

An Investigation of the Longitudinal Effects of Criminal Victimisation on Quality of Life in
Older Adults

A DISSERTATION

By

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Thank you to Lara, who taught me how to think; Steffi, whose positivity is infectious; and

Trevor, whose capacity for new ideas is endless...

...and Anna. Thank you, Anna.

This has affected me deeply.

Abstract

Despite a wealth of evidence identifying criminal victimisation as a reliable predictor of detrimental outcomes across a range of domains of health and wellbeing, the exact mechanism by which these outcomes come about and are determined is not clearly understood. Across three studies, the current research project aims to remedy this gap in our understanding and clarify specifically the way in which criminal victimisation impacts the quality of life of older adults. Study one made use of data taken from wave 3 of the English Longitudinal Study of Ageing (ELSA; Banks et al., 2019) to build a profile of sociodemographic characteristics most associated with having victimisation experience. It was found that amongst older adults, it is the not-so-old, the unmarried, and the more educated who are most likely to report having been victimised at some point in their lives. Study two applied structural equation modelling (SEM) to the same wave 3 ELSA data used in study one to construct and evaluate a theoretical framework of the relationship between victimisation experience, quality of life, and a group of possible mediating variables (social isolation, fear of crime, cognitive function, mental health, and physical health). Of these variables, mental health (specifically a person's level of depression) was the only significant mediator such that victimisation increases depression which, in turn, reduces quality of life. Study three used SEM to extend the theoretical framework identified in study two longitudinally across multiple ELSA waves. The role of depression as a mediator of post-victimisation quality of life outcomes was preserved over time. Additionally, victims were found to report increased depression and reduced quality of life almost a decade before non-victims. The importance of these findings for tackling the negative long-term impacts of criminal victimisation, and the extent to which future research can build on this work, are discussed.

Key words: Criminal victimisation, aging, quality of life, depression.

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No one should be alone in their old age, he thought.

- Ernest Hemingway, *The Old Man and the Sea*

Introduction

With the number of UK residents aged 65-years and over predicted to increase by 8.6 million over the course of the next half century (ONS, 2018), it is now more important than ever that scientific research studies society's aging population. In particular, the ways in which healthy aging can be promoted must be investigated. Criminal victimisation has long been identified as a predictor of reduced health and wellbeing amongst those who experience it. Yet, the exact mechanism by which instances of criminal victimisation bring about these negative changes remains unclear, especially amongst older adults who may have experience of criminal victimisation in their distant past.

Importantly, older adults have been shown to experience deficits in domains such as social isolation (Gale et al., 2018), worry and fear about crime (Rader et al., 2012), cognitive function (Bosworth et al., 1999), mental health (Mirowsky & Ross, 1992) and physical health (Walker, 2007) as part of the natural course of aging. Furthermore, poorer social isolation (Elliot et al., 2005), fear of crime (Logan & Walker, 2017), cognitive function (Kavanaugh et al., 2017), mental health (Ullman & Filipas, 2001) and physical health (Black, 2011) circumstances have been identified amongst individuals with experience of victimisation. Older adults may, therefore, be at an even greater risk of the negative consequences of criminal victimisation as they age, or the negative consequences of aging should they experience criminal victimisation. It is crucial, then, that we understand how the effects of criminal victimisation change with increasing age. The following six chapters describe a research project that aims to determine the longitudinal pathways by which experiences of criminal victimisation negatively impact each of the domains mentioned above and, ultimately, the quality of life of older adults in the UK.

Chapter 2 reviews the existing psychological literature. Evidence from empirical research, systematic reviews and meta-analyses is collated to identify a group of potential

mediators (social isolation, fear of crime, cognitive function, mental health, and physical health) of the relationship between victimisation experience and quality of life. The associations between each of these concepts is discussed, and they are organised into a theoretical framework of post-victimisation quality of life outcomes.

Chapter 3 describes in detail the nature of the large-scale longitudinal dataset – the English Longitudinal Study of Ageing (ELSA; Banks et al., 2019) – from which this research project takes its data. Additionally, the process by which variables assessing victimisation experience, social isolation, fear of crime, cognitive function, mental health, physical health, and quality of life were created and evaluated is explained. Considerations for the treatment of missing data are discussed.

Chapter 4 (study one) makes use of a single wave of ELSA data to better understand the sociodemographic characteristics most associated with having experience of criminal victimisation. A sociodemographic profile of increased likelihood of victimisation experience drawn from victim age, sex, and level of educational attainment was built, improving our understanding of how those ELSA respondents with victimisation experience differ from those without.

Chapter 5 (study two) uses structural equation modelling (SEM) to construct and evaluate cross-sectionally a theoretical framework of the pathways by which victimisation experience influences quality of life. The extent to which each of the proposed mediators of the relationship between victimisation and quality of life contribute to post-victimisation quality of life outcomes was examined.

Chapter 6 (study three) uses SEM to extend the theoretical framework identified in chapter 5 across multiple waves of ELSA data. In this way, the changing nature of the relationships between victimisation experience, quality of life, and each of the proposed

mediators was examined over time and as ELSAs participants aged. The extent to which victims and non-victims differ in their experience of aging is also examined here.

Chapter 7 provides a summary of the results and findings of chapters 4, 5, and 6. Additionally, both academic and non-academic implications are discussed. Various limitations and directions for future research are also outlined.

Rationale for alternative format

The studies in this research project (chapters 4-7) are written and presented in submitted for publication format. Chapter 5 (Victimisation Affects Quality of Life in Old Age by Making Us Depressed) has been submitted for peer review at Psychology, Crime & Law. Chapter 6 (How Abuse Steals Victims' Golden Years) has been submitted for peer review at Psychological Science.

The studies presented here follow a single interrelated narrative, and the findings of each inform the findings of the others. Yet, chapters 4, 5, and 6 are distinct reports in their own right. All three studies examine the nature of victimisation experience and its effects on quality of life in a sample of older adults in the UK. Consequently, the alternative format presented here was appropriate.

My contributions

While Dr Lara Warmelink and Professor Trevor Crawford identified initially the research area of interest, I was responsible for defining and developing the theoretical background to the research as well as collating theoretical and empirical evidence to this end. I was responsible for the acquisition, tidying, and analysis of all ELSA data used in this research project. This was carried out under the supervision of Dr Lara Warmelink, Professor Trevor Crawford, and Dr Stefanie Doebler. I was also responsible for the writing and presentation of this manuscript. Each chapter of this thesis, while written by myself, has been

proofread and has received feedback from Dr Lara Warmelink, Professor Trevor Crawford, and Dr Stefanie Doebler.

Literature Review

With the number of UK residents aged 65-years and over predicted to increase by 8.6 million over the course of the next 50 years (Office for National Statistics, ONS, 2018), it is now more important than ever that scientific research studies society's aging population and aims to understand drivers of healthy aging. Criminal victimisation (defined below) has long been identified as a predictor of reduced health and wellbeing amongst those who experience it (termed 'victims' from here on in). Importantly, criminal victimisation and its associations with reduced health and wellbeing exist within a wider framework of adversity, which must be briefly outlined before an investigation of the negative impacts of criminal victimisation itself can be effectively undertaken.

Adverse life events include the specific acts of criminal victimisation to be examined in the current research, as well as a wider array of circumstances ranging from natural disasters and traumatic scenes witnessed during military service, to homelessness, disability, parental loss, and unemployment (Edwards et al., 2003). Indeed, each of these forms of adversity have been found to predict reductions in mental health, wellbeing, and quality of life amongst those individuals unfortunate enough to experience them (Emery & Laumann-Billings, 1998; Lucas, 2007; Lucas et al., 2004).

Furthermore, the severity and accumulation of adversity have been tied to increasingly severe negative impacts. Events such as violent victimisation may be more likely to incur deleterious health and wellbeing outcomes for the victim than other life events (Cleland et al., 2016; Shrivya, 2012), while those individuals with experience of a greater number of adverse life events are at a greater risk of poorer health and wellbeing outcomes than those who experience less adversity in their lives (Seery et al., 2010). However, this is not always the case. Research has also identified instances of greater health and wellbeing and resilience to future adversity amongst individuals with some compared to no experience

of adverse life events (Seery et al.). At any rate, what is clear is that the exact mechanism by which adverse life events can bring about these negative health and wellbeing outcomes remains unclear. This research will focus on one type of adversity, experience of criminal victimisation, to generate a theoretical framework that unearths this mechanism, focusing primarily on the post-victimisation health and wellbeing circumstances of older adults who may have experienced criminal victimisation many years previously.

Experiences of criminal victimisation are frequently and reliably tied to reduced subsequent quality of life across a range of measures. Whether we're concerned with the health-related quality of life (a measure taken within the context of health) or self-rated quality of life of individuals with experience of maltreatment as children (Corso et al., 2008; Evren et al., 2010; Lin et al., 2018), adults (Leung et al., 2005), or older adults (Chokkanathan & Lee, 2005; Chokkanathan & Natarajan, 2018) it has been shown time and time again in both empirical research and systematic reviews (Fraga et al., 2017; Weber et al., 2015) that victims are worse off than non-victims. These negative outcomes persist across various types of criminal victimisation. Research has observed similar reductions in victim wellbeing following instances of non-violent property victimisation or violent victimisation (Ambrey et al., 2014; Janssen et al., 2021; Staubli et al., 2014). Furthermore, Kaakinen and colleagues (2018) reported negative outcomes following cybercrime victimisation similar to those observed following victimisation in an offline context. While some research suggests the observed association between victimisation and quality of life is not robust (Hanson et al., 2010), studies overwhelmingly demonstrate negative post-victimisation changes in the quality of life of victims.

It is clear that experience of any type of criminal victimisation, be it child maltreatment, violent physical assault, elder abuse, cybercrime or property victimisation, can incur broadly similar negative outcomes for the victim. Yet, the varying severity of different

types of victimisation and the consequent variation in the severity of their associated negative outcomes must also be considered. Studies have reported poorer recovery in robbery and assault victims compared to those who experienced non-violent burglary (Friedman et al., 1982) and stronger negative effects following physical assault and sexual assault compared to other, less violent, forms of victimisation (Elklit & Brink, 2004; Kilpatrick et al., 2003; Stoliker, 2018). Additionally, rape is consistently identified as being more likely to incur deleterious outcomes than other traumatic events (Ullman & Filipas, 2001).

While research has observed similar negative effects amongst victims irrespective of the type of victimisation they have experienced (Kilpatrick et al., 1985; Eshelman & Levendosky, 2012), it appears that with increasing incident severity – for example, greater threat to life during rape compared to burglary (Frazier et al., 1997) – comes an increased likelihood of poorer post-victimisation health, wellbeing, and quality of life outcomes and less successful recovery from the known negative impacts of the victimisation event. Furthermore, being the victim of more than one type of victimisation has been associated with an increased risk of negative post-victimisation symptoms (Golding, 1999; Follette et al., 1996). Of course, one may argue that these post-victimisation outcomes are only relevant to older adults should an individual become a victim during old age. Yet, the apparent longitudinal nature of victimisation-related effects, alongside the uncertainty of complete and successful recovery (Robinson & Keithley, 2000), means that these factors may indeed be relevant long after the victimisation incident.

Understanding what is meant by criminal victimisation is a small but important step in understanding its effects on quality of life. The way in which we conceptualise victimisation informs which acts we deem criminal, which experiences we deem victimisation and influences which variables are used to assess those experiences. Studies may focus, for example, on the role elder abuse or child neglect plays in determining the quality of life

outcomes of older adults, in which case the nature of trust in caregiver-victim relationships will be vital to both the research and the conceptualisation of victimisation informing it (Pillemer et al., 2016). Despite the clear differences in the severity of outcomes with the severity of the victimisation event, it is also clear that different types of criminal victimisation yield negative health and wellbeing consequences that are broadly similar. Given the wealth of evidence observing comparable negative health and wellbeing outcomes of victims of a wide range of types of victimisation, the exploratory nature of this work, and the small amount of data available for different types of victimisation experience (see chapters 3 and 4), a more simplistic catch-all definition of victimisation as committing a criminal offence that brings physical, mental, or emotional harm or economic loss to another individual (Ministry of Justice, 2020). The following chapter reviews literature concerning a range of victimisation types to paint a picture of the overall effect that experiences of criminal victimisation can have on an individual's health and wellbeing. The extent to which the types of criminal victimisation examined in this research and their effects can be taken as representative of criminal victimisation in general will be discussed (see chapter 7).

Social isolation

The relationship between victimisation and quality of life outlined above is not a direct one. Indeed, several variables appear to mediate this relationship, being affected by victimisation and affecting quality of life in turn. The first of these intermediary variables is social isolation. Social isolation is an objective measure of social participation, social network size, and level of support (or lack thereof; van Baarsen et al., 2001), reflected by a small network size and scarcity of social contact (Stephoe et al., 2013). A person's level of social isolation encapsulates not only the number of individuals in their social network, but also the frequency and quality of contact with those individuals and, where victimisation is concerned, the positive or negative nature of reactions to the victimisation event from

members of that social network (Margolin & Gordis, 2000). Clarifying the role social isolation plays in determining the severity and longevity of negative victimisation effects is a particularly necessary focus given recent recognition of a social isolation pandemic amongst the world's ageing population, and in light of recent Covid-19-related social distancing measures (Murthy, 2017; Cacioppo & Cacioppo, 2018; Berg-Weger & Morley, 2020).

Studies have reported the importance of supportive family members and friends, and of tolerance and sensitivity in their reactions to experiences of victimisation, to positive post-victimisation adjustments (Krupnick & Horowitz, 1980). Other research has identified the occurrence of fewer deleterious effects, lower levels of trauma, and improved outcomes in victims who are closer to their families (Boney-McCoy & Finkelhor, 1995; Sales et al., 1984), and in those victims with a greater number of supportive individuals to rely upon (Lueger-Schuster et al., 2015; Margolin & Gordis). Additionally, the importance of the type of reactions provided by social support network members has been examined, with negative perspectives and behaviours or even victim-blaming tied to more severe negative post-victimisation effects (Ullman & Filipas, 2001). Most importantly, increased feelings of social isolation have been identified in individuals with victimisation experience (Elliott et al., 2005). Victims have also shown impairments in their ability to maintain relationships with members of their social support network (Bolger et al., 1998), and a tendency to withdraw from social engagement (Haskett & Kistner, 1991). Furthermore, increased levels of social isolation have been repeatedly tied to subsequent reductions in quality of life (Beridze et al., 2020; Theeke et al., 2012). Given the apparent benefits of social support for reducing and improving post-victimisation symptom severity and recovery respectively, it seems reasonable to regard social support as a potential buffer against the known negative effects of experiences of victimisation (Gow et al., 2007), and social isolation as an important mediator of post-victimisation quality of life.

Amongst older adults, social isolation is increasingly likely due to lifestyle changes that frequently occur with advanced age. Bereavement, widowhood, retirement, and activity-limiting illnesses may lead to fewer social relationships and less involvement in social activities (Berg-Weger & Morley, 2020; Cornwell & Waite, 2009). Together with the aforementioned findings of more successful recovery amongst those victims able to rely on members of their social network for support, we can assume that older adults are less able to access such support and are thus at a disadvantage in terms of achieving positive post-victimisation adjustments. Furthermore, studies have observed associations between social isolation and less educated and less wealthy individuals (Gale et al., 2018; Smith et al., 2018), and greater social isolation amongst men compared to women (Liu et al., 2019; Vandervoort, 2000). Overall, it seems that being socially isolated promotes less successful ageing but being socially isolated with experience of victimisation incurs even less successful ageing.

Fear of crime

Fear can, undoubtedly, be useful in its capacity to warn us of potential danger (Ferraro & LaGrange, 1992), but it can also have detrimental influences on health and wellbeing. Definitions of fear of crime in the psychological literature have changed since the term's emergence in the 1930s, progressing from loose descriptions of concern about becoming a victim (Sundeen & Mathieu, 1976) to more comprehensive definitions describing emotional reactions to environmental cue-associated anxiety (Garofalo, 1981) that reflect its status as an established concept in social science (Lee, 2011). More recently, commonalities amongst these descriptions have been synthesised into a single definition of fear of crime as “an emotional response to a danger or threat of an actual or potential criminal incident” (Henson & Reyns, 2015).

This definition is supported by theoretical work identifying fear of crime as the emotional component of an overarching ‘threat of victimisation’ concept, which also consists

of a cognitive assessment of risk and a behavioural response (Rader, 2004; Rader & Haynes, 2014). Greater fear of crime has generally been reported amongst individuals with both direct and indirect experience of criminal victimisation (Hale, 1996; Jackson & Gouseti, 2016; Logan & Walker, 2017, Reese, 2009). Additionally, reductions in life satisfaction and quality of life have been observed amongst individuals experiencing increased fear of crime (Krulichova, 2018). Although other work reports no relationship between fear of crime and quality of life (Michalos & Zumbo, 2000), generally increases in the former are regarded as having a negative influence on the latter.

Research tends to show that older adults exhibit greater fear of crime than their younger counterparts (Ferraro & LeGrange, 1987; Rader et al., 2012; Warr, 1990; Zhao et al., 2010), despite their being less likely to become victims of violent crime than individuals in younger age groups (ONS, 2021). This finding is widely regarded as being due to perceptions of vulnerability arising from age-related physical frailty or health problems, such that older adults believe themselves unable to effectively ward off acts of physical victimisation (Cobbina et al., 2008; Cossman & Rader, 2011; McKee & Milner, 2000). However, some studies suggest older individuals are no more afraid of crime than younger adults (Ferraro & LaGrange, 1992), and others identify greater fear of crime amongst the young and the old compared to those in middle-aged groups (Goodey, 1997; May, 2001). Findings of greater levels of precautionary constrained behaviours associated with increased fear of crime (Ferguson & Mindel, 2007; Garofalo, 1981; Liska et al., 1988) suggest that older adults are also at an increased risk of experiencing FoC-induced social isolation.

Other sociodemographic variables have also been observed to influence an individual's fear of crime. Sex is a powerful predictor of fear of crime, with women consistently reporting higher levels compared to men despite their being less at risk of victimisation than men (Hilinski et al., 2011). This difference between the sexes in their fear

of crime is attributed to socialisation (women are taught to fear victimisation), the ‘shadow of sexual assault’ hypothesis (for women all crime carries the threat of sexual violence), and the greater physical ability of men to fend off attackers (Rader, 2008; Rader & Haynes, 2011; Rader et al., 2007). Several studies have observed an association between low income and socioeconomic status and increased fear of crime (de Donder et al., 2012b; Hanslmaier, 2013), thought to arise from the inability of those without sufficient financial resources to engage in or afford protective measures (Pantazis, 2000), while the increased prevalence of low socioeconomic status amongst older adults means they are more likely to experience increased fear of crime (Pantazis). Additionally, research points to an association between level of education and fear of crime, such that lower levels of educational attainment are tied to increased fear of crime (Adu-Mireku, 2002; Reese, 2009).

Cognitive function

Cognitive function refers to a range of mental processes including memory, reasoning, and learning (APA, 2022). Importantly, decline in these cognitive abilities is widely accepted as being a normal part of ageing (Bosworth et al., 1999) and is, therefore, to a certain degree to be expected amongst older adults. Experiences of criminal victimisation such as emotional abuse and neglect (Majer et al., 2010), physical abuse (Prasad et al., 2005), and general maltreatment (Beers & De Bellis, 2002; Kavanaugh et al., 2017) have all been shown to predict subsequent deficits in a variety of cognitive domains including intelligence, working memory, and pattern recognitions regardless of the victim’s age (Fang & Yan, 2019; Masson et al., 2015). Importantly, reductions in cognitive function have been found to have adverse effects on quality of life in older adults experiencing varying levels of cognitive decline. This includes typical age-related cognitive changes (Zaninotto et al., 2018), mild cognitive impairment (a transitional degree of decline prior to the onset of dementia; Barrios et al., 2013; Maki et al., 2014; Teng et al., 2012), and the significant cognitive deficits found

in dementia (Beerens et al., 2013; Mate et al., 2012). While some studies report no relationship between scores on cognitive tests and quality of life (Woods, 2012; Thorgrimsen et al., 2003), the evidence points overwhelmingly to a negative association between cognitive function and quality of life (Hsiao et al., 2016).

Although a degree of decline in cognitive functioning is an inevitable part of ageing (Bosworth et al., 1999), there are considerable individual differences in the trajectories of cognitive changes that occur with increasing age (Schaie & Willis, 2016). On average, cognitive function declines in old age (Wilson et al., 2002), yet this pattern is not universal since the rate of decline for various domains of cognition may be different (Zaninotto et al., 2018). Indeed, it has been observed that memory and executive function do not persist into old age in the same way as other skills such as verbal ability (Deary et al., 2009).

Furthermore, some individuals may simply experience decline earlier than others because their sociodemographic circumstances impart greater or lesser resilience to various negative cognitive changes. Men and women perform differently across a range of cognitive tasks, with men doing better on tests of visuospatial ability (de Frias et al., 2006; Weiss et al., 2003) and women performing better in linguistic (Halpern & LaMay, 2000), memory (Herlitz et al., 1997; Larrabee & Crook, 1993) and processing speed tasks (Burns & Nettelbeck, 2005; Camarata & Woodcock, 2006). Additionally, the positive relationship between education and cognitive function, wherein individuals with higher levels of educational attainment exhibit higher levels of cognitive function than those with less education (Lövdén et al., 2020; Opdebeeck et al., 2015), is so well-established that it can be observed in virtually any studied population.

However, to understand the nature of cognitive decline amongst older adults with experience of victimisation it is important to also consider how cognitive function is influenced by those other variables affected by victimisation. Where social isolation is

concerned, a lack of social ties (Bassuk et al., 1999), social engagement and integration (Fratiglioni et al., 2004; Gow et al., 2007; Seeman et al., 2001), and a limited social support network (Fratiglioni et al., 2000) have all been found to incur an increased risk of cognitive decline. Furthermore, decreased cognitive performance and impaired memory have both been tied to heightened stress (Bell et al., 2021; Wolf et al., 2005). Fear of crime can be a key source of chronic (long-lasting) stress (Collins & Marrone, 2015) particularly for older adults who, as noted previously, tend to experience greater levels of fear of crime and who generally exhibit increased stress responses than younger adults to the same stressor (Lupien et al., 2007; Sindi et al., 2013). The increased social isolation and fear of crime observed amongst victims means older adults with experience of victimisation are at an even greater risk of cognitive decline than non-victims.

Mental health

Broadly, mental health can be regarded as a subjective state of mental wellbeing that is free from disabling symptoms and that allows an individual to effectively build relationships, cope with life stressors and function in society (APA, 2021; Manwell et al., 2015; WHO, 2022). Importantly, defining ‘good’ mental health goes beyond simple freedom from disorders and illnesses (such as depression and anxiety) that may lead to its impairment. Yet, the very fact that individuals who do experience mental health conditions like depression are more likely to report reduced mental health means that the presence of these conditions is useful in determining a person’s general mental wellbeing.

Where criminal victimisation is concerned, research overwhelmingly points to the negative impact that it has on mental health. Studies consistently report that individuals with experience of criminal victimisation are at an increased risk of a range of mental health problems, including depression, anxiety, and post-traumatic stress disorder (PTSD, Kilpatrick & Acierno, 2003). These negative outcomes persist whether victims are children (Briere &

Runtz, 1990; Duncan et al., 1996; Han et al., 2016; Herrenkohl et al., 2008; Moylan et al., 2010) or adults (Adams et al., 2013; Golding, 1999), and across a range of types of victimisation including sexual assault (Epstein et al., 1997), physical violence (Riggs et al., 1992) and psychological maltreatment (Briere & Runtz, 1988). While the type and severity of negative post-victimisation mental health changes will depend on the type of victimisation experienced, victimisation generally incurs an increased risk of suffering from disorders that result in negative mental health outcomes. The deleterious effects of experiences of victimisation on mental health are perhaps best summed-up by real-life testimony from victims themselves: “the psychological effects have continued ever since, resulting in years of unbearable guilt, depression, nightmares, anxiety and PTSD symptoms” (Jay et al., 2020).

Additionally, the association between mental health and quality of life is equally clear, such that reduced quality of life is often experienced by individuals reporting mental health problems (Bot et al., 2011; Connell et al., 2012; Evren et al., 2010; Sawyer et al., 2002). Indeed, research has observed that as mental health difficulties become more severe, quality of life is reduced further (Bastiaansen et al., 2004; Brenes, 2007; Sharpe et al., 2015), while improvements in mental health are met with an associated positive change in quality of life (Coffey et al., 2019).

The relationship between mental health and age is complex. Studies have observed poorer mental health with age (Brault et al., 2011; Stordal et al., 2001; Stordal et al., 2003; Yang, 2007), improved mental health with age (Charles et al., 2001; Christ et al., 2007; Fiske et al., 2009, van Ours, 2021), differential changes with age depending on which aspect of mental health is being examined (Brummer et al., 2014; Tuohy et al., 2004), and no relationship whatsoever between mental health and age (Blazer et al., 1991; Blazer et al., 2003). It is unclear exactly how mental health changes across the lifespan, and it seems likely that a simple linear relationship does not exist between mental health and age. Indeed,

Mirowsky and Ross (1992) offer a more nuanced conceptualisation that reflects the non-linearity of this relationship, suggesting that mental health (specifically levels of depression) gets better throughout young adulthood, reaches its peak in middle age, and begins to decline as we reach very old age.

Research examining sex differences in mental health consistently report differences in the type of mental health problems likely to be experienced by men and women. Women have been found to be more likely to develop internalising disorders such as depression and anxiety (Jalnapurkar et al., 2018; Kuehner, 2003; Piccinelli & Wilkinson, 2000), whereas men are prone to externalising disorders that result in aggressive and antisocial behaviour (Herrenkohl et al., 2008; Kessler et al., 2005; Needham & Hill, 2010). While some research suggests that women report reduced general mental health compared to men (Sialino et al., 2021), the consensus appears to be that there exist differences in the type of mental health problems experienced by men and women but not in the prevalence rates of these problems (Wilhelm, 2014). The existence of an education gradient in mental health is a well-documented finding that persists across samples and domains of mental health (Eikemo et al., 2008; Halpern-Manners et al., 2016; Jokela et al., 2010). Indeed, individuals with lower levels of educational attainment are at a greater risk of poor mental health than their more educated counterparts (Kurtze et al., 2013; McDonald et al., 2017; Ten Have et al., 2013).

There exist well-documented relationships between mental health and each of the three proposed mediators discussed above. Indeed, levels of social engagement and isolation appear to be vital in determining a person's mental health (Leigh-Hunt et al., 2017; Lueger-Schuster et al., 2015; Usher & Bhullar, 2020). Research shows that individuals who are socially isolated report a greater number of depressive symptoms (Gale et al., 2018; Okabayashi et al., 2004) and increased levels of anxiety (Evans & Fisher, 2022), while a lack of social support following experiences of victimisation predicts more severe post-

victimisation PTSD symptomatology (Rosebrock et al., 2011; Ullman & Filipas, 2001; Ullman & Peter-Hagene, 2016). Greater fear of crime has been consistently tied to reductions in a range of domains of mental health (Green et al., 2002). Higher levels of depression (Golovchanova et al., 2021; Kreski et al. 2018; Wilson-Genderson & Pruchno, 2013), increased anxiety (Morrall et al. 2010; Pearson & Breetzke, 2014) and psychological distress (Beaulieu et al., 2002) have all been observed amongst individuals experiencing heightened fear of crime. Stafford et al. (2007) suggest that it is the reductions in social engagement and interaction associated with increased fear of crime that lead to fear of crime-related negative mental health changes. Collins & Marrone (2015) also highlight the importance of reduced physical activity – known to predict poor mental health (Emery et al., 1998; Penninx et al., 1998) – stemming from fear of crime in determining mental health.

