Brewer et al., 1981; Hummert, 1990, 2011), frailty is regarded as a common and inevitable feature of ageing. Previous research found that such views have the ability to influence health in later life (Horton et al., 2007; Levy, 2009). A relationship between ageing perceptions and health was verified to support the theorised relationship between ageing perceptions and frailty (Figure 7.1). Since frailty involves multiple bodily systems and presents in heterogeneous ways (Rockwood et al., 2000; Chapter 2, Section 2.2), the relationship between older adult's ageing perceptions and their health and functioning was investigated in the first piece of work (Chapter 4). This investigation established that the impact of ageing perceptions extended beyond a single domain (e.g., cognitive performance) to a variety of health outcomes and conditions. By determining that a relationship existed between older adults' ageing perceptions and their health and functioning, the relationship between ageing perceptions and frailty could be tested in the subsequent piece of work (Chapter 5).

The systematic review of observational research (Chapter 4) revealed a significant relationship between older adults' ageing perceptions and their health in seven different domains: health status, wellbeing and quality of life; memory and cognitive performance; physical and physiological performance; medical conditions and outcomes; disability and functioning; healthy behaviours; and mortality (see Table 4.4). Generally, older adults who had negative perceptions of ageing were more likely to have poor health and functioning. Some of these health and functioning domains are associated with or used to indicate frailty (e.g. disability and medical conditions), suggesting that there could be a relationship between ageing perceptions and frailty.

The conclusions of the review were limited for two main reasons. Firstly, the majority of the studies were cross-sectional. Secondly, there was some evidence supporting differing explanations and conceptual models in the longitudinal studies. Some of these studies in the review found that negative perceptions of ageing predicted later poor health and functioning, supporting stereotype embodiment theory (Levy, 2009) and the internationalisation hypothesis (T. Bennett & Gaines, 2010). However, other studies included in the review (e.g., Sargent-Cox, Anstey, & Luszcz, 2012a) found evidence of the reverse relationship; i.e., that adverse health experiences predicted negative perceptions. These latter studies provide more support for the externalisation hypothesis (T. Bennett & Gaines, 2010), which advocates that expectations (or beliefs) about getting older can be revised in response to personal experiences (e.g., health changes). For these reasons, conclusions about the directionality and causality of the

relationship between ageing perceptions and older adults' health were restricted and needed further investigation.

7.3.2. Ageing perceptions and frailty

Despite these limitations, the systematic review revealed that ageing perceptions were associated with a variety of health and functioning measures (Chapter 4). Such a finding supported the hypothetical relationship between ageing perceptions and frailty (Figure 7.1). However, an association between older adults' ageing perceptions and frailty had not been directly investigated previously. To address this limitation and corroborate the proposed relationship between ageing perceptions and frailty, a secondary data analysis was conducted using data from a large longitudinal dataset. This analysis (Chapter 5) had two aims. Firstly, the study aimed to test whether there was an association between older adults' ageing perceptions and frailty, extending the findings of the systematic review to a measure of frailty (i.e., a Frailty Index). The study tested whether negative perceptions of aging were associated with higher frailty scores as findings from the systematic review would suggest. The second aim of the study was to test whether ageing perceptions could predict later frailty. By analysing the relationship longitudinally, this study aimed to determine whether negative ageing perceptions related not only to frailty but contributed to its onset and progression in older adults.

The analysis showed that negative perceptions of ageing were associated with greater frailty and also predicted frailty later. This pattern remained

even when adjusting for participant age, sex, depression symptoms, and socioeconomic status. Put simply, older adults who viewed ageing more negatively were more likely to be frail and become more frail six years later. This finding complements previous research that has found that ageing perceptions predict other related health outcomes, such as functional health (Levy, Slade, & Kasl, 2002; Sargent-Cox et al., 2012b) and mortality (Levy, Slade, Kunkel, & Kasl, 2002; Sargent-Cox et al., 2013). While the effect was statistically significant, it is noteworthy that ageing perceptions explained little variance in the longitudinal model; that is, they were not strong predictors of frailty years later. This finding was discussed in terms of the measure of perceptions of ageing available in the dataset (ELSA). The ELSA perceptions of ageing measure did not distinguish between self-perceptions and general perceptions toward ageing. According to some theories (e.g., internationalisation hypothesis), this distinction is crucial for the older adults' health to be influenced by their ageing perceptions. Furthermore, many of the previous studies in the systematic review (Chapter 4) focused on self-perceptions of ageing rather than general views towards ageing. If the perceptions of ageing measure had distinguished between self-perceptions and general views then the study may have found older adults' ageing perceptions were a stronger predictor of frailty years later.

Overall, the results of this piece of work showed that there was a relationship between ageing perceptions and frailty, extending the findings from the systematic review study. However, it was also clear that simply having negative perceptions of ageing did not inevitably lead to frailty in the

future. That is, an individual may endorse negative views of ageing (e.g., old age as a time of ill-health) but not become frail him or herself. Such a finding suggests that there are moderators of the relationship between ageing perceptions and negative health outcomes which were not acknowledged or considered. The underlying mechanisms and influential variables in the relationship (e.g., social comparison, stereotype threat and identity) between older adults' ageing perceptions, health, and frailty were examined in the next study (Chapter 6).

7.3.3. Identifying as frail

The systematic review in Chapter 4 and secondary analysis in Chapter 5 determined that there is a link between ageing perceptions and frailty (indicated as an arrow in the Figure 7.1 above). However, it seemed that this link may not be present in everyone and it is possible that there might be other factors which structure that relationship or carry its effect that were not included in the heuristic model (Figure 7.1). The final piece of work (Chapter 6) investigated the relationship between ageing perceptions and frailty so as to identify the mechanisms and moderators of it. The qualitative study explored attitudes and views of older people towards frailty and considered how ageing perceptions were thought to influence them. There were three key findings. First, it was observed that older adults' understanding of frailty was informed by ageing stereotypes. Second, older adults believed that identifying as frail encouraged attitudinal and behavioural confirmation of it. Third, it was found that self-identifying as frail

was not an inevitable consequence of frailty-related symptoms and was deterred with the use of resistance strategies.

A clear finding from the qualitative study was that the way in which older adults conceptualised frailty differed from biomedical models. This finding supports previous qualitative research (Grenier, 2006; Puts et al., 2009) that found that older adults' conceptualisation of frailty included social and psychological aspects (discussed in Chapter 2). Biomedical models of frailty (e.g., phenotypic frailty; Fried et al., 2001) often do not consider the ways that social, psychological, and behavioural factors are connected to the development and progression of frailty in older adults. Moreover, older people's conceptualisations of frailty reflected common negative old age stereotypic beliefs about ageing (ill-health, functional limitations, mobility difficulties, reclusive, and depressed; Hummert, 1990; 2011; see Chapter 2, Section 2.3.3).

As previous research has suggested (e.g., Levy, 2009; Chapter 2, Section 2.3.3), stereotypes and perceptions of ageing were related to older adults' self-views. According to participants in the study, identity played a role in the relationship between ageing perceptions and frailty. Identifying as frail was believed to have negative consequences, including poor health and functioning, disengagement from physical and social activities, depressive thoughts, negative affect, stigmatisation, and discrimination. More specifically, self-identifying as frail stemmed from and led to disengagement from physical or social activities which, in turn, would lead to reduced physical functioning and further decline. In short, older adults discussed a 'cycle of decline' in which health changes can both be a cause and an

outcome of self-identifying as frail. Accordingly, identifying as frail was perceived could result in the development of frailty and further physical decline. However, participants felt that this process could be avoided if the older person resisted identifying as frail. For instance, an older adult could endorse negative ageing stereotypes yet not identify as frail. This distinction could determine whether frailty develops and explained the variance observed in the secondary analysis data (Chapter 5). In the secondary analysis, not all the older adults who had negative perceptions of ageing became frail or physically deteriorated further years later. Some of them may have not self-identified as frail and thus negative ageing perceptions did not lead to frailty.

Indeed, most participants actively resisted identifying as frail, even those who could be classified as frail using objective criteria (i.e., Clinical Frailty Scale; CFS). These participants used a variety of resistance strategies: (1) emphasising abilities and activity; (2) attribution to a particular cause, part of the body, or event; (3) social comparisons. Depending on their circumstances (e.g., specific functional limitations, living situation, or amount of independence), participants reported employing these strategies in order to view themselves positively and to resist the negative connotations associated with identifying as frail. These resistance strategies protected the individual self by affirming an individualised identity (distinct from the negative frailty identity) or articulating another, preferred self-identity (e.g., 'independent' or 'fit'). These findings supported Zebrowitz's (2003) proposal that older people use individuating information about

themselves and compensatory behaviours to resist internalising the negative views of ageing.

7.3.4. Model of the relationship between older adults' ageing perceptions and frailty

Drawing from the findings of all three studies, the proposed model (Figure 7.1 in Section 7.2) can now be revised in an attempt to elucidate more fully the relationship between ageing perceptions and frailty. Overall, the relationship between older adults' ageing perceptions and frailty presented in this model is more complex compared to the originally proposed model and previous theories (e.g., stereotype embodiment theory; Levy, 2009). The preliminary model was the starting point for the systematic review (Chapter 4) and secondary analysis (Chapter 5); Figure 7.2 depicts the revised model that incorporates the findings from all the empirical work (Chapter 4, 5, and 6) and relevant previous literature (e.g., Zebrowitz, 2003).

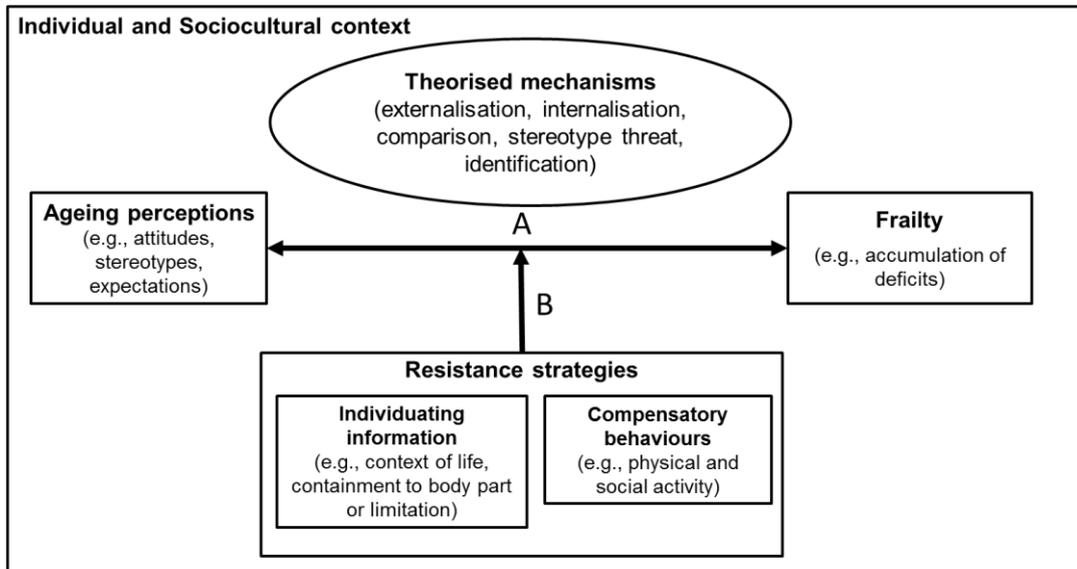


Figure 7.2. Revised model of frailty and its relationship with older adults' ageing perceptions and their health and functioning

The revised model suggests that the relationship between ageing perceptions and frailty is multidirectional and nuanced. From the systematic review in Chapter 4, it was observed that older adults' ageing perceptions were related to their health and functioning in multiple domains (see Section 7.3.1) – an older adult who has more negative ageing perceptions (i.e., endorses ageing stereotypes, holds negative attitudes towards ageing, and has low expectations about old age) is more likely to have poor health and functioning (Path A). Several of those health and functioning domains (e.g., disability, poor cognitive functioning, and comorbidity) signify the development of frailty and are consequences of it. Moreover, when tested (secondary analysis in Chapter 5), older adults' ageing perceptions were found to be associated with and even predict greater frailty (Path A).

Previous literature (e.g., T. Bennett & Gaines, 2010; see Chapter 2, Section 2.3.3) has suggested various theorised mechanisms (i.e., externalisation, internalisation, stereotype threat and comparison; depicted as an oval above Path A in Figure 7.2) through which ageing perceptions can influence health, and vice versa (Path A). Upon closer examination in the qualitative study (Chapter 6), it became clear that identification can play a role in the relationship between ageing perceptions and frailty (Section 7.3.3).

