Investigating the impact of social contact, coping strategies, and social cognition on loneliness and psychological distress in older adults during the COVID-19 pandemic: An online survey

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ABSTRACT

This study investigated factors associated with wellbeing in 114 older adults (aged ≥70) during the COVID-19 pandemic; namely, the effects of social contact, coping strategies, and social cognition. Data was collected through an online survey. The relationships between variables were investigated using multiple linear regression. Qualitative data on wellbeing and coping strategies was also collected and analysed using content analysis. Results showed that participants who lived alone reported higher levels of psychological distress than those who lived with someone else. Higher face-to-face social contact with people from outside of one’s household was associated with lower reported distress; however, virtual social contact and attendance of organised online groups were not associated with distress. Negative coping strategies, including denial, self-blame, and behavioural disengagement were associated with higher distress, whereas Theory-of-Mind ability and cognitive empathy were associated with lower distress. Additionally, the negative relationship between face-to-face social contact and distress was stronger in participants who lived with someone than in participants who lived alone. There was also a suggestion that social cognition, namely cognitive and affective empathy, may moderate the relationship between social contact and distress. This research is important for understanding how older adults can be supported during the COVID-19 pandemic, and implications are discussed. Further research with larger and more representative samples is needed to clarify and confirm these effects. Further research also needs to focus on experiences of carers and cared-for individuals during the COVID-19 pandemic

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PHQ9	Patient Health Questionnaire-9
PHQ8	Patient Health Questionnaire-8
GAD7	General Anxiety Disorder Scale-7
QCAE	Questionnaire of Cognitive and Affective Empathy
ANT	Affect Naming Test
SSQ	Social Stories Questionnaire
ToM	Theory of Mind
SES	Socio-Economic Status
U3A	University of the Third Age

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1. INTRODUCTION

1.1. COVID-19 Context in the UK: Social Distancing and Lockdown

The global COVID-19 pandemic has resulted in many countries implementing guidelines asking people to remain socially distanced or to isolate themselves at home. In the UK, the first social distancing guidance was introduced on March 16th 2020. Since then, there have been three national lockdowns, and various regional lockdowns (Dunn et al., 2020; Institute for Government analysis, 2021). A timeline of UK social distancing advice and lockdowns is given in Appendix A, summarised from Dunn et al. (2020) and the Institute for Government analysis (2021).

Whilst social distancing guidelines are intended to protect people's physical health, these measures may negatively affect emotional wellbeing. In the UK this is particularly salient for those categorised as 'clinically vulnerable' (including those age ≥70) and 'clinically extremely vulnerable' (including those with certain health conditions), who were advised to stay at home and avoid social contact for longer than the rest of the population, and to be especially cautious regarding social distancing (GOV.UK, 2020a, 2020b).

1.2. Emotional Wellbeing during COVID-19: General Population

Multiple studies have examined psychological distress and wellbeing during the COVID-19 pandemic. Studies have reported increased anxiety (Ferreira et al., 2021), symptoms of traumatic stress (A. L. Park et al., 2020), 'serious distress' (McGinty et al., 2020), and loneliness (Groarke et al., 2020), related to COVID-19, as well as poorer health-related quality of life (Ferreira et al., 2021) and quality of sleep (Wright et al., 2020).

A systematic review and meta-analysis of 69 studies across 19 countries in August 2020 (Y. Wang et al., 2020), reported the prevalence of anxiety and depression during the pandemic as 33% and 30%, respectively (measured as people who reached threshold scores on self-report measures). They reported that risk factors for poor mental health included: being female; being in a younger age group (<35 versus ≥35); living in rural areas; having lower socio-economic status (SES); having higher risk of COVID-19 infection; having pre-existing mental health conditions; and longer media exposure. Protective factors included social support, physical activity, and being in employment. A meta-analysis of 62 studies by M. Luo et al. (2020), and a systematic review of 19 studies by Xiong et al. (2020), also reported similar results.

The prevalence of depression and anxiety during the pandemic reported by the studies above is higher than prevalence estimates from before the pandemic. Prevalence of common mental health disorders in the UK pre-pandemic has been reported as 16-19% (Macrory, 2016; Public Health England, 2020; Stansfeld et al., 2016). Prior to the pandemic, Giebel, Corcoran, et al. (2020) reported the prevalence of depression as 17%, and prevalence of anxiety as 13%, although these figures may be higher than average in the general population because participants were people from deprived areas with low socioeconomic status (SES), and SES is associated with mood (Stewart-Brown et al., 2015).