While some research finds no association between changes in mental health and cognitive function (Gale et al., 2012; Petersen et al., 2016), it is widely accepted that poorer mental health predicts reduced performance across a range of cognitive tasks. Greater levels of depressive symptoms and increased anxiety have been frequently tied to impaired executive function and memory deficits (Baumeister & Bunce, 2014; Bunce et al., 2008), negative changes in processing speed (Bunce et al., 2014), and an increased risk of cognitive decline and Alzheimer's disease (Hakansson et al., 2015; Perrino et al., 2008). Furthermore, research has reported a strengthening of this association between mental health and cognitive function with increasing age (Baumeister & Bunce).

It is important to understand that the associations between each of these variables and mental health are bi-directional, such that individuals may, for example, experience increased social isolation because of a pre-existing mental health problem. Additionally, when the aforementioned increases in social isolation and fear of crime, and decreases in cognitive function, with age are considered alongside the relationship between each of these variables

with mental health, older adults are at an increased risk of associated reductions in mental health.

Physical health

Traditionally, to be in good physical health means to be free from illness and disease. More recently, though, conceptualisations of physical health have begun to incorporate aspects of wellbeing beyond the simple presence of sickness (WHO, 2022). The extent to which a person can engage in physical activity, whether that be exercise or those activities simply required for daily living, and the ability to adapt to physical challenges are important indicators of physical health (Huber et al., 2011). Yet, given the debilitating effects of many illnesses, the presence of disease remains a useful metric of physical health.

Regardless of how it is defined, what is very clear is the negative impact experience of criminal victimisation has on a victim's physical health. Victims may acquire serious physical injuries or acute health problems, such as fractures or sexually transmitted diseases, during a victimisation event (Black, 2011). Additionally, these acute victimisation-related health issues can incur long-term sequelae such as chronic infection or an increased risk of future physical injuries like fractures and dislocations (Resnick & Acierno, 1997). Research has identified an association between experiences of violence and an increased risk of health problems affecting the cardiovascular (Coker et al., 2002; Kendall-Tackett, 2007) and nervous systems (Banks, 2007), and of poor general physical health and even physical disability (Carbone-Lopez et al. 2006). It is important to understand that this association between victimisation and physical health can extend far beyond the immediate consequences of a victimisation event. Indeed, experiences of child physical abuse have been shown to impact physical health in adulthood (Rueness et al., 2019; Widom et al., 2012), resulting in hypertension and various cancers (Herrenkohl et al., 2021).

There also exists a positive association between an individual's physical health and their quality of life. Indeed, not only is it clear that physical illness incurs a reduction in quality of life (Baumeister et al., 2005; Small et al., 1996), but it is also apparent that the greater the number of chronic illnesses an individual is diagnosed with the worse their quality of life becomes (Li et al., 2009; Somrongthong et al., 2016). Furthermore, the negative impact of physical ill-health on quality of life varies across health problems, with some conditions (such as stroke) reducing quality of life to a greater degree than others (such as cancer; Wilkman et al., 2011). Understanding the association between physical health and quality of life amongst older adults is particularly important when one recognises that the occurrence of chronic disease, and the likelihood of suffering from several chronic diseases at the same time, increases in older adulthood (Walker, 2007).

Where age is concerned, research generally identifies declines in physical health with increasing age (Carmel & Bernstein, 2003), although it has also been observed that older adults tend to rate their own physical health more positively (Bowling, 2011). This latter finding is likely due to the changing way in which individuals define health in older age as simply being able to keep doing those things they have always done. Thus, in the face of debilitating physical illness, older adults may maintain a positive outlook should they manage to go about their daily lives largely unchanged. Yet, when one considers that older adults are more likely to suffer from multiple chronic diseases at the same time (Salisbury et al., 2011; Walker, 2007), it seems more than reasonable to conclude that physical health is worse amongst the old compared to the young.

Research shows clear sex differences in patterns of physical health. Women have higher morbidity rates (the rate of occurrence of illness), yet men have higher mortality (death) rates (Rieker & Bird, 2005). This counterintuitive pattern of results, that women appear to be less physically healthy than men yet live longer, is due to both the type of

physical health problems experienced and the attitudes towards physical health taken by each sex. Indeed, studies report that women suffer more from chronic physical health problems, such as osteoporosis, arthritis, and auto-immune disease, while men are at a greater risk of experiencing life threatening physical health conditions such as coronary heart disease, cerebrovascular disease, and cancer (Haavio-Mannila, 1986; Needham & Hill, 2010; Rieker & Bird; Ziobrowski et al., 2017). Furthermore, the greater willingness of women to seek help and advice from medical professionals means that women are more likely to receive diagnoses for any physical health conditions (Carmel & Bernstein, 2003). Thus, while research reveals poorer physical health amongst women compared to men (Chen & Hsiao, 2018), this finding may not capture the true physical health circumstances of men and may depend on the indicator used.

As with the other intermediary variables discussed here, the effects of level of education on physical health are well-documented, robust, and highly replicable across samples (Freedman & Martin, 1999). Those individuals who have reached a higher level of educational attainment tend to be in greater physical health (Johnson et al., 2010). A person's level of education has important implications for their ability to lead a healthy lifestyle, access healthcare, and develop and engage in healthy behaviours (Zhang et al., 2011).

Physical health is an important determinant of social isolation, and vice versa. Illness and disease may limit the extent to which an individual is able to participate in social activities and interact with members of their social network (Victor & Bowling, 2012), resulting in greater social isolation. Consequently, physically unhealthy individuals are less able to access the benefits of social support and integration outlined previously. Research has shown that social isolation is associated with poor physical health (Cornwell & Waite, 2009; Miyawaki, 2014; Victor et al., 2012), and poor self-rated physical health (Hammig, 2019). Specifically, individuals are at an increased risk of hypertension (Hawkey et al., 2010),

cardiovascular disease (Courtin & Knapp, 2017; Steptoe et al., 2013), infection (Pressman et al., 2005) and reduced immune function (Berkman et al., 2000; Cudjoe et al., 2020). The benefits of social participation for physical health have also been consistently identified. Studies report significantly better physical health amongst individuals with higher levels of social participation and engagement, and more social connections (Douglas et al., 2017; Thraen-Borowski et al., 2013; Victor et al., 2000). The promotion of healthy behaviours, such as physical exercise and the maintenance of personal hygiene (Trieber et al., 1991), and the availability of opportunities to engage in social functions drive the positive physical health outcomes seen in individuals with access to social support (Berkman et al.).

Studies also report an association between physical health and fear of crime, such that greater fear of crime has been reported amongst less healthy individuals (Cossman & Rader, 2011; Pearson & Breetzke, 2014; Stafford et al., 2007). Most notably, fear of crime-related reductions in physical health tend to manifest as cardiovascular disease (Browning et al., 2012; Chandola, 2001). Several explanations have been put forward for the negative relationship between fear of crime and physical health, yet the tendency toward cardiovascular problems highlights the role of fear of crime in manufacturing stress as the main driver of associated reductions in physical health. As noted previously, fear of crime can be a key source of chronic stress (Macassa et al., 2017). It is the burden of this fear of crime-induced chronic stress (allostatic load; McEwen, 1998) which incurs serious physical health consequences such as cardiovascular and immune system impairment (Boardman, 2004; Kaplan & Keil, 1993; Kwarteng et al., 2017).

It is also important to consider the role fear of crime has to play in reducing engagement in activities that benefit physical health. Indeed, individuals reporting increased fear of crime have been found to exercise less (Carver et al., 2008; Collins & Marrone, 2015), yet participation in physical activity is a well-known means by which physical health can be

improved (Cerasola et al., 2022; Janssen, 2014; Jaansen & LeBlanc, 2010). The avoidance behaviours associated with heightened fear of crime may, therefore, decrease physical activity and, consequently, physical health (Lorenc et al., 2012). Furthermore, fear of crime-related reductions in social participation (discussed previously) limit the extent to which social support can act as a buffer against stress (Gow et al., 2007) and its associated negative influence on physical health.

Research consistently identifies associations between aspects of physical health and various domains of cognitive ability. Obesity (Dahl et al., 2010; Hartanto et al., 2019), high blood pressure (Novak & Hajjar, 2010), diabetes (Rawlings et al., 2014) and coronary artery disease (Eggermont et al., 2012; Kovacic et al., 2012) have all been found to predict greater cognitive decline in midlife and older adulthood (Hagenaars et al., 2017). Studies have also shown that these physical health outcomes are predicted by lower levels of cognitive ability in childhood (Belsky et al., 2013; Lawlor et al., 2008; Mottus et al., 2013). Furthermore, reductions in cognitive function have been associated with poorer oral health amongst older adults (Wu et al., 2008), whilst physical activity and exercise promote cognitive function (Tait et al., 2022; Zhu et al., 2014).

Physical health and cognitive function exist, then, in a bidirectional relationship, where the circumstances of each inform the circumstances of the other. Reduced cognitive function, especially amongst older adults (who, as discussed previously, are at an increased risk of cognitive decline), may impair an individual's ability to effectively maintain their own physical health. On the other hand, improving physical health, in particular cardiovascular system function, by engaging in physical exercise increases the flow of oxygenated blood to the brain, yielding improvements in cognitive function (Ainslie et al., 2008; Donley et al., 2014; Song & Yu, 2019).

The nature of the relationship between physical and mental health is perhaps the most well-known discussed here. The two are inextricably linked, such that as one improves it is highly likely that the other will improve similarly. Findings from empirical research and systematic reviews consistently report strong direct associations between mental and physical health (Nabi et al., 2008; Ohrnberger et al., 2017; Surtees et al., 2008). Importantly, the poorer a person's physical health becomes (as determined by an increasing number of physical health problems) the greater the likelihood of their reporting associated mental health problems, particularly depression (Barnett et al., 2012; Gunn et al., 2012; Moussavi et al., 2007). This relationship is most widely understood in terms of the benefits that physical activity and exercise have on mental health. Indeed, findings of the negative impacts of physical inactivity (Gerber & Puhse, 2009; Hegberg & Tone, 2015) and the positive impacts of physical exercise (Clegg et al., 2012; Forbes et al., 2008) on mental health outcomes are highly replicable across samples. These findings extend beyond academia and scientific research and into the knowledge base of the general public - as shown by the recognition by organisations such as Mental Health Foundation that what is good for the mind is good for the body, and vice versa (MHF, 2021).

It appears that those individuals who are socially isolated and experience greater levels of FoC and cognitive decline, and worse mental health will be in the poorest physical health. Furthermore, given the previously discussed increased likelihood of worsening social isolation, fear of crime, cognitive function, and mental health in older adulthood and as a result of victimisation, it seems victims are at an even greater risk of reduced physical health.

Quality of life

Quality of life is commonly talked about and assessed purely within the context of a person's health, particularly their physical health (Bowling, 2005). The tendency to do this becomes all the more prevalent when discussing the quality of life of older adults, amongst

whom physical health typically declines and can loom ever larger as a barrier to maintaining wellbeing. Yet, in recent years, conceptualisations of quality of life have moved beyond consideration of how many years a person might live given their current physical health status, to incorporate the extent to which an individual may lead a fulfilling life despite any limiting factors, recognising that a person's quality of life must also reflect their subjective appraisals of various psychosocial domains (Proctor et al., 2009a). Thus, quality of life can be regarded as the extent to which an individual is able to pursue and satisfy higher-order needs, such as happiness, beyond those fundamental requirements for human survival, such as food and shelter (Maslow, 1968). In this way, good quality of life may be indicated, for example, simply by a person's ability to engage in those activities that make them happy (Hyde et al., 2003).

The close and clear association between a person's mental health and their quality of life (discussed previously) is not surprising, given that research often identifies each as affective and eudemonic components respectively of an overarching concept of wellbeing that may also consist of a cognitive aspect of life satisfaction (Vanhoutte & Nazroo, 2016). As defined above, quality of life reflects the ability of a person to engage in those activities that make them happy (Hyde et al., 2003) and, most importantly, to have agency and autonomy over such acts. On the other hand, a person's mental health is defined by their freedom from disabling symptoms brought on by disorders such as depression and anxiety; a freedom which permits their effective functioning in society (APA, 2021; Manwell et al., 2015; WHO, 2022). Mental health is, due to its emphasis on the absence of symptoms of ill health, at its core a measure of health and, as such, is best seen as a driver of quality of life. Consequently, while it may be the case that mental health and quality of life together inform our understanding of overall wellbeing, in this research they are treated as distinct, albeit

closely tied, concepts. Indeed, mental health functions as a predictor of quality of life rather than a correlate in the analyses to be outlined and discussed in later chapters

Importantly, and in the same way as for those variables that have been shown above to influence it, quality of life may differ across individuals depending on their sociodemographic profile. Where age is concerned, there appear to be consistent findings of a U-shaped relationship between it and quality of life, such that greater wellbeing is observed at younger and older ages, whilst the lowest quality of life occurs in middle age (Blanchflower & Oswald, 2008; Dolan et al., 2008; Frey & Stutzer, 2002; Wang & Vanderweele, 2011). However, there are variations in these findings. Argyle (1999) reports that investigations also consistently observe a negative relationship between age and quality of life; while others identify a U-shaped relationship between age and quality of life up to a point, followed by deteriorating quality of life in very old age (Gwozdz & Sousa-Poza, 2010). Others simply report findings of a better quality of life during younger ages (Patricio et al., 2014; Cruz et al., 2011).

Indeed, while research shows a tendency for improvements in quality of life amongst individuals from the ages of 50 to 65 years of age (Netuveli et al., 2006; Steptoe et al., 2012), studies report declines in quality of life and wellbeing beyond this point when individuals progress into very old age (Hansen & Slagsvold, 2012; Wiggins et al., 2004). Still other research has failed to identify differences in quality of life between older age groups (Gerstorf et al., 2007; Zaninotto et al., 2009). However, given the conclusion of Van Praag and Ferrer-I-Carbonell (2010) that the U-shaped association between age and quality of life can, in effect, be regarded as law like, it seems reasonable to conclude that quality of life is greatest amongst the young and the old but begins to decline in very old age. The negative age-related changes shown to occur in levels of social isolation, FoC, cognitive function, mental health and physical health discussed above, and the associations between those

variables and quality of life support this notion that entering very old age brings an associated reduction in quality of life.

Sex differences in quality of life are also apparent, with women reporting lower quality of life compared to men (Conde-Sala, 2017; Olsen et al., 2020). While some studies report no statistically significant differences in the quality of life of men and women (Brajša-Žganec et al., 2011; Spagnoli et al., 2012), the finding of sex differences in quality of life appears to persist across low-, middle-, and high-income countries (Lee et al., 2020; Molzahn et al., 2010) and becomes more apparent with increasing age (Olsen et al.). This latter finding may be related to the higher mortality rates of men such that only the healthiest men with the best quality of life live to reach very old age, while less healthy women who have accompanying low quality of life may still reach the oldest age groups (Austad & Fischer, 2016).

Finally, a person's level of education can influence their quality of life too. Individuals who have reached a higher level of educational attainment have been found to report better quality of life than their less educated counterparts (von dem Knesebeck et al., 2007; Pinguart & Sörensen, 2000). A greater level of education incurs a range of quality of life benefits, including an improved chance of acquiring a high-income job which, subsequently, improves an individual's ability to afford a healthier lifestyle (such as exercise class memberships and healthier foods; Pascarella & Tenzerini, 2005). While some studies show no association between a person's level of education and their quality of life (Vaez et al., 2004), and others that greater quality of life exists amongst those with lower levels of education (Gobbens & Van Assen, 2014; Sirgy, 2012; Stutzer, 2004), it is abundantly clear that being more educated predicts higher quality of life (Edgerton et al., 2011).

This review of the relevant literature shows that experiences of criminal victimisation can have negative effects on a variety of domains of human life, and that these impacts can

persist longitudinally to drive health and wellbeing outcomes many years after the victimisation event occurred. It should also be clear that there are many causal pathways that can be traced from victimisation experience to quality of life. Not only must the impact of victimisation on each intermediary variable and of each of these variables on quality of life be considered, but the impact of each intermediary variable on the others (and what this means for the post-victimisation quality of life outcomes driven by these variables) must also be taken into account.

Generally, it seems that worsening circumstances of each intermediary variable predicts worsening circumstances of each of the others, leading to subsequent reductions in quality of life that are more pronounced in victims compared to non-victims precisely because of the effects of victimisation on each intermediary variable. Yet, the complex nature of the relationships between these variables means that not all victims will follow the same causal pathway or exhibit the same trajectory of post-victimisation quality of life outcomes. Rather, it is the combination of a victim's pre- and post-victimisation circumstances across the range of intermediary variables outlined above that will determine their overall post-victimisation quality of life. The way in which these intermediary variables fit in the space between victimisation and quality of life to create a framework of post-victimisation quality of life outcomes, and how the structure of this framework changes over time and with increasing age is the focus of this project.

In developing this theoretical framework, I hope to identify ways in which victim support interventions might be better tailored to the specific social, cognitive, physical, and mental health circumstances of each older victims. Furthermore, should longitudinal analyses show persistent reductions in quality of life or any aspect of the theoretical framework over time for victims beyond what we might reasonably expect amongst older adults, the long-term nature of negative post-victimisation outcomes will be confirmed. Importantly, should a

theoretical framework consisting of the various interrelated social, health and wellbeing concepts described in this chapter be identified, findings from previous research discussing these concepts separately and failing to account for their relationships with one another must be carefully reconsidered.

The English Longitudinal Study of Ageing (ELSA)

To achieve the aims of this research project, a dataset recording the health and well-being circumstances and the experiences of victimisation of older adults over a meaningful period of time was required. The English Longitudinal Study of Ageing (ELSA; Banks et al., 2019) is that required dataset. Taking its initial sample of respondents from households that had taken part in the Health Survey for England from 1998 to 2001, ELSA has, since 2002 collected extensive information on the changing health, social, well-being, and economic circumstances of people aged 50 and over in England (ELSA, 2019).

ELSA respondents are interviewed every two years in what are called ‘waves’, to assess change in their health, social, well-being, and economic circumstances. At the time of writing there have been nine completed ELSA waves collected between 2002 and 2019, with the tenth due to be completed by July 2023. Additionally, ELSA runs various sub-studies, including a Covid-19 sub-study that collected data at two time points in 2020 regarding experiences of Covid-19, testing, and hospitalisation, alongside content from the core ELSA project regarding mental health, physical health, and social isolation (ELSA, 2019). ELSA provides the perfect opportunity, then, to examine psychosocial predictors of quality of life outcomes following experiences of victimisation in a large sample of older adults.

This chapter outlines and explains the decisions made during this project’s data tidying process. The selection, creation and tidying of variables to assess respondents’ experience of criminal victimisation and their social isolation, fear of crime, cognitive function, mental health, physical health, and quality of life circumstances takes place within the context of ELSA waves 3, 5, 7, and 9. This provided a spread of 12 years overall, and 4 years between each data collection time point. Wave 3 was the starting point because it was at this wave that information about an individual’s experience of criminal victimisation was collected. Four waves were used because: this balanced the necessity of allowing a

meaningful length of time to have passed between data collection points (ensuring measurable change on the variables of interest could occur) with the complexity and volume of statistical output from longitudinal analysis; and ensured the most recent data at the time of analysis (wave 9) was incorporated. All initial data tidying was done in wave 3 and, where possible, the same data tidying process was applied in waves 5, 7, and 9 for each variable. Where this was not possible, I have stated so and explained the revised data tidying process. All data tidying and statistical analyses were carried out in R Studio (Version 1.4.1106, RStudio Team, 2021), and all R scripts can be found at https://osf.io/r6nz5/?view_only=ae611e22fa284feaf7d86112cb1f98d.

Victimisation experience

At wave 3 only, ELSA issued alongside its core questionnaire an additional set of measures in the Life History Questionnaire. Of the 9771 respondents in wave 3, 7855 also completed this additional set of measures. The Life History Questionnaire asked respondents about key events throughout their lives, including the places where they have lived and worked, the nature of their relationships with their parents as a child, and experiences of traumatic life events such as natural disasters or instances of victimisation. The presence of this criminal victimisation experience information led us to use ELSA wave 3 as the starting point for data tidying and analysis.

The Life History Questionnaire contains three variables assessing experiences of criminal victimisation. The first, 'rsattac', asks respondents if they have ever been a victim of a serious physical attack or assault; the second, 'rssexas', asks respondents if they have ever been a victim of sexual assault (including rape or harassment); and the third, 'rsabuse', asks respondents whether they had been physically abused by their parents when they were younger than 16 years of age. Given the similarities in negative health and wellbeing outcomes between different types of criminal victimisation, particularly various types of

violent victimisation (Kaakinen et al., 2018; Janssen et al., 2021), these separate criminal victimisation variables were combined to form a single variable assessing the occurrence of any of the three types of victimisation (VictExp).

VictExp was constructed so that a score of 0 indicates no victimisation experience, and a score of 1 indicates experience of any of ELSA's three types of victimisation. This item gives no information regarding the type, severity, or number of experiences of victimisation. Since experience of criminal victimisation was only assessed at wave 3, no data tidying in other waves was required. Instead, VictExp is fixed and does not change over time but is used to determine the effects of victimisation experience on the proposed intermediary variables and quality of life at all waves. While this variable assesses self-reported victimisation experience, throughout this research project it will be talked about simply in terms of victimisation experience. This is to preserve the fluidity of the narrative.

Social isolation

Generally, measures of social isolation attempt to capture the size of an individual's social network, the frequency with which they are in contact with social network members, their marital status, and their level of engagement and participation in social and community organisations (Bassuk et al., 1999; Berkman et al., 2000; Cornwell & Waite, 2009; Gow et al., 2007). Indeed, several studies using ELSA to investigate the detrimental impact of social isolation on health and wellbeing (Gale et al., 2018; Shankar et al., 2011; Smith et al., 2018; Steptoe et al., 2013) have constructed a social isolation index out of constitutive ELSA items assessing social network size, the frequency and quality of contact with that social network, and social engagement.

ELSA also includes a group of five variables which it specifically labels as 'social isolation/loneliness', that ask respondents, for example, how often they feel lonely and how often they feel isolated from others. At first glance these items might seem suitable measures

to use in research examining social isolation, yet, feeling lonely or isolated and being isolated are two different things. The former refers to subjective feelings of isolation that reflect a disconnect between the nature of a person's actual relationships and social support circumstances and those they would like to have (Perlman & Peplau, 1981; Steptoe et al., 2013). Social isolation, on the other hand, refers to the objective, quantifiable state of having limited contact with a small social network. ELSAs group of 'social isolation/loneliness' items do not reflect this objectivity.

Consequently, and following the example of previous researchers (Gale et al., 2018; Shankar et al., 2011; Smith et al., 2018; Steptoe et al., 2013), ELSA items assessing whether respondents are members of any social organisations, clubs, or societies, their marital status, and the frequency with which they have face-to-face, telephone, and written contact with children, family and friends were used to construct an index of social isolation (SI_Total). ELSA respondents were assigned points on this index should they be unmarried or not cohabiting, have less than monthly contact of any of the aforementioned forms with children, with family, and with friends, and if they did not participate in any social organisations, clubs, or societies. Scores ranged from 0-5 on this index, with higher scores indicating greater social isolation. Respondents needn't have provided responses to all constitutive items to receive a social isolation score. Importantly, because ELSA allows respondents to choose from a range of marital statuses, being unmarried in the context of SI_Total includes those respondents who have never been married, those who are separated from their spouse, divorced, or widowed, and those who were in a civil partnership but are now separated from their partner or whose partner has died, or a civil partnership that has since been dissolved.

Finally, a Cronbach's Alpha test of internal consistency was conducted on the constitutive ELSA items used to construct SI_Total, indicating a good/acceptable level of internal consistency ($\alpha = .79$). Given the repeated use of the same social isolation index by

other researchers, and the good level of internal consistency, it seems reasonable to regard SI_Total as an effective measure of social. All SI_Total constitutive items were also available in waves 5, 7, and 9, therefore the same data tidying process was applied in these later waves, yielding the same social isolation index.

Fear of crime

ELSA contains a single item (labelled 'scsce') assessing respondents' fear of crime. Scsce is one of a group of items assessing respondents' perceptions of their neighbourhood. Items in this group ask respondents, for example, whether they feel part of the area, if people in the area are friendly, and if the area is kept very clean. Together these items offer an insight into a respondent's overall thoughts of their area, but scsce – which follows the traditional format of measures of fear of crime (Miethe & Lee, 1984), asking respondents if 'People would be afraid to walk alone after dark in this area' – provides an insight into a person's fear and worry of and about crime.

Yet, fear of crime is a complex construct, and research recognises that it cannot be adequately measured using a single item. Scsce may be inadequate as a measure of fear of crime for several reasons. Crime does not occur only at night nor only in your neighbourhood, and an individual's levels of fear may differ between types of crime or may be influenced by their concern for the welfare of others as much as for their own (Collins & Marrone, 2015; Ferraro & LaGrange, 1992; Henson & Reynolds, 2015). Yet, scsce is the best item to use should fear of crime need to be assessed by just one variable.

Scsce is scored on a 7-point Likert scale such that higher scores reflect increasing disagreement with the item statement – i.e. higher scores indicate reduced fear of crime. To make scores on this item easier to understand and the output of any analyses easier to interpret, scsce scores were reversed so that higher scores reflect increasing agreement with the item statement and, therefore, greater levels of fear of crime. Importantly, fear of crime

has only been assessed by ELSA on three occasions, at waves 1, 3, and 7. Since this research project is only concerned with ELSA data from wave 3 onwards, fear of crime is only present in two of the four waves used here (waves 3 & 7 of 3, 5, 7, & 9). The same fear of crime item was present in wave 7 so the same data tidying process was used as in wave 3, producing the same fear of crime measure.

Cognitive function

Methods of assessing cognitive function vary from study to study. Many researchers regard a simple memory task or tasks as a sufficient means of assessing cognitive function (Maharani et al., 2018; Smith et al., 2018; Tampubolo & Sutherland, 2015), while others try and reflect in their measures the multi-faceted nature of cognition by including assessments of verbal fluency and processing speed alongside memory tasks (Brailean et al., 2019; Fancourt & Steptoe, 2019; Veronese et al., 2018). Fortunately, ELSAs wave 3 dataset includes its own composite index of cognitive function – ‘cfind’. This index totals respondents’ scores on separate memory and executive function indices, which are themselves derived from respondents’ scores across several constitutive items. The memory index is made up of variables assessing respondents’ orientation in time, their immediate and delayed recall, and their prospective memory. The executive function index is made up of variables assessing respondents’ verbal fluency and processing speed.

ELSAs cfind variable exists in its complete form in waves 3 and 5, and, therefore, it was used to assess respondents’ cognitive function at those time points only. However, in waves 7 and 9 cfind does not exist. This is because not all of the individual items used to construct cfind were included in ELSAs data collection at these later time points. Measures of prospective memory and processing speed were not administered to respondents in waves 7 and 9. Rather than try and use some other ELSA variable as a proxy for cognitive function, it was decided that a reduced cognitive function index would be constructed in waves 7 and 9

based on those constitutive cognitive function items that *were* available. Confirmatory factor analysis was used in wave 7 to determine whether the remaining cognitive function variables effectively measured an underlying cognitive function construct. The Tucker_Lewis Index (TLI) and the Comparative Fit Index (CFI) compare model fit to the worst possible model. The Root Mean Square Error of Approximation (RMSEA) and the Standardised Root Mean Square Residual (SRMR) indicate how far a model is from perfect fit. The CFI and TLI (for which scores of greater than .90 suggest good fit) values of 1.00 and .99 respectively indicate good model fit, as do the RMSEA and SRMR (for which values of less than .70 and .80 respectively suggest good fit) values of .05 and .02 (Hooper et al., 2008; Kline, 2005; Steiger, 1989; MacCallum et al., 1996). Table 1 shows the output of this confirmatory factor analysis. Each of the constitutive cognitive function variables available in ELSA wave 7 load significantly onto the underlying cognitive function construct. Consequently, it was concluded that this reduced cognitive function index is a useful measure of cognitive function, and the same approach was taken in ELSA wave 9. At waves 7 and 9, then, this reduced cognitive function index was used to assess cognitive function.