Furthermore, older people use the strategies (e.g., emphasising abilities and activity, attribution to specific cause, part of the body, or event) to resist negative ageing perceptions into their self-perceptions and the possibility of these views resulting in adverse health outcomes (i.e., frailty). The resistance strategies complemented Zebrowitz's (2003) proposal that older people use individuating information about themselves and compensatory behaviours to resist the influence of negative ageing stereotypes (illustrated as the box below the relationship between ageing perceptions and frailty) and were included in the model as Path B.

Lastly, it has to be noted that these processes take place in a broader individual and sociocultural context, which is indicated by the large box that the relationship is inside. The relationship between ageing perceptions and frailty is influenced by this context (e.g., cultural views of ageing or an individual's living situation). Personal and social contextual factors may determine whether this relationship exists as well as whether certain mechanisms and moderators are present. For instance, if cultural views of old age do not consider frailty as an inevitable consequence of ageing then

there may not be a relationship between an older individual's ageing perceptions and frailty.

7.4. Theoretical contributions and implications

The current thesis has advanced our overall understanding of frailty in older adults in a number of ways. First of all, it has discerned the role of psychosocial factors associated with frailty. Frailty has previously been investigated from biomedical, clinical and sociocultural perspectives (see Chapter 2, Section 2.2). These perspectives focus on problem and the context of frailty, but investigation into the underlying processes is still needed to understand how frailty develops and progresses. In particular, the social and psychological processes have received little attention (Chapter 2, Section 2.3). According to Markle-Reid and Browne (2003), current models of frailty overlook the role of contextual factors, subjective perceptions, and interactions between biological, psychological and social factors. By recognising the interrelationships among biological changes, psychological status, and the sociocultural context (Chapter 2, Section 2.3), the previously unstudied psychosocial processes related to the development and progression of frailty have been explored. The findings contribute to an understanding of frailty which is comprehensive and incorporates its heterogeneous and multifactorial nature. In particular, this thesis expands the current models of frailty beyond biomedical variables by including the physical, social, psychological, and contextual factors and their interplay.

Secondly, the work of this thesis adds to the literature on the health effects of ageing perceptions. Previous research has shown that ageing perceptions and beliefs can influence older adults in many ways, including impacting on physiological processes (e.g., Levy et al., 2000), behaviour (e.g., Levy & Myers, 2004), and psychological mechanisms (e.g., Levy, Slade, & Kasl, 2002). By demonstrating their relationship with the development and progression of frailty in older adults, this work buttresses the previous findings that ageing perceptions are connected to an older person's health and functioning in later life (e.g., Hausdorff et al., 1999; Levy, 2009; Sargent-Cox et al., 2012b). The physical and mental decline that is assumed to be the result of biological ageing can also be explained, at least partially, by non-biological factors (e.g., stereotypes and social support). People's beliefs about themselves and others play a role in their health, wellbeing and survival (Jetten, Haslam, & Haslam, 2012). Furthermore, the relationship with frailty is particularly noteworthy because the indirect effects of ageing perceptions on survival through health decline have not been studied to a great extent (Westerhof & Wurm, 2015). Since frailty is a clinically-recognised state of increased risk of adverse outcomes after health changes (Strandberg et al., 2011), it is used to identify those older people who are most at risk of adverse health outcomes such as death. Accordingly, frailty may be a possible pathway through which ageing perceptions influence an older adult's survival.

Lastly, the findings of this thesis have been used to construct a comprehensive model (Figure 7.2) which articulates the underlying mechanisms and pathways of the relationships between older adults'

ageing perceptions, their health and functioning, and frailty. This model synthesises the multiple constructs of ageing perceptions and theorised underlying processes from previous literature (e.g., T. Bennett & Gaines, 2010; Diehl et al., 2014; see Chapter 2, Section 2.3.3) and builds on this by integrating and constructing a more complete or holistic theory. In this model (Figure 7.2), identification is another possible mechanism by which ageing stereotypes and perceptions affect older adults and can lead to a self-fulfilling prophecy (Jussim et al., 2000; Merton, 1948). That is, identification as 'old and frail' can lead older people to engaging in certain behaviours (e.g., disengaging from physical and social activity) and cognitions (e.g., depressive thoughts or threat), which may lead to frailty and further health decline. Additionally, this model presents strategies whereby identification (and other theorised mechanisms) can be resisted or influenced. These resistance strategies demonstrate how older people are able to differentiate themselves from these negative perceptions in order to prevent or stop health consequences such as frailty. This novel model of the relationship between older adults' ageing perceptions and frailty can guide future empirical research on frailty and the relationship between ageing perceptions and health in later life.

7.5. Practical implications

The findings of the thesis have only begun to explore ageing perceptions in relation to frailty in older adults, and many practical implications require further investigation. In this section, the possible implications and the necessary future work are identified and recommended. Section 7.5.1

begins by discussing how the thesis findings are relevant to the use of a classification, or label, of frailty. Section 7.5.2 considers the findings in relation to care and practice, including patient interactions with healthcare professionals and their experiences with services. Section 7.5.3 describes how the processes and relationships studied in the current thesis could contribute to the development of interventions for older adults in the future.

7.5.1. Implications for the classification or assessment of frailty

Despite the lack of consensus on a standard definition of frailty (Rodríguez-Mañas et al., 2012), frailty classifications and measures are increasingly used in the planning and delivery of health and social care of older adults (Clegg et al., 2013). For example, any interactions with an older person and a healthcare professional are now being encouraged to include an assessment of frailty (British Geriatrics Society, 2014). However, the current findings (Chapter 6) highlight the discrepancy between how frailty is operationalised in clinical settings and older adults' personal understandings of it (e.g., Grenier, 2006; 2007; see Chapter 2). The biomedical perspective considers frailty as distinct from ageing (Chapter 2, Section 2.2.1) and as treatable (Chapter 2, Section 2.2.4). In contrast, older people's understandings of frailty incorporate one's identity, relationships, and coping with changes or losses, and they consider it as an inevitable part of old age (Chapter 6). While frailty classifications can be useful in guiding clinical care, these findings suggest that it is important to take account of individuals' perceptions and understandings of frailty.

A direct implication of this research is that a classification, or diagnosis, of frailty would be unlikely to mean the same to an older person as it does to a healthcare professional and service provider. This distinction is exemplified by older adults not referring to themselves as frail (Becker, 1994; Grenier, 2006; Grenier & Hanley, 2007). Resistance to the concept of *being frail*, or the imposed medical or functioning classification, was previously identified by Grenier (2006). From findings of the qualitative study (Chapter 6), it was clear that older adults view frailty in a negative stereotypical manner, and identifying as frail was believed to have many health and social consequences (Section 7.3.3). Frailty was perceived negatively not only in terms of health but also in outlook and coping. Past research (Andrew, Fisk, & Rockwood, 2012; Fillit & Butler, 2009) supports these findings that considering one's self to be frail may hinder one's ability to see oneself in the future, or conceive future opportunities, and be harmful to psychological wellbeing. In other words, older people's understandings of frailty include psychological (e.g., depressive thoughts and negative attitudes) and social components (e.g., stigmatisation, discrimination and disengagement from social interaction), and biomedical approaches do not (see Figure 7.2).

Since older adults' understandings of frailty include physical, cognitive, psychological and social aspects, comprehensive assessments of each of these should be incorporated in clinical tests. Although comprehensive assessments may not be feasible for every older patient (e.g., because of time constraints), the use of these measures may provide a better detailed account of an individual that can be used to develop a personalised care and support plan. Assessments that are more comprehensive and holistic

are known to be useful in determining the effectiveness of an intervention targeting frailty and describing the health trajectories over time (Cesari et al., 2014).

Being labelled as frail can be stigmatising (see Chapter 6), and feeling stigmatised can represent a threat to one's positive self-view or identity (Branscombe, Ellemers, Spears, & Doosje, 1999). The stigma associated with being labelled as frail could have consequences for older people's behaviour. In a study on the negative effects of self-categorisation (Haslam et al., 2012), healthy older adults who were encouraged to categorise themselves as 'older' and to expect cognitive abilities to decline with age performed poorly on an assessment of dementia, with 70% of them meeting the diagnostic screening criteria for this condition. This finding suggests that a change in self-views can impact on diagnostic outcomes. With regards to a frailty classification, the possibility of being labelled as frail in an assessment could result in altered responses from the older person. They may, for example, report fewer health problems to avoid being labelled as frail. Conversely, they could perform poorly on a measure of frailty (e.g., balance test or cognitive assessment) due to an identity shift (i.e., thinking that they are old and frail). Further research could investigate these potential effects.

It is important to educate older people about what frailty is and what it is not. Healthcare professionals should explain to older people how frailty is treatable, presents heterogeneously, and is not an inevitable part of old age (see Chapter 2). Before any assessments of frailty are conducted, older people should be informed about what measures of frailty are assessing

(e.g., mobility, social support or depression) and what they imply about them (e.g., increased risk of disability or death). By informing older people, they can distinguish between a clinical frailty classification and ageing stereotypes. This distinction could reduce the stigma surrounding ageing and frailty because older people will realise that frailty is not an inevitable consequence of ageing but a condition that can be prevented and treated. Reducing this stigma could also lead to fewer adverse consequences of identifying as frail as the meaning of a label of frailty no longer has its negative connotations (depressive thoughts and disengagement).

7.5.2. Implications for care and services of older people

Aside from the implications for identifying frailty, the findings could have utility in the context of care and services of older people. Previous research (Minichiello, Browne, & Kendig, 2000; Ory, Kinney Hoffman, Hawkins, Sanner, & Mockenhaupt, 2003) has revealed the ageist attitudes held by some health professionals and caregivers and shows how these views can result in harmful behaviours in clinical settings (e.g., patronising messages, no offers of involvement in decision-making, and expectations of tolerance of pain or discomfort). For instance, nurses' attitudes were identified as a key reason why low standards of care for older people occurred in UK hospitals (Liu, Norman, & While, 2013). When nursing, medical, or allied health professionals use information based on stereotypes to inform their judgements about older people and their behaviour towards them, they treat their patients as a member of the stereotyped group and not as an individual (Carstensen & Hartel, 2006; Nelson, 2004). Healthcare policies in

the UK have encouraged the employment of patient-centred care, which focuses on patients' individual wants, needs, and preferences (NHS Patient Experience Framework, <http://www.dh.gov.uk/health/2012/02/patient-experience-framework/>). Negative ageing stereotypes apply general characteristics to individuals and work against the goals of patient-centred care.

In the qualitative work of this thesis (Chapter 6), participants discussed being labelled by others as frail, and some participants specifically discussed visits from or examinations with health professionals. In these situations, participants mentioned how health professionals reminded them about their age and limitations and reinforced the adoption of a frailty identity. Kaufman's (1994) observations showed how frailty can be constructed through social interactions in a clinical setting. In these interactions, older adults' lived experiences become lists of health or functioning problems. She proposed that frailty was a label imposed upon older people as a result of their interactions with the health care system and society (Kaufman, 1994). Context and feedback from others informs people's views about themselves, and interactions with healthcare professionals or informal caregivers might therefore have consequences for older adults' self-views. In a recent study (Kwak, Ingersoll-Dayton, & Burgard, 2014), it was suggested that being in receipt of care may make frail people more vulnerable to negative self-perceptions of ageing. The social interactions when the older person is receiving care may increase their risk for negative ageing perceptions. Although receiving care can be a source of support that buffers the effects of adverse health-related events

(e.g., illness and disabilities), it also can elicit negative perceptions of the self as an *old frail person*. In other words, older adults' exchanges with health professionals or caregivers may influence the older adults' self-perceptions of ageing more than their actual health condition. As this thesis found, negative ageing perceptions and identifying as frail can impact the older person's health (Chapter 4) and result in greater frailty (Chapter 5).

As discussed above, older adults' interactions with healthcare professionals and their experiences with services could influence their quality of care and self-view. Therefore, it is important for carers and health professionals to be made aware of the potential effects of negative perceptions of ageing and frailty (Chapter 4, 5 and 6). Programmes in the education and training (e.g., NHS Health Education England) for the care and services of older people should confront and challenge negative stereotypes of ageing and frailty. A systematic review investigating the effects of educational and teaching interventions on undergraduate attitudes in medicine found that interventions with longer durations, included contact with healthy older adults, or used an ageing simulation game were more effective at promoting positive attitudes towards older people (Tullo, Spencer, & Allan, 2010). For example, education in gerontological nursing could be revised to combine positive clinical learning experiences with effective interventions to improve attitudes towards older people (Liu et al., 2013). These programmes should inform carers and healthcare professionals about how their actions and comments to an older person can influence them. The goals of these programmes should be to encourage the treatment of older people with respect, dignity and compassion as an individual and not according to

negative stereotypic beliefs. Ultimately, patient-centred care could be enhanced by changing perceptions of ageing and frailty.