Studies examining the emotional impact of the pandemic generally use standardised mood measures such as the PHQ9 (Patient Health Questionnaire-9; Kroenke et al., 2001) and GAD7 (Generalised Anxiety Disorder-7; Spitzer et al., 2006). However, specific scales developed for measuring COVID-19-related distress may be more appropriate for measuring mood during the pandemic, as these could incorporate measurements of phenomena more specific to COVID-19, including stigma, fear of social contact, and post-traumatic stress (Ransing et al., 2020). Several such measures have been developed, summarised by Cortez et al. (2020); however, there are problems associated with these new measures, including that many were developed early in the pandemic so may be less useful for assessing distress later during the pandemic, and there has not been time for these new measures to be validated in multiple samples (Ransing et al., 2020).

1.3. Concern for Older Adults during COVID-19

1.3.1. Physical Health

COVID-19 has disproportionately impacted older adults compared to the younger population (Centers for Disease Control and Prevention [CDC], 2020; World Health Organization [WHO], 2020). Older adults who contract COVID-19 are at greater risk of severe symptoms, health complications, hospitalisations, and death, compared to younger people (Garg et al., 2020; Ho et al., 2020; Strang et al., 2020; Tsamakis et al., 2021). Even in the absence of other risk factors, such as pre-existing health conditions, age is an independent predictor of COVID-19 mortality (Ho et al., 2020). This has remained consistent throughout the first and second waves of the pandemic (Ioannidis et al., 2021). Older adults with COVID-19 are also more likely to require admission to intensive care (Tsamakis et al., 2021), which frequently leads to negative mental health outcomes (Rawal et al., 2017).

1.3.2. Ageism

As well as the physical risks to older adults, concern has been expressed for the emotional wellbeing of older adults during the pandemic, for several reasons. There has been an increase in ageism (i.e. discrimination on the basis of age) since the beginning of the pandemic. In the media, COVID-19 has often been characterised as a problem specific to the older generation (and not to the younger generation), and governmental guidance given to older adults was stricter than that for younger adults. This has encouraged separation between generations (Ayalon, 2020). This kind of generational divide splits societies, causing negative impacts for both older and younger adults; including lack of empathy between generations and perpetuation of ageist stereotypes (Ayalon, 2020). Ageism has been evident on social media (Aronson, 2020; Jimenez-Sotomayor et al., 2020), and ageism has been suggested as a reason why some younger individuals have not adhered to social distancing guidance due to the sense that the pandemic is “not their problem,” thus putting older people at risk (Monahan et al., 2020).

Ageist beliefs affect healthcare decisions relating to older adults, which likely adds to the increased risks associated with COVID-19 for older adults (Chrisler et al., 2016; Monahan et al., 2020). In many countries, older adults with COVID-19 have been considered the lowest priority to receive medical treatment with ventilators and other life-saving interventions (Arya et al., 2020; Emanuel et al., 2020; Rosenbaum, 2020). In the UK, whilst age is not specifically referenced in guidance regarding allocation of ventilators, use of the Clinical Frailty Scale to guide decisions around allocating ventilators (National Institute for Health and Care Excellence, 2021; Sablerolles et al., 2021) disproportionately disadvantages older adults. To help promote compliance with lockdown strategies, the government and media promoted ‘altruism,’ whist emphasising the ‘neediness’ and vulnerability of older adults as a group (Webb, 2021). This could perpetuate ageist stereotypes; for example, ideas that older adults are vulnerable, weak, or make limited contribution to society, and ignores the heterogeneity within this age group (Ayalon, 2020; Monahan et al., 2020; Webb, 2021). Such stereotypes may add to narratives that healthcare resources should not be ‘spent’ on older adults (Chrisler et al., 2016).

Ageism could affect mental and physical wellbeing in older adults, through adding to everyday stress and impacting self-esteem (Monahan et al., 2020). Ageist stereotypes can become internalised by older adults, leading to dependency through ‘self-fulfilling prophecies.’ Ageist stereotypes can also interfere with help-seeking (Chrisler et al., 2016; Levy, 2009), and studies report that negative self-views related to ageism are associated with increased loneliness and distress during the COVID-19 pandemic (Losada-Baltar et al., 2021). Indeed, D’cruz and Banerjee (2020) argue that marginalisation is the ‘final common pathway’ between risk factors and negative outcomes for physical and mental health during the COVID-19 pandemic.