Table 1. Output of confirmatory factor analysis of constitutive cognitive function index (cfind) items present in ELSA wave 7.

Constitutive item	Coefficient Estimate	SE	z-value
Orientation in time	1.00		
Immediate word recall	8.24***	.49	16.66
Delayed word recall	9.34***	.56	16.70
Verbal fluency	6.42***	.42	15.32

*** $p < .001$

Mental health

At wave 3 ELSA contains two mental health screening measures. The first is a shortened form of the General Health Questionnaire (GHQ-12). The GHQ-12, developed by Goldberg and Blackwell (1970), assesses whether a respondent has recently experienced symptoms or behaviours indicative of non-psychotic and minor psychiatric disorders. Higher GHQ-12 scores, when scores on all items are summed, suggest a greater severity or occurrence of symptoms of mental illness, and are thus indicative of poorer mental health. The second mental health screening measure is the Center for Epidemiological Studies – Depression scale (CES-D). Developed by Radloff (1977), the CES-D is a 20-item scale assessing the extent to which major facets of depression, such as depressed mood and sleep disturbance, were experienced by respondents in the preceding week. Responses are given in simple yes/no format and positive items are reverse coded to ensure that when item scores are summed, higher scores indicate a greater occurrence of depressive symptoms in the past seven days.

ELSA makes use of a reduced format CES-D scale, the CES-D 8. This smaller scale has, though, been found to be a valid and useful measure of depressive symptomatology when compared to its larger counterpart (Briggs et al., 2018). One might be concerned that a measure of just depressive symptomatology cannot be as useful in comprehensively representing mental health outcomes as an assessment of general mental health. Yet, the fact that a great many individuals living with depression suffer from comorbid mental health problems such as PTSD (Armenta et al., 2019) and panic and anxiety disorders (Gorman et al., 1996/1997; Kessler et al., 1996; Wittchen, 1996) means it is likely that levels of depressive symptomatology offer a useful insight into a person's general mental health circumstances.

Furthermore, a correlational analysis assessing the nature of the relationship between the two mental health screening measures yielded a strong positive correlation ($.63, p < .001$), indicating that as scores on one measure increase so do scores on the other. Both mental health screening measures can, therefore, be regarded as assessing the same construct, and it seems reasonable to conclude that there is no detriment or benefit to using one over the other. This is fortunate since the GHQ-12 scale is not administered to ELSA respondents after wave 3, whereas the CES-D scale is included in every single ELSA data collection wave. The CES-D scale was used to assess respondents' mental health in this research. Additionally, because the CES-D scale is available in all ELSA data collection waves, the same data tidying process was used in waves 3, 5, 7, and 9, producing the same mental health variable in each. Throughout this research project, then, respondent mental health is determined by their level of depression, and this is reflected in the use of terms like 'depression' and 'depressive symptomatology' throughout.

Physical health

Measurement of physical health in psychological research varies significantly in its extent. Some researchers are confident that a single item assessing self-rated health can be a powerful and objective predictor of physical health (Idler & Benyamini, 1997; Wu et al., 2013). Other researchers create complex indices based on the presence of chronic health conditions and the extent to which these health conditions limit a person's daily activities (Jürges, 2009). A middle-ground approach to the assessment of physical health might, then, include a self-report measure alongside an item or group of items assessing diagnoses of chronic health conditions. Yet, despite research identifying self-rated health as a useful objective measure, it remains highly subjective since respondents approach such a measure with unique points of reference against which they judge their health.

ELSA contains a group of seven variables assessing diagnoses of chronic health conditions (lung disease, asthma, arthritis, osteoporosis, cancer, Parkinson's disease, and Alzheimer's disease) and an eighth item identifying diagnoses of a range of cardiovascular system diseases (including angina, myocardial infarction, congestive heart failure, heart murmur, arrhythmia, diabetes, and stroke). This group of eight variables follow closely those used in other work (Fancourt & Steptoe, 2019; Savva et al., 2013), and include some of those chronic illnesses most observed in both sexes – osteoporosis and arthritis in women, and cancer and cardiovascular diseases in men (Needham & Hill, 2010; Rieker & Bird, 2005; Ziobrowski et al., 2017).

This group of eight physical health items were reduced to a single composite index of objective physical health (No.OfDoctorDiagnosed), assessing the total number of chronic health condition diagnoses reported by a respondent. However, to ensure that each constitutive item represented an overarching dimension of objective physical health and could justifiably be used to create the proposed composite index, a confirmatory factor analysis was carried out. This analysis revealed a mix of findings. The CFI and TLI values of .78 and .69 respectively indicate a poor fitting model, while the RMSEA and SRMR values of .03 and .02 respectively indicate a good fitting model. Additionally, the confirmatory factor analysis identified statistically significant z-scores at the $p < .001$ value for each objective physical health measure except those for Parkinson's and Alzheimer's disease ($p = .14$, $p = .44$ respectively), suggesting that all others load onto the overarching dimension of objective physical health (Table 2).

However, rather than remove Parkinson's disease and Alzheimer's disease as constitutive items in the construction of No.OfDoctorDiagnosed, the RMSEA and SRMR indicators of good model fit suggest that it is reasonable to create the composite No.OfDoctorDiagnosed variable complete with all eight objective measures of physical

health. Furthermore, the prevalence of Parkinson's disease and Alzheimer's disease rises with age such that Parkinson's disease is one of the most common neurological conditions amongst older adults, while Alzheimer's disease affects one in six adults over the age of 80 (NICE, 2022; NHS, 2021). To comprehensively measure the objective physical health of older adults one *must* include assessment of conditions as common as Parkinson's disease and Alzheimer's disease.

Table 2. Output of confirmatory factor analysis of constitutive physical health index (No.OfDoctorDiagnosed) items.

Constitutive item	Coefficient Estimate	SE	z-value
Cardiovascular disease	1.00		
Lung disease	.89***	.10	9.39
Asthma	.90***	.10	9.15
Arthritis	1.23***	.14	9.04
Osteoporosis	.61***	.07	8.70
Cancer	.21***	.05	4.31
Parkinson's disease	.02	.02	1.49
Alzheimer's disease	.01	.01	.77

*** $p < .001$

Given these considerations, a composite No.OfDoctorDiagnosed measure of physical health was created by summing across all eight constitutive items to obtain the total number of chronic health condition diagnoses per ELSA respondent. Additionally, a correlational analysis between ELSAs measure of self-reported general health and No.OfDoctorDiagnosed revealed a positive association of moderate strength ($.43, p < .001$) between these subjective and objective measures of physical health. This not only suggests that an increasing number of doctor diagnosed chronic health conditions is associated with ratings of poorer general

health, but that No.OfDoctorDiagnosed is useful as a means of determining both objective *and* subjective physical health. Thus, it seems reasonable to conclude that this variable represents a good middle-ground approach to the assessment of physical health.

In waves 5, 7, and 9 diagnoses of cardiovascular diseases are not grouped in a single summary variable as in wave 3. Consequently, at these later time points this summary variable was constructed based on items charting pre-existing and new diagnoses of any of the conditions encapsulated within the wave 3 cardiovascular disease summary variable. Furthermore, in wave 3 diagnoses of each of the chronic health conditions were indicated by one item per condition; in waves 5, 7, and 9 diagnoses of each chronic health condition had to be determined by combining items charting pre-existing and new diagnoses of these conditions. Having done this, No.OfDoctorDiagnosed was then constructed in the same way as in wave 3.

Quality of life

At all waves of data collection ELSA contains two measures of quality of life. To be specific, there is a measure of quality of life and a measure of life satisfaction. The former is the CASP-19 (Hyde et al., 2003), the latter the Satisfaction with Life Scale (SWLS, Diener et al., 1985). The CASP-19 scale includes 19 items spanning four psychosocial domains of control, autonomy, self-realisation and pleasure, culminating in a score on a 0–57-point scale where higher scores reflect greater quality of life. The SWLS is a 5-item assessment which aims to measure cognitive judgements of life satisfaction, also culminating in scores on a scale where higher scores reflect greater happiness/well-being.

There seems little point in utilising two questionnaires measuring the same construct, especially since research has identified that each measure is correlated with the other (Sim et al., 2010) such that better quality of life as indicated by the CASP-19 scale reflects greater life satisfaction as indicated by the SWLS. Furthermore, ELSAs target demographic, the

individuals from whom ELSA collects its data reveal CASP-19 to be the more appropriate quality of life measure. The CASP-19 quality of life questionnaire has been specifically developed and designed with older adults in mind and, indeed, was originally constructed and validated in a sample of UK individuals aged between 65-75 years (Sim et al.; Zaninotto et al., 2009). On the other hand, Diener et al's (1985) SWLS measure was developed during research involving undergraduates at the University of Illinois in the US. While the SWLS has been used in several cross-cultural investigations (Moksnes et al., 2014; Clench-Aas et al., 2011), and consistent non-US sample SWLS findings are deemed representative of levels of life satisfaction across the Western world (Pavot & Diener, 2008), its use in a specifically UK context has been limited. Given that this project aims to clarify the nature of the quality of life circumstances of older adults with experiences of criminal victimisation, and that the respondents from whom ELSA has collected so much data are older UK adults, CASP-19 is a perfect fit.

Additionally, over the course of ELSA's data collection program it is possible that its respondents have aged alongside the age range within which CASP-19 was originally validated. The mean age at wave 3 of those ELSA respondents who were present at both waves 3 and 9 was 60 years. Thus, in the 12 years between the first ELSA wave used in this research and the last ELSA wave used in this research, many respondents will have provided longitudinal CASP-19 data at those ages for which the measure was originally constructed (65-75 years). With this reasoning in mind, the CASP-19 scale was used to assess quality of life in this research. Additionally, because the CASP-19 scale is available in all ELSA data collection waves, the same data tidying process was used in waves 3, 5, 7, and 9, producing the same quality of life variable in each. Descriptive statistics for each of the variables described here in the ELSA wave 3 dataset used in statistical analyses can be found in Table 3.

Sociodemographic variables

A variety of sociodemographic variables are incorporated into each of the three sets of analyses that make up this research project. Associations between age, sex, and socioeconomic status and the variables included in the theoretical framework are well-documented (see chapters 2 and 4). As such, all three were included as independent variables in all analyses. Victim sex is scored as 1 – ‘Male’ and 2 – ‘Female’. Level of education functions excellently as a predictor of socioeconomic status since educational attainment is considered its primary determinant (Johnson et al., 2010; ten Have et al., 2003; Zhang et al., 2011). ELSA collects detailed information about respondent qualifications, as such a new variable charting the highest level of education reached was created. This variable reduced the seven available level of education responses (‘NVQ4/5/Degree or equivalent’, ‘Higher education below degree’, ‘NVQ3/GCE A Level equivalent’, ‘NVQ2/GCE O Level equivalent’, ‘NVQ1/CSE other grade equivalent’, ‘Foreign/other’, ‘No qualification’) to a more manageable variable that combined equivalent qualifications (w3edqual_collapsed; 1 – ‘no qualification’, 2 – ‘below degree qualification’, 3 – ‘degree or equivalent’).

In study three (chapter 6) these variables are controlled for in longitudinal analysis. However, only values for each of these sociodemographic variables attained at wave 3 were used since increasing respondent age can be determined by the number of ELSA waves included in the longitudinal analysis, and respondent sex and level of education is unlikely to have changed amongst older adults. Indeed, the often unchanging nature of level of education during adulthood is one of its main strengths as a measure of socioeconomic status (ten Have et al., 2003). Additionally, marital status and ethnicity were included as independent variables in study one. As with level of education ELSA collects detailed information about marital status and allows respondents to select from a wide variety of statuses, including civil partnership, separated, widowed, and dissolved civil partnership. This information was

collapsed into a single marital status variable (dimar_collapsed; 1 – ‘Married’, 2 – ‘Unmarried’). ELSA collects only basic data about respondent ethnicity, which is scored as 1 – ‘White’ and 2 – ‘non-white’.

Table 3. Descriptive statistics for tidied ELSA wave 3 dataset. Mean, standard deviation (SD), minimum and maximum scores for continuous variables, mode and count data included for nominal variables.

Variable	Mean/ mode (SD/count)	Min. value	Max. value
Age	66.23 (9.51)	24.00	99.00
Sex	Female (2623) Male (2050)		
Level of education	Below degree (2192) No qualification (1235) Degree/equivalent (1246)		
Marital status	Married (3286) Unmarried (1387)		
Ethnicity	White (4615) Non-white (58)		
Victimisation experience	No (4143) Yes (530)		
Social isolation	.79 (.81)	0.00	4.00
Fear of crime	3.24 (1.85)	1.00	7.00
Cognitive function	30.14 (6.26)	8.00	48.00
Depression	1.29 (1.78)	0.00	8.00
Physical health	1.08 (1.02)	0.00	6.00
Quality of life	41.70 (8.30)	4.00	57.00

Missing data

The handling of missing values in a dataset is a contentious issue that requires careful and balanced consideration of a range of factors, including the amount of missing data there is, the sample size and statistical power of the dataset should missing data be removed, and how variables with missing data are to be used in statistical analysis (Dong & Peng, 2013;

Madley-Dowd et al., 2019). Additionally, various methods of dealing with missing data exist, including multiple imputation and removal of missing values entirely. Table 2 shows the proportion of missing data for variables in the ELSA wave 3 dataset used in the analyses presented in chapters 4, 5, and 6 below.

Table 4. Number and percentage of missing values for each ELSA wave 3 variable used in statistical analysis.

Variable	Number of missing values	Percentage missing
Age	0	.00
Sex	0	.00
Level of education	42	.40
Marital status	3	.00
Ethnicity	5	.10
Victimisation experience	3328	34.10
Social isolation	3	.00
Fear of crime	1746	17.90
Cognitive function	766	7.80
Depression	364	3.70
Physical health	1727	17.70
Quality of life	2038	20.90

The large amount of missing victimisation experience can be attributed to the fact that not all ELSA wave 3 respondents completed the additional Life History Questionnaire described above. Many of the variables are missing no data at all, yet the amount of missing fear of crime, physical health, and quality of life data is worth noting. Various guidelines exist for the amount of data that can be missing before data imputation is no longer viable. Indeed, just 5% missing data has been identified as a safe upper boundary for the use of imputation (Alice, 2015). Yet, the nature of the variables which are missing large amounts of

data is a more important factor to consider than the amount of missing data. For example, it would not be appropriate to impute data for a variable that assesses the presence of chronic illnesses diagnosed by a qualified medical physician, since doing so would necessarily require bestowing upon respondents who may be perfectly health chronic physical illnesses such as cancer or lung disease.

Furthermore, in the theoretical framework of post-victimisation quality of life effects developed throughout this thesis, fear of crime and physical health are closely tied to the outcome measure quality of life. Research has identified extremely poor performance of data imputation methods when strong associations exist between the variables whose data is incomplete and the outcome measure of a particular model (Morris et al., 2014). Power analyses appropriate for regression models conducted on the complete case datasets used in statistical analyses throughout this research (chapter 4 and 5 cross-sectional dataset and chapter 6 longitudinal dataset: power of 1 for effect size of .80 and significance level of .05) suggest that the removal of the missing values in shown in Table 1 did not reduce statistical power. For these reasons it was decided that the most appropriate course of action was to remove missing values from the dataset entirely.

The demographics of ELSAs victims

Experiences of criminal victimisation can have both short- and long-term negative effects on health and wellbeing, from which there is no guarantee of complete recovery (Robinson & Keithley, 2000). These effects include increases in social isolation (Elliott et al., 2005) and fear of crime (Jackson & Gouseti, 2016), and reductions in cognitive function (Fang & Yan, 2019), mental health (Kilpatrick & Acierno, 2003), physical health (Rueness et al., 2019) and overall quality of life (Weber et al., 2015). Importantly, the likelihood of becoming a victim and, therefore, the extent to which these physical, psychological, or social effects manifest following experience of criminal victimisation, is influenced by a variety of sociodemographic factors.

Age is a frequently studied predictor and correlate of an individual's likelihood of being victimised, and of the health and wellbeing circumstances of individuals with experience of victimisation. Old age incurs lifestyle changes that can lead to increased social isolation (Berg-Weger & Morley, 2020), and declines in cognitive function (Bosworth et al., 1999) and mental health (Mirowsky & Ross, 1992) and physical health (Carmel & Bernstein, 2003). Furthermore, older adults frequently report greater fear of crime (Rader et al., 2012). Consequently, older adults may be at a heightened risk of the poorer circumstances of each of these variables observed amongst individuals with victimisation experience.

Yet, research has also shown that different post-victimisation symptoms manifest depending on the victim's age. Younger victims have been shown to present more drug abuse problems and negative physical health symptoms, such as headaches, following rape, robbery, and assault; while older rape victims report more symptoms of obsessive-compulsive disorder (Burnam et al., 1988; Lurigio & Davis, 1989). Furthermore, older adults have been found to be at a lower risk of experiencing criminal victimisation compared to younger age groups (Pain, 1995; Walker et al., 2006). Meta-analyses have also observed little

to no effect of age on post-victimisation health and wellbeing (Dworkin et al., 2017; Kilpatrick et al., 1985), suggesting there is no obvious pattern of post-victimisation outcomes determined by age. However, it seems that despite their reduced risk of becoming victims, older adults are more likely to suffer the detrimental impacts of any experienced criminal victimisation compared to younger individuals precisely because of negative changes that come with advanced age.

Differences exist in the type of victimisation experienced by men and women, such that women are at greater risk of all forms of sexual assault, while men are more likely to experience physical assault – although within intimate relationships a greater proportion of women experience physical assault compared to men (Kessler et al., 1995; Kilpatrick & Acierno, 2003; Koss, 1993; Schafer et al., 1998). Furthermore, studies report that women have more frequent and varied experiences of victimisation (Bastomski & Smith, 2017; Broll, 2014). Differing post-victimisation outcomes between men and women have also been widely researched. Generally, studies observe greater distress and vulnerability to acute stress disorder, higher levels of depression and somatisation, and greater PTSD symptom severity following criminal victimisation amongst women compared to men (Elklit, 2002; Hansen & Elklit, 2012; Leymann, 1985). Yet, several investigations have identified no differences between the sexes in their ability to recover from experiences of victimisation (Goyer & Eddleman, 1984; Harrison & Kinner, 1998) and even an increased likelihood of negative outcomes amongst men. However, given findings of a greater likelihood of experiencing victimisation amongst women (Fox et al., 2009), it appears that women are at a greater subsequent risk of negative post-victimisation consequences.

The effects of an individual's level of educational attainment on their likelihood of having experience of criminal victimisation is less clear. Messner et al., (2007) observed a greater risk of victimisation by theft or robbery amongst the more educated, while Reid

(2014) reports a reduced risk of sexual abuse with greater educational attainment. Similarly, studies identify both an increased risk of victimisation amongst individuals with high socioeconomic status (Wittebrood & Nieuwbeerta, 1999), of which educational attainment is a reliable indicator (ten Have et al., 2003), and amongst those from low socioeconomic backgrounds (Breiding et al., 2008; Jansen et al., 2012; Spriggs et al., 2009). While it is unclear whether a higher level of educational attainment incurs an increased or reduced risk of victimisation, what is very clear is that individuals with fewer years in formal education will experience a greater number of more severe negative health and wellbeing symptoms following victimisation (Brewin et al., 2000; Elklit, 2002; Ullman & Filipas, 2001). This may be because level of education can influence the extent to which an individual is able to access healthcare (Zhang et al., 2011) and engage in social groups and activities (Gale et al., 2018) that can mediate the deleterious impact of victimisation experience.

Where the effects of ethnicity are concerned, findings are inconsistent across studies. Research has identified, for example, a higher prevalence of sexual assault amongst White compared to Black and Hispanic women (Koss et al., 1987; Sorenson et al., 1987), and varying rates of different types of sexual assault across ethnicities (Kalof, 2000). Furthermore, Black males are at greater risk of experiencing violent armed victimisation compared to White males (Berg, 2014), while Black females are more likely to experience intimate partner violence (Tjaden & Theonnes, 2000). Importantly, individuals from ethnic minority groups exhibit reduced help-seeking behaviour following victimisation compared to White individuals, particularly where help from mental health services is concerned (Amstadter et al., 2008; Campbell et al., 2001). While several studies have observed no association between ethnicity and post-victimisation outcomes (Alvidrez et al., 2011; Burnam et al., 1988), the lower rates of help-seeking behaviour amongst non-White groups means these individuals may be at greater risk of negative post-victimisation outcomes.

With regard to marital status the evidence seems to indicate that being unmarried, in particular being separated or divorced, is a risk factor for victimisation (Brennan et al., 2010). Similarly, amongst women specifically it is those who are unmarried that have been found to be at a higher risk of experiencing victimisation (Siddique, 2015). Furthermore, studies have observed a beneficial influence of marriage on the incidence of negative post-victimisation symptoms such as acute stress disorder (Elklit, 2002). Yet, studies have also reported poorer post-victimisation coping amongst married individuals (McCahill et al., 1979), and even an increased likelihood of re-victimisation amongst married individuals with previous experience of criminal victimisation (Arata & Lindman, 1979). On balance, though, it seems that being married brings a reduction in an individual's risk of experiencing criminal victimisation.

This chapter will make use of data from the English Longitudinal Study of Ageing (ELSA; Banks et al., 2019) and the sociodemographic characteristics discussed above (age, sex, level of education, marital status, and ethnicity) to build a profile of people with increased likelihood of victimisation experience. In doing so, we hope to increase our understanding of how those ELSA respondents with victimisation experience differ from those without.

Method

Data

This set of analyses used data taken from ELSA Wave 3 (available at <http://doi.org/10.5255/UKDA-SN-5050-23>), since it was at this data collection wave that ELSA collected information about its respondents' victimisation history using the Life History Questionnaire. Data tidying yielded a dataset of 4673 respondents ($M_{\text{age}} = 66$ years, 2623 women, 530 victims; statistical power of 1 at the $p < .05$ level for an effect size of .80). All data tidying took place in R Studio (Version 1.4.1106, RStudio Team, 2021).

Victimisation experience

Three items assessing experience of child physical abuse, sexual assault and physical assault (ELSA names: rsabuse, rssexas, rsattac respectively; each coded as 1 – ‘Yes’, 2 – ‘No’) were collapsed into one variable assessing the occurrence of any of the three (VictExp: 0 – ‘No victimisation experience’, 1 – ‘Victimisation experience’).

Statistical analysis

To determine whether changing sociodemographic circumstances predict change in the likelihood of reporting experience of criminal victimisation, a logistic regression was conducted with VictExp as the dependent variable and age, sex (indsex: 1 – ‘Male’, 2 – ‘Female’), level of education (w3edqual_collapsed: 1 – ‘No qualification’, 2 – ‘Below degree’, 3 – ‘Degree or equivalent’), marital status (dimar_collapsed: 1 – ‘Married’, 2 – ‘Unmarried’) and ethnicity (fqethnr: 1 – ‘White’, 2 – ‘Non-white’) as independent variables. Participant age, sex, level of education, marital status, and ethnicity are those at the time of data collection, rather than at the time of any reported victimisation experience. Data plotting and analysis were carried out in R Studio. The full reproducible data tidying and analysis R code can be found at https://osf.io/r6nz5/?view_only=ae611e22fa284feaaf7d86112cb1f98d.

Results

Prior to analysis, descriptive statistics and scatterplots were examined to better understand the interrelation of each of the sociodemographic variables and the specific types of criminal victimisation included in the analysis. Table 1 shows the mean age at which men and women with different education, marital status, and ethnicity profiles experienced child sexual abuse, physical assault, and sexual assault. Of particular interest is the greater mean age at which women with a degree level education appear to experience sexual assault compared to women with below degree level educations and those with no qualifications. Additionally, the large standard deviation scores for both men and women with experience of

physical assault regardless of level of education, marital status, or ethnicity is of note. These scores suggest substantial variation in the ages of respondents with experience of physical assault, with both young children and adults reporting instances of physical assault. Finally, one can see in Table 1 how few of the 530 victims present in the current dataset are of a non-white ethnicity, since it was not possible to obtain mean and standard deviation scores for non-white men or women with experience of child physical abuse or sexual assault.

Table 1. Mean and standard deviation (SD) scores for the age at which male and female victims from each level of education, marital status, and ethnicity experienced each type of victimisation.

Victim Profile	Child Physical Abuse		Physical Assault		Sexual Assault	
	Mean	SD	Mean	SD	Mean	SD
Male						
No qualification	10.50	.71	29.05	20.17	10.50	3.32
Below degree	7.41	2.79	29.82	15.39	12.28	3.54
Degree/equivalent	7.69	3.22	27.58	14.65	11.50	3.69
Married	7.96	2.95	28.54	15.70	12.44	3.08
Unmarried	6.40	2.70	30.24	16.97	8.40	4.04
White	7.72	2.93	29.10	16.11	11.81	3.51
Non-white			23.50	4.95		
Female						
No qualification	9.64	3.47	35.30	20.62	13.36	6.15
Below degree	8.95	3.84	25.00	15.98	15.78	8.71
Degree/equivalent	7.90	2.85	28.30	19.42	16.93	11.04
Married	9.03	3.46	25.26	16.57	15.24	8.91
Unmarried	8.45	3.80	33.31	20.46	16.89	9.94
White	8.88	3.51	29.21	18.66	15.77	9.29
Non-white			3.00		17.00	

Initial scatterplots (Figure 1) were created showing the distribution across each sociodemographic variable and type of victimisation of those ELSA respondents who, at wave 3, reported experience of criminal victimisation. Figure 1-A, which shows the age at which victims experienced a particular type of victimisation, illustrates that most instances of victimisation occurred before victims were 20 years of age, regardless of the current age of the respondent. One-way analysis of variance revealed a significant difference in the age at which respondents reported having experienced each type of victimisation ($F(2, 527) = 93.71, p < .001$). Post-hoc Tukey tests identified significant differences between child all three types of victimisation at the $p < .001$ level, such that both physical and sexual assault occurred at older ages than child physical abuse, while physical assault occurred at older ages than sexual assault (child physical abuse – mean = 8.39, SD = 3.31; sexual assault – mean = 15.02, SD = 8.59; physical assault – mean = 28.96, SD = 17.14). Additionally, it appears that amongst adult victims, physical assault is more common than sexual assault.

Figure 1-B shows a disparity with regard the type of victimisation reported by either sex. It is clear that sexual assault is more commonly experienced by women compared to men, whereas the reverse is true for physical assault. No clear difference is apparent in the number of men and women reporting child physical abuse. Figure 1-C shows no clear association between a victim's level of education, and the type of victimisation they report having experienced. Figure 1-D appears to show little relationship between a victim's marital status and the type of victimisation they report, but it does illustrate the greater number of married compared to unmarried individuals who report having experienced criminal victimisation. Finally, figure 1-E, while offering no insight into the association between a victim's ethnicity and the type of victimisation they experienced, is nonetheless informative since it clearly shows that just four victims are of a non-white ethnicity.