Further research is also warranted to study how interactions in clinical settings influence healthcare professionals' and caregivers' ageing perceptions and older adults' identification as frail. Twenty years after Kaufman's (1994) study, there is very little research exploring how frailty is collectively understood, expressed in social interactions, and guides behaviour. Studies that investigate the discourses between nursing, medical, or allied health professionals and older people are needed in order to gain insight into how these interactions can influence older adults' perceptions and identity. For example, when speaking to an older person, people often use simplified language and endearing or diminutive terms (e.g., "sweetie", "love", or "dear") which can be patronising and viewed negatively by an older person because they equate it with being treated like a child (The Gerontological Society of America, 2012). Communication between healthcare professionals and their older patients can have effects on their care and outcomes (Thompson, Robinson, & Beisecker, 2004). By studying these interactions, the care and services for older people can be improved, and recommendations for the teaching and training of health professionals and service providers can be made.

7.5.3. Implications for intervention development

Frailty in older adults is a heterogeneous and poorly understood health condition (Rockwood, 2005). The findings of this research have contributed to the overall puzzle of understanding frailty and its contributing factors.

Recognising the challenge and complexity of the issue, future interventions for the prevention or treatment of frailty must consider these different factors and their interactions in their development and planning. It has to be stated that this research is only the start and implications for interventions are not as readily actionable as those discussed previously in Sections 7.5.1 and 7.5.2. The following section discusses how this research could contribute to further empirical work for the development of an intervention.

The research conducted for this thesis could inform part of the intervention mapping process employed to develop new interventions that target frailty in older adults. Intervention mapping (IM) is an iterative process for the development, implementation and evaluation of health promotion and behaviour change interventions (Bartholomew, Parcel, Kok, Gottlieb, & Fernandez, 2011; Denford et al., 2015). IM has six stages: (1) needs assessment; (2) defining intervention objectives; (3) identification of underlying mechanisms; (4) developing practical ways of delivery; (5) implementation planning; and (6) evaluation (Denford et al., 2015). In the development of an intervention for frailty using IM, the work conducted as part of this thesis can be seen as contributing to the identification of underlying mechanisms and selection of change techniques. The findings here suggest that psychosocial factors need to be considered in an intervention for frailty and, in particular, highlight the contributing factors of ageing perceptions and frailty identity. Although more work is needed before the implementation of an intervention for older people, three different avenues for further research are offered below.

Firstly, modifying age-related perceptions may prevent or delay frailty in older adults and could be explored as a possible behaviour change technique. Few studies have attempted to modify ageing perceptions in order to encourage better health and wellbeing. In a recent physical activity intervention, Wolff and colleagues (2014) found that including initiatives to improve older people's views of ageing was effective at increasing their engagement in physical activity. These initiatives simply informed older people about the positive aspects of ageing and corrected their negative misconceptions. Wolff et al. (2014) found that these strategies were effective at modifying individual views. Providing information and knowledge is a commonly used and effective technique in behaviour change interventions (Abraham & Michie, 2008). The findings of this thesis support the view that more positive perceptions of ageing could help prevent or slow frailty (Chapter 4 and 5); providing positive information about ageing could help to encourage behavioural change. Techniques that highlight the positive aspects of ageing and challenge myths about old age could be employed not only on an individual level but on the societal level through the use of media portrayals, for example by showing television audiences older people who contradict negative views of ageing or highlighting the variability in older people's experiences (Kotter-Grühn, 2015).

Secondly, the findings of this thesis suggest that identification could also be used to encourage health-promoting behaviours in older adults (Chapter 6). Previous interventions which have encouraged positive shared identities (e.g., with others in a care home or being from the same generation) have shown improvements in older people's health and wellbeing (Gleibs,

Haslam, Haslam, & Jones, 2011; Haslam et al., 2010; Weiss & Lang, 2009). Future work could test whether building in an identity component could make interventions for frailty more effective. For example, in a study by Weiss & Lang (2009), older adults were encouraged to think about their generation (a collective identity) and not their age (a personal identity). The study found that this identity shift resulted in greater wellbeing. Similarly, interventions that promote adoption of a resilient or 'active ageing' identity could elicit thoughts and behaviours which could prevent frailty or further decline (e.g., physical activity or positive outlook). However, the delivery and feasibility of such interventions require further investigation. For example, Weiss and Lang's (2009) study included 68 older participants who had access and could use the internet, and their overall health status was not reported. This 'identity shift' may not be feasible using a different population (e.g., frail older adults) or on a wider scale.

Thirdly, as an alternative to encouraging other identities in an intervention, the findings of the qualitative study (Chapter 6) also revealed strategies used by older people to resist identifying as frail in their lives. For example, participants in the qualitative study resisted identification by using social comparison. Previous research (Frieswijk et al., 2007; Frieswijk et al., 2004a, 2004b) found frail older adults' wellbeing was greater when they used social comparison and did not identify with frail older people. Other research (e.g., Miche & Wahl, 2013; Stephan, Chalabaev, Kotter-Gruhn, & Jaconelli, 2013) has shown that providing positive older adults with social comparison feedback about their performance (cognitive recall and hand-grip strength, respectively) changes their perceptions of their own age and

improved their performance on the tasks. One can see how techniques based on positive feedback may be of benefit to new interventions. Such interventions could, for example, inform participants when they are performing better than their peers or similar to someone of a younger age on physical, mental, or diagnostic tasks. By providing positive social comparison information, participants may come to see themselves as less frail than previously and to resist identification.

Social comparison is just one possible technique for improving older adults' ageing perceptions and wellbeing (Kotter-Grühn, 2015). The resistance strategies found in the qualitative study (i.e., emphasising abilities and activity, attribution to particular cause, part of the body, or event, and social comparisons) may also be utilised as techniques for older adults to resist identification as part of an intervention for frailty. Currently, no previous studies have explored the use of the other resistances strategies. Further investigations would therefore be needed before these strategies could be implemented in an intervention.

7.6. Strengths and weaknesses of the research

This section considers the strengths and limitations of research conducted for the thesis. Earlier chapters have outlined the strengths and weaknesses for each particular investigation: these are not repeated here. Rather, the current section addresses the overall strengths and weaknesses of the thesis.

A considerable strength of the research was the application of multiple methods. This approach allows for understanding and corroboration that is broad and in-depth, and these different methods answer different research questions and aid in the development of a theoretical framework (Yardley & Bishop, 2008). Quantitative methods were used to test the theorised relationship involving older adults' ageing perceptions and health (frailty) while qualitative methods provided rich data, allowing for elaboration on observed associations. By using different methods, the relationship between ageing perceptions and frailty were investigated using past research, longitudinal secondary data, and older people's own perceptions and understandings. Thus, the overall aim of the thesis was explored from different perspectives to obtain a triangulated perspective on frailty.

The research also had high ecological validity (i.e., the extent to which it is related to or reflected everyday or real life). The research benefited by comprising of and conducting investigations with older adults exclusively. Social psychological research is often criticised for its lack of external validity (e.g., over-reliance on university student samples), or the extent to which the findings can be generalised to other situations and people (Druckman & Kam, 2011; Sears, 1986). This thesis focused on older adults to maximise the validity of the work (and therefore its later potential to inform interventions for frailty). Designers need to be sure that the interventions will work on the intended population; it cannot be assumed that findings translate to different populations or contexts (implementation planning during IM; Denford et al., 2015). The research was also enhanced by including older people who were both in care homes and in the

community. The systematic review and qualitative study included participants from these different settings, and this inclusion provides a more complete view of older people's daily lives in differing contexts.

Furthermore, the research concentrated on observational studies in order to capture the naturally occurring variation in older adults' ageing perceptions and their wide range of health experiences. By focusing on older adults in different living situations, perceptions and experiences, the research reflected their specific views and was more applicable for them.

An additional strength of this thesis is that it has not adhered to one particular theoretical perspective within the discipline of social psychology. An approach that only considers one theoretical explanation could be criticised for its narrow focus on a few processes at the expense of a more comprehensive understanding of multiple influences on behaviour (Denford et al., 2015). By mapping out a broader array of processes, the multiple pathways or mechanisms from a range of psychosocial theories and models can be specified (Denford et al., 2015). This research incorporated and compared differing constructs (attitudes, self-perceptions, stereotypes) and hypotheses (described in Chapter 2), such as the stereotype embodiment theory (Levy, 2003, 2009) and externalisation hypothesis (T. Bennett & Gaines, 2010). Studying multiple theories simultaneously allowed for integration and the construction of a more complete or holistic theory than currently exists. For example, a considerable amount of research investigating ageing stereotypes has been conducted from the perspective of stereotype embodiment theory (Levy, 2009), and the possibility of older people resisting these negative stereotypes was often overlooked in these

studies (Zebrowitz, 2003). By not adhering to one theory, this thesis attempted to identify the common themes (e.g., identification and social comparison) and incorporate the varying viewpoints (e.g., strategies to resist) into a new model of the relationship between ageing perceptions and frailty.

Despite these clear strengths, there are a number of limitations of the research presented in this thesis that must also be considered. The first limitation relates to the type of data obtained for the three pieces of work. The associations reported between older adults' ageing perceptions, identity, and frailty were explored using evidence from correlational and qualitative studies. Any conclusions concerning causality are cautioned. The causal direction of the relationship patterns identified here would need testing using experimental methods. These studies would provide the best possible evidence for making decisions about the care of older individuals (Guyatt et al., 1995).

A second limitation concerns the core measures used in the thesis (ageing perceptions and frailty). Although self-reported measures are widely-used in social psychological studies and research on frailty, it must be noted that these measures have inherent limitations. Using self-reported measures assumes that people are able to reliably recall and quantify their attitudes, beliefs, symptoms, and health conditions. In addition, self-reported measures can be subject to socially desirable responding (i.e., participants attempting to create a certain impression in their responses). For instance, people may not give the impression that they view older people as

negatively as they do because that could be seen as discriminatory or ageist. However, self-report measures do give insight into participants' own views directly, which was of interest to the thesis. They reveal the perceptions older people have of themselves and their world, which are unobtainable in any other way (Barker, Pistrang, & Elliott, 2002). The use of self-report allows for information to be collected when observational data may not be obtainable (e.g., during a serious health event). Additionally, the qualitative study (Chapter 6) confirmed many of the relationships identified through the secondary data and previous studies (e.g., Sargent-Cox et al., 2013).

Although self-reported methods and measures were used in the empirical work, it is notable that many of the studies in the systematic review (Chapter 4) did not rely on them for health outcomes and found the same pattern of results as the studies with self-reported outcomes (Chapter 4, 5 and 6). In a recent study (Theou et al., 2015), frailty measures that were constructed using exclusively self-reported items or test-based health measures were compared, and it was found that the characteristics of frailty were similar regardless of the measure used. Theou et al. (2015) determined that a frailty measure with the combined self-report items and test-based measures was the strongest predictor of health outcomes (i.e., mortality, disability, hospitalisation, and falls). Future work may benefit from including objective and behavioural measures of frailty in combination with self-reported items.

Finally, the research is limited in its generalisability. This limitation has been discussed regarding the sample in the qualitative study (Chapter 6) but the

overall thesis findings need to be considered in light of this. Most of the work was conducted using samples from high income countries (i.e., predominately in United States and United Kingdom), and thus stereotypes and attitudes towards older adults may differ from those of other cultures. In other cultures and countries (e.g., China) that have traditionally more positive views towards ageing, older people may have more ways to avoid or accept negative views and their consequences (see Levy & Langer, 1994). However, the prevalence of frailty in Chinese samples has been found to be comparable to that in Western samples (Gu et al., 2009; Shi et al., 2011). More positive cultural views towards ageing may not always result in better health and functioning in later life. For example, Marques et al. (2014) found in European countries where older people are perceived as having lower social status, strongly identifying with old age was associated with lower levels of subjective health. In these countries, identity played a role in the relationship between ageing perceptions and older adults' health, supporting the findings of the qualitative study (Chapter 6). However, there was no relationship in the countries where older people are perceived as having higher social status. Therefore, the influence of culture and social context needs to be considered and warrant further investigation.