1.3.3. Social Distancing Guidance

Social isolation has important implications for physical and mental wellbeing (Courtin & Knapp, 2017; Golden et al., 2009; Lubben & Gironda, 2003; Steptoe et al., 2013). Associations between social connectedness/isolation and wellbeing are discussed further in Section 1.6. Guidance around social distancing during the pandemic has been stricter for older adults (GOV.UK, 2020a), prompting concern that older adults are at greater risk of social isolation and loneliness (Campbell, 2020; D'cruz & Banerjee, 2020; García-Portilla et al., 2020; Monahan et al., 2020; Shuja et al., 2020; Vernooij-Dassen et al., 2020). Before the pandemic, there was already a higher risk of social isolation for older adults compared to younger people (Cudjoe et al., 2020; Nicholson, 2012; Steptoe et al., 2013). Social support is an important protective factor when adapting to challenging situations (Guilaran et al., 2018; McGuire et al., 2018; Platt et al., 2016); however, social distancing likely makes it harder for individuals to feel supported, since individuals can no longer interact in-person with their usual social environment, or adhere to their usual routines and cultural habits (Vernooij-Dassen et al., 2020). Older people also may be less likely than younger people to use technology such as social media to stay socially connected (Knowles & Hanson, 2018; Ofcom, 2016; Vaportzis et al., 2017). Additionally, data from previous pandemics (e.g. the SARS-CoV-1 outbreak in Hong Kong in 2002) reported that older adults experienced increased psychological distress and suicides during these times (Cheung et al., 2008), prompting concern around risk of suicide during the current pandemic (Banerjee et al., 2021).

Social distancing may also affect physical wellbeing. Everyday routines have a large impact on physical health, and social distancing may cause changes to these; for example, the types of food available if people are unable to go to the shops by themselves, and amount of exercise and cognitive stimulation people get when isolating at home (Steinman et al., 2020). Lack of social interaction is associated with worse cognition and symptoms of dementia, and conversely, socially active lifestyles are associated with better cognitive function (Barnes et al., 2004; Bellou et al., 2017; Kuiper et al., 2015; Pillemer & Holtzer, 2016).

1.3.4. Grief

Older adults may be more likely to experience bereavements than younger people during the pandemic, as greater morbidity and mortality in older adults means they are more likely to lose friends. The pandemic is likely to affect grief following bereavements, since social distancing means that people are unable to access the same social and cultural support that they would normally use to cope with grief (Carr et al., 2020; Goveas & Shear, 2020). Again, this is likely to impact older adults more than younger adults, due to the stricter social distancing guidance given to older adults.

1.3.5. Risk of Abuse

Several authors have raised concerns about increased risk of elder abuse during the pandemic. The pandemic and social distancing have placed older adults at greater risk of social isolation, financial difficulties, and difficulties accessing health and social care, whilst also placing family carers under increased stress. These factors are known to increase the risk of elder abuse (Burnes et al., 2015; Chang & Levy, 2021; Makaroun et al., 2020). Reduced access to healthcare and reduced home visits from staff also reduce opportunities for abuse to be noticed and reported. An online survey reported that around one in five older adults in the USA experienced elder abuse during the COVID-19 pandemic, an increase of 83.6% from pre-pandemic levels (Chang & Levy, 2021). Actual prevalence of abuse may be even higher, since online surveys may not access the most vulnerable members of society.

1.4. Older Adult Mental Health during COVID-19: Worldwide

Several studies have examined the relationship between age and emotional wellbeing during the pandemic. Studies across multiple countries have reported that—perhaps contrary to expectations—older age is a protective factor for distress during the COVID-19 pandemic (Carstensen et al., 2020; Ferreira et al., 2021; García-Portilla et al., 2020; Holingue et al., 2020; Klaiber et al., 2021; Losada-Baltar et al., 2021). Systematic reviews by Y. Wang et al. (2020) and Xiong et al. (2020) both found that younger age group (ages <35 versus ≥35, and <40 versus ≥40, respectively) was associated with increased distress. However, this does not mean that older adults are unaffected by the COVID-19 pandemic. For example, studies have reported increases in loneliness in older adults as a result of the pandemic (Dahlberg, 2021; Van Tilburg et al., 2020), as well as increases in anxiety and insomnia (Shan Wong et al., 2020), depression (Cigiloglu et al., 2021), and suicide (Rana, 2020).