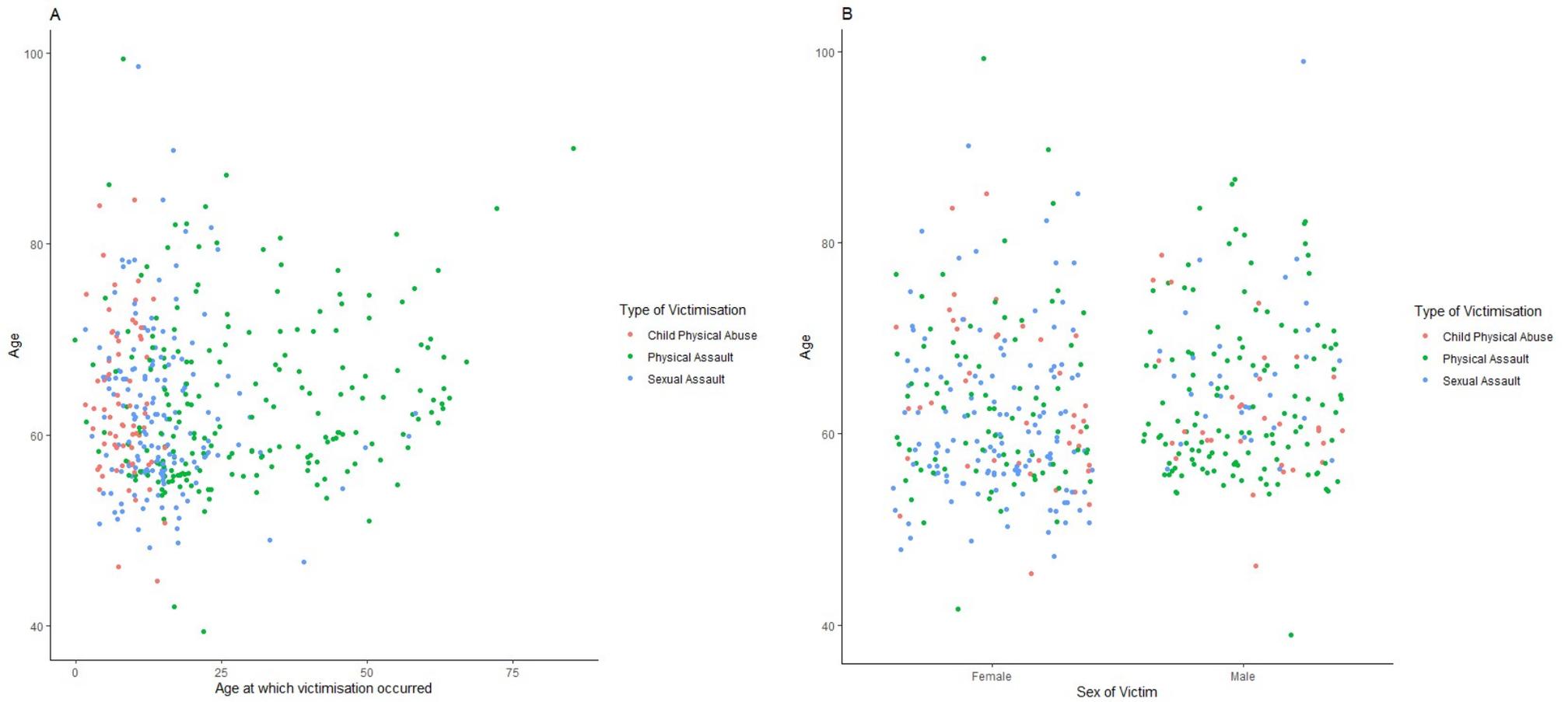


Figure 1. Plots showing the age ELSA wave 3 victims experienced victimisation (A), the distribution of victims' sex (B), level of education (C), marital status (D), and ethnicity (E) across the victimisation types.

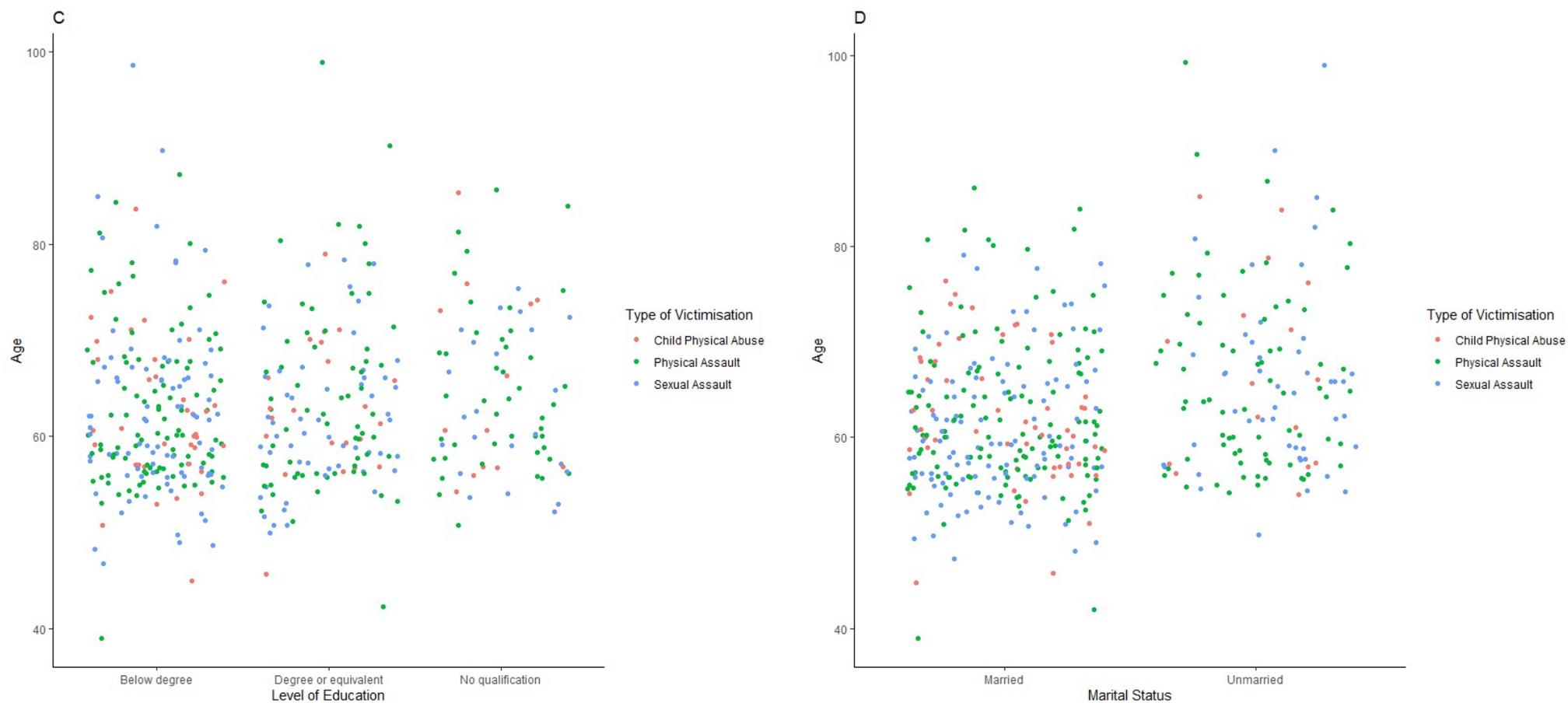


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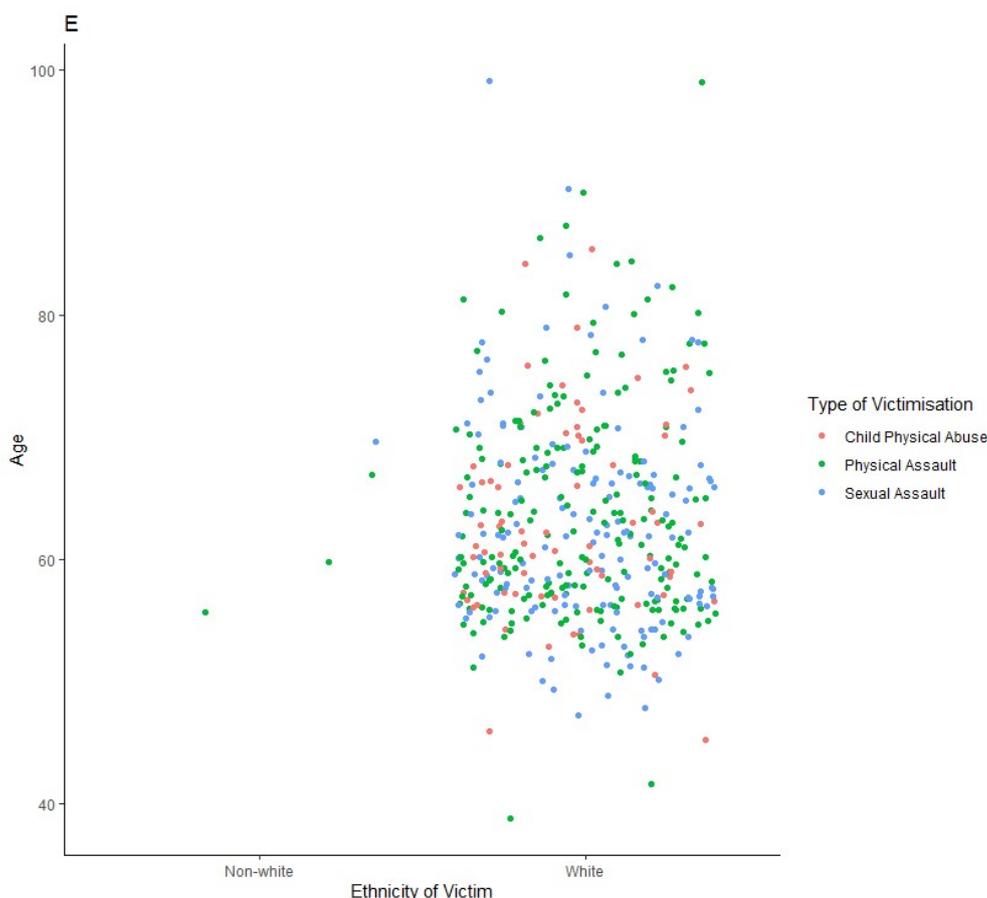


Figure 1. Plots showing the age ELSA wave 3 victims experienced victimisation (A), the distribution of victims' sex (B), level of education (C), marital status (D), and ethnicity (E) across the victimisation types.

Table 2 shows the output of Pearson's chi-square tests carried out to determine the statistical significance of differences in the prevalence of each type of criminal victimisation between men and women, between each level of education, and between married and unmarried individuals. The significant chi-square score for victim sex supports the interpretation drawn above from Figure 1-B suggesting differences in the prevalence of sexual and physical assault between men and women. The non-significant chi-square scores for level of education and marital status also support the patterns, or lack thereof, identified in Figures 1-C and 1-D. No significance testing regarding difference in prevalence of

victimisation type between ethnicities since so few non-white victims are present in the dataset.

Table 2. Pearson's Chi-square tests of significance showing differences in the prevalence of type of victimisation between victims at each level of sex, level of education, and marital status.

Variable	X ²	df	p-value
Sex	61.62	2	<.001
Level of education	2.42	4	.66
Marital status	4.75	2	.09

Table 1 shows the output of the planned logistic regression analysis. This analysis revealed statistically significant associations between victimisation experience and age (-.04, $p < .001$), level of education (.41, $p < .01$) and marital status (.30, $p < .01$). It appears that amongst ELSA wave 3 respondents, being younger, educated to degree level or equivalent, and being unmarried are all associated with an increased likelihood of reporting any of the three types of victimisation assessed here. These findings and their implications are discussed below.

Table 2. Summary of logistic regression with victimisation experience as dependent variable. Reference levels: sex = male, level of education = no qualification, ethnicity = white, marital status = married. Standard error (SE).

Term	Coefficient Estimate	SE	t-value
(Intercept)	.35	.39	.09
Age	-.04***	.01	-7.74
Sex (female)	.06	.10	.61
Level of education (below degree)	.23	.13	1.84
Level of education (degree level)	.41**	.14	2.96
Ethnicity (non-white)	-.07	.41	-.18
Marital status (unmarried)	.30**	.11	2.82

*** $p < .001$, ** $p < .01$

Discussion

This chapter sought to identify a profile of sociodemographic characteristics most associated with experience of criminal victimisation. A logistic regression was carried out using data taken from wave 3 of the English Longitudinal Study of Ageing, and a set of sociodemographic variables frequently controlled for in studies investigating the nature of victimisation risk. This analysis revealed that amongst a group of older adults it is the not-so-old, the more educated, and the unmarried who are more likely to report having experience of criminal victimisation.

The results of the logistic regression offer, when paired with the patterns present in each of the scatterplots shown in Figure 1 and the profile of sociodemographic interrelations shown in Table 1, interesting insights into the nature of the risk of becoming a victim and the nature of ELSA as a dataset. First and foremost, the significant association observed between victimisation experience and age does not necessarily indicate that younger ELSA wave 3 respondents were more likely to have victimisation experience, since age was recorded at the time of data collection rather than at the time of the victimisation event. Rather, the effect of respondent age on the likelihood of victimisation experience points to a disparity in the reporting of experiences of victimisation across age groups. Several explanations exist for this pattern of results. It may be that the prevalence of criminal victimisation has increased over time, leading to the greater likelihood of reporting experiences of victimisation amongst the not-so-old. Alternatively, there may exist some generational divide in attitudes towards disclosure of victimisation experience. Finally, it is possible that very old adults who experienced criminal victimisation early on in life have simply forgotten about it. While some evidence suggests a rise in recorded crime during the latter half of the 20th century, this trend seems to be due to changes in the type of activity being criminalised, the type of crime being recorded and the frequency with which those crimes were reported (Thompson et al., n.d.).

The latter explanations of a disparity in willingness to disclose victimisation experience or old-age related forgetting seem to be the most likely explanations.

Yet, interesting conclusions regarding age-related risk of victimisation experience can be drawn from Figure 1-A. This scatterplot shows, together with the mean age at which each type of victimisation occurred and the large proportion of victimisation events reported to have occurred during childhood, that it is younger adults and, worryingly, children who are at the greatest risk of becoming victims. This finding supports those from previous studies observing a greater likelihood amongst young adults of becoming victims of crime than older age groups (Klaus, 2000; Maguire & Pastore, 1995; Moore, 2010). Additionally, it would seem to also add weight to the argument that the increased levels of FoC exhibited by older adults (Ferraro & LaGrange, 1987; Zhao et al., 2010) are, at least where the age group's actual risk of victimisation is concerned, unwarranted.

The significant association between level of education and victimisation experience observed here appears to swing the debate regarding the nature of this relationship, such that a greater level of education incurs a greater likelihood of having victimisation experience (Messner et al., 2007). Specifically, it is the attainment of a degree level qualification or similar that appears to lead to an increased risk of victimisation. Interestingly, university aged individuals have been found to be particularly vulnerable to victimisation (Baum & Klaus, 2005), with research identifying an increased risk of falling victim to sexual assault during female students' time at university (Daigle et al., 2019; Krebs et al., 2009). This increased risk of sexual victimisation on university campuses also explains the greater mean age at which women with degree level educations experienced sexual assault (Table 1). It seems reasonable to conclude, then, that being a member of a university community brings an associated increase in the risk of victimisation. Furthermore, given the absence of a clear and obvious pattern in Figure 1-C, it seems that level of education indicates a greater likelihood

of having victimisation experience but offers little in the way of identifying which type of victimisation is most likely to be experienced by more educated individuals.

Of particular interest are the substantial standard deviation scores observed in Table 1 for both men and women with experience of physical assault. These scores suggest victims have reported experiencing violent physical assault during both childhood and adulthood. This is an interesting pattern of results given that ELSAs Life History Questionnaire, from which this study's victimisation data was taken, allows respondents to record instances of child physical abuse. One would expect, therefore, violent physical assault during childhood to be recorded not as physical assault but as child abuse. It may be that some victims of child abuse endeavour to protect themselves from any stigma associated with the classification of 'child abuse' by instead labelling their experiences physical assault. Non-disclosure is common enough amongst child victims due to feelings of shame (Foster & Hagedorn, 2014) and anticipation of stigma (Schomerus et al., 2021), so it is entirely possible that reclassifications of victimisation experience can also occur.

As with the effect of respondent age on the likelihood of victimisation experience, it may be that the effect of educational attainment observed here indicates a disparity in the disclosure of victimisation experience with changing education level. Indeed, those individuals educated to degree level may have a better understanding of the kind of support available to victims when the opportunity to disclose their experience of victimisation arises. In this way, less educated individuals may fail to disclose their victimisation experience.

A similar picture can be painted of the association between marital status and victimisation experience. The significant finding of an increased likelihood of having victimisation experience amongst unmarried respondents bolsters those previous studies that have identified being unmarried as a risk factor for victimisation (Brennan et al., 2010; Siddique, 2015). Unfortunately, the lack of sensitivity in the marital status variable which, as

described in the previous chapter, collapses several categories of 'unmarriage' into one, means it cannot be determined whether the likelihood of having experienced victimisation is greatest amongst those who have always been unmarried or amongst those who were married and now are not. In the same way as for level of education, the significant association between marital status and victimisation experience together with the lack of a clear trend in Figure 1-D suggests that marital status is useful in determining an individual's risk of victimisation but not the type of victimisation they are most at risk of experiencing. Additionally, the greater likelihood of victimisation experience amongst unmarried individuals may, once again, be due to issues of disclosure. It is possible that many married ELSA respondents feel unable to disclose their experience of victimisation because it is, in fact, their significant other who is the perpetrator. Unwillingness to disclose instances of domestic abuse is not surprising when one considers that it is the violent crime that is least likely to be reported to the police (Living Without Abuse, n.d).

The opposite story exists where sex is concerned. No significant association was observed between respondent sex and likelihood of having experienced victimisation. Yet, Figure 1-B shows clearly a greater prevalence of sexual assault and physical assault amongst female and male respondents respectively. This pattern of results contradicts studies identifying a greater likelihood of victimisation experience amongst women compared to men (Fox et al., 2009). However, it sits well with observations of differences in the type of victimisation experienced by either sex (Kilpatrick & Acierno, 2003). It seems, then, that an individual's sex incurs no greater or lesser risk of victimisation but does influence the type of victimisation that is experienced.

The non-significant association between ethnicity and victimisation experience is hardly surprising given Figure 1-E. Just four individuals who reported victimisation at wave 3 were non-white. It is not just the group of respondents reporting victimisation experience that

is dominated by White individuals, the entire wave 3 dataset is white-dominated (4615 White compared to 58 non-white respondents). Given the differences in the risk of victimisation (Berg, 2014, Kalof, 2000), post-victimisation help-seeking behaviour (Amstadter et al., 2008), and impact of victimisation (Bryant-Davis et al., 2009) across ethnic groups, a failure by ELSA to adequately represent minority ethnic groups in their data is a major drawback of the project's sampling method.

The outcomes of this analysis also have implications for which sociodemographic variables are controlled for in subsequent analyses within this project. Age and level of education are, as has been demonstrated in the literature review, important predictors of each of the variables of interest in this project. Furthermore, their association with victimisation experience has been demonstrated clearly in the current chapter. Sex, whilst not found to be significantly related to victimisation experience here, is as important a driver of the circumstances of each of the variables interest as age and level of education. Consequently, age, sex, and level of education are controlled for throughout this project. Despite its significant association with victimisation experience, marital status was not controlled for in subsequent analyses. Marital status is one of several constitutive items forming the index of social isolation used in this research, so it was important avoid estimating an association between a variable and a composite index of which marital status is a part. No meaningful conclusions can be drawn regarding the impact of ethnicity on post-victimisation outcomes from data where almost all respondents are from a single ethnic group. Therefore, ethnicity was not controlled for in subsequent analyses.

The following chapter has been submitted for peer review to the journal *Psychology, Crime & Law* as 'Victimisation Affects Quality of Life in Old Age by Reducing Mental Health'.

Victimisation Affects Quality of Life in Old Age by Making Us Depressed

Criminal victimisation has long been identified as a predictor of reduced quality of life (Fraga et al., 2017). Quality of life can be regarded as a measure of the satisfaction of needs beyond those required for basic human survival (Hyde et al. 2003). Poor post-victimisation quality of life outcomes can persist in the long-term, such that exposure to violence or maltreatment during childhood will often result in diminished quality of life during adulthood (Weber et al., 2015). Victimisation earlier in life may, therefore, influence quality of life in old age. However, the association between victimisation experience and quality of life is by no means direct. A series of intermediary factors (e.g., social isolation, fear of crime, cognitive function, mental health, and physical health) may mediate this relationship.

Social isolation, an objective measure of reduced social participation, support, and social network size (van Baarsen et al., 2001), appears to be associated with victimisation. Experience of victimisation has been tied to greater subsequent feelings of isolation (Elliott et al., 2005), and victims with supportive social networks have been found to be more likely to adjust to and recover from a victimisation event (Boney-McCoy & Finkelhor, 1995).

Fear of crime, an emotional response to the perceived threat of criminal victimisation (Henson & Reynolds, 2015) has been identified as another important factor. Research reports increased fear of crime amongst individuals with experience of victimisation (Logan & Walker, 2017). Of particular interest is the relationship between social isolation and fear of crime. Given that the associated behavioural component of fear of crime involves precautionary measures such as fewer trips outside and decreased engagement in social activities that serve to reduce worry about crime, increased fear of crime may lead to greater social isolation (Rader & Haynes, 2014). So, fear of crime may be associated with quality of life both directly and indirectly via social isolation.

Associations have also been observed between victimisation and cognitive function. Childhood experiences of emotional and physical abuse have been tied to reduced motor and language skills, verbal episodic memory, intelligence, processing speed and executive function (Kavanaugh et al., 2017; Masson et al., 2015; Su et al., 2019). Furthermore, a positive association has been observed between cognitive function and quality of life (Hsiao et al., 2016).

Additionally, experiences of victimisation have been shown to have both short- and long-term negative influences on mental and physical health, from which there is no guarantee of complete recovery (Robinson & Keithley, 2000). These negative outcomes vary from psychological problems such as depression, anxiety, sexual dysfunction, and post-traumatic stress disorder (Han et al., 2016; Russo & Roccato, 2010), to physical injuries obtained during the victimisation event, which may be acute or become chronic (Resnick et al., 1997), as well as increased risk of hospitalisation (Yunus et al., 2019).

These intermediary factors are related to one another: greater cognitive impairment is associated with poor mental and physical health (Wray et al., 2012; Hartanto et al., 2019), and mental and physical health are similarly related (Barnett et al., 2012). Post-traumatic stress disorder is reliably associated with low quality of life (Evren et al., 2010), while symptoms of depression and anxiety have also been associated with reduced quality of life (Mendlowicz & Stein, 2000; Wells et al., 1989). Physical ill-health is related to reduced quality of life, and it appears that the greater the number of comorbid illnesses suffered by an individual the lower their quality of life becomes (Fortin et al., 2006). Additionally, increased physical activity (and, therefore, increased physical health) has been found to have a positive influence on quality of life (Vagetti et al., 2014).

The effects of victimisation on cognitive function, mental health, and physical health described above may themselves be explained and, therefore, mediated by social isolation

and fear of crime. Social isolation is associated with poorer cognitive function (Sampson et al., 2010), decreased physical health (Shiovitz-Ezra et al., 2010) and decreased mental health (Gale et al., 2018; Okabayashi et al., 2004). Additionally, the stress associated with fear of crime (Collins & Marrone, 2015) may result in an increased risk of cognitive impairment (Bell et al., 2021), and of stress-related physical health problems such as cardiovascular diseases, diabetes, and cancer (Mariotti, 2015; McEwen, 2008). Finally, social isolation and fear of crime are associated with reduced engagement in physical and social activities that promote better cognitive function and mental and physical health (Lorenc et al., 2012; Stafford et al., 2007).

Yet, no research has looked at these factors simultaneously to examine their combined effect on quality of life. In Figure 1, the hypothesised relationships between victimisation experience, social isolation and fear of crime, of these latter two variables on cognitive function, mental and physical health, and of those on quality of life are illustrated. It is hypothesised that cognitive function, mental health, and physical health mediate the relationship between victimisation and quality of life, but the associations between victimisation and cognitive function, mental health and physical health are themselves mediated by social isolation and fear of crime.

The English Longitudinal Study of Ageing (ELSA; Banks et al., 2019) allows us to examine this hypothesised model in a large sample of older adults (9771 respondents at Wave 3, 2006). ELSA has, since 2002, collected extensive longitudinal data on the health, social, well-being and economic circumstances of people aged 50 and over in England (ELSA, 2019). Wave 3 included an additional Life History Interview which assessed respondents' early life circumstances. This additional interview collected the victimisation experience data needed for this study.

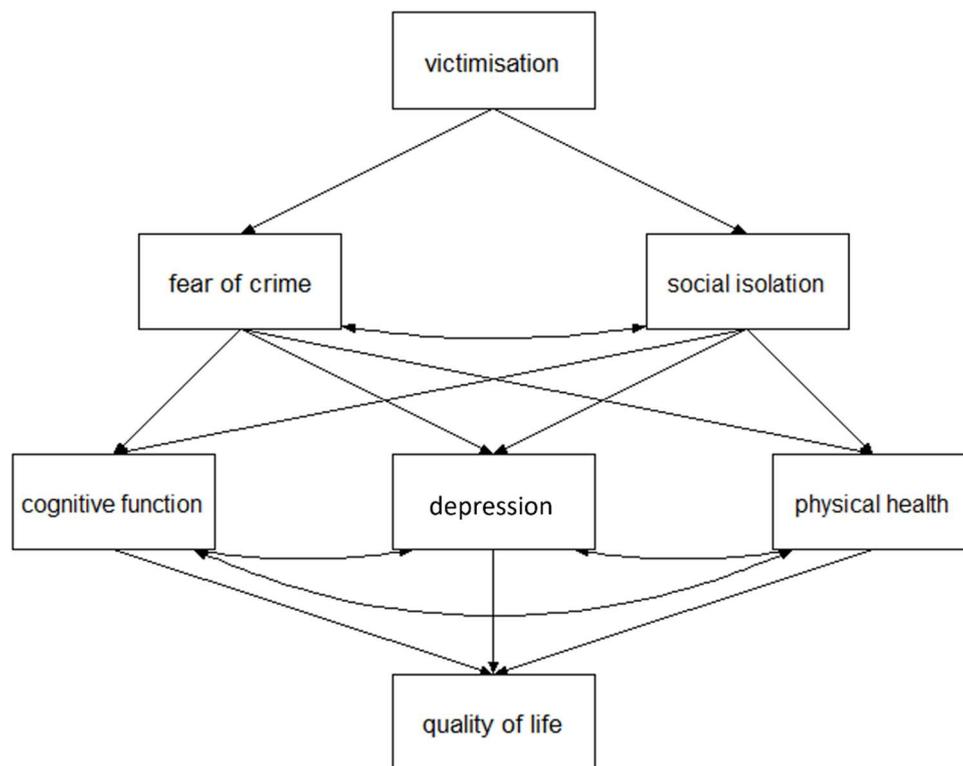


Figure 1. Path model of hypothesised post-victimisation quality of life outcomes. Single-headed arrows indicate a unidirectional relationship, double-headed arrows a bi-directional relationship.

Method

Data

This study used ELSA Wave 3 only (available at <http://doi.org/10.5255/UKDA-SN-5050-23>) since information regarding respondents' victimisation history was collected at this wave alone, as part of the Life History Questionnaire. Following the reduction of this dataset down to the variables of interest (outlined variable-by-variable below) and the removal of missing values, a final dataset of 4673 respondents remained (statistical power of 1 for an effect size of .8 and $p < .05$, 2623 women, M_{age} of 66 years). All data tidying took place in R Studio (Version 1.4.1106, RStudio Team, 2021) and was stored alongside the associated R

code on a password protected laptop. The full reproducible data tidying and analysis code is available at https://osf.io/r6nz5/?view_only=ae611e22fa284feaaf7d86112cb1f98d.