7.7. Future research directions

Although this thesis has furthered our understanding of frailty, the research conducted has only begun to explore the psychosocial processes that are related to it (namely, older adults' perceptions and identity). Each of the empirical chapters has outlined a number of ways in which each particular

investigation could be extended. Earlier in this chapter, some necessary future work also was described concerning interactions in clinical settings (Section 7.5.2), intervention development (Section 7.5.3) and the limitations of research conducted for the thesis (Section 7.6). This section expands on the key themes and suggests future directions for research relating to them.

Ageing and frailty was perceived to relate to older adults' health and functioning, and these perceptions influenced how older adults viewed themselves. These findings suggest age-related perceptions and identification are connected and may lead to frailty or further decline. Future experimental studies could test whether making the frailty identity salient or encouraging older adults to think of themselves as frail results in: disengagement in physical and social activity; negative perceptions of ageing; poor performance on a physical functioning task; or higher scores on a frailty measure. Alternatively, longitudinal studies could examine the onset and trajectories of frailty among older adults who do identify as frail compared to those who do not. More work is needed to examine the causal pathways by which ageing perceptions and identification are related to older adults' health and functioning.

Secondly, additional mechanisms or moderators may also contribute to the relationship between ageing perceptions and identification with the development and progression of frailty. In a recent review (Westerhof & Wurm, 2015), how subjective ageing (ageing perceptions) was related to different psychological resources, health and survival was described, and the authors proposed that positive ageing perceptions accumulate psychological resources and guide behavioural regulation. Identifying as

frail could influence the use of these psychological resources (e.g., self-regulation, will-to-live, and perceived control of health; Sargent-Cox and Anstey, 2014, Levy, Ashman, & Dror, 2000, and Wurm et al., 2013, respectively), which have previously been found to influence the relationship between ageing perceptions and health. Conversely, the reverse relationship may also exist. That is, the lack of these psychological resources may lead to identification, and this relationship should be studied. Further studies should therefore investigate these other psychological resources and their relationship with ageing perceptions, identification and frailty.

Thirdly, this thesis has identified a potential opportunity for older people to cope with health and functioning decline so often associated with frailty. Future work into the ways older adults employ resistance strategies is warranted to examine how they are enacted in response to certain cues of ageing and physical decline (e.g., a fall, need for mobility aids, or death of peers). Studies could test whether performing certain strategies after health changes: encourages engagement in physical and social activity; positive perceptions of ageing; better performance on a physical functioning task; or lower scores on a frailty measure. Furthermore, some resistance strategies may encourage better coping with health changes and be more beneficial than others. For example, those who strongly resist self-identifying as frail by emphasising abilities and activity may participate in more physical and social activities, and engagement in these activities could help prevent (or delay) frailty and improve general health. On the other hand, those who attribute their poor health to a particular cause, part of the body, or event

may not alter their behaviour or join programmes to reduce their risk of frailty or improve their health. Although these strategies may protect the self (Westerhof and Tulle, 2007; Weiss & Lang, 2011), future work could explore these strategies influence on health and behaviour. Observational studies could ascertain how and when each of these resistance strategies is activated and utilised by older adults in response to different health changes. Research on differences between these strategies may determine when they are best used and how to employ them effectively.

Lastly, this thesis has focused on the negative aspects of ageing perceptions and identification, and it has been largely assumed that identifying as frail is negative. However, self-identifying as frail may also be advantageous in some contexts. First, identifying as frail could be useful in order to receive social support and financial aid. Previous research has found that individuals with chronic illnesses change or assume identities (e.g., 'the patient' or 'ill') in order to receive financial resources and support from others (Charmaz, 1995). If an older adult identifies and acts 'frail', they may be more likely to attract attention, get support from the people around them, or secure better access to services: in certain circumstances (such as when an individual is in need of support or denied services that they rely on), this could be advantageous. For example, older women activist groups bring canes and walkers to demonstrations to gain sympathy from policymakers and the media (Grenier & Hanley, 2007). Second, identifying as frail can be adaptive for an older individual when they are not able to resist identification due to numerous medical conditions and impairments. In this thesis (Chapter 6), older adults who self-identified as frail related it to an

acceptance of their limitations and inabilities. These older people attributed frailty to external causes beyond their personal control (e.g., age) and did not perceive frailty as negatively as those who resisted self-identification. Third, identifying as frail could be used by older adults to change the socially constructed negative views of frailty and old age. Sharing an identity (i.e., social identification) is essential for collective action and social change (Hogg & Abrams, 1988). By sharing an identity, groups can change these views, or social representations (Murray, 2004), and challenge ageing myths (e.g., that frailty is common and an inevitable outcome of ageing). Stereotypic views of frailty have been assumed for collective action and political agendas (Grenier & Hanley, 2007). In these situations, a frail identity was used by a group of older people to challenge preconceptions about ageing. Further investigation is needed into the reasons and situations where an older person assuming a frail identity could be useful or preferred.

7.8. Overall conclusions

With the numbers of older people expected to rise and the projected increases in frailty prevalence in the coming years (Office for National Statistics, 2011), understanding the contributing factors and mechanisms of frailty are imperative. Research into the physical as well as psychosocial risk and protective factors along with the relationships between them are needed to inform policy and practice (NICE, 2015). The current thesis employed a multimethod approach to advance understanding of frailty and its relationship with ageing perceptions in older adults. Overall findings from

the three pieces of work here suggest a critical psychosocial aspect to frailty: older adults' views of their own ageing and self have identifiable health consequences and benefits with implications for the way they are identified, supported and treated.

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Appendix: Thesis measures and materials

Appendix A: List of Search terms

- | | | | |
|-----|---|-----|--|
| 1. | ag#ing | 21. | inactivity |
| 2. | older adult\$ | 22. | weight loss |
| 3. | geriatric | 23. | gait speed |
| 4. | elderly | 24. | walk* |
| 5. | frail* | 25. | impairment |
| 6. | 60 and older | 26. | medical condition\$ |
| 7. | 1 OR 2 OR 3 OR 4 OR
5 OR 6 | 27. | morbidity |
| 8. | stigma* | 28. | comorbidity |
| 9. | ageis* | 29. | strength |
| 10. | prejud* | 30. | balance |
| 11. | stereotyp* | 31. | fall\$ |
| 12. | self-stereotyp* | 32. | sarcopenia |
| 13. | expectation\$ | 33. | ADL |
| 14. | attitud* | 34. | IADL |
| 15. | 8 OR 9 OR 10 OR 11
OR 12 OR 13 OR 14 | 35. | disabilit* |
| 16. | 10 AND 15 | 36. | dependenc* |
| 17. | function* | 37. | 17 OR 18 OR 19 OR
20 OR 21 OR 22 OR
23 OR 24 OR 25 OR
26 OR 27 OR 28 OR
29 OR 30 OR 31 OR
32 OR 33 OR 34 OR
35 OR 36 |
| 18. | mobility | 38. | 16 AND 37 |
| 19. | immobility | | |
| 20. | activit* | | |

Appendix B: References of included studies in systematic review

- ¹Freelove, J. (2009). *The influence of aging-expectations and neighborhood environment on healthy aging behaviors in older adults*. Unpublished doctoral dissertation, University of South Carolina, Columbia, USA.
- ²Janecková, H., Dragomirecká, E., Holmerová, I., & Vanková, H. (2013). The attitudes of older adults living in institutions and their caregivers to ageing. *Central European Journal of Public Health*, 21(2), 63-71.
- ³Jang, Y., Bergman, E., Schonfeld, L., & Molinari, V. (2006). Depressive symptoms among older residents in assisted living facilities. *International Journal of Aging & Human Development*, 63(4), 299-315.
- ⁴Jang, Y., Poon, L. W., Kim, S.-Y., & Shin, B.-K. (2004). Self-perception of aging and health among older adults in Korea. *Journal of Aging Studies*, 18(4), 485-496.
- ⁵Kim, G., Jang, Y., & Chiriboga, D. A. (2012). Personal Views about Aging among Korean American Older Adults: The Role of Physical Health, Social Network, and Acculturation. *Journal of Cross-Cultural Gerontology*, 27(2), 139-148.
- ⁶Kim, S. H. (2009). Older people's expectations regarding ageing, health-promoting behaviour and health status. *Journal of Advanced Nursing*, 65(1), 84-91.
- ⁷Kotter-Grühn, D., Kleinspehn-Ammerlah, A., Gerstorf, D., & Smith, J. (2009). Self-Perceptions of Aging Predict Mortality and Change With Approaching Death: 16-Year Longitudinal Results From the Berlin Aging Study. *Psychology & Aging*, 24(3), 654–667.

Appendix B

- ⁸Levy, B., Ashman, O., & Slade, M. D. (2009). Age attributions and aging health: contrast between the United States and Japan. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, *64B*(3), 335-338.
- ⁹Levy, B., & Langer, E. (1994). Aging free from negative stereotypes: Successful memory in China among the American deaf. *Journal of Personality and Social Psychology*, *66*(6), 989-997.
- ¹⁰Levy, B., Slade, M. D., & Gill, T. M. (2006). Hearing decline predicted by elders' stereotypes. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, *61B*(2), 82-87.
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- ¹⁴Louis, E. D., Benito-Leon, J., Bermejo-Pareja, F., & Neurological Disorders in Central Spain Study, G. (2008). Philadelphia Geriatric Morale Scale in essential tremor: a population-based study in three Spanish communities. *Movement Disorders*, *23*(10), 1435-1440.

- ¹⁵Milligan, W. L., Powell, D. A., Harley, C., & Furchtgott, E. (1984). A comparison of physical health and psychosocial variables as predictors of reaction time and serial learning performance in elderly men. *Journal of Gerontology, 39*(6), 704-710.
- ¹⁶Moor, C., Zimprich, D., Schmitt, M., & Kliegel, M. (2006). Personality, aging self-perceptions, and subjective health: a mediation model. *International Journal of Aging & Human Development, 63*(3), 241-257.
- ¹⁷Moser, C., Spagnoli, J., & Santos-Eggimann, B. (2011). Self-perception of aging and vulnerability to adverse outcomes at the age of 65-70 years. *Journals of Gerontology Series B-Psychological Sciences & Social Sciences, 66*(6), 675-680.
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- ¹⁹Polverino, A. M. (2010). *Examining the roles of identity processing styles and self-perceptions of aging on well-being in later life*. Unpublished doctoral dissertation, Fordham University, New York City, USA.
- ²⁰Sargent-Cox, K. A., Anstey, K. J., & Luszcz, M. A. (2012a). Change in health and self-perceptions of aging over 16 years: The role of psychological resources. *Health Psychology, 31*(4), 423-432.
- ²¹Sargent-Cox, K. A., Anstey, K. J., & Luszcz, M. A. (2012b). The relationship between change in self-perceptions of aging and physical functioning in older adults. *Psychology and Aging, 27*(3), 750-760.
- ²²Sargent-Cox, K. A., Anstey, K. J., & Luszcz, M. A. (2013). Longitudinal Change of Self-Perceptions of Aging and Mortality. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*.