However, data collected in non-UK countries may be less applicable to older adults in the UK (the setting of the current study), since social distancing guidance and timing of lockdowns have varied across countries, and the amount of support offered to citizens also varies by country. Additionally, across different countries there may be different attitudes towards illness (Angermeyer & Dietrich, 2006; Germani et al., 2020; Papadopoulos et al., 2013); attitudes towards older adults and ageism (B. Luo et al., 2013; Wilińska et al., 2018); and attitudes towards lockdowns, social distancing, and the communal responsibility to protect others (Huynh, 2020). Therefore, I decided to focus on studies conducted with UK populations.

1.5. Scoping Review: Older Adult Mental Health in the UK during COVID-19

1.5.1. Literature Search

To identify studies examining wellbeing in UK older adults during the COVID-19 pandemic, a scoping review of the research literature was conducted. Observational studies that examined older adults specifically were included; and studies that examined samples with both younger and older adults were included, provided that data was presented by age-group or age was used as a predictor in the statistical analysis.

A literature search was conducted using the databases Academic Search Complete, PsychINFO, and PubMed. Search terms used are shown in Appendix B. A simultaneous search of Academic Search Complete and PsychINFO returned 183 results. After screening of titles, 39 potentially relevant studies were selected. The search of PubMed returned 288 results, 84 of which were identified as being potentially relevant. Two pre-print articles were also identified from searches of grey literature. After removal of duplicates this left 96 potentially relevant studies.

The full texts of these studies were examined. Seventy-one were excluded (see Appendix C for reasons), and twenty-five were retained (see Appendix D for summary table). All 25 studies included data collected during the COVID-19 pandemic (i.e. from March 2020 onwards), with participants from the UK. Two studies also included participants from other countries (Généreux et al., 2020; Thombs et al., 2020). All studies included information about older adults (i.e. used a sample of only older adults, included data separated by age group, or used age as a predictor in statistical analyses) and addressed the impact of age on mental health outcomes.

Seventeen studies included both younger and older adults. All were quantitative. Thirteen of these seventeen used a sample from the general population (refer to Appendix D). Some of these had overlapping samples: two used participants from the COVID-19 Psychological Wellbeing Study (Groarke et al., 2020, 2021), three used participants from the UK Household Longitudinal Study (L. Z. Li & Wang, 2020; Niedzwiedz et al., 2021; Pierce et al., 2020), and three used participants from the COVID-19 Social Study (Bu et al., 2020; Fancourt et al., 2021; Saunders et al., 2021). The remaining four of these seventeen studies looked at particular groups, including doctors (Shah et al., 2020); and people with specific health conditions including inflammatory bowel disease (Harris et al., 2020), COVID-19 infection (Varatharaj et al., 2020), and scleroderma (Thombs et al., 2020).

The other eight studies focused explicitly on older adults. Six used samples of community-dwelling older adults (Brooke & Clark, 2020; Brown et al., 2021; Corley et al., 2021; Okely et al., 2021; A. M. Taylor et al., 2020). Three of the six were quantitative and had overlapping samples due to all using participants from the Lothian Birth Cohort of 1936 (Corley et al., 2021; Okely et al., 2021; A. M. Taylor et al., 2020); two were qualitative (Brooke & Clark, 2020; McKinlay et al., 2020); and one used mixed-methods (Brown et al., 2021). The other two studies included people with dementia, carers, and older adults without dementia or caring responsibilities (Giebel, Lord, et al., 2021; Giebel, Pulford, et al., 2021), both quantitative. It is noted that the studies by A. M. Taylor et al. (2020) and McKinlay et al. (2020) are pre-prints, therefore may be less reliable than others since they have not been peer-reviewed.