Victimisation experience

Three criminal victimisation variables, assessing experiences of violent physical attack, sexual assault, or child physical abuse (ELSA names: rsattac, rssexas, rsabuse respectively; coded as 1–‘Yes’, 2–‘No’), were reduced to a single variable assessing the occurrence of any of the three (VictExp). VictExp was scored as 0, no victimisation experience, and 1, experience of any of the three types of victimisation. This work is concerned with the negative QoL consequences of victimisation in general, therefore no nuances regarding type, severity, or multiple experiences of victimisation were assessed.

Social isolation

As per previous research (Gale et al., 2018), variables examining marital status, membership of any social organisations, and frequency of face-to-face, telephone, and written contact with children, family, and friends were collapsed into a single index of social isolation (SI_Total). Scores ranged from 0-5 on this index, with higher scores indicating greater social isolation. To create this index, points were assigned should respondents be unmarried or not cohabiting, have less than monthly contact of any of the aforementioned forms with children, family, and friends, and if they did not participate in any social organisations. Participants needn’t have provided responses to all constitutive items to receive a social isolation score.

Fear of crime

Fear of crime was here assessed by a single 7-point Likert scale asking respondents whether “People would be afraid to walk alone after dark in this area” (1 = Strongly agree, 7 = Strongly disagree). To make interpretation of results easier, these scores were reverse-coded, so that 1 = Strongly disagree and 7 = Strongly agree. Thus, higher scores indicate

increasing item agreement and, therefore, increasing fear of crime. Typically, research recognises that fear of crime cannot be adequately measured using one item. Crime does not occur only at night nor only in your neighbourhood, and fear of crime may be crime-dependent and influenced by concerns for the well-being of others (Ferraro & LaGrange, 1992; Henson & Reynolds, 2015). Yet, ELSA's measure is the best single-item measure of fear of crime, so was considered adequate for this research.

Cognitive function

ELSA's Wave 3 data includes its own composite cognitive function variable (cfind) that totals respondents' scores on separate memory and executive function indices. These separate indices are derived from respondents' scores across several constitutive variables: orientation in time, word-list learning and prospective memory for the memory dimension; verbal fluency and letter cancellation for the executive function dimension. Higher cfind scores reflect better cognitive function.

Depression

The Center for Epidemiological Studies – Depression Scale (CES-D, Radloff, 1977; CESD_Total) was used to assess level of depression. CES-D is a 20-item scale assessing the extent to which major facets of depression, such as depressed mood and sleep disturbance, were experienced in the preceding week. Responses are given in a simple yes/no format and positive items are reverse coded to ensure that when item scores are summed, higher scores indicate a greater occurrence of depressive symptoms.

Physical health

Eight variables – seven assessing diagnoses of chronic health conditions (lung disease, asthma, arthritis, osteoporosis, cancer, Parkinson's disease, and Alzheimer's disease) and an eighth, identifying diagnoses of various cardiovascular-related diseases – were reduced to a single physical health index (No.OfDoctorDiagnosed). This index assessed the

total number of chronic health condition diagnoses reported by a respondent. Correlational analysis between No.OfDoctorDiagnosed and a self-reported general health measure revealed a moderate association of .34 ($p < .001$), wherein a greater number of chronic health condition diagnoses was associated with worse self-reported general health. Research has shown that increased numbers of chronic illnesses predict poorer physical functioning (Small et al., 1996); while cancer, hypertension, and osteoporosis (the presence of each of which is assessed by No.OfDoctorDiagnosed) are amongst the most frequent diseases leading to reduced quality of life (Somrongsong et al., 2016). No.OfDoctorDiagnosed is, therefore, a useful measure of determining physical health. Since individuals can be ranked based on the number of diagnoses reported, but reductions in physical health may not be directly associated with the number of conditions, this measure was taken forward to analysis as an ordinal variable.

Quality of life

The CASP-19 (Hyde et al., 2003; CASP19) is a measure of quality of life specifically developed and designed for older adults and was constructed and validated in a sample of UK individuals aged between 65-75 years. It includes 19 items spanning four psychosocial domains of control, autonomy, self-realisation, and pleasure, assessing aspects of life beyond those fundamental human needs ensuring physical wellbeing and survival. The CASP-19 produces a score from 0–57 where higher scores reflect better quality of life. In the hypothesised model – and, therefore, in the statistical modelling to follow – quality of life is the outcome or dependent variable.

Sociodemographic variables

Given consistent findings of age, sex, and socioeconomic status differences in each of the variables included in the hypothesised framework, all three were controlled for in a final stage of statistical modelling. Highest level of education received (w3edqual_collapsed; 1 =

no qualification, 2 = below degree qualification, 3 = degree or equivalent) was used here as an indicator of socioeconomic status, since research considers educational attainment the primary determinant of socioeconomic status (ten Have et al., 2003).

Statistical modelling process

Structural Equation Modelling (SEM) – specifically, path analysis – was used to examine the hypothesised model (Figure 1) because this method permits simultaneous estimation of associations between multiple variables. Path models of increasing complexity, estimating an increasing number of associations were fit. Each model was assessed for good fit by inspecting a series of statistics: chi-square (X^2 , a measure of overall fit); Comparative Fit Index and Tucker-Lewis Index (CFI & TLI, relative fit indices that compare the fit of your model to a ‘worst case scenario’ model); Root Mean Square Error of Approximation and Standardised Root Mean Square Residual (RMSEA & SRMR, absolute fit indices that determine how far from perfect fit the model is). Ordinal variables (FoC, SI_Total, No.OfDoctorDiagnosed, CESD_Total) were identified as such in each model. Diagonally weighted least squares (DWLS) estimation, a robust estimation method appropriate for ordinal data, was used in all analyses. Additionally, DWLS provides more accurate parameter estimates under conditions of non-normality and constrains inflated X^2 values that can occur when sample sizes are large (Mîndrilă, 2010). All SEMs were carried out using the ‘lavaan’ package (Rosseel, 2012).

The X^2 tests the extent to which the observed data and fitted model are equal. Consequently, a non-significant X^2 suggests good model fit. CFI and TLI Values of greater than .9 and .95 suggest good model fit, while SRMR and RMSEA values of less than .08 and .05 suggest good fit (Hooper et al., 2008; Kline, 2005; Steiger, 1989; MacCallum et al., 1996). Fit measures are interpreted alongside the degrees of freedom (df) of the fitted model

(since increased complexity and, therefore, fewer df 's, increases the likelihood of observing good model fit for some measures) and the theory driving the hypothesised model.

Where model fit was poor, modification indices were examined to identify by how much parameters absent from each model would reduce the X^2 value upon their inclusion, thus revealing potential model improvements. Parameters highlighted for inclusion by large modification indices were compared to the available theoretical literature. Should the association between two variables be theoretically valid, it was included in the next model.

To examine whether the inclusion of additional parameters improved model fit significantly, Likelihood Ratio Tests (LRT) were used to compare each model to its predecessor. A significant LRT X^2 value indicates that model fit has been significantly improved and, therefore, the inclusion of additional parameters was justified. This modelling process was repeated until a theoretically valid and well-fitting model was identified. Once such a model was identified, no more were created thus preserving parsimony. LRTs were not used to identify improved fit in non-nested models (neither were Akaike's Information Criteria or Bayesian Information Criteria, since DWLS-estimated SEMs do not produce these values). Instead, the fit indices outlined above were compared across models to determine improvement in fit. Determining the endpoint of this modelling process requires a holistic perspective, wherein the fit measures described above provide a general sense of goodness-of-fit. Finally, bias-corrected bootstrapping was used to examine the specific indirect effect of each mediated pathway from victimisation experience to quality of life and, therefore, the statistical significance of the effect of victimisation experience on quality of life when mediated by, for example, fear of crime.

Results

Model 1 (Figure 1) required all effects of victimisation on cognitive function, level of depression, physical health, and quality of life to be mediated by social isolation and fear of

crime. Furthermore, all effects of social isolation and fear of crime on quality of life were mediated by cognitive function, level of depressive symptomatology, and physical health. Social isolation and fear of crime were allowed to covary, as were cognitive function, level of depression, and physical health. SEM revealed a significant X^2 of 155.39 and CFI, TLI, RMSEA, and SRMR values of .96, .90, .07, and .03 respectively for 6df, indicating poor model fit overall. Modification indices were computed, revealing that a direct association between victimisation experience and mental health whereby the former predicts the latter would yield the greatest reduction in X^2 value (64.37) and, therefore, the greatest improvement in model fit. Importantly, including this parameter in the model also made sense according to the relevant theoretical literature. Research has frequently observed a range of negative mental health outcomes, including increased levels of depression and anxiety, following instances of the kind of violent criminal victimisation assessed here (Adams et al., 2013; Golding, 1999).

Model 2 included all regressions and covariances present in Model 1 as well as a direct effect of victimisation experience on mental health. Despite the inclusion of this additional parameter, model fit remained poor at this stage (significant X^2 of 90.86 for 5df, CFI = .98, TLI = .92, RMSEA = .06, SRMR = .03). An LRT revealed a significant improvement in model fit from Model 1 to Model 2 (X^2 difference = 64.53, $p < .001$). Modification indices revealed that a direct association between social isolation and quality of life, with the former predicting the latter, would yield the greatest reduction in X^2 value (39.06). The relationship between social isolation and quality of life is well-documented, with studies reporting a positive association between social isolation and quality of life such that a more connected and supportive social network increases an individual's quality of life (Litwin & Stoeckel, 2013; Newman-Norlund et al., 2022).

Model 3 all regressions and covariances present in Model 2 as well as a direct effect of social isolation on quality of life. Fit statistics still suggested that Model 3 was a poor fitting model (significant X^2 51.62 for 4df, CFI = .99, TLI = .95, RMSEA = .05, SRMR = .02). An LRT revealed a significant improvement in model fit from Model 2 to Model 3 (X^2 difference = 39.23, $p < .001$). Modification indices revealed that a direct association between fear of crime and quality of life, such that the former predicts the latter, would yield the greatest reduction in X^2 value (17.44). While it is clear that one must consider fear of crime when evaluating quality of life (Hale, 1988), the direct nature of the relationship between these two variables is contested. Some researchers state categorically that the former does not predict the latter (Roberts, 2011), while others have observed an explicit association between the two such that increased fear of crime reduces quality of life (Kulichova, 2018; Moore, 2006). On balance, the well-documented importance of fear of crime to our understanding of quality of life led to the inclusion of a direct association between the two in Model 4.

Only at Model 4 – which included all regressions and covariances in Model 1 *and* direct associations between social isolation, fear of crime and quality of life, and between victimisation and level of depressive symptomatology – was good model fit reached according to model fit statistics and theoretical considerations (Figure 2; significant X^2 of 34.44 for 3df, CFI = .99, TLI = .95, RMSEA = .05, SRMR = .01). An LRT revealed a significant improvement in model fit from Model 3 to Model 4 (X^2 difference = 17.18, $p < .001$). The modelling process was terminated at this iteration.

Figure 2 shows the regression and covariance outputs of Model 4. Victimization was significantly associated with greater depressive symptomatology (.36, $p < .001$), but not with social isolation (.01, $p = .91$) or FoC (.05, $p = .30$). Increased fear of crime and social isolation were significantly associated with greater depressive symptomatology (.16, $p < .001$; .16, $p < .001$), reduced cognitive function (-.64, $p < .001$; -.96, $p < .001$), and a greater

number of doctor-diagnosed chronic illnesses (.11, $p < .001$; .01, $p < .001$). Reduced fear of crime, social isolation and depressive symptomology, better cognitive function, and fewer doctor-diagnosed chronic illnesses were all significantly associated with better quality of life ($-.60$, $p < .001$; $-.95$, $p < .001$; -3.56 , $p < .001$; $.13$, $p < .001$; -1.12 , $p < .001$).

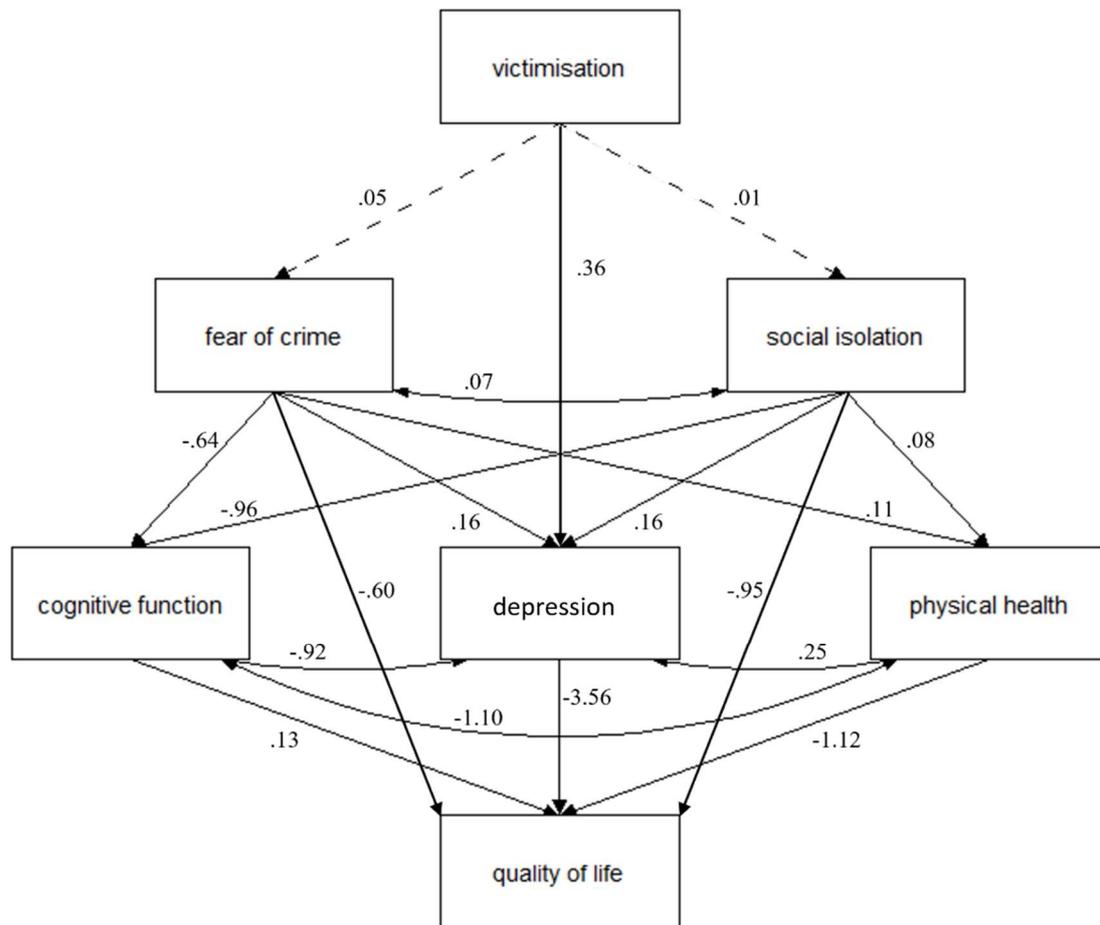


Figure 2. Model 4. Straight arrows are regressions, curved double-headed arrows covariances. Dashed arrows are non-significant effects, whole arrows significant effects at the $p < .001$ level. Values represent unstandardised coefficient estimates for the associated parameter.

Increased fear of crime was associated with increased social isolation (Table 1).

Increased depressive symptomatology was associated with poorer cognitive function and a greater number of doctor-diagnosed chronic illnesses. Better cognitive function was

associated with fewer doctor-diagnosed illnesses. Bias-corrected bootstrapping (Table 2) revealed that despite the significant effect of social isolation and fear of crime on cognitive function, level of depression, physical health and quality of life, and of cognitive function and physical health on quality of life, the only significant specific indirect effect was that which passed through level of depression alone (-1.18, $p < .001$).

Table 1. Model 4 covariances (SE = standard error).

Covariance	Coefficient Estimate	SE	z-value
fear of crime social isolation	.07***	.08	4.19
depression cognitive function	-.92***	.10	-8.78
physical health	.25***	.02	15.35
cognitive function physical health	-1.10***	.10	-10.78

*** $p < .001$

Table 2. Model 4 bootstrapping. Specific indirect effects of victimisation on quality of life via each causal pathway.

Specific Indirect Effects	Coefficient Estimate	SE	z-value
via fear of crime	-.02	.03	-.64
and cognitive function	-.003	.01	-.64
and depression	-.02	.03	-.65
and physical health	-.004	.01	-.66
via social isolation	-.01	.05	-.24
and cognitive function	-.001	.01	-.25
and depression	-.01	.03	-.25
and physical health	-.001	.01	-.24
via depression	-1.18***	.21	-5.76

*** $p < .001$

To control for the effects of age, sex, and level of education all three were added as covariates of victimisation in a fifth model. Model 5 fit as well as Model 4, yielding similar fit measure values (CFI = 1, TLI = .92, RMSEA = .05, SRMR = .02, non-significant X^2 of 35.11 for 3df). The direction and significance of all effects observed in Model 4 remained the same. Increasing age was significantly associated with poorer cognitive function ($-.27, p < .001$), increased social isolation and depressive symptomology ($.01, p < .001$; $.01, p < .05$) and a greater number of doctor-diagnosed chronic illnesses ($.03, p < .001$). The associations between age and both fear of crime and quality of life were non-significant ($.002, p = .14$; $.02, p = .37$). Being female was significantly associated with increased fear of crime ($.19, p < .001$), better cognitive function ($1.55, p < .001$), increased depressive symptomology ($.24, p < .001$), a greater number of doctor-diagnosed chronic illnesses ($.21, p < .001$), and better quality of life ($1.55, p < .001$) compared to being male. The association between sex and social isolation was non-significant ($-.02, p = .59$). Higher educational attainment was significantly associated with reduced fear of crime, social isolation, depressive symptomology, and fewer doctor-diagnosed chronic illnesses ($-.16, p < .001$; $-.14, p < .001$; $-.12, p < .001$; $-.04, p < .05$) and better cognitive function ($1.67, p < .001$).

All Model 4 covariances remained the same in Model 5. Victimization was significantly associated with age and education ($-.30, p < .001$; $.02, p < .001$), such that younger and more educated individuals are more likely to report experience of victimization, while increasing age was significantly associated with lower educational attainment ($-1.83, p < .001$). Being female was significantly associated with being younger ($-.23, p < .01$) and lower educational attainment ($-.05, p < .001$).

Bias-corrected bootstrapping was applied to Model 5 (Table 3). As in Model 4, the only statistically significant specific indirect effect stemming from victimization experience was that which was mediated by level of depression ($-1.12, p < .001$), such that victimization

experience results in greater depressive symptomatology, which in turn leads to reduced quality of life. All specific indirect effects stemming from age, sex, and education can be found in Table 3.

Table 3. Model 5 bootstrapping summary, showing specific indirect effects of victimisation, age, sex, and level of education on quality of life via each mediating variable.

Pathway	Specific Indirect Effects	Coefficient Estimate	SE	z-value
Victimisation	via fear of crime	-.04	.03	-1.44
	and cognitive function	-.004	.003	-1.38
	and depression	-.03	.02	-1.49
	and physical health	-.01	.004	-1.43
	via social isolation	-.06	.05	-1.30
	and cognitive function	-.003	.002	-1.27
	and depression	-.04	.03	-1.32
	and physical health	-.004	.003	-1.07
	via depression	-1.12***	.21	-5.40
	Age	via fear of crime	-.003**	.001
and cognitive function		0*	0	-2.34
and depression		-.002**	.001	-2.65
and physical health		0*	0	-2.38
via social isolation		-.01***	.002	-4.75
and cognitive function		0**	0	-3.22
and depression		-.01***	0	-4.90
and physical health		-.001*	0	-2.35
via depression		-.01	.01	-1.81
via cognitive function		-.03***	.01	-5.67
via physical health	-.04***	.004	-9.65	
Sex	via fear of crime	-.12***	.03	-4.18

	and cognitive function	-.01**	.003	-3.33
	and depression	-.09***	.02	-4.96
	and physical health	-.02***	.01	-3.70
	via social isolation	.02	.03	.83
	and cognitive function	.001	.001	.82
	and depression	.01	.02	.83
	and physical health	.001	.002	.73
	via depression	-.80***	.11	-6.97
	via cognitive function	.17***	.04	4.81
	via physical health	-.25***	.04	-5.86
Education	via fear of crime	.12***	.03	4.79
	and cognitive function	.01***	.003	3.67
	and depression	.09***	.02	5.63
	and physical health	.02***	.004	4.05
	via social isolation	.14***	.03	5.40
	and cognitive function	.01**	.002	3.28
	and depression	.08***	.02	5.30
	and physical health	.01*	.003	2.36
	via depression	.50***	.08	6.43
	via cognitive function	.23***	.04	5.55
	via physical health	.07**	.03	2.63

*** $p < .001$, ** $p < .01$, * $p < .05$

Discussion

This study examined the extent to which a hypothesised framework represented the effects of victimisation experience on quality of life in a large sample of UK older adults. The initial framework proposed an immediate mediation of victimisation effects by social isolation and fear of crime, and a subsequent mediation stage by cognitive function, level of depression, and physical health. SEM revealed that the effects of victimisation on quality of life are better represented by a framework that also includes direct associations between both fear of crime and social isolation and quality of life, and between victimisation experience

and level of depression. Of the proposed mediating variables, depression alone was found to significantly mediate the relationship between victimisation and quality of life.

Victimisation was significantly associated with increased depression. This finding bolsters the already extensive literature recording negative effects of criminal victimisation on mental health (Han et al., 2016). Furthermore, level of depression was positively related to quality of life as hypothesised and as suggested by previous research (Evren et al., 2010). Taken alongside the bootstrapping results it can be concluded that being the victim of crime reduces quality of life by increasing the occurrence of depressive symptomatology.

Despite a wealth of evidence identifying the benefits of post-victimisation social support (Boney-McCoy & Finkelhor, 1995) and increased social isolation and fear of crime amongst victims (Russo et al., 2013), neither was significantly associated with victimisation in this dataset. Similarly, Model 4 does not reflect consistently reported findings of reduced cognitive function (Kavanaugh et al., 2017) and poorer physical health (Resnick et al., 1997) amongst victims. It is possible that the known negative associations between victimisation and physical health, cognitive function, social isolation and fear of crime do not persist in the same way as for depression. Most victimisation events, be they physical assault, sexual assault or child physical abuse reported by respondents in this study occurred before the victim was 25 years old. Given the mean age of 66 years, it may be that the intervening 40-year period was sufficiently long to allow the resolution of victimisation-related reductions in physical health and cognitive function or increases in social isolation and fear of crime, but not the resolution of negative mental health effects.

Alternatively, it may be that many respondents have not reached the age at which significant increases in social isolation and fear of crime, and reductions in cognitive function and physical health begin. However, age-related decline in various cognitive domains has been observed as early as an individuals' 20s (Salthouse, 2009), and age-related physical

decline does not follow a universal trajectory (Schaie, 2015). Additionally, it seems unlikely that these factors would begin to mediate the relationship between victimisation experience and quality of life after several decades of not doing so.

Social isolation, fear of crime, cognitive function and physical health were all significantly related to quality of life. Better quality of life under circumstances of reduced social isolation (Beridze et al., 2020) and fear of crime (Stafford et al., 2007), and better cognitive function (Hsiao et al., 2016) and physical health (Fortin et al., 2006) is a well-documented pattern of results. Additionally, social isolation, fear of crime, cognitive function, level of depression and physical health were all significantly associated with one another. These observed relationships between the five proposed mediators reflect the predictions of Model 1, such that ‘worsening’ of one is associated with ‘worsening’ of the others. Taken in conjunction with the finding that victimisation influences quality of life through depression alone, these results suggest that relationships between victimisation and social isolation, fear of crime, cognitive function and physical health reported in the literature may in fact be a consequence of unidentified mediation by depression. This suggests that depressive symptomatology is the key junction in the framework, and that negative victimisation effects propagate outwards from increased depression.

It is tempting to conclude that to optimise post-victimisation recovery and quality of life it is the extent to which a person experiences depressive symptomatology that must be prioritised. Yet, the primacy of depression, and the significant associations observed between the five mediators, means that level of depression is also a point at which the effects of the other proposed mediators converge. Model 4 indicates that level of depression can be improved by increasing social support, reducing fear of crime, fostering better cognitive function, and improving physical health. When developing pathways to improve quality of life, the circumstances of the individual must be considered so that the proposed mediating

variable most relevant to their situation – and, therefore, most likely to yield change in depressive symptomatology and quality of life – can be targeted.

The revised theoretical framework observed in Model 4 persists when key sociodemographic variables are controlled for in Model 5. In this sample of older adults, the conclusions made above regarding post-victimisation quality of life outcomes, and the primacy of depression in determining them, hold whether individuals are not-so-old or very old men or women with high or low levels of educational attainment. The significant associations observed between age and social isolation (Cacioppo & Cacioppo, 2018), cognitive function, depression (Brailean et al., 2019), and physical health (Moreno-Agostino et al., 2020) bolster previous findings of worsening of each as individuals get older. However, the non-significant association between age and fear of crime contradicts the well-documented finding of greater fear of crime amongst older adults (Rader et al., 2012). The pattern of education effects reflects observations from previous research of better cognitive function (Lövdén et al., 2020), mental and physical health (Kurtze et al., 2013) and reduced social isolation (Röhr et al., 2021) and fear of crime (Reese, 2009) amongst the more educated. Combined with the conclusions regarding level of depression, these results suggest that older and less educated individuals are at an increased risk of poor post-victimisation quality of life.

The effects of sex are more difficult to parse since research often identifies differences in the type of, for example, physical health problems reported by men and women. The increased level of depression and poorer physical health observed amongst women may be due to how each were assessed, since women are more likely to be diagnosed with ‘internalizing’ disorders such as depression and chronic health conditions (Needham & Hill, 2010). The greater cognitive function observed amongst women may also be due to method of assessment, since patterns of superior cognitive abilities are gendered – women

outperform men in linguistic tasks, for example, whereas the opposite occurs in visuospatial tasks (Pardeller et al., 2017). Sex differences in fear of crime are consistently reported in the manner observed in this study: women fear crime at greater levels than men (Rader et al., 2020). The significant direct association between sex and quality of life – women report better quality than men – is at odds with the influence that the observed increased depression levels and poorer physical health and greater fear of crime amongst women should have on quality of life. In fact, this finding suggests that something unaccounted for in Model 5 is contributing to this association between sex and quality of life. Future research would do well to address this.

There are several limitations of the current work that must be addressed. Primarily, of the sample of 4673 respondents, just 57 were of a non-white ethnicity. When one considers differences in the prevalence (Kalof, 2000) and psychological impact (Bryant-Davis et al., 2009) of victimisation across ethnicities, failure to control for ethnicity is a major drawback of the current work. Future research must ensure that assessments of victimisation experience, and its association with quality of life, are carried out in more ethnically diverse samples of UK older adults.

Second, of the 4564 respondents in this sample, just 508 reported having experience of victimisation. This sample wasn't large enough to study the effect of each type of victimisation separately. However, research has identified different post-victimisation outcomes across different types of victimisation. More negative mental health effects follow physical and sexual assault compared to other forms of victimisation (Stoliker, 2018), while post-traumatic stress disorder is associated with rape more than other traumatic events (Ullman & Filipas, 2001). Researchers interested in how the theoretical framework outlined in this study applies to specific types of victimisation must first collect a larger amount of data assessing experiences of different types of victimisation in older adults.

Given that the number of UK residents aged 65-years and over is set to increase by 8.6 million in the next half-century (ONS, 2018), understanding drivers of healthy aging is vital. The current study has defined a framework of variables determining the relationship between victimisation experience and quality of life outcomes in a sample of UK older adults. It appears that neither social isolation nor fear of crime are as important in guiding post-victimisation quality of life outcomes as suggested by the literature. Only level of depression was observed to be a significant mediator of the relationship between victimisation experience and quality of life. Yet, as outlined above, researchers and policymakers cannot focus solely on mental health in their discussions of appropriate quality of life-enhancing victim support programs, since each proposed mediating variable was significantly associated with the others and quality of life. Indeed, future research should seek to establish the cause of persistent victimisation-related increases in depressive symptomatology, and the benefits of individualised victim support programs that seek to improve mental health and, consequently, quality of life.