Appendix B

- ²³Sarkisian, C. A., Hays, R. D., & Mangione, C. M. (2002). Do older adults expect to age successfully? The association between expectations regarding aging and beliefs regarding healthcare seeking among older adults. *Journal of the American Geriatrics Society*, *50*(11), 1837-1843.
- ²⁴Sarkisian, C. A., Prohaska, T. R., Wong, M. D., Hirsch, S., & Mangione, C. M. (2005). The Relationship Between Expectations for Aging and Physical Activity Among Older Adults. *Journal of General Internal Medicine*, *20*(10), 911-915.
- ²⁵Stewart, T. L., Chipperfield, J. G., Perry, R. P., & Weiner, B. (2012). Attributing illness to 'old age:' consequences of a self-directed stereotype for health and mortality. *Psychology & Health*, *27*(8), 881-897.
- ²⁶Top, M., & Dikmetaş, E. (2012). Quality of life and attitudes to ageing in Turkish older adults at old people's homes. *Health Expectations: An International Journal Of Public Participation In Health Care And Health Policy*.
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Appendix C

Appendix C: Details of journals of the included articles

Study	Unpublished	Health	Nursing	Ageing/ gerontology	Psychology
Freelove, (2009)	X				
Janecková, Dragomirecká, Holmerová, & Vanková (2013)		X			
Jang, Bergman, Schonfeld, & Molinari, (2006).				X	
Jang, Poon, Kim, & Shin, (2004).				X	
Kim, Jang, & Chiriboga, (2012).				X	
Kim, (2009).			X		
Kotter-Grühn, Kleinspehn-Ammerlah, Gerstorf, & Smith (2009).					X
Levy, Ashman, & Slade, (2009).				X	
Levy, & Langer, (1994).					X
Levy, Slade & Gill, (2006).				X	
Levy, Slade, Kunkel, & Kasl, (2002).					X
Levy, Slade, Murphy, & Gill, (2012).		X			

Appendix C

Li, Lv, Li, Zhang, Li, & Jin, (2013).		X		
Louis, Benito-Leon, Bermejo-Pareja, & Neurological Disorders in Central Spain Study Group (2008).	X			
Milligan, Powell, Harley, & Furchtgott, (1984).			X	
Moor, Zimprich, Schmitt, & Kliegel, (2006).			X	
Moser, Spagnoli, & Santos-Eggimann (2011).			X	
Palacios, Torres, & Mena, (2009).			X	
Polverino, (2010).		X		
Sargent-Cox, Anstey, & Luszcz, (2012a).				X
Sargent-Cox, Anstey, & Luszcz, (2012b).				X
Sargent-Cox, Anstey, & Luszcz, (2013).			X	
Sarkisian, Hays, & Mangione, (2002).			X	
Sarkisian, Prohaska, Wong, Hirsch, & Mangione, (2005).	X			
Stewart, Chipperfield, Perry, & Weiner, (2012).				X
Top, & Dikmetaş, (2012).	X			
Trigg, Watts, Jones, Tod, & Elliman, (2012).			X	
Witham, Argo, Johnston, Struthers, & McMurdo, (2006).	X			

Appendix D: Details of included articles theoretical assumptions and models

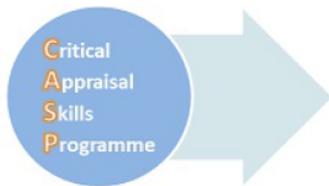
Study	Theoretical assumptions
Freelove, (2009)	Internalisation of stereotypes and expectations (or beliefs) regarding ageing predicting healthy behaviours
Janecková, Dragomirecká, Holmerová, & Vanková (2013)	None
Jang, Bergman, Schonfeld, & Molinari, (2006).	Mention Maier & Smith 1999 and Levy, Slade, Kunkel & Kasl, 2002
Jang, Poon, Kim, & Shin, (2004).	Health Belief Model (Rosenstock, 1974)
Kim, Jang, & Chiriboga, (2012).	Referenced Levy 2002 and Maier & Smith 1999
Kim, (2009).	Developed model: ERA influence health status indirectly through health-promoting behavior
Kotter-Grühn, Kleinspehn- Ammerlah, Gerstorf, & Smith (2009).	Draws from work on subjective age, satisfaction with ageing, and self-perceptions of age
Levy, Ashman, & Slade, (2009).	Social identity is mentioned but not referenced or defined Based on cultural differences in (situational vs. dispositional) attribution
Levy, & Langer, (1994).	Lifelong exposure to ageing stereotypes Premature cognitive commitments (Chanowitz & Langer 1981)

Appendix D

Levy, Slade & Gill, (2006).	Internalised ageing stereotypes
Levy, Slade, Kunkel, & Kasl, (2002).	Internalised ageing stereotypes, stereotype threat
Levy, Slade, Murphy, & Gill, (2012).	None
Li, Lv, Li, Zhang, Li, & Jin, (2013).	Bouchard's model of health and physical activity (Bouchard, Shepard, & Stephens, 1994) and relationship between ERA and health outcomes (Kim 2009 & Sarkisian et al 2005)
Louis, Benito-Leon, Bermejo-Pareja, & Neurological Disorders in Central Spain Study Group (2008).	None
Milligan, Powell, Harley, & Furchtgott, (1984).	None
Moor, Zimprich, Schmitt, & Kliegel, (2006).	Five-factor model of personality (Marshall, Wortman, Vickers, Kusulas, & Hervig, 1992; Smith & Williams, 1992) Personality and subjective health mediated through self-perceptions of ageing
Moser, Spagnoli, & Santos-Eggimann (2011).	Internalised ageing stereotypes
Palacios, Torres, & Mena, (2009).	Cognitive social theory (Bandura, 1997)
Polverino,	Internalised ageing stereotypes and Identity processing styles

(2010).	(Whitbourne, 1986)
Sargent-Cox, Anstey, & Luszcz, (2012a).	Health problems affect wellbeing and self-perceptions when one is distressed about health problems or changes (social comparison; VanderZee & Buunk, 1995)
Sargent-Cox, Anstey, & Luszcz, (2012b).	Internalised ageing stereotypes compared to externalisation hypothesis that SPA and functioning covary
Sargent-Cox, Anstey, & Luszcz, (2013).	Internalised ageing stereotypes (stereotype embodiment theory)
Sarkisian, Hays, & Mangione, (2002).	None
Sarkisian, Prohaska, Wong, Hirsch, & Mangione, (2005).	None
Stewart, Chipperfield, Perry, & Weiner, (2012).	Attribution models: learned helplessness (Abraham, Garber, & Seligman, 1980); attributional theory (Wiener, 1985; 1995)
Top, & Dikmetaş, (2012).	None
Trigg, Watts, Jones, Tod, & Elliman, (2012).	No theory, but mentioned Levy et al 2002, Levy et al, 2000, Levy & Meyer, 2004, Levy 1996, and Hess et al 2004.
Witham, Argo, Johnston, Struthers, & McMurdo, (2006).	None

Appendix E: Critical Appraisal Skills Programme (CASP) Case Control
Study Checklist



11 questions to help you make sense of case control study

How to use this appraisal tool

Three broad issues need to be considered when appraising a case control study:

- **Are the results of the trial valid?** (Section A)
- **What are the results?** (Section B)
- **Will the results help locally?** (Section C)

The 11 questions on the following pages are designed to help you think about these issues systematically.

The first two questions are screening questions and can be answered quickly. If the answer to both is “yes”, it is worth proceeding with the remaining questions.

There is some degree of overlap between the questions, you are asked to record a “yes”, “no” or “can’t tell” to most of the questions. A number of prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

There will not be time in the small groups to answer them all in detail!

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(A) Are the results of the study valid?

Screening Questions

1. Did the study address a clearly focused issue? Yes Can't tell No

HINT: A question can be focused in terms of

- The population studied
- The risk factors studied
- Whether the study tried to detect a beneficial or harmful effect?

2. Did the authors use an appropriate method to answer their question? Yes Can't tell No

HINT: Consider

- Is a case control study an appropriate way of Answering the question under the circumstances? (Is the outcome rare or harmful)
- Did it address the study question?

Is it worth continuing?



Detailed questions

3. Were the cases recruited in an acceptable way?

Yes

Can't tell

No

HINT: We are looking for selection bias which might compromise validity of the findings

- Are the cases defined precisely?
- Were the cases representative of a defined population? (geographically and/or temporally?)
- Was there an established reliable system for selecting all the cases
- Are they incident or prevalent?
- Is there something special about the cases?
- Is the time frame of the study relevant to disease/exposure?
- Was there a sufficient number of cases selected?
- Was there a power calculation?

4. Were the controls selected in an acceptable way?

Yes

Can't tell

No

HINT: We are looking for selection bias which might compromise The generalisibility of the findings

- Were the controls representative of defined population (geographically and/or temporally)
- Was there something special about the controls?
- Was the non-response high? Could non-respondents be different in any way?
- Are they matched, population based or randomly selected?
- Was there a sufficient number of controls selected?

5. Was the exposure accurately measured to minimise bias?

 Yes

 Can't tell

 No

HINT: We are looking for measurement, recall or classification bias

- Was the exposure clearly defined and accurately measured?
- Did the authors use subjective or objective measurements?
- Do the measures truly reflect what they are supposed to measure? (Have they been validated?)
- Were the measurement methods similar in the cases and controls?
- Did the study incorporate blinding where feasible?
- Is the temporal relation correct? (Does the exposure of interest precede the outcome?)

6. (a) What confounding factors have the authors accounted for?

List:

HINT: List the ones you think might be important, that the author missed.

- Genetic
- Environmental
- Socio-economic

(b) Have the authors taken account of the potential confounding factors in the design and/or in their analysis?

 Yes

 Can't tell

 No

HINT: Look for

- Restriction in design, and techniques e.g. modelling stratified-, regression-, or sensitivity analysis to correct, control or adjust for confounding factors

7. What are the results of this study?

HINT: Consider

- What are the bottom line results?
- Is the analysis appropriate to the design?
- How strong is the association between exposure and outcome (look at the odds ratio)?
- Are the results adjusted for confounding, and might confounding still explain the association?
- Has adjustment made a big difference to the OR?

(B) What are the results?

8. How precise are the results?

How precise is the estimate of risk?

HINT: Consider

- Size of the P-value
- Size of the confidence intervals
- Have the authors considered all the important variables?
- How was the effect of subjects refusing to participate evaluated?

9. Do you believe the results?

Yes

No

HINT: Consider

- Big effect is hard to ignore!
- Can it be due to chance, bias or confounding?
- Are the design and methods of this study sufficiently flawed to make the results unreliable?
- Consider Bradford Hills criteria (e.g. time sequence, dose-response gradient, strength, biological plausibility)

(C) Will the results help locally?

10. Can the results be applied to the local population?

 Yes

 Can't tell

 No

HINT: Consider whether

- The subjects covered in the study could be sufficiently different from your population to cause concern
- Your local setting is likely to differ much from that of the study
- Can you quantify the local benefits and harms?

11. Do the results of this study fit with other available evidence?

 Yes

 Can't tell

 No

HINT: Consider all the available evidence from RCT's, systematic reviews, cohort studies and case-control studies as well for consistency.

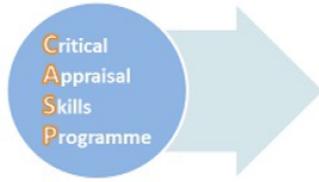
Remember

One observational study rarely provides sufficiently robust evidence to recommend changes to clinical practice or within health policy decision making.

However, for certain questions observational studies provide the only evidence.

Recommendations from observational studies are always stronger when supported by other evidence.

Appendix F: Critical Appraisal Skills Programme (CASP) Cohort Study Checklist



12 questions to help you make sense of cohort study

How to use this appraisal tool

Three broad issues need to be considered when appraising a cohort study:

- Are the results of the study valid? (Section A)
- What are the results? (Section B)
- Will the results help locally? (Section C)

The 12 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is “yes”, it is worth proceeding with the remaining questions.

There is some degree of overlap between the questions, you are asked to record a “yes”, “no” or “can’t tell” to most of the questions. A number of prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

There will not be time in the small groups to answer them all in detail!

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(A) Are the results of the study valid?

Screening Questions

1. Did the study address a clearly focused issue?

 Yes

 Can't tell

 No

HINT: A question can be 'focused' in terms of

- The population studied
- The risk factors studied
- The outcomes considered
- Is it clear whether the study tried to detect a beneficial or harmful effect?

2. Was the cohort recruited in an acceptable way?

 Yes

 Can't tell

 No

HINT: Look for selection bias which might compromise the generalisability of the findings:

- Was the cohort representative of a defined population?
- Was there something special about the cohort?
- Was everybody included who should have been included?

Is it worth continuing?



Detailed questions

3. Was the exposure accurately measured to minimise bias?

Yes Can't tell No

HINT: Look for measurement or classification bias:

- Did they use subjective or objective measurements?
- Do the measurements truly reflect what you want them to (have they been validated)?
- Were all the subjects classified into exposure groups using the same procedure

4. Was the outcome accurately measured to minimise bias?

Yes Can't tell No

HINT: Look for measurement or classification bias:

- Did they use subjective or objective measurements?
- Do the measures truly reflect what you want them to (have they been validated)?
- Has a reliable system been established for detecting all the cases (for measuring disease occurrence)?
- Were the measurement methods similar in the different groups?
- Were the subjects and/or the outcome assessor blinded to exposure (does this matter)?

5. (a) Have the authors identified all important confounding factors?

 Yes

 Can't tell

 No

List the ones you think might be important, that the author missed.

(b) Have they taken account of the confounding factors in the design and/or analysis?

 Yes

 Can't tell

 No

List:

HINT: Look for restriction in design, and techniques e.g. modelling, stratified-, regression-, or sensitivity analysis to correct, control or adjust for confounding factors

6. (a) Was the follow up of subjects complete enough?

 Yes

 Can't tell

 No

(b) Was the follow up of subjects long enough?

 Yes

 Can't tell

 No

HINT: Consider

- The good or bad effects should have had long enough to reveal themselves
- The persons that are lost to follow-up may have different outcomes than those available for assessment
- In an open or dynamic cohort, was there anything special about the outcome of the people leaving, or the exposure of the people entering the cohort?