1.5.2. Comparisons of Older and Younger Adults

1.5.2.1. *Age as a protective factor*

Most of the studies that included both younger and older participants reported that older adults report lower levels of emotional distress during the COVID-19 pandemic. Despite studies using different measures of mood and different age categories, there was agreement between studies. Older adults were less likely than younger adults to report anxiety and depression (Fancourt et al., 2021; Généreux et al., 2020; Jia et al., 2020; Saunders et al., 2021; Shevlin et al., 2020; L. Smith et al., 2020), stress (Jia et al., 2020), psychological distress (Ben-Ezra et al., 2020; L. Z. Li & Wang, 2020; Niedzwiedz et al., 2021; Pierce et al., 2020), symptoms of traumatic stress (Shevlin et al., 2020), loneliness (Bu et al., 2020; Groarke et al., 2020, 2021; L. Z. Li & Wang, 2020; Niedzwiedz et al., 2021), and difficulties with emotional regulation (Groarke et al., 2021).

1.5.2.2. Prevalence during-pandemic

Estimates of the prevalence of mental distress (measured as scoring above a certain threshold on a measure of distress), and mean scores on measures of distress, were lower for older adults than for the general population.

Estimates of anxiety prevalence in older adults ranged from 7-10%, compared to estimates of around 22% for the general population (Brown et al., 2021; Fancourt et al., 2021; Shevlin et al., 2020). Prevalence of depression in older adults ranged from 9-13%, whereas estimates of depression rates across the whole sample ranged from 22-34% (Fancourt et al., 2021; Groarke et al., 2021; Shevlin et al., 2020). Similarly, mean scores on measures of anxiety were lower in older adults than in the general population (Fancourt et al., 2021; Jia et al., 2020; Saunders et al., 2021; L. Smith et al., 2020), and the same was true of depression measures (Fancourt et al., 2021; Jia et al., 2020; Saunders et al., 2021; L. Smith et al., 2020). Older adults who did not have dementia or caring responsibilities also had substantially lower levels of depression and anxiety than people with dementia and carers (Giebel, Lord, et al., 2021; Giebel, Pulford, et al., 2021). Studies reported the prevalence of general psychological distress as 18-19% in older adults, compared to reports of 20-27% prevalence across the whole sample of (L. Z. Li & Wang, 2020; Niedzwiedz et al., 2021; Pierce et al., 2020). Stress levels (Jia et al., 2020) and prevalence of traumatic stress (Shevlin et al., 2020) were also lower in older adults.

Regarding loneliness, Groarke et al. (2020, 2021) measured loneliness using the UCLA 3-item loneliness scale and reported that 3% of older adults experienced loneliness compared to around 27% across the whole sample. Other studies used single-item measures of loneliness (Brown et al., 2021; L. Z. Li & Wang, 2020; Niedzwiedz et al., 2021), and reported rates of loneliness (a score of “often” or “most of the time”) in older adults as 4-5%, compared with 9% across the whole sample. Studies using the UCLA-3 measure may be more reliable than those using a single item, as the UCLA-3 is a validated measure and can capture more detail than a single item.

1.5.2.3. Changes from pre-pandemic to during-pandemic

In a cross-sectional study of patients with Inflammatory bowel disease, participants of all ages reported that COVID-19 caused an increase in stress compared to pre-pandemic; however, participants age ≥55 were more likely than younger participants to report that the pandemic had also had positive effects on their quality of life (Harris et al., 2020). Retrospective measures of change are less reliable than longitudinal measures, since issues with memory, systematic biases, and momentary experiences can affect retrospective ratings of mood, and there may be differences in the ways that older and younger adults perceive and rate events retrospectively (Mill et al., 2016). In a longitudinal study of participants with scleroderma (Thombs et al., 2020), older age was associated with smaller increases in anxiety due to the pandemic. However, these studies may be less relevant to older adults in the general population, since participants were people with specific health conditions.

Longitudinal studies of the general population reported that older adults had smaller increases in general psychological distress from pre-pandemic to during-pandemic than younger adults (Niedzwiedz et al., 2021; Pierce et al., 2020). Interestingly, Niedzwiedz et al. (2021) reported that the pandemic was associated with increased loneliness in participants aged 18-24, but with decreased loneliness in participants aged 45-64. In contrast, Okely et al. (2021) reported that loneliness in older adults (mean age 84) was higher during the pandemic than pre-pandemic.

1.5.2.4. Exceptions to the rule

Studies generally showed that older adults reported better mental health than younger adults during the pandemic; however, there were some exceptions. L. Smith et al. (2020) and Jia et al. (2020) both reported that, whilst depression scores generally decreased with advancing age, adults age ≥75 had slightly higher scores on measures of depression than those aged 65-74. Additionally, when participants were doctors, as opposed to individuals recruited from the general population, general anxiety scores increased with age (Shah et al., 2020). Notably, older adults had higher rates of anxiety that was specifically related to fear of COVID-19 (Shevlin et al., 2020).