The following chapter has been submitted for peer review at the journal Psychological Science in a shortened format. The terms 'fear of crime' and 'quality of life' have been abbreviated in that submission to 'FoC' and 'QoL' respectively to help meet journal word count requirements.

How Abuse Steals Victims' Golden Years

Exposure to criminal victimisation can have long-term effects on the victim's quality of life. Indeed, Fraga et al. (2017) observed significant reductions in quality of life amongst older adults who experienced abuse at some point in their lives, while Sun (2021) identified acute reductions in quality of life following maltreatment amongst urban Chinese children. It is clear, then, that being the victim of crime can have both immediate and long-lasting negative effects on a person's quality of life and experiencing victimisation early on in life can lead to reduced quality of life even in old age.

However, several elements of health and wellbeing that are associated with both victimisation and quality of life may mediate the relationship between the two. Compared to non-victims, victims tend to feel more socially isolated (Elliott et al., 2005), report increased fear of crime (Logan & Walker, 2017), experience reductions in various domains of cognitive functioning (Kavanaugh et al., 2017), and are at an increased risk of a range of mental and physical health problems, such as depression (Norris & Kaniasty., 1994) and victimisation related injuries (Resnick et al., 1997). Furthermore, research has found that increased social isolation (Beridze et al., 2020) and fear of crime (Stafford et al., 2007), and reduced cognitive function (Hsiao et al., 2016), mental health (Evren et al., 2010), and physical health (Fortin et al., 2006) are all associated with poorer quality of life.

In the previous chapter cross-sectional analyses showed that while each of these mediators (social isolation, fear of crime, cognitive function, level of depression, and physical health) significantly predicted quality of life, depression was the only significant *mediator* of the relationship between victimisation and quality of life. Older adults with victimisation experience reported increased depressive symptomatology and, consequently, worse quality of life than non-victims. Additionally, each of the five proposed mediators were significantly

associated with one another, such that worse circumstances of one predicted worse circumstances of the others.

This is in line with findings from past research. Greater social isolation is associated with increased fear of crime (Rader & Haynes, 2014) and reduced cognitive function (Sampson et al., 2010), mental health (Gale et al., 2018), and physical health (Shiovitz-Ezra et al., 2010). Fear of crime may limit activities that foster better mental health, physical health and cognitive function (Lorenc et al., 2012); and poor mental health is associated with poor physical health (Barnett et al., 2012), both of which are associated with increased cognitive impairment (Hartanto et al., 2019; Wray et al., 2012). Figure 1 shows the path diagram from the previous chapter illustrating these relationships.

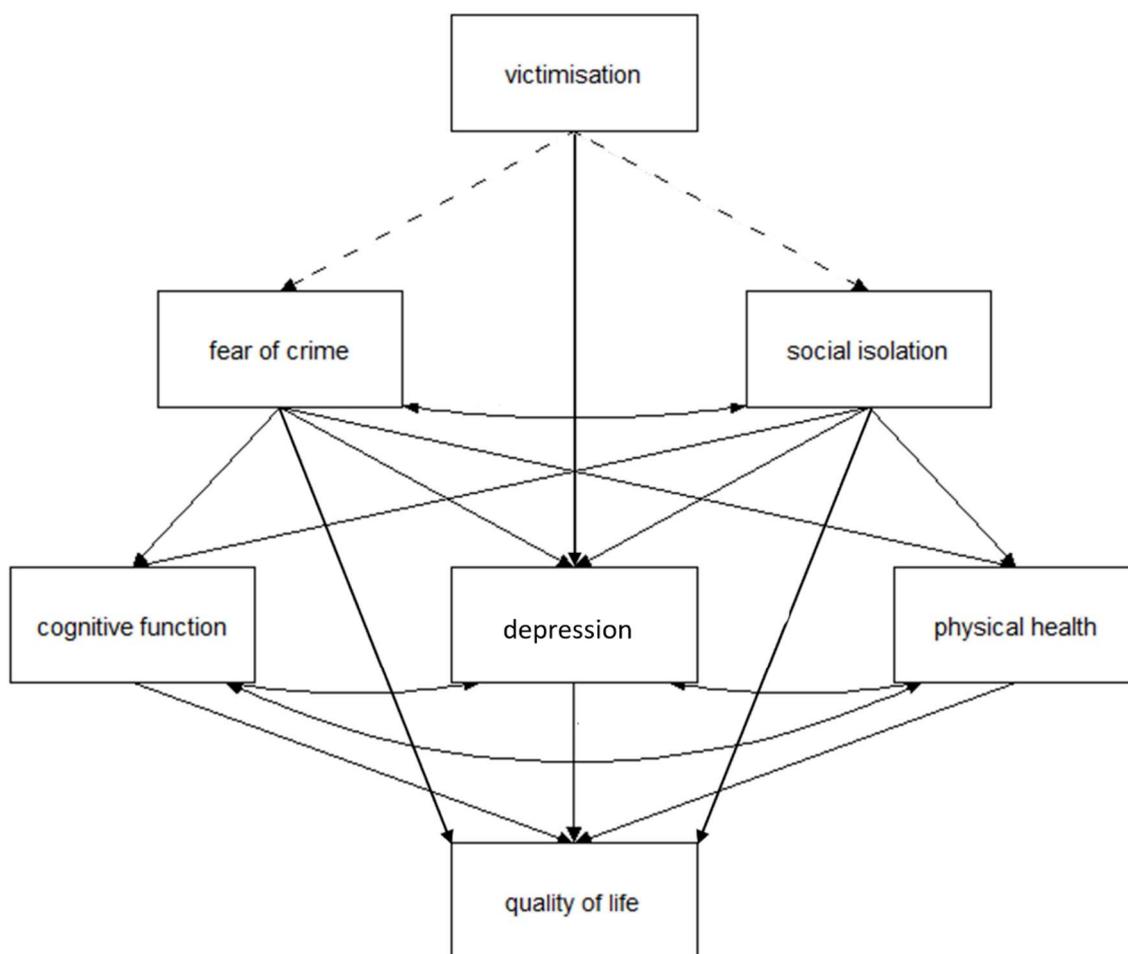


Figure 1. Cross-sectional framework of post-victimisation quality of life outcomes. Straight arrows are regressions, curved arrows covariances. Dashed arrows are non-significant effects, whole arrows significant effects at the $p < .001$ level.

Age is associated with each of the variables shown in Figure 1. Negative post-victimisation outcomes change with age e.g., older victims may be more likely to experience obsessive compulsive disorder following rape than younger adults (Lurigio & Davis, 1989). Older adults are more likely to be socially isolated because of events such as retirement and bereavement that become more likely with age. Studies frequently report increased fear of crime amongst older adults compared to younger individuals (Ferraro & LaGrange, 1987), despite them being less likely to experience victimisation. Declines in a variety of domains of cognitive functioning, including memory and processing speed, become increasingly likely with advancing age (Bosworth et al., 1999). Depression has been found to reach its highest levels in very old age (Mirowsky & Ross, 1992), while declines in physical health are typical in old age (Carmel & Bernstein, 2003). Additionally, there are a wide variety of trajectories of aging since, for example, not all older adults succumb to the looming social isolation of old age and continue to be active and engaged members of their social groups (Wilson et al., 2002).

To fully understand how victimisation influences quality of life in older adults, we must examine how this influence changes over time and *why* these changes occur. The current study sought to develop a framework of the longitudinal effects of victimisation on quality of life in older adults. Two hypotheses were developed. First, poorer circumstances at earlier timepoints will significantly predict poorer circumstances at later timepoints. Together this represents the presence of a negative spiral of aging, wherein those who are worse off continue to worsen and be worse off than those who started with more favourable circumstances. Second, the mediating effect of depression observed in the previous chapter's cross-sectional analyses will persist over time, independent of the spiral effect in Hypothesis 1, such that older adults with victimisation experience will continue to report increased

depression and, consequently, poorer quality of life than non-victims. In other words, victims will progress through this negative aging spiral at a faster rate than non-victims.

Method

Data

This study made use of waves 3, 5, 7, and 9 of the English Longitudinal Study of Ageing (ELSA, Banks et al., 2019; available at <https://doi.org/10.5255/UKDA-SN-5050-24>). Wave 3 was chosen as the first timepoint since information regarding respondents' experiences of victimisation was collected at this wave, as part of an additional Life History Questionnaire. Odd-numbered waves up to wave 9 were chosen as subsequent timepoints because this provided a 12-year spread with 4-year intervals. Data tidying and analysis took place in R Studio (Version 1.4.1106, RStudio Team, 2021). The data, and all associated R Scripts are available at https://osf.io/r6nz5/?view_only=ae611e22fa284feaf7d86112cb1f98d.

Participants

Joining wave 3, 5, 7, and 9 data into a single dataset, and reducing that dataset down to the variables of interest (outlined below) yielded a longitudinal dataset of 1068 respondents ($M_{\text{age}} = 63.10$ years).

Victimisation experience

Three victimisation variables were present in wave 3. These assessed experiences of violent physical assault (rsattac), sexual assault (rssexas), and child physical abuse (rsabuse). A single variable assessing experiences of any of the three types of victimisation (VictExp: 0 = no victimisation experience, 1 = victimisation experience) was created. Information regarding respondents' victimisation experience was collected at wave 3 only. Consequently, VictExp was used to examine the effects of victimisation at all other timepoints. Of the 159 individuals present in Wave 9 who reported victimisation experience at wave 3, 32 experienced child physical abuse, 57 violent physical assault, and 70 sexual assault. Eighteen

violent physical assaults and 43 sexual assaults occurred before the victim was 18 years of age. Thus, 93 of the 159 instances of victimisation were perpetrated against children.

Social isolation

Following Steptoe et al. (2013), items assessing marital status, memberships of social organisations and frequency of written, telephone, and face-to-face contact with friends, family, and children were used to create a social isolation index (SI_Total, range = 0-5). Points were assigned if respondents were not involved in any social organisation, were unmarried, and had less than monthly contact of any form with friends, family, and children. SI_Total was computed in the same way using the same set of items in each wave.

Fear of crime

Fear of crime data is only available in waves 3 and 7 and, therefore, was only represented at those two timepoints in this study. Fear of crime was assessed in waves 3 and 7 by the same 7-point Likert scale asking participants whether “People would be afraid to walk alone after dark in this area” (1 = Strongly agree, 7 = Strongly disagree). Scores on this item were coded so that higher scores indicated increased item agreement and, therefore, greater fear of crime.

Depression

In all four waves, depression was assessed by the Center for Epidemiological Studies–Depression Scale (CES-D; Radloff, 1977; CESD_Total). CES-D is a 20-item measure assessing the recent presence of depressive symptomology. Each item requires a simple yes/no response, and positive items are reverse coded so that when item scores are summed a measure is produced where higher scores indicate increased depressive symptomology. Throughout this paper, the terms depressive symptomology and depression will be used interchangeably.

Physical health

In all four waves a composite variable (No.OfDoctorDiagnosed) measuring the number of diagnosed chronic illnesses reported by each participant was created. In wave 3 one item assessing diagnoses of various cardiovascular-related diseases, and seven items assessing diagnoses of various of chronic health conditions (arthritis, asthma, cancer, lung disease, osteoporosis, Parkinson's disease, and Alzheimer's disease) were used to create No.OfDoctorDiagnosed. In waves 5, 7, and 9 however, cardiovascular-related diseases were assessed by individual items rather than one variable. Additionally, in these waves the presence of both cardiovascular-related and chronic diseases was determined by combining variables assessing new and previous diagnoses. Items in these later waves were tidied so as to keep the format of wave 3 No.OfDoctorDiagnosed consistent.

Cognitive function

In waves 3 and 5, cognitive function was assessed using ELSA's own composite variable (cfind). This measure sums participants' scores on separate memory and executive function indices, derived from scores on word-list learning, prospective memory and orientation in time items and verbal fluency and letter cancellation items respectively. In waves 7 and 9, however, no composite cognitive function variable exists because prospective memory and letter cancellation data was not collected at these timepoints. Consequently, a reduced cognitive function index (cfind) was computed in these later waves using those constitutive items that were available: orientation in time, word-list learning, and verbal fluency.

Quality of life

In all four waves quality of life was assessed using the CASP-19 (Hyde et al., 2003; CASP19), a measure constructed and validated in a sample of UK older adults. This variable includes 19 items assessing participants' autonomy, pleasure, control, and self-realisation

that, when summed, yield a score from 0-57, with higher scores reflecting better quality of life.

Sociodemographic variables

Effects of age, sex, and socioeconomic status on each of the variables included in the theoretical framework are well-documented. Consequently, all three were controlled for in this study. Highest level of education received (edqual_collapsed; 1- no qualification, 2 = below degree qualification, 3 = degree or equivalent) functions as a predictor of socioeconomic status because educational attainment is considered its primary determinant (ten Have et al., 2003). Only values for each of these sociodemographic variables attained at wave 3 were used in the current study since increasing respondent age can be determined by the amount of time spanned by the waves, and respondent sex and level of education is unlikely to have changed amongst older adults.

Statistical modelling process

The cross-sectional theoretical framework constructed in the previous chapter was used to inform the modelling (Figure 1). This framework estimates direct effects of victimisation on three of five proposed mediators (social isolation, fear of crime, depression) and of all five proposed mediators (social isolation, fear of crime, cognitive function, depression, and physical health) on quality of life. Structural equation modelling (SEM) was used to determine whether this framework persists over time as individuals age, because SEM permits simultaneous estimation of multiple associations between multiple variables.

In the current work, this framework was constructed at each timepoint (waves 3, 5, 7 & 9) included in the longitudinal analysis using wave-specific data pertaining to all variables except victimisation. At waves 5 and 9 a framework without fear of crime was constructed because fear of crime data was not collected at those timepoints. The goodness-of-fit of each model was determined by examining a series of statistics. Chi-square (X^2) is a measure of

overall model fit. The Root Mean Square Error of Approximation (RMSEA) and the Standardised Root Mean Square Residual (SRMR) indicate how far a model is from perfect fit. The Tucker_Lewis Index (TLI) and the Comparative Fit Index (CFI) compare model fit to the worst possible model. In each model, ordinal variables from each wave (SI_Total, FoC, CESD_Total and No.OfDoctorDiagnosed) were declared as such, while models were fit using diagonally weighted least squares estimation (DWLS – appropriate for ordinal data).

To examine whether the inclusion of additional parameters improved model fit significantly, Likelihood Ratio Tests (LRT) compared each model to its predecessor. A significant LRT X^2 value indicates that model fit is significantly improved, and the inclusion of additional parameters was justified. This modelling process was repeated until the inclusion of new parameters no longer improved model fit according to LRT outputs, and a theoretically valid and well-fitting model was identified. Models of increasing complexity, estimating an increasing number of associations were fit. Longitudinal Model 1 constructed the ‘base’ theoretical framework at each wave, and estimated 1st order stabilities – the effect of each variable on its counterpart one timepoint later. Despite spanning two time gaps, the association between fear of crime in waves 3 and 7 was regarded as a 1st order stability since this data only exists at those two timepoints. SEM revealed this model did not fit the data well (Table 1, $X^2 = 3098.42$, 177df, $p < .001$; CFI = .98; TLI = .98; RMSEA = .13; SRMR = .07). Model complexity was increased sequentially by adding 1st order cross-lagged effects (the effects of variables at each timepoint on other variables one timepoint later), 2nd order stabilities (the effects of variables at each timepoint on their counterparts two timepoints later), and 2nd order cross-lagged effects (the effects of variables at each timepoint on other variables two timepoints later). Having reached a theoretically and statistically well-fitting model an additional model was constructed estimating the effects of age, sex, and education on all dependent variables at each timepoint. R Studio was used for all data tidying and

analysis. SEMs were constructed using the ‘lavaan’ package (Rosseel, 2012), and longitudinal weights were integrated using the ‘lavaan.survey’ (Oberski, 2014) and ‘survey’ (Lumley, 2020) packages.

Table 1. Model fit statistics. LRTs used to compare improved model fit were all significant.

Model	Parameters added	X^2	CFI	TLI	RMSEA	SRMR
1	Base framework	3098.42	.98	.98	.13	.07
2	1 st order cross-lagged effects	1373.79	.99	.99	.10	.03
3	2 nd order stabilities	549.46	.99	.99	.06	.02
4	2 nd order cross-lagged effects	449.00	.99	.99	.07	.02
5	Age, sex, education controls	406.34	.99	.99	.07	.05

Results

Prior to analysis, preliminary plots (Figure 2) of mean scores for those with and without victimisation experience were obtained for all five proposed mediators and quality of life. Figure 2-A shows that victims report lower quality of life than non-victims over time, although this disparity is diminished at wave 9 where there is a reduction in the quality of life of non-victims. Figure 2-B illustrates the increased and more changeable levels of depression reported by victims compared to non-victims over time and that at wave 9 the previously stable depressive symptomology of non-victims is reduced. Figure 2-C shows similar and stable levels of social isolation between victims and non-victims until at wave 9 both victims and non-victims report much-increased social isolation.

In contrast to the worsening circumstances illustrated by Figure 2-A, B, and C, Figure 2-D shows reduced fear of crime for both victims and non-victims over time and greater decline in fear of crime for victims. In Figure 2-E we see that both victims and non-victims experience nearly identical trajectories of cognitive decline with increasing age. Of particular interest is the sudden and sharp decline in cognitive function between waves 5 and 7. Finally, Figure 2-F shows the consistently poorer physical health of victims compared to non-victims, while both groups experience worsening physical health over time and with increasing age. These figures support the hypothesis that as time passes and as old adults become very old adults, quality of life, mental health, social isolation, cognitive function, and physical health worsen amongst victims and non-victims alike, while fear of crime is reduced. The full output of the statistical analysis can be found at Appendix A. Here we focus on those mediators that are affected by victimisation and affect quality of life in a model that contains all mediators.

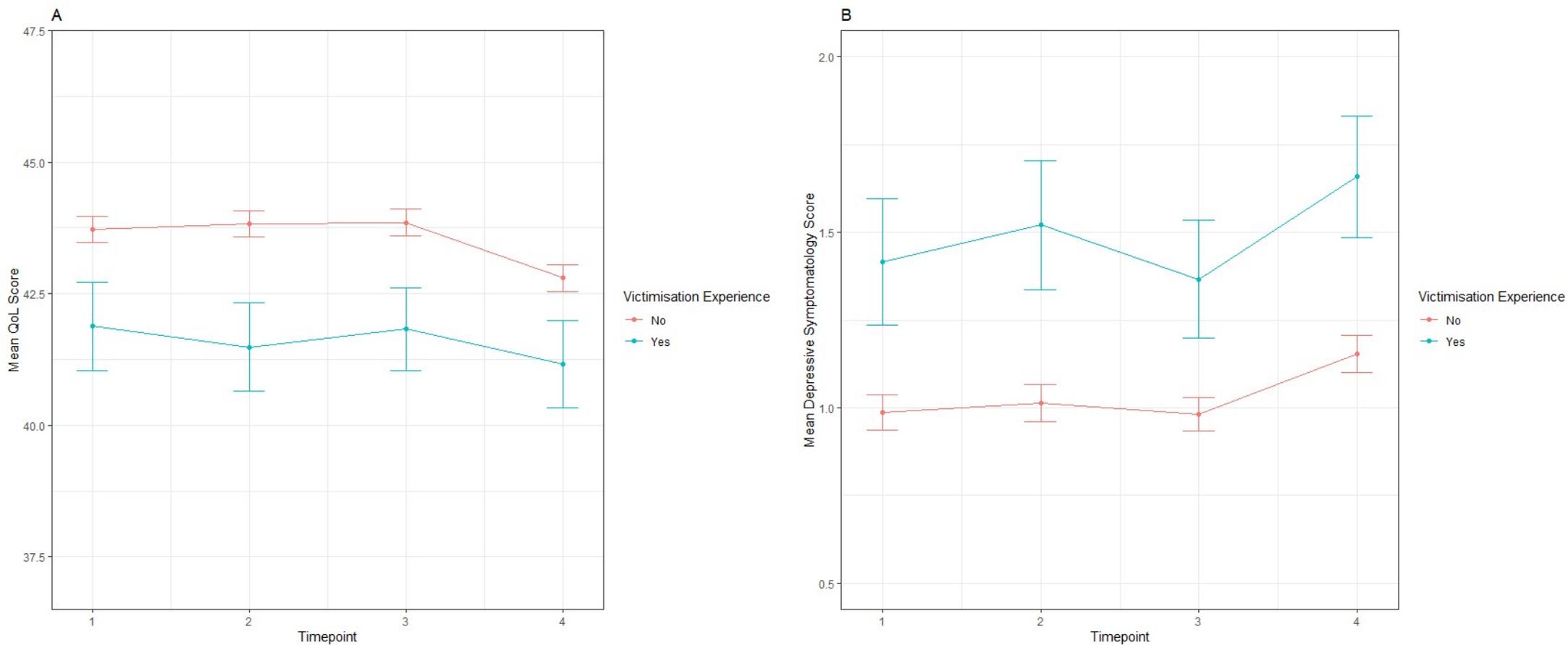


Figure 2. Mean and standard error plots of quality of life (QoL; A), depressive symptomatology (B), social isolation (C), fear of crime (FoC; D), cognitive function (E), and physical health (F) for victims and non-victims in each wave.

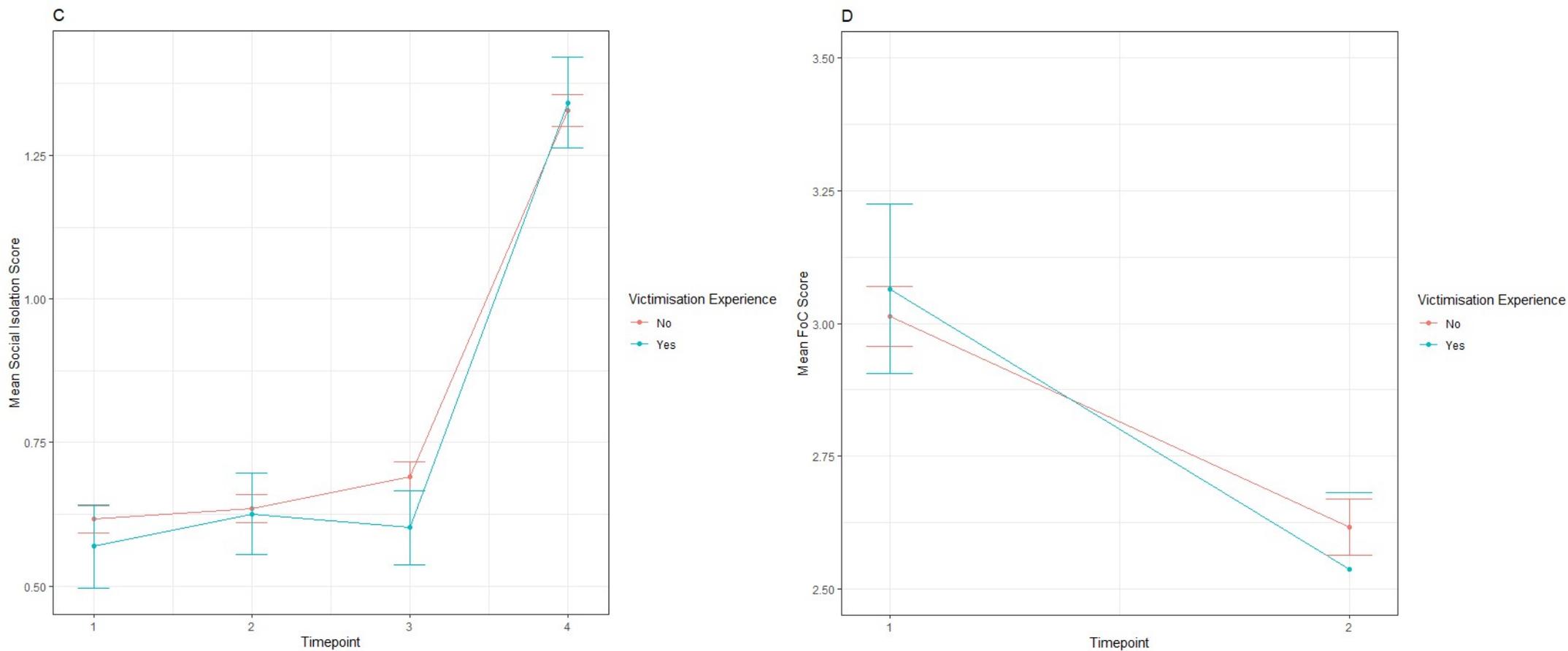


Figure 2. Mean and standard error plots of quality of life (QoL; A), depressive symptomology (B), social isolation (C), fear of crime (FoC; D), cognitive function (E), and physical health (F) for victims and non-victims in each wave.

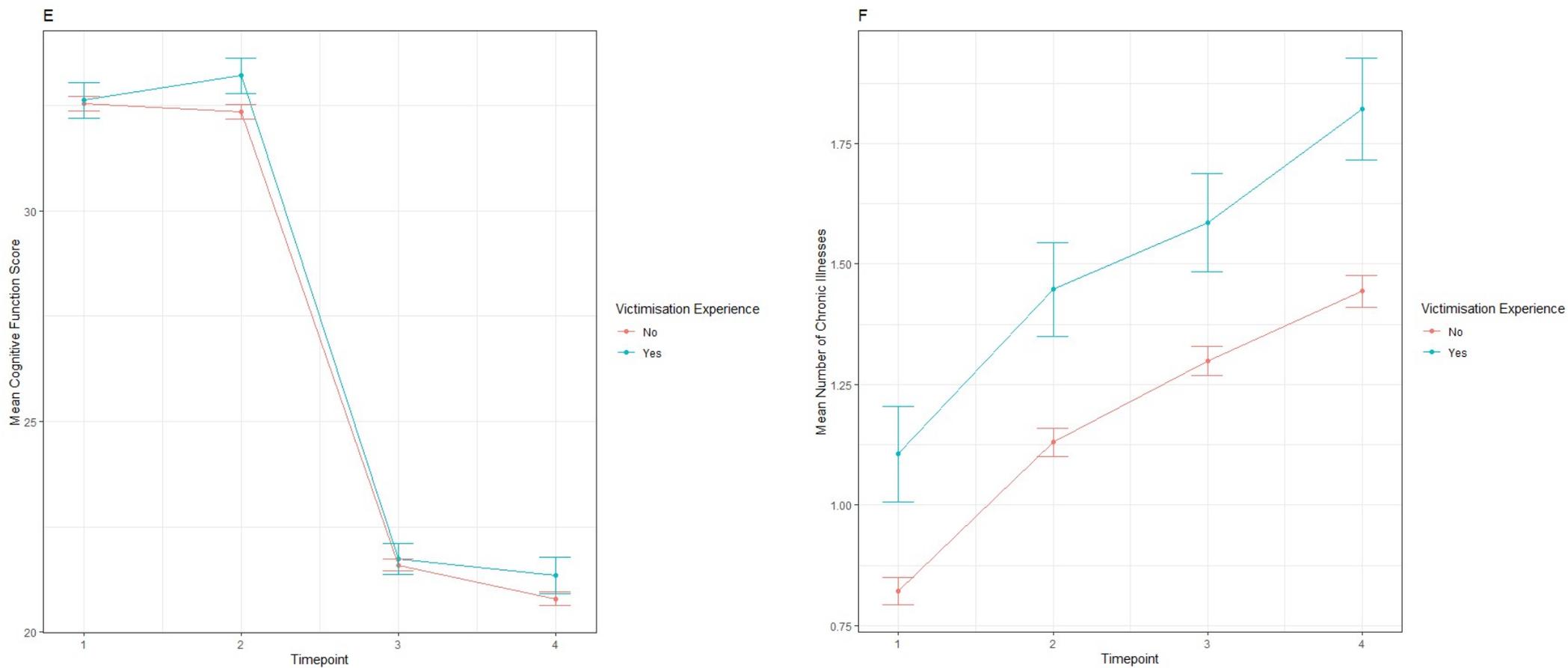


Figure 2. Mean and standard error plots of quality of life (QoL; A), depressive symptomology (B), social isolation (C), fear of crime (FoC; D), cognitive function (E), and physical health (F) for victims and non-victims in each wave.