(B) What are the results?

7. What are the results of this study?

HINT: Consider

- What are the bottom line results?
 - Have they reported the rate or the proportion between the exposed/unexposed, the ratio/the rate difference?
 - How strong is the association between exposure and outcome (RR,)?
 - What is the absolute risk reduction (ARR)?
-

8. How precise are the results?

HINT: Look for the range of the confidence intervals, if given.

9. Do you believe the results?

Yes Can't tell No

HINT: Consider

- Big effect is hard to ignore!
- Can it be due to bias, chance or confounding?
- Are the design and methods of this study sufficiently flawed to make the results unreliable?
- Bradford Hills criteria (e.g. time sequence, dose-response gradient, biological plausibility, consistency)

(C) Will the results help locally?

10. Can the results be applied to the local population?

 Yes

 Can't tell

 No

HINT: Consider whether

- A cohort study was the appropriate method to answer this question
- The subjects covered in this study could be sufficiently different from your population to cause concern
- Your local setting is likely to differ much from that of the study
- You can quantify the local benefits and harms

11. Do the results of this study fit with other available evidence?

 Yes

 Can't tell

 No

12. What are the implications of this study for practice?

HINT: Consider

- One observational study rarely provides sufficiently robust evidence to recommend changes to clinical practice or within health policy decision making
- For certain questions observational studies provide the only evidence
- Recommendations from observational studies are always stronger when supported by other evidence

Appendix G: ELSA perceptions of ageing measure

34 Thinking of old age and your own ageing experience, to what extent do you agree or disagree with each of the following statements?

Tick one box on each line

	Strongly agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Strongly disagree
We can learn a lot from old people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As I get older, I expect to become more lonely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Old age is a time of ill health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As I grow older, I become more tolerant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Old age is a time of loneliness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As I get older, I expect to be able to do the things I've always done	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When I think of old people, I think of them as generally grumpy and miserable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I worry that my health will get worse as I grow older	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I don't think of myself as old	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Old people don't get respect in society	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Retirement is a time of leisure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Growing older doesn't bother me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix H: Factor analysis of the Perceptions of Ageing measure

Exploratory factor analysis (EFA) was conducted on the Perceptions of Ageing measure prior to the main analysis. EFA is a technique to potentially identify unobserved variables and accounts for the structure of the correlations between measured variables. It is useful when data has been obtained on a number of variables and some of the variables are potentially part of same unified concept or factor.

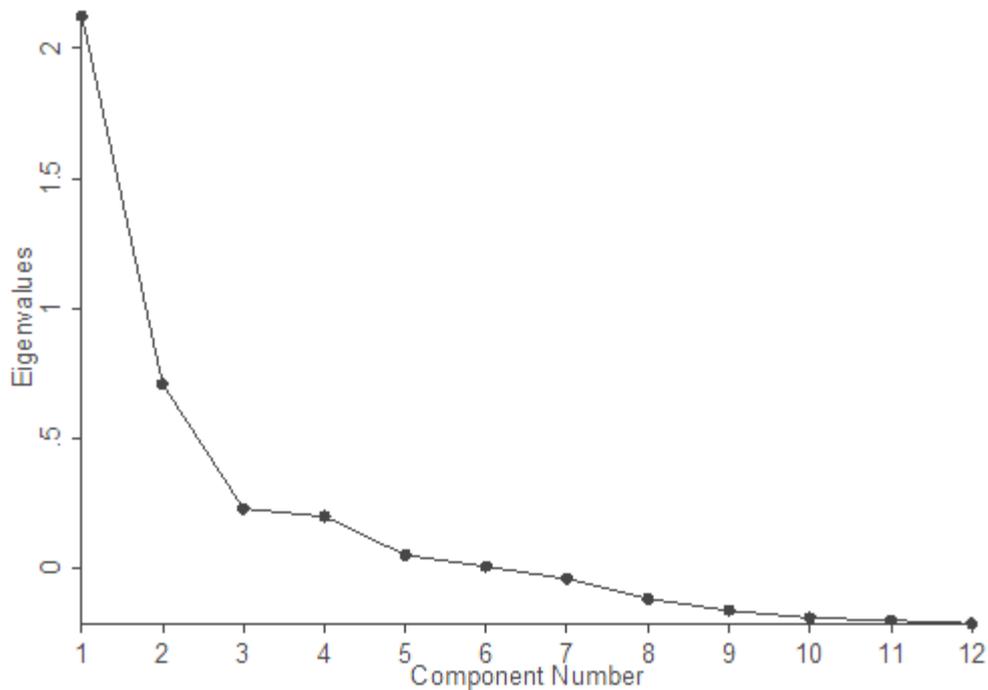


Figure 1. *Scree Plot of Perceptions of Ageing*

A EFA was conducted on the 12 items with oblique rotation. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO

Appendix H

= .75. Bartlett's test for sphericity indicated that the correlation between items was sufficiently large for EFA, $\chi^2(66) = 13,210.66$, $p < .001$. An initial analysis was conducted to obtain eigenvalues for each component. Three factors had eigenvalues over Kaiser's criterion of 1 and in combination explained 45.68% of the variance. Given the large sample ($N=7,178$), the convergence of the scree plot (see above in Figure 1) and Kaiser's criterion, 3 factors were retained.

Five items ("As I get older I expect to become more lonely", "Old age is a time of ill health", "Old age is a time of loneliness", "I worry that my health will get worse as I grow older", and "Old people don't get respect in society") loaded on the first factor. Four items ("As I get older I expect to be able to do things I've always done", "I don't think of myself as old", "Retirement is a time of leisure", and "Growing older doesn't bother me") loaded on Factor 2. The third factor included three items ("We can learn a lot from old people", "As I grow older, I become more tolerant", and "When I think of old people, I think of them as grumpy and miserable"). The factor loadings after rotation are shown below in Table 1.

Table 1. Factor loadings of each factor extracted from the Perceptions of Ageing measure (N=7,178)

Items	1	2	3
We can learn a lot from old people			0.75
As I get older I expect to become more lonely	0.75		
Old age is a time of ill health	0.73		
As I grow older, I become more tolerant			0.64
Old age is a time of loneliness	0.80		
As I get older I expect to be able to do things I've always done		0.67	
When I think of old people, I think of them as grumpy and miserable	0.46		0.47
I worry that my health will get worse as I grow older	0.63		
I don't think of myself as old		0.51	
Old people don't get respect in society	0.42	-0.24	
Retirement is a time of leisure		0.59	
Growing older doesn't bother me	0.33	0.55	

Note. Factor loadings less than .3 are not displayed and those in bold indicate the substantial loadings.

Appendix H

Reliability of each factor

After the factor analysis, the reliability of the items for each of the three factors extracted was analysed using Cronbach's alpha. The items of Factors 2 and 3 were found to not be internally consistent, $\alpha = 0.47$ and $\alpha = 0.28$, respectively. The internal consistency of Factor 1 ($\alpha = 0.75$) was only slightly higher than the scale as a single dimension and was not considered meaningfully improved. Due to the unreliability of the different components and no significant improvements in the scale reliabilities, the measure was treated as a single dimension in the main analyses in Chapter 5.

Appendix I: ELSA Frailty Index items

Mobility

- difficulty walking 100 yards
- difficulty sitting 2 hours
- difficulty getting up from chair after sitting long periods
- difficulty climbing several flights stairs without resting
- difficulty stooping, kneeling or crouching
- difficulty reaching or extending arms above shoulder level
- difficulty pulling or pushing large objects
- difficulty lifting or carrying weights over 10 pounds
- difficulty picking up 5p coin from table

ADL

- difficulty dressing, including putting on shoes and socks
- difficulty walking across a room
- difficulty bathing or showering
- difficulty eating, such as cutting up food
- difficulty getting in and out of bed
- difficulty using the toilet, including getting up or down

IADL

- difficulty using map to figure out how to get around strange place
- difficulty preparing a hot meal
- difficulty shopping for groceries
- difficulty making telephone calls
- difficulty taking medications
- difficulty managing money, (e.g. paying bills, keeping track expenses)
- doing work around the house or garden

Chronic conditions

- lung disease
- asthma
- arthritis
- osteoporosis
- cancer
- Parkinson's disease
- psychiatric condition
- Alzheimer's disease
- Dementia

CVD

- high blood pressure diagnosis
- angina diagnosis
- heart attack diagnosis
- congestive heart failure diagnosis
- abnormal heart rhythm diagnosis
- diabetes or high blood sugar diagnosis
- stroke diagnosis

Appendix I

Sensory

- Eyesight
- Hearing

Cognitive functioning test

- whether correct day of month given
- whether correct month given
- whether correct year given
- whether correct day given
- whether prompt given for prospective memory test (remembering to write initials)
- number of words recalled immediately
- number of animals mentioned
- number of words recalled after delay

Other

- Falls
- Fractured hip
- Joint replacement
- Pain while walking
- Self-rated general health

Appendix J: National Statistics Socio-Economic Classification Code (NS-SEC)
Code

FINAL NS-SEC - Long Version (Including Unclassifiable and Non-Workers)

Variable name: W2NSSEC

Value labels:

-9	Refusal
-8	Don't know
-1	Not applicable
1.0	Employers in large organisations
2.0	Higher managerial occupations
3.1	Higher professional occupations - Traditional employee
3.2	Higher professional occupations - New employee
3.3	Higher professional occupations - Traditional self-employed
3.4	Higher professional occupations - New self-employed
4.1	Lower professional & higher technical - Traditional employee
4.2	Lower professional & higher technical - New employee
4.3	Lower professional & higher technical - Traditional self-employed
4.4	Lower professional & higher technical - New self-employed
5.0	Lower managerial occupations
6.0	Higher supervisory occupations
7.1	Intermediate clerical and administrative
7.2	Intermediate sales and service
7.3	Intermediate technical and auxiliary
7.4	Intermediate engineering
8.1	Employers in small organisations - non-professional
8.2	Employers in small organisations - agriculture
9.1	Own account workers - non-professional
9.2	Own account workers - agriculture
10.0	Lower supervisory occupations
11.1	Lower technical craft
11.2	Lower technical process operative
12.1	Semi-routine sales
12.2	Semi-routine service
12.3	Semi-routine technical
12.4	Semi-routine operative
12.5	Semi-routine agricultural
12.6	Semi-routine clerical
12.7	Semi-routine childcare
13.1	Routine sales and service
13.2	Routine production
13.3	Routine technical
13.4	Routine operative
13.5	Routine agricultural
14.0	Never worked
15.0	Full-time students
16.0	Occupations not stated or inadequately described
17.0	Not classifiable for other reasons

Appendix K

Appendix K: Reliability of perceptions of ageing scale if item removed

Item	Cronbach's α if removed
We can learn a lot from old people	.66
As I get older I expect to become more lonely	.60
Old age is a time of ill health	.60
As I grow older, I become more tolerant	.66
Old age is a time of loneliness	.59
As I get older I expect to be able to do things I've always done	.65
When I think of old people, I think of them as grumpy and miserable	.64
I worry that my health will get worse as I grow older	.62
I don't think of myself as old	.66
Old people don't get respect in society	.66
Retirement is time of leisure	.66
Growing older doesn't bother me	.62

Appendix L: Ethics approval letter



Our Ref: PF/CB/12/03/147

22nd May 2012

Miss Krystal Warmoth
PhD Student
Peninsula College of Medicine & Dentistry
The Haighton Building
Room 31
University of Exeter
Heavitree Road
EXETER
EX1 2LU

Please reply to:
Peta Foxall, PhD
Chair, PCMD Research Ethics Committee
Peninsula College of Medicine & Dentistry
c/o Carol Barkle
Administrator to PCMD REC
Knowledge Spa
Royal Cornwall Hospital
TRURO
Cornwall
TR1 3HD
Tel: /01872 256460
Fax: 01872 256401
Email: carol.barkle@pms.ac.uk

Dear Miss Warmoth

Application Number: 12/03/147

Project Title: Understanding Frailty in Older Adults

I am writing to confirm that I am now happy that you have addressed all the points made by the PCMD Research Ethics Committee relating to the above project. I have approved this project under Chair's Action with immediate effect and have pleasure in enclosing your Certificate of Approval.

Approval of this study will be formally ratified by the Peninsula College of Medicine and Dentistry Research Ethics Committee when it meets again on the 14th June 2012.

Good luck with your study.

Yours sincerely,

A handwritten signature in black ink that reads 'Peta Foxall'.