Additionally, a study of patients with COVID-19 infection reported that older and younger adults experienced similar levels of psychiatric issues following COVID-19 infection (Varatharaj et al., 2020).

1.5.2.5. Conclusions on comparisons of older and younger adults

Despite the concern that many authors expressed towards older adults, older adults seem to report lower distress levels during the pandemic than younger people. This is consistent with pre-pandemic figures. For example, Public Health England (2020) reported the prevalence of common mental health disorders in 2017 as 16% for the general population (age ≥18) compared to 10% for adults age ≥65. The Adult Psychiatric Morbidity Survey 2014 (Stansfeld et al., 2016) in the UK, and National Comorbidity Survey Replication in 2001/2 (Kessler et al., 2010) in the USA, also reported lower prevalence of common mental health difficulties in older adults than in younger adults. Socioemotional Selectivity Theory, the theory that improvements in mood with age occur due to prioritising positive and meaningful experiences, has been proposed to explain this ‘positivity effect’ in older adults (Carstensen, 1992, 2006). However, there is also evidence that depressive symptoms may increase in adults over the age of 75 (Litwin & Stoeckel, 2013; Skoog, 2011), which is consistent with the findings from studies in this scoping review, that depression symptoms were higher in people age ≥75 than in people aged 65-74.

There are several possible explanations for why older adults seem less emotionally impacted by the COVID-19 pandemic than younger adults. It has been suggested that younger people may have engaged in more social activity pre-COVID-19, so might suffer more during lockdown (Bu et al., 2020). Older adults may have more stable living environments and greater financial security than younger adults (McKinlay et al., 2020), which may mean that younger adults experience more anxiety about their futures than older adults (Y. Wang et al., 2020). Older people may have experienced previous infection outbreaks, therefore may experience less uncertainty than younger people; and younger people may have more access to media than older people (Y. Wang et al., 2020), which is associated with increased psychological distress during COVID-19 (Levaot et al., 2020; Liu & Liu, 2020; M. Luo et al., 2020). Older adults might also have a greater sense of coherence (Antonovsky, 1996), e.g. through drawing on previous life experiences, thus finding more meaning in the events of the pandemic (McKinlay et al., 2020). Sense of coherence has been associated with reduced anxiety and depression (Généreux et al., 2020), reduced stress and distress (Schäfer et al., 2020), and increased life satisfaction (Dymecka et al., 2021) during COVID-19. It is also suggested that increased wisdom with older age could be a protective factor, thus explaining why older adults report less distress during the pandemic than younger adults (Vahia et al., 2020). However, it is also possible that results of studies, both pre-pandemic and during-pandemic, are affected by biases in reporting. Older adults may underreport mental health symptoms due to stigma (Bharadwaj et al., 2017), therefore it is possible that actual rates of distress in older adults may be higher than reported, and we must be conscious of this when interpreting findings.

1.5.3. Experiences of Older Adults

1.5.3.1. *Changes from pre-pandemic to during-pandemic*

Despite studies reporting that older adults report lower distress levels than younger adults during the pandemic, this does not mean that older adults are emotionally unaffected by the pandemic. As mentioned above, whilst older adults showed smaller increases in distress than younger adults, distress levels for older adults still increased due to the pandemic (Niedzwiedz et al., 2021; Pierce et al., 2020; Thombs et al., 2020). Additionally, longitudinal studies of older adults from the Lothian Birth Cohort 1936 reported that the pandemic was associated with a reduction in self-rated physical and mental health, and an increase in loneliness (Okely et al., 2021; A. M. Taylor et al., 2020).

1.5.3.2. Anxiety about health

As mentioned above, older adults reported higher levels of COVID-19-related anxiety than younger adults (Shevlin et al., 2020). This is to be expected, as COVID-19-related anxiety was higher in participants with higher perceived risk of COVID-19 and with pre-existing health conditions, which likely includes many older adults. A cross-sectional survey of individuals age ≥75 reported that slightly under half of participants were worried about their physical health during the pandemic (Brown et al., 2021).