Figure 3 shows, wave-by-wave, those variables found to be significantly associated with victimisation, their associations with current and previous quality of life, and the longitudinal effects of depression and quality of life on one another. At wave 3, victims report greater depressive symptomology than non-victims (.52, $p < .001$), which predicts worse quality of life (-2.19, $p < .001$) and increased wave 5 depressive symptomology (.30, $p < .001$). The same pattern of results persists in wave 5, with victims again reporting greater depressive symptomology (.32, $p < .001$), which in turn predicts worse quality of life (-1.44, $p < .001$). Of particular interest is the cross-lagged effect of wave 3 quality of life on wave 5 depression, wherein worse earlier quality of life significantly predicts worse later depression (-.06, $p < .001$). This cross-lagged effect persists over time, such that worse wave 5 and wave 7 quality of life significantly predict worse wave 7 and wave 9 depression (-.07, $p < .001$ and -.06, $p < .001$ respectively). Additionally, 1st and 2nd order quality of life stabilities were significant at each time point such that: better wave 3 quality of life predicts better wave 5 and 7 quality of life (.62, $p < .001$ and .36, $p < .001$), better wave 5 quality of life predicts better wave 7 and 9 quality of life (.43, $p < .001$ and .24, $p < .001$), and better wave 7 quality of life predicts better wave 9 quality of life (.51, $p < .001$). Together, these results support hypothesis 1: the existence of a spiral of negative outcomes as people age.

At wave 7 the pattern of results observed at the previous two timepoints changes dramatically. Indeed, at wave 7 victimisation experience predicts reduced depressive symptomology (-.21, $p < .05$), while greater depressive symptomology still predicts worse quality of life (-.73, $p < .001$) and earlier wave 5 quality of life still predicts greater later wave 7 depressive symptomology (-.07, $p < .001$). Although victims still report increased depression compared to non-victims (see figure 2-B), the gap between them is smaller at wave 7 than at wave 5. Additionally, at wave 7 victimisation significantly predicts fear of crime and social isolation such that victims report reduced fear of crime (-.46, $p < .001$) and

social isolation (-.11, $p < .01$), increases in social isolation significantly predict increased depressive symptomology (.24, $p < .01$). Social isolation and fear of crime are themselves not correlated. It seems that victims experience reduced social isolation compared to non-victims at wave 7, which leads to a partial recovery of the increased depressive symptomology exhibited by victims throughout the other waves. Indeed, Figure 2-C & D show that at wave 7 victims are doing better than non-victims in terms of their social isolation and fear of crime scores, while the improved depressive symptoms of victims from wave 5 to 7 shown in Figure 2-B suggests an inverse victimisation-depression relationship in wave 7.

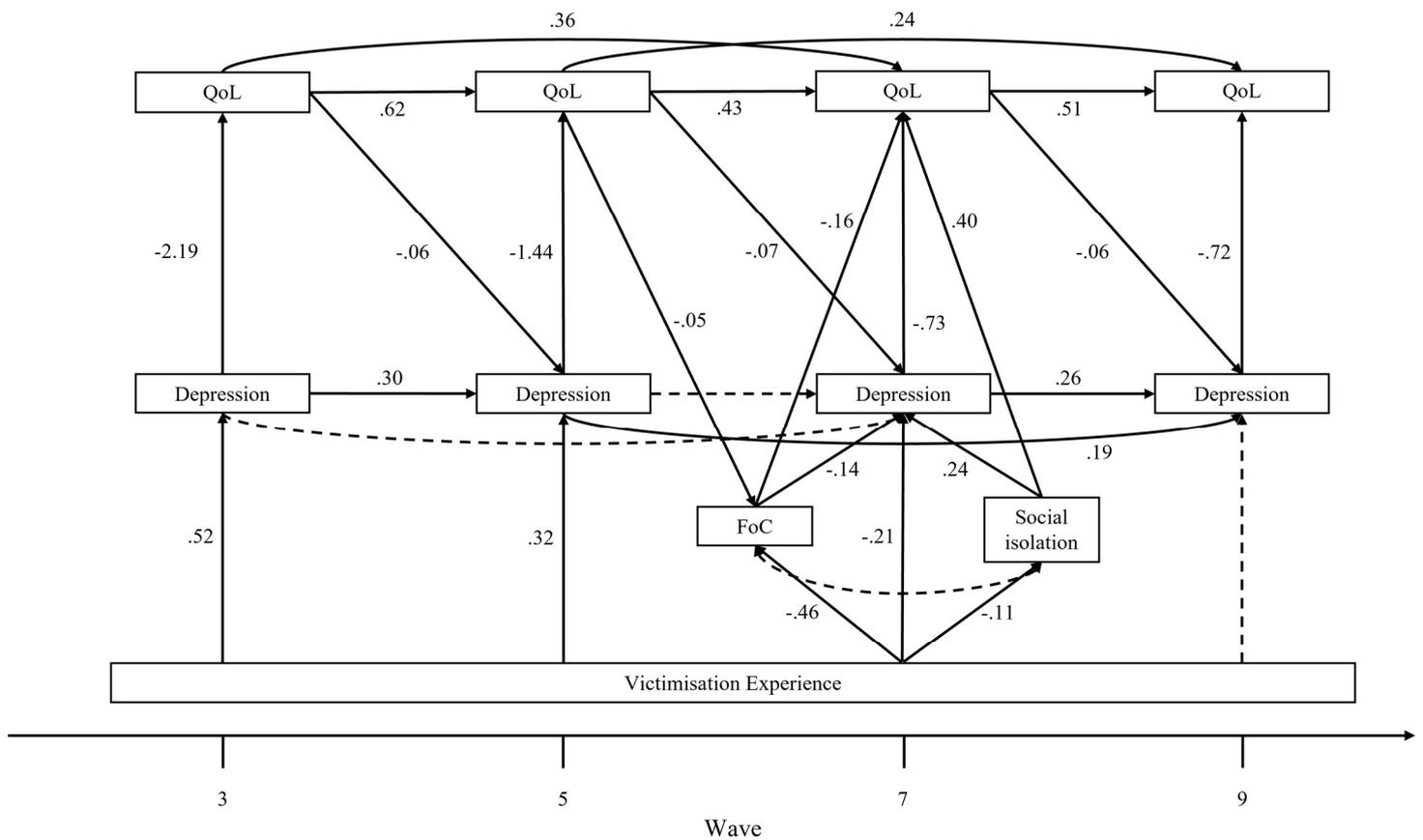


Figure 3. Path diagram of final longitudinal model (QoL – quality of life; FoC – fear of crime). Straight arrows are regressions, curved arrows covariances. Dashed arrows are non-significant effects, whole arrows significant effects at the $p < .001$ level. Values represent unstandardised coefficient estimates for the associated parameter.

Yet, greater wave 7 social isolation exhibited by non-victims significantly predicts better wave 7 quality of life (.40, $p < .001$). Considering the better wave 7 quality of life reported by non-victims compared to victims in Figure 2-A, it appears that while victims are doing better than non-victims in some areas in wave 7, their recovery is only partial. The finding that increased wave 7 fear of crime exhibited by non-victims significantly predicts worse quality of life (-.16, $p < .05$) but reduced depressive symptomology (-.14, $p < .01$) is difficult to integrate (see discussion).

At wave 9 victimisation is no longer significantly associated with any of the five proposed mediating variables, while greater depression continues to significantly predict worse quality of life (-.72, $p < .001$) and worse wave 7 quality of life significantly predicts increased wave 9 depressive symptomology (-.06, $p < .001$). Increased earlier depressive symptomology predicts increased later depressive symptomology (.26, $p < .001$). Together, these findings indicate that the negative aging spiral persists into wave 9. However, victims are no longer aging faster, their worse outcomes are entirely caused by their earlier poorer outcomes.

Discussion

This study used SEM to examine the longitudinal effects of victimisation in a sample of UK older adults. This paper focused on variables that are predicted by victimisation and predict quality of life. It was hypothesised that a negative spiral would be observed wherein poorer outcomes at earlier timepoints predict poorer outcomes at later timepoints.

Furthermore, victims were expected to report worse depressive symptomatology and quality of life than non-victims and, consequently, to decline along the negative spiral more quickly.

As Figure 3 shows, at wave 3 victims report increased depression, which is tied to reduced quality of life, compared to non-victims. This finding of depression-induced reductions in quality of life amongst individuals with victimisation experience supports the

findings from the cross-sectional modelling conducted in the previous chapter, and well-documented negative post-victimisation mental health (Fergusson et al., 2008; Kilpatrick et al., 2003) and quality of life (Brenes, 2007) effects. Furthermore, the finding that worse wave 3 quality of life predicts increased wave 5 depression supports the existence of the hypothesised spiral of negative circumstances. Additionally, at wave 5 victimisation experience continues to predict increased depression which predicts reduced quality of life. The persistence of the association between victimisation and depression in wave 5 when the effects of earlier quality of life are controlled for suggests that victimisation affects depression *independently* of the influence of aging. Victims are, therefore, progressing through this negative spiral faster than non-victims.

This pattern of results persists until wave 7, when non-victims begin to experience increases in social isolation, fear of crime and depressive symptomology compared to victims. Increased social isolation is frequently tied to reductions in mental health (Heikkinen & Kauppinen, 2004) and is often seen as being due to lifestyle changes associated with older age, such as retirement and bereavement (Cornwell & Waite, 2009). Given the results observed here, it seems reasonable to conclude that at wave 7, non-victims experience age-related lifestyle changes leading to increased social isolation and, subsequently, increased depression. Victims, who still report poorer quality of life than non-victims at wave 7 (Figure 2-A), are doing better than would have been expected based on their levels of social isolation, fear of crime, and depression at wave 5 compared to non-victims.

The stability of victims' detriment over time (Figure 2-A), and the inverse and new effects of victimisation on depression and social isolation respectively, appears to represent a closing of the gap between victims and non-victims. This is even more likely when one considers the negative spiral still exists at wave 7 – worse wave 5 quality of life predicts worse wave 7 depression. Victims remain worse off, but non-victims begin to display

declines in health and wellbeing associated with old age (Brailean et al., 2019; Cacioppo & Cacioppo, 2018; Moreno-Agostino et al., 2020), reducing the differences between the experiences of victims and non-victims. It may also be the case that victims are themselves taking action to close the gap. Victims may be aware that they are worse off than non-victims and decide to seek help from medical professionals or from friends and family (thus decreasing social isolation and depression). In this way, victims may be actively contributing to the nature of these findings.

The wave 7 effects of victimisation on fear of crime and of fear of crime on depression and quality of life are more difficult to interpret. The greater fear of crime reported by non-victims is tied to reduced depression but poorer quality of life. Indeed, the improvement in depression with increased fear of crime is at odds with the effects of victimisation on depression and social isolation and with previous research identifying greater psychological distress and depression with greater fear of crime (Beaulieu et al., 2002). The increase in the depression levels of non-victims appears, then, to be related to their increasing social isolation rather than their fear of crime.

Several explanations exist for these contradictory fear of crime effects. Perhaps respondents are misattributing increases in depression as due to worry about crime in their local area. Individuals may think, for example, that rather than them being depressed, it is their neighbourhood that is depressing. This would certainly account for the negative association between fear of crime and depression but does not explain why non-victims (who report greater fear of crime than victims at wave 7) also report increased depression. Alternatively, it may simply be that the combined effects of social isolation and fear of crime on depression and quality of life at wave 7 are balancing each other out, driving the stable quality of life of non-victims that persists until wave 9 (Figure 2-A). Future researchers might use qualitative methods to examine exactly how social isolation and fear of crime affect older

adults' mental health and quality of life. While further research is needed to better understand these complex findings, it is important to note that depression continues to be the primary mediator of post-victimisation quality of life outcomes.

At wave 9 victimisation no longer significantly predicts depression, social isolation, or fear of crime. However, greater depression remains a significant predictor of reduced quality of life, while the negative spiral of aging persists. Together this means that victimisation no longer directly influences the depressive symptomatology and quality of life of older adults. At wave 9, possibly because of the changing effects of victimisation, depression, social isolation and fear of crime observed at wave 7, victims are no longer progressing through this spiral more quickly than non-victims. Victims' lower quality of life is determined entirely by their having been worse-off in previous waves. At wave 9, victims and non-victims are experiencing age-related decline at similar rates.

Overall, these findings suggest that victims report increased depression and reduced quality of life for at least 8 years (waves 3-7) before similar aging changes are experienced by non-victims. Indeed, since most victims in the current sample reported experiences of childhood victimisation (i.e. occurring before the age of 18 years) it seems reasonable to conclude that the deleterious effects of victimisation observed here occurred much earlier than wave 3, when the victimisation data was gathered. The number of years stolen from victims may very well exceed the 8 years observed here. This has important implications for victim support. When opportunities arise to introduce positive change to the wellbeing of individuals who have, for the most part, endured a lifetime of negative victimisation effects, they must be taken.

The longitudinal negative effects of victimisation support the findings of previous research (Robinson & Keithley, 2000), and highlight the importance of implementing victim support interventions amongst older victims even if their victimisation experiences occurred

many years earlier. The role of depression in driving negative post-victimisation quality of life outcomes suggests that victim support interventions focused on improving mental health will be most useful in optimising quality of life in older victims. Cognitive behavioural therapy (CBT), for example, has been identified as an effective method of treating depression amongst victims (Gautam et al., 2020; Lomax & Meyrick, 2022). Furthermore, the influence of social isolation on the mental health and quality of life of victims and non-victims alike suggests that interventions offered in a group setting may also be useful. Group intervention programs have been shown to produce positive outcomes for psychological wellbeing (Santos et al., 2017) and may, where older adults are concerned, introduce much needed social engagement.

The fact that most ELSA victims report childhood victimisation highlights the importance of early interventions to avoiding negative longitudinal mental health and quality of life outcomes. Indeed, Cohen et al. (2005) identified the beneficial effects of CBT in producing durable reductions in depression amongst sexually abused children and teenagers. Effective identification of victims, and offering them support and mental health treatment, soon after victimisation occurs will likely help prevent suffering that may otherwise be lifelong.

General discussion

This research project sought to improve our understanding of the nature of the detrimental effects of experiences of criminal victimisation on the quality of life of older adults. To achieve this, three studies were conducted, each with their own specific aims, using the English Longitudinal Study of Ageing (ELSA; Banks et al., 2019). The first (Chapter 4) identified which sociodemographic characteristics of a group of older adults were associated with having experience of victimisation. The second (Chapter 5) developed a theoretical framework of the pathways by which experiences of victimisation negatively affect quality of life in older adults. The third and final study (Chapter 6) extended this theoretical framework to a longitudinal context, examining how the effects of victimisation experience on the quality of life of older adults change with increasing age. The findings of these studies provide valuable insights into the long-term experiences of individuals with victimisation experience, and of the effects victimisation has on both quality of life and aging.

Summary of findings

Study one used logistic regression to identify a sociodemographic profile of increased likelihood of victimisation amongst a sample of older adults taken from ELSA wave 3. This analysis revealed that it is the not-so-old, the more educated, and the unmarried who were more likely to have reported experience of criminal victimisation. The finding that the oldest old are less likely to report victimisation experience supports previous research identifying a reduced risk of criminal victimisation amongst older compared to younger adults (Walker et al., 2006). Furthermore, studies have observed an increased risk of victimisation associated with greater educational attainment (Messner et al., 2007), while being unmarried has also been found to incur an increased risk of victimisation (Brennan et al., 2010).

The absence of a significant association between victimisation experience and sex in study one suggests there is no difference between men and women in their risk of victimisation. This is in line with previous studies identifying no difference in the likelihood of victimisation generally, but in the likelihood of experiencing specific types of victimisation. Indeed, men are at a greater risk of physical assault, while women are more likely to experience all forms of sexual assault (Kilpatrick & Acierno, 2003; Schafer et al., 1998). The non-significant association between victimisation experience and ethnicity in study one does not reflect the well-established findings of changing victimisation risk across ethnic groups (Berg, 2014; Kalof, 2000). Yet, this finding is hardly surprising when one considers the white-dominated nature of ELSA.

Study two modelled all five intermediary variables simultaneously to determine which mediate the relationship between victimisation experience and quality of life. Structural equation modelling (SEM) was applied to the same ELSA wave 3 data used in study one. SEM revealed that the only significant mediator of the effects of victimisation on quality of life was depression, such that being the victim of crime reduces quality of life by increasing the victim's levels of depression. Victimization experience was not significantly associated with social isolation, fear of crime, cognitive function, or physical health, but worsening circumstances of each of these significantly predicted reduced quality of life. Additionally, each of the five intermediary variables were significantly associated with one another such that worsening circumstances of each predicts worsening circumstances of all the others. Depression appears, then, to be the key junction in this theoretical framework through which the negative impacts of victimisation experience, and changes in the other intermediary variables, influence quality of life.

These findings contradict those from previous studies identifying increased social isolation (Elliott et al., 2005) and fear of crime (Logan & Walker, 2017), and poorer

cognitive function (Kavanaugh et al., 2017) and physical health (Yunus et al., 2019) amongst victims. Yet, findings of reduced mental health in victims are well-documented (Han et al., 2016). As observed here, previous research has tied reductions in quality of life to increased social isolation (Beridze et al., 2020) and fear of crime (Stafford et al., 2007), and poorer cognitive function (Hsiao et al., 2016), mental health (Mendlowicz & Stein, 2000), and physical health (Fortin et al., 2006). The significant associations between each of the intermediary variables in the theoretical framework support the observations of past studies. Decreased cognitive function, mental health and physical health are associated with both greater social isolation (Gale et al., 2018; Sampson et al., 2010; Shiovitz-Ezra et al., 2010), and fear of crime (Bell et al., 2021; Lorenc et al., 2012; Mariotti, 2015), which are themselves positively related (Rader & Haynes, 2014). Additionally, cognitive impairment has been associated with poor mental and physical health (Hartanto et al., 2019; Wray et al., 2012), while reductions in either mental or physical health tend to bring reductions in the other (Barnett et al., 2012).

To fully understand the way in which victimisation experience influences aging, the relationships between victimisation, quality of life, and each intermediary variable (as well as the circumstances of each intermediary variable) must be assessed over time and with increasing age. The significant effects of victimisation experience on depressive symptomatology and of depressive symptomatology on quality of life observed in study two persisted over time in study three. This is until wave 9, when victimisation experience was no longer significantly associated with any intermediary variable. It was also observed that at wave 7 victimisation experience is significantly associated with social isolation and fear of crime, such that non-victims report increases in both compared to victims relative to their levels of social isolation and fear of crime at the previous timepoint. This is accompanied by a reversal of the victimisation-depression relationship observed previously, such that

victimisation experience is significantly associated with reduced depressive symptomatology. These findings, which are unique to wave 7, suggest that at this timepoint non-victims begin to experience changes in their social isolation and fear of crime circumstances that lead to negative changes in their levels of depression. Indeed, previous research has identified an increased likelihood of social isolation and fear of crime (Ferraro & LaGrange, 1987) and, in some studies, reduced mental health (Mirowsky & Ross, 1992) with increasing age.

Additionally, a spiral of negative aging was observed, wherein reduced quality of life at each timepoint significantly predicted poorer mental health one timepoint later.

Importantly, the significant associations between victimisation experience and level of depression at each timepoint exist independently of this negative spiral, suggesting that victims move along the spiral more quickly than non-victims. As a result of this faster negative aging, victims experience increases in depressive symptomatology and reductions in quality of life almost a decade before those same reductions are seen in non-victims.

Implications

Reporting criminal victimisation

The sociodemographic profile of increased likelihood of victimisation experience identified in study one has several important implications. Observations of significant relationships between victimisation experience, level of education and marital status suggest that attending university and being unmarried bring an associated increase in the likelihood of having victimisation experience. It remains unclear from these results whether it is victimisation experience that results in greater educational attainment and a tendency toward ‘unmarriage’, or if the opposite is true. It may be that individuals attending university are particularly vulnerable to victimisation. Indeed, research has shown this to be true (Baum & Klaus, 2005), with female students experiencing an increased risk of sexual assault during their time at university (Daigle et al., 2019). Furthermore, being separated or divorced has

been found to incur a specific increase in the risk of victimisation (Brennan et al., 2010). It may be, then, that unmarried respondents were once married but have since become separated or divorced *because* of victimisation at the hands of their significant other.

The significant association between victimisation experience and age points to an increase in the occurrence of the types of victimisation assessed here over the course of the 20th Century. The mean age of ELSA respondents at wave 3 was 66-years; and 292 instances of victimisation reported by ELSA respondents at wave 3 occurred before the individual was 18 years old. Given that ELSA wave 3 data was collected in 2006, many of the younger older adults found here to be more likely to have victimisation experience will have become victims around the year 1960. Indeed, in a report for the House of Commons, Thompson and colleagues (n.d.) identify a sharp rise in the number of crimes recorded by the police in England and Wales from the 1950s onwards. This increase in crime rates may be due to changes in the type of activity being criminalised, the type of crime being recorded and the frequency with which those crimes are reported. However, it is also possible that the relationship between victimisation experience and age observed here is due to increases in the occurrence of criminal victimisation.

Yet, it may be that amongst the oldest old, the less educated and the married victimisation experience is more likely to go unreported. Estimates from the Office for National Statistics (ONS, 2021) suggest that 60% of crimes in England and Wales go unreported. While many of these unreported crimes will not be instances of the type of victimisation assessed in this research, the prevalence of violent victimisation (1.8 million offences between March 2019 and 2020; ONS) in England and Wales suggests that many of them will. There exists, then, a large amount of victimisation data that has gone unassessed here. Where the effect of age on victimisation experience is concerned, rather than there being an actual increase in the occurrence of criminal victimisation over time, the finding that

the not-so-old are more likely to report victimisation experience suggests there is a divide amongst this study's sample of older adults in their willingness to disclose instances of abuse.

Given the mean age of 66-years when victimisation experience was assessed at ELSA wave 3, it may be that respondents older than 66-years regard their own experiences of victimisation as inconsequential compared to historic events, such as the Second World War, that oldest members of the sample would have lived through as children and young adults. Research has identified long-term negative effects on the psychological wellbeing of British children who lived through WWII (Foster et al., 2003). The deleterious impacts of historic events such as WWII may outweigh those that can be attributed to any experience of criminal victimisation. The negative consequences of victimisation experience may, therefore, have been lost within a wider context.

Alternatively, there may be important attitudinal differences between the oldest and youngest older adults sampled here. The oldest old may be of a generation still subject to the constraints of the traditional British 'stiff upper lip'. This quality of repression of emotion, the habit of 'laughing off' traumatic experiences, and the expectation that traumatic experiences will be dismissed was prevalent in the inter-war years and those years immediately following WWII (Capstick & Clegg, 2013; Machin & Williams, 1998). Only towards the end of the 20th Century were instances of child abuse and their negative impacts given the focus and recognition required to make them an issue in need of attention (Delap, 2018). Societal commitments to discretion may have left many victims unable to give voice to their experiences of victimisation as children.

In this way, the sociodemographic profile presented in study one may be indicative of a skew in the reporting of victimisation experience. Consequently, the findings described above, the conclusions drawn from them regarding the nature of the relationship between victimisation experience and quality of life, and those implications yet to be discussed may

only be applicable to those individuals who have disclosed their experience of victimisation. Indeed, it may be that individuals who do not disclose their victimisation experience are those victims who are able to recover from the negative impact of victimisation of their own accord. Non-disclosers might have, for example, the kind of tolerant, supportive, and concerned social support networks – shown to be so important to post-victimisation recovery (Lueger-Schuster et al., 2015) – that enable them to recover fully from a victimisation event.

The wider context of adversity within which criminal victimisation sits adds weight to the argument that non-disclosers are those individuals who are capable of overcoming the negative impacts associated with their experiences of criminal victimisation, and may offer an alternative explanation for this suggested phenomenon. While it is clear that adverse experiences, be they instances of victimisation or not, can reduce people's mental health and wellbeing in the manner observed in this research, this is not always the case. Indeed, adverse life events can imbue an individual with greater resilience to subsequent adversity. Research has observed frequent rather than rare occurrences of resilience following even substantial adversity (Masten, 2001; Werner & Smith, 1992), and has even identified better health and wellbeing amongst individuals who have experienced at least some adversity in their lives compared to those who have experienced high levels of adversity and those who have experienced none (Seery et al., 2010).

These reports of the apparent benefits of some degree of adversity, of which the instances of criminal victimisation examined in this research are an example, lead us to the sad conclusion that there may in fact be a 'right amount' or 'useful' of victimisation that one can experience. In this way those individuals who choose not to disclose their victimisation experience may be those whose experience was of a degree of severity that fostered rather than sapped their resilience to the reductions in mental health and quality of life to be expected amongst victims. Conversely, individuals who do disclose their victimisation

experience are those whose experiences of victimisation are so severe or so numerous that their mental health and quality of life are reduced for many years following the event in the manner observed in study 3 and discussed in detail below. This conclusion is in line with observations of a greater likelihood of deleterious outcomes following victimisation events of greater severity (Ullman & Filipas, 2001) and with experience of more than one type of victimisation (Golding, 1999; Follette et al., 1996). A person's willingness to disclose may, therefore, be related to both their likelihood of suffering the lifelong negative post-victimisation outcomes identified in this research and the level of adversity presented by their particular history of victimisation.

It is also entirely possible that the significant association between victimisation experience and age observed in study 1 is indicative of nothing more than the diminishing cognitive abilities that we accept as a natural part of the aging process (Bosworth et al., 1999). Indeed, memory continuously declines as we age (Jia et al., 2023), and the incidence of Alzheimer's disease, a notorious component of which is the rapid decline of the sufferer's memory and wider cognitive faculties (Holger, 2013), increases substantially as one progresses from old age to very old age (Kawas et al., 2000). The observation that the not-so-old are more likely to report having experienced criminal victimisation may, therefore, be a consequence of forgetting, Alzheimer's-induced or otherwise, by ELSA's oldest respondents.

One might examine the viability of this particular argument by assessing the victimisation experience of those ELSA respondents identified as victims in ELSA wave 3 in a subsequent data collection wave, when these individuals have aged. In this way, any wave 3 victims no longer reporting having had experience of victimisation may have succumbed to age-related declines in memory. However, the number of reasons why an individual might decide not to report their victimisation experience, particularly after having already done so,

are endless. Unfortunately, then, short of curing age-related memory loss, this suggested explanation will have to remain just that, a suggestion.

Negative effects of criminal victimisation

Study two showed that depression is the means by which experiences of victimisation negatively impact older adults' quality of life. This finding bolsters the already extensive psychological literature identifying greater risk of depression, anxiety, and post-traumatic stress disorder (PTSD; Briere & Runtz, 1990; Jay et al., 2020; Kilpatrick & Acierno, 2003; Han et al., 2016) amongst victims. It also reflects the well-documented finding that mental health problems often lead to reductions in quality of life (Evren et al., 2010; Sharpe et al., 2015). The persistence of this pattern of results longitudinally in study three only adds weight to the conclusion that mental health, specifically the severity of depressive symptomatology, is a key driver of post-victimisation quality of life outcomes.