Peta Foxall, PhD
Chair
Peninsula College of Medicine & Dentistry Research Ethics Committee

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College and Medical School Dean **Professor Steve Thornton**
Interim Associate Dean for Cornwall **Dr Nicki Saulsbury**



**Peninsula College of Medicine & Dentistry
Research Ethics Committee**

Certificate of Ethical Approval

School/Institute/Department: Institute of Health Services Research

Title of Project: Understanding Frailty in Older Adults

Name(s) of Project Research Team member(s): Miss Krystal Warmoth,
Dr Mark Tarrant, Dr Iain Lang, Professor Charles Abraham

Project Contact Point: Miss Krystal Warmoth

This project has been approved for the period

From: May 2012

To: May 2013

**Peninsula College of Medicine & Dentistry
Research Ethics Committee approval reference:** May12/CA/147

Signature: 

Date: 17th May 2012

**Name of Chair
Peta Foxall, PhD**

Your attention is drawn of the attached paper "Guidance for Researchers when Ethics Committee approval is given", which reminds the researcher of information that needs to be observed when Ethics Committee approval is given.

Application Reference Number 12/03/147

Appendix M: Recruitment letter

Dear _____,

My name is Krystal Warmoth and I am doing a PhD at Peninsula College of Medicine and Dentistry. I am studying people's attitudes and views of frailty. I am contacting you because I am hoping you can help me recruit people to be interviewed for a research study. If you are willing to help, I would be grateful if you could display the attached poster in your work environment, where it will be seen by potential interviewees, and/or provides copies of the poster to interested individuals.

In conducting this research, I hope to understand what can be done to reduce the likelihood of an individual experiencing some of the harmful health consequences of frailty. This project is part of the applied health research of National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) for the South West Peninsula, or PenCLAHRC.

What will interviewees be asked to do?

In the study, participants will be interviewed about their attitudes and experiences regarding frailty and ageing. Besides their attitudes, they will be asked some questions that relate to their health and daily life. These questions are to ensure that the study includes people with a range of experiences.

Who is eligible to be interviewed?

I am seeking adults who are 65 years or older with a range of experiences of frailty and attitudes to it. The study will not include someone if they are unable to consent independently to participate due to cognitive impairment. Therefore, we would appreciate it if you didn't pass the recruitment poster to any such individuals who are unlikely to be able to consent independently.

How long will the interview take?

The time commitment for the interview is between 30 and 60 minutes. Interviewees will have the option to spread the interview over course of more than one session, if they wish.

Where will the interview take place?

Interviews will be held at a location that is the most convenient for the interviewee and they can have a relative/friend/carer present for support during the interview should they wish to.

I would be grateful if you could forward the attached poster and information sheet about the study to anyone who is eligible or interested in being interviewed, and also to display these in your place of work so that potential interviewees are exposed to it directly. I would be happy to talk to you in person about the study if you feel this would be useful. Please feel free to contact me on the telephone number/email below.

Thank you for considering this request.

Yours sincerely,

Krystal Warmoth

Lead researcher and PhD student
Peninsula College of Medicine & Dentistry
The Highton Building, Room 31
University of Exeter
St Luke's Campus
Heavitree Road
Exeter, EX1 2LU

Tel: 01392 72 6337

Email: krystal.warmoth@pcmd.ac.uk

Appendix N: Recruitment poster



Health and Ageing in Later Life

We are looking for volunteers over 65 years old to be interviewed for a study about experiences of ageing.

How long will it take?

The interview will take between 30 and 60 minutes. You can spread the interview over course of more than one session.

Where will it take place?

Interviews will be held at a location that is the most convenient for you and you can have a relative/friend/carer present during the interview if you wish.

For more information about this study or to volunteer to take part, please contact:

Krystal Warmoth

Tel: 01392 72 6337

Email: krystal.warmoth@pcmd.ac.uk

The Research team

Krystal Warmoth (below), lead researcher and PhD student; Dr. Mark Tarrant, Senior Lecturer in Human Science; Dr. Iain Lang, Consultant in Public Health, NHS Devon, and Senior Lecturer in Public Health, and Prof. Charles Abraham, Professor of Behaviour Change.



All information will be kept **confidential and secure** by the research team.

The project has been approved by the Peninsula College of Medicine and Dentistry Research Ethics Committee.

PenCLAHRC

The NIHR CLAHRC for the South West Peninsula

Appendix 0: Letter to possible participant



Hello _____,

Thank you for contacting me with an interest in being interviewed. I have included more information about the study and a consent form which needs to be signed. This can be returned to me at the time of the interview or sent to me beforehand. Feel free to contact me with any questions or concerns regarding the study.

If you are willing to be interviewed please inform me of when you are available. I am willing to travel to wherever is most convenient for you.

Best wishes,

Krystal Warmoth

PhD student and lead researcher
Peninsula College of Medicine & Dentistry
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Heavitree Road
Exeter, EX1 2LU
Tel: 01392 72 6337
Email: krystal.warmoth@pcmd.ac.uk

Appendix P: Information sheet



UNDERSTANDING FRAILITY IN OLDER ADULTS

Information Sheet for

Participants

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you of any kind and we thank you for considering our request.

Aim of the Project

The aim of this study is to gain a more detailed understanding of the attitudes and views of people towards frailty. In conducting this research we hope to gain a deeper understanding of what it is like to grow older and face health challenges. This study is being conducted as part of a PhD project to improve the lives of those whom some people would consider frail.

What will I be asked to do?

Should you agree to take part in this project, you will be interviewed and asked questions about your attitudes and experiences regarding frailty.

Besides your attitudes and views, you will be asked questions from a short

Appendix P

questionnaire that relate to your health and daily life, which should only take 5 minutes to complete. These questions are will help us determine your adjustment to getting older and ensure that the study includes people from with a range of experiences.

The interview will be audio recorded and later transcribed. This project involves an open questioning technique where the precise nature of the questions which will be asked have not been determined in advance but will depend on the way in which the interview develops. Consequently, although the College Research Ethics Committee is aware of the general areas to be explored in the interview, the Committee has not reviewed the precise questions to be used.

If there is anything that you said that you do not want included in the final transcript for analysis, you can inform the researcher and they will remove it from the data.

Please be aware that you may decide not to take part in the project without any disadvantage to yourself of any kind.

Time Commitment

Depending on how much you would like to say and how the interview develops, the interview could last from 30 to 60 minutes. If any point in the in the interview you need a break or would like to stop, the interview will stop and can be resumed later. Furthermore, if the time commitment is too long, the interview can be conducted over the course of more than one session.

Can I have a friend or family member present?

Yes! If you would like to have a friend, relative, or carer present during interviews, you may invite them to be present in order to support you.

Can I change my mind and withdraw from the interview?

You may withdraw from participation in the project at any time and without any disadvantage to yourself of any kind and for any reason.

What use will be made of the information collected?

Your responses to the questions will be used to identify a common theme and compared with other participants' responses. These similarities and differences will form the basis of the theory for the lead researcher's PhD thesis. The findings may be shared through academic publications, conference presentations, or other educational audiences. A summary sheet describing the study findings will be sent to everyone who took part in the study.

Your personal information will not be disclosed without your permission except in the most exceptional circumstances, such as when somebody is at grave risk of serious harm. You will be assigned a pseudonym to protect your identity in any report or publication of the findings of the study.

The data collected will be securely stored in such a way that only those mentioned below will be able to gain access to it.

Appendix P

A summary sheet of the findings will be sent to the participants involved in the study.

Questions or Comments

If you have any questions about our project, either now or in the future, please feel free to contact either:-

Krystal Warmoth

Lead researcher and PhD student
Tel: 01392 725921

Dr. Mark Tarrant

Senior Lecturer in Human Science
Tel: 01392 726 337

Dr. Iain Lang

Senior Lecturer in Public Health
Tel: 07970 799 249

Other Sources of Support

Age UK

Tel: 0800 169 6565

www.ageuk.org.uk

Care Direct Devon

Tel: 0845 1551 007

www.devon.gov.uk/caredirect

Complaints or Ethical Concerns

If you have any complaints about the way in which this study has been carried out please contact the Chair of the Peninsula College of Medicine and Dentistry Research Ethics Committee:-

Prof. Peta Foxall, PhD

Chair, PCMD Research Ethics Committee
Email: peta.foxall@pcmd.ac.uk

This project has been reviewed and approved by the Peninsula College of
Medicine and Dentistry Research Ethics Committee

Appendix Q: Consent form

**UNDERSTANDING FRAILTY IN OLDER ADULTS****Consent form for *Participants***

I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:-

1. my participation in the project is entirely voluntary;
2. I am free to withdraw from the project at any time without any disadvantage;
3. the data (audio-tapes and transcripts) will be retained in secure storage;
4. I will be asked to complete a short questionnaire regarding my health and daily life
5. that this project involves an open-questioning technique where the precise nature of the questions which will be asked have not been determined in advance, but will depend on the way in

Appendix Q

which the interview develops.

6. in the event that the line of questioning does develop in such a way that I feel hesitant or uncomfortable I have the right to decline to answer any particular question(s) and also that I may withdraw from the project at any stage without any disadvantage to myself of any kind.
7. the results of the project may be published but my anonymity will be preserved.

I agree to take part in this project.

.....

(Printed name of participant)

(Date)

.....

(Signature of participant)

.....

(Printed name of researcher)

(Date)

.....

(Signature of researcher)

If you would like to receive a copy of the summary at the end of the study,
please tick this box and provide your contact details below.

Contact address:

**This project has been reviewed and approved by the Peninsula College of
Medicine and Dentistry Research Ethics Committee**

Appendix R: Frailty measure questionnaire

Help Bathing	Yes = 1, No = 0	Walk outside	<3 days = 1, or ≤ 3 days = 0
Help Dressing	Yes = 1, No = 0	Feel Everything is an Effort	Most of time = 1, Sometimes = 0.5, Rarely = 0
Help getting in/out of Chair	Yes = 1, No = 0	Feel Depressed	Most of time = 1, Sometimes = 0.5, Rarely = 0
Help Walking around house	Yes = 1, No = 0	Feel Happy	Most of time = 0, Sometimes = 0.5, Rarely = 1
Help Eating	Yes = 1, No = 0	Feel Lonely	Most of time = 1, Sometimes = 0.5, Rarely = 0
Help Grooming	Yes = 1, No = 0	Have Trouble getting going	Most of time = 1, Sometimes = 0.5, Rarely = 0
Help Using Toilet	Yes = 1, No = 0	High blood pressure	Yes = 1, Suspect = 0.5, No = 0
Help up/down Stairs	Yes = 1, No = 0	Heart attack	Yes = 1, Suspect = 0.5, No = 0
Help lifting 10 lbs	Yes = 1, No = 0	Injurious Fall	Yes = 1, No = 0
Help Shopping	Yes = 1, No = 0	Stroke	Yes = 1, Suspect = 0.5, No = 0
Help with Housework	Yes = 1, No = 0	Cancer	Yes = 1, Suspect = 0.5, No = 0
Help with meal Preparations	Yes = 1, No = 0	Diabetes	Yes = 1, Suspect = 0.5, No = 0
Help taking Medication	Yes = 1, No = 0	Arthritis	Yes = 1, Suspect = 0.5, No = 0

Help with Finances	Yes = 1, No = 0	Chronic Lung Disease	Yes = 1, Suspect = 0.5, No = 0
Lost more than 10 lbs in last year	Yes = 1, No = 0	Self Rating of Health	Poor = 1, Fair = 0.75, Good = 0.5, V. Good = 0.25, Excellent = 0
How Health has changed in last year	Worse = 1, Better/Same = 0	Cut down on Usual Activity (in last month)	Yes = 1, No = 0
Stayed in Bed at least half the day due to health (in last month)	Yes = 1, No = 0	Frail in the near future? (within 6 months)	Yes = 1, No = 0

Appendix S

Appendix S: Worked example of coding and theme identification for strategies to resist identifying as frail

Raw Data	Initial coding	Focused coding	Theoretical coding
I: would you consider yourself to be frail?			People may have the ability to resist identifying as frail, even in the presence of influences encouraging self-perceptions as frail.
J2: no	Does not identify as frail		
I: why would you not consider yourself to be frail?	Reason not considered frail		
J2: physically I don't consider myself frail. I consider myself unfit and I think there might be a difference there. I get about, I walk I run, I cycle, I row, um I don't play any ball game anymore but I don't think I could be frail. I'm part of a cricket match for 6 or 7 hours continuously. I mean you might define it differently but physical frailty and mental frailty if I if I compare myself with taking out the age parallel if I consider myself as somebody I do consider frail I feel a lot of people who are frail staggering into say the hospital in the outpatient department they look very frail to me	Unfit but not frail Emphasising abilities Comparing with past, Considers definition of frailty Still "being active" Understanding frailty as mental & physical, Compares with others who he considers frail Obviously frail people	Being active (physically, mentally, or socially) Social comparisons with others they consider frail	
I: what does frail mean?	Understanding of frailty		
P1: haven't got any strength innit?	Frailty is a lack of strength Viewing self in their definition of frailty,		
I: ok	"Being alright", specific part mentioned as frail	Relating their frailty to a particular limitation, part of the body, or	
P1: haven't got any strength. I'm alright in that way except my legs.			