1.5.3.3. Risk factors and protective factors

Some studies looked in more detail at factors associated with wellbeing in older adults during the pandemic. Older adults from the Lothian Birth Cohort 1936 reported that during lockdown they had less face-to-face social contact and more virtual social contact (A. M. Taylor et al., 2020), and reported an increase in perceived social support during lockdown (Okely et al., 2021). This could suggest that virtual social contact was still enough to mean that participants felt supported, even despite reduced face-to-face contact. However, these findings are from two different studies, and, despite the overlap in samples, it is not possible to know whether participants who reported an increase in perceived social support were the same participants who reported reduced face-to-face contact.

Higher anxiety and living alone were associated with increased loneliness (Okely et al., 2021; A. M. Taylor et al., 2020). Better wellbeing was associated with higher social support and emotional stability, whereas worse wellbeing was associated with loneliness, memory problems, and cardiovascular problems (Okely et al., 2021; A. M. Taylor et al., 2020). Spending more time in the garden during the pandemic compared to pre-pandemic was associated with better self-rated physical health, emotional health, and sleep (Corley et al., 2021). Reduced access to social support services during the pandemic was also associated with increased anxiety in people with dementia, and reduced wellbeing in carers and older adults without dementia or caring responsibilities (Giebel, Lord, et al., 2021; Giebel, Pulford, et al., 2021).

1.5.3.4. Qualitative studies

Qualitative studies with older adults highlighted negative aspects of the pandemic including: concerns about catching COVID-19 and loss of normal routines and activities (Brown et al., 2021; McKinlay et al., 2020); restricted access to health services (McKinlay et al., 2020); managing daily tasks and activities (Brown et al., 2021); and frustration at people not adhering to social distancing (Brooke & Clark, 2020). Some positives were also highlighted, including increased sense of community (Brown et al., 2021), and that the pandemic had made life simpler and provided more time for hobbies (Brooke & Clark, 2020; Brown et al., 2021; McKinlay et al., 2020). Participants discussed the importance of social support, including socialising (McKinlay et al., 2020) and supporting others (Brooke & Clark, 2020), and also talked about the helpfulness of maintaining routines and using past coping skills (McKinlay et al., 2020). Participants also discussed wanting to challenge assumptions about older people, for example by evaluating their own risk tolerance rather than automatically following the standard recommendations (Brooke & Clark, 2020).

1.5.4. Scoping Review: Conclusion

Studies demonstrate that whilst older adults in the UK report better emotional wellbeing than younger adults, they still have experienced increases in anxiety, low mood, general distress, and loneliness due to the pandemic. Living alone and having pre-existing physical health problems were associated with distress, whereas social support, access to support services, and garden usage were associated with improved wellbeing.

Such studies have some limitations. Studies using convenience sampling and those collecting data online are unlikely to obtain representative samples of older adults. Additionally, many studies were undertaken towards the beginning of the pandemic, therefore we have less information on how mood changes over the longer term. Additionally, while studies have examined the impact of demographic factors on wellbeing, few studies have further explored the impact of other factors, for example the impact of different types of social contact and use of different coping strategies.

1.6. Impact of Social Contact

1.6.1. Defining Concepts

There are different concepts used within research on social ties, which include both objective and subjective aspects. The term ‘social networks’ refers to objective structural aspects of social ties, including the size of networks (i.e. number of people), frequency of social contacts, and objective quality of relationships (Lubben & Gironda, 2003). Social isolation falls under this objective aspect to social ties. Another concept is *social support*. Within *social support*, there are different objective and subjective aspects: *received* social support refers to the specific supportive behaviours and resources that a person receives from their social network, whereas *perceived* social support refers to subjective perceptions of the received social support (Haber et al., 2007). In younger adults, received social support appears to have a large influence on perceived social support; whereas in older adults, perceived social support is also associated with other factors including low mood, negative thinking, and amount of social contact (Lynch et al., 1999). Research suggests that perceived social support is more strongly associated with health outcomes, while received support influences health through its impact on perceived support (Haber et al., 2007). Perceived social support is associated with emotional wellbeing (F. Li et al., 2021; Peirce et al., 2000), and a review of 51 studies (Santini et al., 2015) reported that perceived social support (both emotional and instrumental support), and large diverse social networks were associated with reduced risk of depression. This was a large systematic review, which suggests that these findings are reliable; however, findings may also be influenced by publication bias and reporting bias, and there may also be reverse causality (i.e. a bi-directional relationship between depression and social support).