However, the lack of a significant relationship between victimisation experience and each of the other intermediary variables is novel. This pattern of results contradicts the work of previous research identifying increased social isolation and fear of crime (Elliott et al., 2005; Russo et al., 2013) and reduced cognitive function and physical health (Kavanaugh et al., 2017; Resnick et al., 1997) amongst victims. Two explanations exist for this contradictory pattern of results. The first holds that the deleterious impacts of victimisation experience on social isolation, fear of crime, cognitive function, and physical health do not persist longitudinally in the same manner as the effects of victimisation on level of depression. In the years between the victimisation event occurring and its occurrence being recorded by ELSA, victims may have recovered effectively from victimisation-related negative changes in social isolation, fear of crime, cognitive function, or physical health. Under this explanation, any of the intermediary variables may have at one point been an important mediator of the effects of victimisation on quality of life.

However, the observation in study three that at ELSA wave 7 victimisation experience is significantly associated with social isolation and fear of crime makes this first conclusion less likely. The appearance of these wave 7 associations has been used above to describe the age-related changes experienced by non-victims that lead to increased depression and reduced quality of life. Yet, the presence of these relationships suggests that both social isolation and fear of crime may hold important implications for the effects of victimisation experience on quality of life many years after the victimisation event. Future research should seek to determine whether the better social isolation and fear of crime circumstances of victims at wave 7 compared to non-victims, relative to the levels of each at wave 5, is indicative of victimisation-related improvements for victims or age-related negative changes for non-victims.

The second explanation suggests that level of depression is the only true mediator of the effects of victimisation on quality of life. Consequently, previous research reporting direct relationships between victimisation and social isolation, fear of crime, cognitive function, and physical health may derive from a failure to account for depression and to identify its role as the key driver of post-victimisation quality of life outcomes. Researchers must, then, pay close attention to what can be understood about post-victimisation quality of life outcomes from studies that do not acknowledge the role of depression. Either of these explanations is possible, and research will need to assess the theoretical framework constructed in this project in groups of individuals with either recent or historic victimisation experience to determine which is correct.

Implications for victim support

Victimisation negatively impacts the victim's quality of life by increasing their level of depression. This relationship, shown to exist in studies two and three, has important implications for the kind of support that victims are offered. To ensure effective recovery

following victimisation, and to promote positive quality of life outcomes amongst victims, it appears that the mental health of the victim must be prioritised. Cognitive Behavioural Therapy, a victim support intervention method that aims to change the way an individual thinks and behaves (NHS, 2019), has been found to be effective in treating depression (Lomax & Meyrick, 2022) and PTSD (Resick et al., 2014) amongst victims. Yet, the associations between each of the intermediary variables within the theoretical framework developed in this research suggest that to be most effective, victim support intervention methods like CBT must be adapted to reflect the specific challenges faced by each victim.

Level of depression appears to be a point at which the effects of each of the intermediary variables converge. According to the theoretical framework identified in study two, reductions in the severity of depressive symptomatology can be made by improving an individual's social support, cognitive function, and physical health and by reducing their fear of crime. If CBT can be adapted to address deficiencies in any of these four variables, it stands to reason that the ability of this intervention method to improve a victim's mental health would be enhanced. Amongst older victims who, because of age-related lifestyle changes such as retirement and bereavement (Berg-Weger & Morley, 2020), often experience increased social isolation, CBT administered in a way that addresses both victimisation-related increases in levels of depression and social isolation may be particularly efficacious. Indeed, CBT administered in a group setting has been found to be effective for older victims since it encourages social engagement (Santos et al., 2017) which can reduce feelings of depression and anxiety (Evans & Fisher, 2022; Gale et al., 2018).

Similarly, victims found to be in poor physical health (as is increasingly likely in old age; Bosworth et al., 1999) may be able to engage in exercise-based interventions. The significant relationship between physical and mental health observed in studies two and three is well-documented (Barnett et al., 2012; Ohrnberger et al., 2017), and research has found

exercise-based interventions such as walking football to have a positive impact on physical fitness (Krustrup et al., 2010; Reddy et al., 2017) and mental health (Lamont et al., 2017; Rosenbaum et al., 2014). It is clear, then, that an opportunity exists to provide victims with targeted methods of support that address their specific circumstances. In this way it may be possible to increase the likelihood of positive mental health and quality of life outcomes for individuals with experience of criminal victimisation.

The findings from study three show that victims report increased depression and reduced quality of life almost a decade before the same decline is seen in non-victims – although the rate at which both progress along the negative spiral of aging becomes similar with increasing age. Additionally, given the number of instances of childhood victimisation reported at ELSA wave 3, many victims will likely have been suffering from increased depression and reduced quality of life for many years prior to the decade of old age assessed here. Unfortunately, amongst many older victims sampled by ELSA the damage may have already been done. Indeed, it appears that victimisation can set out a lifelong path of depression and reduced quality of life. To reduce the likelihood of these lifelong negative mental health and quality of life outcomes, victim support interventions must be administered as soon after the victimisation event as is possible. Those weeks and months immediately following experiences of victimisation represent a critical period wherein implementing appropriate support may mitigate the severity of negative post-victimisation symptoms (Guay et al., 2019). While traditional CBT has been shown to be effective amongst child and adolescent victims (Cohen et al., 2005; Wetherington et al., 2008) appropriate support, where child victims are concerned, may again involve the adaptation of established intervention methods to ensure positive outcomes and recovery. Game-based variations of CBT that have been developed especially for use with children have been found to yield positive outcomes (Springer et al., 2012) and represent a viable method of support for child victims.

However, before interventions can be put in place the victim must disclose their experience of victimisation. Many instances of criminal victimisation go unreported, and children in particular fail to disclose such experience because of feelings of shame, embarrassment or worry about being blamed (Foster & Hagedorn, 2014). Consequently, those individuals who experience victimisation during childhood often fail to access and to benefit from available support. Yet, as noted previously, a person's willingness to disclose their victimisation experience may be related to their likelihood of suffering negative victimisation effects and the degree of adversity encountered during the victimisation event. Indeed, to encourage non-disclosers to report their victimisation experience, causing them to relive long-forgotten traumatic events, may, in fact, be detrimental. We need to understand non-disclosure better before we can regard disclosure as a necessary part of recovery from criminal victimisation. Nevertheless, it remains important to create tolerant, understanding, and non-judgemental environments to ensure individuals feel comfortable disclosing experiences of victimisation should they wish to. In this way, more victims can access vital support and victimisation-related reductions in mental health that can have lifelong negative effects on quality of life may never arise.

Given the implications set out here, these findings highlight the importance of victim support councillors and charities such as Victim Support and NSPCC, who strive to help people cope and recover following criminal victimisation, and wellbeing services like Mindsmatter that offer a range of psychological therapies. Indeed, if these services can more effectively identify individuals in need of victim support interventions, and more effectively adapt those interventions to the specific needs of each service user, long-term negative victimisation impacts may become less and less frequent.

Limitations and directions for future research

Several limitations of this research project offer opportunities for future studies to build on the findings observed here. First and foremost, the victimisation experience data used in this research project lacks the kind of nuance that is necessary to conclusively determine the cause of negative post-victimisation depression and quality of life outcomes. Instances of criminal victimisation must not be thought of as homogenous events, but as unique experiences within which several distinct trauma elements exist and inform one another. Subjective factors such as self-blame, perceived life-threat, and the relationship between victim and perpetrator (Elklit, 2002; Weaver & Clum, 1995) may lead to different post-victimisation outcomes between victims. To assess experiences of criminal victimisation and the negative impacts they can have most effectively it seems that quantitative data must be accompanied by qualitative information.

Future research would do well to pair quantitative and qualitative victimisation experience data. Subjective and independent perspectives on instances of criminal victimisation which, for the respondent, constitute a significant life event may open-up and push forward new emphases within investigations of the effects of victimisation. We may learn, for example, that variability in the self-blame victims feel following criminal victimisation is a greater predictor of post-victimisation outcomes than has previously been detected. In this way, even more comprehensive theoretical frameworks of post-victimisation outcomes than that which has been constructed in this research may be developed.

This kind of qualitative information may already have been collected by ELSA. As part of ELSAs Life History Questionnaire (LHQ) collected in wave 3, from which the victimisation experience data used in this research was taken, respondents were asked to think back over their life and write about three aspects of it that have been especially important, explaining how those things affected them. This section of the LHQ allowed respondents to provide subjective and open-ended descriptions of their most defining

experiences, good or bad. While many respondents will have written about positive life experiences, some may have focused on experiences of criminal victimisation. At the time of writing, however, the content of these qualitative responses is under review to determine if special requirements must be put in place for their use. At the very least the LHQ is a place at which the coming together of qualitative and quantitative assessments of victimisation experience may begin.

Additionally, researchers might endeavour to pair both quantitative and qualitative victimisation experience data with information concerning an individual's experience of various victim support interventions. If this were done it would be possible to establish if the patterns of results observed here – that victims experience lifelong detriments in mental health and quality of life compared to non-victims – persists despite the implementation of victim support interventions. If it were found that victims remain worse off than non-victims even when, for example, CBT had been implemented, those responsible for developing and delivering victim support interventions would be forced to rethink their strategy and develop more effective and long-lasting methods.

Given that the types of criminal victimisation examined in this research are themselves just one of many types of criminal victimisation, it may be that the findings and implications observed and outlined here can be extended from physical assault, sexual assault, and child abuse to other forms of victimisation. Indeed, this seems likely when one considers the wealth of evidence identifying comparable negative effects on the health and wellbeing of victims of property and violent victimisation (Ambrey et al., 2014; Janssen et al., 2021; Powdthavee, 2005; Staubli et al., 2014) and victimisation in both offline and online contexts (Kaakinen et al., 2018). Yet, it is not sufficient to merely assume the results observed here can be extrapolated beyond the specific context of this project. Rather, researchers must endeavour to examine the theoretical framework set out here within the

context of a variety of criminal victimisation circumstances to establish the viability of these findings beyond this work.

Similarly, and as outlined previously, criminal victimisation is just one aspect of the wider concept that is lifetime adversity and is, therefore, just one of many adverse life events that can yield deleterious health and wellbeing outcomes for those who experience them. Research has identified victimisation as one of several events varying in their severity – including bereavement, relationship breakdown, and natural disasters – that can negatively impact an individual’s health and wellbeing (Cleland et al., 2016; Edwards et al., 2003). It may be that the mechanism driving longitudinal negative post-victimisation outcomes – i.e. increased levels of depression and subsequent reductions in quality of life - is the very same one (or similar) that drives the negative outcomes produced by these other forms of adversity.

The LHQ collected as part of ELSA wave 3 contains items recording participant experiences of a range of traumatic events such as disturbing experiences during military service. Future researchers might, therefore, test the extent to which the findings of this research can be generalised to the wider context of adversity by including in study 3’s theoretical framework these measures assessing respondent experience of traumatic events that are not instances of criminal victimisation. Additionally, and as discussed previously, the negative impacts of non-criminal traumatic experiences may outmuscle those that can be attributed to victimisation experience. To determine whether experiences of criminal victimisation continue to produce increased levels of depression and reduced quality of life outcomes independently of other trauma, studies would do well to control for the kind of non-victimisation-related traumatic experiences present in ELSA’s LHQ.

Victimisation experience is not the only variable included in this project’s theoretical framework that would benefit from additional qualitative data. The findings from study three show that the role of fear of crime in determining post-victimisation quality of life outcomes

with increasing age is complex. Indeed, the observation that at ELSA wave 7 increased fear of crime is significantly associated with reduced depressive symptomatology contradicts the well-documented finding that greater fear of crime yields increased depression and psychological distress (Beaulieu et al., 2002). Furthermore, this association between fear of crime and level of depression is at odds with the observed significant relationship between fear of crime and quality of life at wave 7 wherein greater fear of crime predicts poorer quality of life, which *is* in line with findings from previous research (Krulichova, 2018).

Several explanations were proposed in study three for these strange fear of crime effects, including respondents' misattribution of their own depression as worry about crime in their local area. Yet, no sufficient explanation was identified and, consequently, the extent to which we can draw conclusions about the effect of victimisation on quality of life and aging is reduced. Qualitative assessment of fear of crime may be able to determine exactly how fear of crime affects the depression levels and quality of life of older adults as they age. Indeed, the combination of quantitative and qualitative information should be a key goal for researchers seeking to better understand the longitudinal effects of victimisation experience.

Furthermore, the effects of criminal victimisation on a victim's life are not limited to those variables captured within the theoretical framework developed in this research. Beyond the victimisation-related increases in level of depression observed here, individuals with experience of criminal victimisation have been found to exhibit problematic behaviours and risk factors that impair their ability to act as competent parents (DeLillo & Damashek, 2003; Fitzgerald et al., 2005; Merrill et al., 1996), and increase the likelihood of intimate relationship breakdown (Hanson et al., 2010; Nelson & Wampler, 2000), unemployment and absenteeism (Reeves & O'Leary-Kelly, 2007; Tolman & Wang, 2005) to name a few. Each of these aspects of a victim's life might themselves be important consequences of the negative post-victimisation mental health and quality of life changes observed in the model

evaluated in study 3. Equally, they might be important predictors of mental health and quality of life, or outcome measures whose circumstances are themselves determined effectively by the component one or more components of the theoretical framework developed throughout this research. Regardless of the role they might play, it is vital that future research recognise their importance by expanding the theoretical framework developed in this research to examine the relationship between victimisation experience and the victim's ability to function in their roles as an intimate partner, an employee, and a parent. In this way, our understanding of the mechanism driving longitudinal post-victimisation health and wellbeing outcomes, and the circumstances under which these outcomes are most likely to manifest can be enhanced.

The degree of missing data in the data used throughout this research project must also be acknowledged as a potential limitation. Removal of missing data can introduce bias into subsequent statistical analyses (Dong & Peng, 2013; Rubin, 1996), and has been warned against (Wilkinson, 1999). Indeed, future research might seek to employ methods of multiple imputation or, where structural equation modelling is concerned, maximum likelihood estimation to determine whether the findings observed and discussed in this research persist regardless of the method of missing data treatment. However, the reasons driving the decision to remove missing data outlined in chapter 3 highlight the possible issues with multiple imputation – in particular the imputation of data for covariates strongly associated with a statistical model's outcome variable. Furthermore, to carry out maximum likelihood or full information maximum likelihood estimation rather than diagonally weighted least squares (see chapters 5 and 6) during statistical modelling would represent a failure to utilise available tools that account for the ordinal nature of several variables in the theoretical framework of post-victimisation quality of life outcomes developed here.

As it stands the findings and conclusions discussed here are only applicable to White older adults living in England. ELSA is dominated by White respondents. In the tidied wave

3 dataset used in studies 1 and 2 just 58 of the 4573 respondents (four individuals with victimisation experience) were of a non-white ethnicity. This represents a failure in ELSAs ability to attract non-white respondents. White men and women have been found to be less likely to experience criminal victimisation than their non-white counterparts (ONS, 2021), and studies report differential victimisation effects (Bryant-Davis et al., 2009) and post-victimisation help-seeking behaviour (Amstadter et al., 2008; Campbell et al., 2001) across ethnic groups. Given the lack of ethnic diversity in ELSA, and the apparent importance of ethnicity in determining post-victimisation outcomes, it is not possible to determine the true utility of the theoretical framework developed here.

This issue extends beyond the poor ethnic diversity of ELSAs respondents. The findings and implications discussed here are only applicable within an English context. However, data collection projects like ELSA are being carried out by institutions in a variety of countries. The Irish Longitudinal Study on Ageing (Cronin et al., 2013) and the Australian Longitudinal Study of Ageing (Luszcz et al., 2016) offer opportunities to determine the robustness of the model of victimisation effects on quality of life identified in this project. In this way, the extent to which the longitudinal negative victimisation impacts identified in this research are applicable across different cultures can be tested. Researchers would do well to examine the model of post-victimisation quality of life outcomes identified in this project in samples of older adults from a variety of countries, making sure to represent the true ethnic diversity of the population from which each sample is taken.

Conclusion

This research project has shown clearly that experiences of criminal victimisation have negative impacts on the victim's quality of life that can persist longitudinally many years after the victimisation event occurred. While previous research suggests that there are many causal pathways that exist between victimisation experience and quality of life, this

work has shown that level of depression is the only significant mediator of the relationship between experiences of criminal victimisation and quality of life. Most importantly, the lifelong disparity in the health and wellbeing circumstances of victims compared to non-victims has been demonstrated.

Future research must create an increasingly nuanced framework of post-victimisation quality of life outcomes so that victims can access increasingly effective support. Indeed, paying close attention to the specific circumstances of each victim may be the most effective means of optimising victim support. We have the knowledge; all we need now is the social and political will to act on it. The will to develop measures that ensure individuals unlucky enough to experience criminal victimisation aren't left to carry that bad luck with them throughout their lives, leaving yet another generation blighted by victimisation.

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Appendix A

Study Three Longitudinal SEM Output

Wave	Parameter	Coefficient Estimate	SE	z-value
3	W3social isolation			
	~victimisation	.05	.04	1.44
	~age	-.004**	.002	-2.45
	~sex	-.25*	.12	-2.18
	~education	-.15***	.02	-7.14
	W3fear of crime			
	~victimisation	.12	.12	.93
	~age	.02***	.01	3.18
	~sex	1.24***	.29	4.26
	~education	-.31***	.06	-5.17
	W3depression			
	~victimisation	.52***	.08	6.29
	~W3social isolation	.23***	.04	6.73
	~W3fear of crime	.12***	.02	6.40
	~age	-.02***	.01	-3.78
	~sex	2.44***	.31	7.87
	~education	-.09	.05	-1.60
	W3cognitive function			
	~W3social isolation	-.17	.11	-1.54
	~W3fear of crime	-.29***	.06	-4.92
	~age	-.23***	.02	-13.99
	~sex	8.78***	1.07	8.18
	~education	1.66***	.21	7.92
	W3physical health			
	~W3social isolation	.001	.02	.07
	~W3fear of crime	.004	.01	.39
	~age	.03***	.003	8.15
	~sex	1.80***	.20	9.22
	~education	.07	.04	1.91
	W3quality of life			
	~W3social isolation	-1.26***	.12	-10.32
	~W3fear of crime	-.48***	.07	-7.02
	~W3depression	-2.19***	.11	-19.48

	~W3cognitive function	.13***	.03	4.24
	~W3physical health	-1.45***	.15	-9.50
	~age	.05*	.02	2.42
	~sex	5.11***	1.41	3.63
	~education	.49*	.22	2.20
5	W5social isolation			
	~W3social isolation	.59***	.02	27.93
	~W3fear of crime	.01	.01	1.01
	~W3depression	.04***	.01	3.26
	~W3cognitive function	.004	.004	.90
	~W3physical health	-.02	.02	-.86
	~W3quality of life	-.001	.002	-.75
	~victimisation	.02	.05	.45
	~age	.004	.002	1.65
	~sex	-.30	.22	-1.36
	~education	-.03	.03	-1.01
	W5depression			
	~W3depression	.30***	.03	8.72
	~W3social isolation	-.05	.06	-.82
	~W3fear of crime	-.01	.02	-.41
	~W3cognitive function	-.02*	.01	-2.41
	~W3physical health	-.04	.05	-.77
	~W3quality of life	-.06***	.004	-13.78
	~W5social isolation	.08	.06	1.41
	~victimisation	.32***	.10	3.29
	~age	-.01*	.01	-2.40
	~sex	1.49**	.52	2.87
	~education	.03	.06	.48
	W5cognitive function			
	~W3cognitive function	.42***	.04	11.13
	~W3social isolation	.21	.21	1.02
	~W3fear of crime	-.12	.07	-1.86
	~W3depression	-.46***	.11	-4.09
	~W3physical health	-.97***	.18	-5.54
	~W3quality of life	-.01	.01	-.98
	~W5social isolation	.06	.23	.25
	~age	-.16***	.02	-6.49
	~sex	12.25***	2.05	5.99

	~education	1.40***	.28	4.98
	W5physical health			
	~W3physical health	.57***	.03	22.24
	~W3social isolation	.01	.03	.43
	~W3fear of crime	.01	.01	1.28
	~W3depression	-.03	.02	-1.79
	~W3cognitive function	-.004	.01	-.91
	~W3quality of life	-.01***	.002	-7.30
	~W5social isolation	.05	.03	1.67
	~age	.01*	.003	2.41
	~sex	.83**	.28	3.03
	~education	.02	.03	.77
	W5quality of life			
	~W3quality of life	.62***	.02	39.56
	~W5social isolation	-.24*	.12	-2.00
	~W5depression	-1.44***	.11	-13.19
	~W5cognitive function	-.16***	.04	-3.78
	~W5physical health	-1.15***	.16	-7.39
	~age	-.14***	.02	-5.77
	~sex	7.33***	1.54	4.77
	~education	.82***	.25	3.23
7	W7social isolation			
	~W5social isolation	.36***	.03	11.68
	~W3social isolation	.34***	.03	11.08
	~W3fear of crime	.004	.01	.45
	~W5depression	-.02	.01	-1.06
	~W3depression	-.001	.02	-.03
	~W5cognitive function	-.002	.01	-.18
	~W3cognitive function	.002	.004	.55
	~W5physical health	-.05	.03	-1.78
	~W3physical health	.07*	.03	2.24
	~W5quality of life	-.004	.003	-1.41
	~victimisation	-.11**	.04	-2.59
	~age	.01*	.003	2.56
	~sex	-.06	.40	-1.16
	~education	-.04	.04	-1.03
	W7fear of crime			
	~W3fear of crime	.23***	.03	7.89

~W5social isolation	.13	.09	1.47
~W3social isolation	-.01	.08	-.06
~W5depression	-.09	.05	-1.89
~W3depression	-.06	.05	-1.23
~W5cognitive function	-.08**	.03	-2.64
~W3cognitive function	-.02	.01	-1.79
~W5physical health	-.19*	.10	-1.97
~W3physical health	-.08	.09	-.90
~W5quality of life	-.05***	.01	-5.55
~victimisation	-.46***	.12	-3.93
~age	-.01	.01	-1.27
~sex	4.23***	1.25	3.39
~education	.29*	.13	2.25
W7depression			
~W5depression	.08	.05	1.65
~W3depression	.10*	.05	1.93
~W5social isolation	.09	.10	.93
~W3social isolation	-.06	.08	-.72
~W3fear of crime	.02	.03	.95
~W5cognitive function	-.06*	.03	-1.96
~W3cognitive function	-.02	.01	-1.68
~W5physical health	-.10	.10	-1.05
~W3physical health	-.18*	.08	-2.25
~W5quality of life	-.07***	.01	-6.81
~W7social isolation	.24**	.10	2.51
~W7fear of crime	-.14**	.06	-2.48
~victimisation	-.21*	.10	-2.19
~age	.01	.01	.75
~sex	4.56***	1.38	3.31
~education	.24	.13	1.84
W7cognitive function			
~W5cognitive function	.23***	.05	4.77
~W3cognitive function	.27***	.02	12.45
~W5social isolation	.17	.16	1.09
~W3social isolation	-.29*	.15	-1.97
~W3fear of crime	.01	.05	.21
~W5depression	-.04	.08	-.53
~W3depression	-.12	.09	-1.30

	~W5physical health	.16	.15	1.07
	~W3physical health	-.39**	.16	-2.48
	~W5quality of life	.001	.02	.06
	~W7social isolation	-.06	0.14	-.44
	~W7fear of crime	-.16*	.08	-1.94
	~age	-.12***	.02	-6.19
	~sex	2.30	2.18	1.05
	~education	.65***	.20	3.21
	W7physical health			
	~W5physical health	.63***	.03	20.53
	~W3physical health	.18***	.03	6.12
	~W5social isolation	.01	.03	.40
	~W3social isolation	-.04	.03	-1.55
	~W3fear of crime	-.002	.01	-.27
	~W5depression	.02	.02	1.12
	~W3depression	.04*	.02	2.11
	~W5cognitive function	-.001	.01	-.04
	~W3cognitive function	-.01	.004	-1.84
	~W5quality of life	-.01	.003	-1.53
	~W7social isolation	-.001	.03	-.03
	~W3fear of crime	.003	.02	.17
	~age	.003	.003	.82
	~sex	.11	.41	.28
	~education	.01	.04	.18
	W7quality of life			
	~W5quality of life	.43***	.03	17.28
	~W3quality of life	.36***	.02	15.14
	~W7social isolation	.40***	.10	4.21
	~W7fear of crime	-.16*	.07	-2.22
	~W7depression	-.73***	.10	-7.50
	~W7cognitive function	.03	.03	.96
	~W7physical health	-.12	.09	-1.26
	~age	-.13***	.02	-7.22
	~sex	-.15	1.00	-.15
	~education	-.08	.18	-.43
9	W9social isolation			
	~W7social isolation	.39***	.03	11.74
	~W5social isolation	.30***	.03	9.32

~W7fear of crime	-.03*	.01	-2.10
~W7depression	-.04*	.02	-2.22
~W5depression	-.01	.01	-1.14
~W7cognitive function	-.003	.01	-.60
~W5cognitive function	.01	.01	1.00
~W7physical health	-.003	.03	-.10
~W5physical health	-.05	.04	-1.31
~W7quality of life	-.01***	.003	-5.56
~victimisation	-.03	.06	-.55
~age	.01**	.003	3.17
~sex	.51	.28	1.81
~education	.002	.03	.06
W9depression			
~W7depression	.26***	.05	5.26
~W5depression	.19***	.03	6.00
~W7social isolation	-.11	.08	-1.33
~W5social isolation	.06	.08	.77
~W7fear of crime	-.04	.04	-1.14
~W7cognitive function	-.02	.01	-1.30
~W5cognitive function	-.06***	.02	-3.75
~W7physical health	-.18**	.07	-2.69
~W5physical health	.004	.08	.05
~W7quality of life	-.06***	.01	-9.44
~W9social isolation	.02	.05	.43
~victimisation	-.15	.10	-1.45
~age	.001	.01	.01
~sex	3.42***	.71	4.81
~education	.20*	.09	2.34
W9cognitive function			
~W7cognitive function	.50***	.03	17.17
~W5cognitive function	.22***	.03	6.29
~W7social isolation	.45**	.17	2.72
~W5social isolation	-.15	.15	-1.05
~W7fear of crime	-.09	.07	-1.40
~W7depression	-.08	.09	-.86
~W5depression	.01	.06	.17
~W7physical health	-.02	.14	-.15
~W5physical health	.001	.17	.01

~W7quality of life	.02	.01	1.60
~W9social isolation	-.16	.13	-1.28
~age	-.16	.02	-9.95
~sex	1.95	1.29	1.51
~education	.06	.16	.38
W9physical health			
~W7physical health	.68***	.04	19.61
~W5physical health	.10*	.04	2.48
~W7social isolation	-.01	.04	-.19
~W5social isolation	.03	.04	.80
~W7fear of crime	-.02	.01	-1.60
~W7depression	-.03	.02	-1.34
~W5depression	-.03**	.01	-2.61
~W7cognitive function	-.01	.01	-1.13
~W5cognitive function	-.02***	.01	-3.18
~W7quality of life	-.01***	.003	-4.48
~W9social isolation	-.01	.03	-.42
~age	-.003	.004	-.72
~sex	1.09***	.29	3.74
~education	.03	.04	.87
W9quality of life			
~W7quality of life	.51***	.03	17.45
~W5quality of life	.24***	.03	8.93
~W9social isolation	-.12	.11	-1.16
~W9depression	-.72***	.10	-7.31
~W9cognitive function	.17***	.03	5.44
~W9physical health	-.49***	.09	-5.43
~age	-.05*	.02	-2.22
~sex	2.12*	.95	2.23
~education	-.16	.19	-.80