I: ok so you wouldn't consider yourself to be frail then?	Does not identify as frail	attributing it to a specific, isolated, event
P1: Oh no, no, no, I don't think so I mean no, no		
I: would ever consider yourself frail?	Does not identify as frail	
M1: not at the moment no. (laughs)	Thankful not to be frail Reason not considered frail	
I: yeah		
M1: Thankfully		
I: yeah Um why not?	Not feeling frail Still "being active" Not active if frail, healthy diet, Enjoying life, "not at the moment", parts of the body are frail, "cross that bridge", frail in the future, inactive, "waiting" for frailty	Being active (physically, mentally, or socially) Not in the current context of life but possible future frailty
M1: Um well I don't feel frail and I led a very active life um I won't be able to do if if um I was frail um I eat well I enjoy what I do um so at the moment I don't feel frail at all in any part of my body not to say in years to come but um we'll cross that bridge when we come to it and we won't we won't sit around waiting for it to come.		
I: yeah		Not in the current context of life but possible future frailty
M1: ya know we l'll just enjoy doing what I do until one or the other of them becomes too much	Enjoying life, it "becomes too much"	
I: ok		
M1: then I shall probably think well yeah I am getting a bit frailer a little more delicate	Admitting frailty, Getting frailer	
I: yeah		
M1: I need to have a little bit more sit down time and a little less running around answering emails and attending shows and helping to put up gazebos and take down gazebos and ya know all this sort of business	Slow down, disengage from activities	Not in the current context of life but

Appendix S

I: yeah		possible future frailty
M1: but at the moment I, I don't feel that um its beyond my ability to do that	"Not at the moment", not feeling frail, emphasis ability	Being active (physically, mentally, or socially)

Appendix T: Lay summary letter



Dear _____,

I just want to thank you again for participating in my research. Your contribution was valuable to my study and much appreciated. In conducting this research, I have gained a deeper understanding of what it is like to grow older and face health challenges. I conducted this study as part of my PhD project to improve the lives of those considered frail.

When the interview was conducted, you requested to receive information about the findings of this study. I have enclosed a summary of the findings from the interviews. If you have any questions or comments, feel free to contact me using the information below.

Yours sincerely,

A handwritten signature in black ink that reads "Krystal Warmoth".

Krystal Warmoth
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UNDERSTANDING FRAILITY IN OLDER ADULTS

Summary of Findings

Introduction

This is a short summary of the findings from my interviews investigating attitudes and views about frailty and ageing which includes quotes from the interviews to demonstrate some of the key findings.

Aims of the study

My aim in this study was to gain a more detailed understanding of the attitudes and views of people towards frailty.

Specifically, I sought to address the following questions:

- What does frailty mean to older adults?
- What are their beliefs regarding frailty and ageing?

What I did

I interviewed 29 residents in the South West of England whose ages ranged from 66 to 98 and health status varied.

I used semi-structured interviews. Semi-structured interviews are a way of questioning that is flexible and allows new questions to be brought up during the interview as a result of what the interviewee says.

In the description below, text in a grey box is a direct quote from someone whom I interviewed.

Key findings

1. People think of frailty as subjective and varied

People often had difficulty giving a concise definition of frailty. They described it as having many definitions and possibly meaning different things to different people.

“the definition of frailty is I don’t think you can in one word do a proper assessment of what that word actually means. I think it might a misused word rather like those tick boxes. Are you frail or are you not?”

The way people thought about frailty usually included a physical dimension. This was described in relation to illnesses, health, and functioning (e.g., Parkinson’s disease, arthritis, stroke, and mobility issues).

“I should think it was associated with health. When a person gets really frail, um I think it is a case of ya know numerous types of illness maybe.”

“she was suffering with getting about and so on ...at latter times she was finding difficult to get in moving around... and coordinating her leg”

However, people also described frailty as having a clear psychological dimension, which was related to a resistance to change, attitude towards life, and doubt in one’s abilities.

“I think frailty is a attitude of the mind, determination of character, cantankerous no one will think you're frail, strength of will not giving in”

They also mentioned a social dimension to frailty. This dimension was characterised by an inability to socialise, isolation, and dependency on others. If someone could socialise and was not isolated, they weren’t considered frail.

“I think it keeps her going and she chats to everybody (laughs) all over the place so it is yah know communication and interaction with people so I would not class her as frail”

Most people’s understandings of frailty were informed by people they knew or stereotypes they held. Stereotypes are thoughts adopted about specific

types of individuals. One example of a stereotype held was of the “little old lady”.

“My perception of the word frailty is very much of my old granny which is probably what we all relate to originally, initially. ...That kind of thing ya know frail old lady frail old man walking stick maybe that like of thing”

Besides stereotypes, grandparents, parents, friends, and neighbours in poor health were often examples used to illustrate their understanding and to describe someone considered frail. Comparisons were often drawn between people whom someone did and did not consider frail to illustrate their point or clarify their definition of the concept.

2. What makes people frail?

Beliefs about what contributed to someone becoming frail included lifestyle choices. These choices (such as exercise, diet, smoking, and drinking) influenced an individual's health.

“It can come because people allowed themselves to become frail by lack of exercise.”

“I never smoked and I honestly think that that combined with a sensible eating is very important”

Lifestyle choices were only part of the story and people described how other things, such as age, genetics, and certain diseases, could lead to inevitable frailty.

“I think it frailty that comes with ageing. You haven't got the strength that you used to have or the coordination”

“if you were really frail and it get attributed to or I would attribute it to health issues no I don't think you could avoid it”

Additionally, perceptions of ageing motivated people to engage in activities that were believed to protect against frailty.

“to keep walking cause I think once you stop walking just sit in a chair that is ya know not very good at all so yes I think we've got a try and do

as much as you can really I do think some people tend to think oh ya know I'm 80 now"

The quote below describes a woman the interviewee knew who had let her beliefs about being 60 and old age determine her abilities and how she was going to behave.

"her head had told her that today she was 59 fine and on her birthday ... we were sewing at the time and she dropped her scissors she said "pick up my scissors for a old age pensioner would you?" The day before she was 59, today she was 60 that was her attitude from on then on from that moment on...she was an old age pensioner and she did very little. She stayed at home watching television and knitting."

3. Sources that inform perceptions of ageing

People's perceptions of ageing were informed by experiences, such as feedback from peers and health professionals.

"if somebody says to you, 'well I did not think you were 60 yet.' I think, 'oh I can't be weathering too badly then.'"

"Some people are may say their frail um just because the doctor says something to them about ya know they should take things easier or something like that not knowing what to do"

Comparisons made with others helped them gauge how they were ageing and cope with limitations.

"sometimes I wish I was a bit more able body than I am but then I got me hands and me arms and I've got me sight... I got me hearing whereas some poor old souls ain't got that then they got their legs so I mean we're all different in'us"

Identifying with certain stereotypes about old age informed people's perceptions of ageing. Being an 'old frail person' was associated with negative characteristics and qualities.

"like a little old lady who is pathetic. I don't want to be a little old lady."

“I was beginning to feel like what I always thought an old man would feel like ... cause I couldn't do stuff. I couldn't bend. I couldn't lift. I couldn't do this. I couldn't stand up I didn't sit down ... I thought oh bother, what the hell is going on? And I just felt like an old man.”

4. Frail identity

Not only did identifying as a frail old person have negative emotions related to it, it also had consequences. Interviewees thought that being considered to be a ‘frail old person’ was related to health and participation in an active life. When one was considered old and frail by others or themselves, it was thought they would act in a way that confirmed that identity.

“if you, if people think that they are old and frail, they will act like they're old and frail”

A loss of interest in participating in social and physical activities, poor health, and reduced quality of life were the consequences of assuming this identity.

“They give up. They've got one or two here that just give up they just don't want to know. They wonder why they're on this earth. And you do try to talk to them but don't want to know.”

People thought that it was possible to get stuck in loop so that if you thought of yourself as frail it could lead to disengagement from activities that could reduce the likelihood of frailty (such as, physical exercise or social participation) and, in turn, mean that you encountered further problems with health and with everyday activities, increasing the likelihood that you would think of yourself as frail. This would mean that once someone started thinking of themselves as frail, they would become frail. Some interviewees described it as a self-fulfilling prophecy.

“I think once you're sort of labelled frail... there is a tendency to get worse but I don't know whether that's ... due to psychology or not but I tend to think that there are pressures on people who are frail that they the majority tend to get worse and therefore they eventually pass away I suppose or depart this life”

Conclusions

The findings of these interviews provide a better understanding of how frailty is understood by older adults. This understanding includes biological-medical, psychological, and social dimensions. Beliefs about frailty and ageing reflected this multidimensional understanding. Interviewees' beliefs described a relationship between the physical, social, and psychological. In particular, responses from this study give insight into the role of self-perceptions in older adults' health and activity. The effects of self-perceptions and identification should be considered in further research and health services.

Research Team: Krystal Warmoth (lead researcher), Dr. Mark Tarrant, Dr. Iain Lang, and Prof. Charles Abraham

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Glossary

Ageing attitudes - social and individual attitudes, which contain affective, cognitive, and behavioural components, towards older adults as a group and the process of ageing

Age identity - a person's subjective sense of age based on his or her various social experiences and identification with a particular age group and consequences of psychological states or physical sensations

Ageing stereotypes - a subset age-related beliefs and attitudes related to the social category of older people

Biopsychosocial (BPS) model- views disease as the complex interaction of biological, psychological, and social factors

Comorbidity - presence of one or more additional disorders or diseases

Downward social comparisons - when people compare themselves with people who are worse off than themselves

English Longitudinal Study of Ageing (ELSA) – representative sample of English people over 50 that contains interdisciplinary data resource on health, economic position and quality of life

Fourth age - the social representation of an old person as weak, ill, and dependant who is without status in Western society

Frailty stereotype - belief that older adults will experience physical impairments, cognitive decline, disability, and ill-health as an inevitable part of getting older

Identification-contrast model – approach to how upward and downward comparison can be positive or negative depending on if the individual identifies with the target

Illness perceptions - organised cognitive representations or beliefs that patients have about their illness

Intervention mapping (IM) - an iterative process for the development, implementation and evaluation of health promotion and behaviour change interventions, containing six stages: (1) needs assessment; (2) defining intervention objectives; (3) identification of underlying mechanisms; (4) developing practical ways of delivery; (5) implementation planning; and (6) evaluation

Phenotypic frailty - considers frailty a clinical syndrome with the following elements: decreased appetite and weight loss; fatigue and weakness; gait disturbance and falling; and declining cognition

Sarcopenia - progressive loss of skeletal muscle mass

Secondary analysis - repeated analysis of data already collected in a previous study or by a different researcher to address a new research question

Glossary

Self-fulfilling prophecies - when beliefs held about the group can lead to its own fulfilment by group members

Self-management abilities – strategies, or multi-functionality of resources, a variety in resources, positive view of the future, possible growth of resources, self-efficacy, and taking initiative, which are used to sustain wellbeing and cope with losses

Self-perceptions of ageing (SPA) - individual's self-evaluations of their ageing and their possible membership in the age-group, also known as attitudes toward own ageing (ATOA)

Social comparison theory - theory suggesting the comparisons people make with others about opinions, characteristics, and abilities can influence their cognition, affect, and behaviour

Social identity - the sense of self derived from one's social group memberships or a shared identity

Social psychology – the study of the effects of construction of reality and cognitive processes on the way individuals perceive, influence, and relate to others

Stereotype embodiment theory – theory suggesting that stereotypes are embodied when their assimilation from the surrounding culture leads to self-definitions that influence functioning and health

Stereotype threat - an individual may sense that they are being judged in terms of that stereotype or they be doing something that confirms that stereotype

Subjective age - how old an individual feels or view themselves

Systematic review - a literature review which addresses a specific research question and attempts to identify, select, appraise, and synthesise the research relevant to that question

Third age - the social representation of an older people as living active and disease-free lives

Upward social comparisons - when people compare themselves with people who are better off than themselves