A related but distinct construct is loneliness. Loneliness is a subjective experience, described as a discrepancy between one's actual versus desired level of social contact (Lubben & Gironda, 2003). Therefore, loneliness is related to, but not necessarily defined by, social networks and social contact. Studies have reported that the effects of social networks and isolation on depression are mediated by loneliness (Santini et al., 2016), amongst other things (Rook, 2015).

1.6.2. Social Networks and Wellbeing in Older Adults pre-COVID-19

As touched on above (Section 1.3.3), evidence suggests that social contact and social support is important for physical and mental health, and important when adapting to challenging situations. In older adults, social interaction is also associated with better cognitive functioning (Barnes et al., 2004; Bellou et al., 2017; Kuiper et al., 2015; Pillemer & Holtzer, 2016). Interestingly, Teo et al. (2015) reported that, in adults age ≥50, face-to-face social contact was associated with lower risk of depression two years later, whereas social contact by telephone was not associated with depression symptoms. This study used a large and nationally representative sample (11,065 participants), suggesting that findings are reliable. Additionally, the longitudinal design is more likely to suggest causality in the relationship between face-to-face social contact and depression than cross-sectional designs.

Social networks tend to shrink in older adults, and older adults have greater risk of social isolation than younger adults (Cudjoe et al., 2020; Nicholson, 2012; Steptoe et al., 2013). However, this does not necessarily mean that older adults experience a drop in wellbeing as a result. Loneliness severity does not necessarily increase linearly with age (E. E. Lee et al., 2019; Luhmann & Hawkley, 2016), and social isolation may have a weaker association with wellbeing individuals age ≥80 compared with people aged 60-79 (Litwin & Stoeckel, 2013). This could be because in very old age there are more factors influencing wellbeing (e.g. physical health), meaning that social networks/isolation plays a proportionally smaller role. Additionally, greater wisdom in older age may act as a protective factor, to buffer the effect of social isolation (E. E. Lee et al., 2019). This is also consistent with Socioemotional Selectivity Theory (Carstensen, 1992, 2006), since older adults may prioritise close relationships with a smaller number of people, resulting in benefits to wellbeing, despite having smaller social networks. Studies have reported that, in working-age adults, social contact with friends may be more important for wellbeing, whereas in adults over 70, social contact with family seems to have stronger associations with wellbeing (Secor et al., 2017; Teo et al., 2015).

1.6.3. Social Ties and Wellbeing during COVID-19

1.6.3.1. Living situation: alone versus with someone

Social contact and social support are shown to be beneficial to wellbeing during the COVID-19 pandemic. People who cohabit with a partner report better health-related quality of life and lower psychological distress, stress, loneliness, and depression, compared to those who live alone (Ferreira et al., 2021; Groarke et al., 2020; Jia et al., 2020; L. Z. Li & Wang, 2020; Okely et al., 2021; Pierce et al., 2020). Hailey et al. (2021) reported that social isolation, living alone, and loneliness were inversely related to levels of physical exercise during the pandemic, which likely has implications for physical and mental health. This study is not peer-reviewed therefore may be less reliable than others; however, the result is consistent with findings from before the COVID-19 pandemic (Schrempft et al., 2019). The protective effect of cohabiting has been demonstrated in both working-age and older adults during the COVID-19 pandemic, and similar findings have been reported before the pandemic (De Jong Gierveld et al., 2012; Tamminen et al., 2019; Theeke, 2009).

1.6.3.2. Carers

The protective effect of cohabiting is not the same for people who are caregivers for a person they live with. Instead, carers often experience ‘carer burden,’ high prevalence of anxiety and depression, and lower levels of life satisfaction than non-carers (Adelman et al., 2014; García-Alberca et al., 2011; Litwin & Stoeckel, 2013; Pinquart & Sörensen, 2003). During the COVID-19 pandemic, carers reported large increases in physical and psychological carer burden (Tsapanou et al., 2021), and reported greater impact of COVID-19 on their physical and mental health, social life, and financial status than non-caregivers (E. Y. Y. Chan et al., 2020; Giebel, Lord, et al., 2021; Giebel, Pulford, et al., 2021). In qualitative studies, carers also reported experiencing stress due to lack of access to social support services; lack of down-time; and anxiety, low mood, and loneliness during the pandemic (Giebel, Cannon, et al., 2020; Giebel, Hanna, et al., 2021; Hanna et al., 2021).

1.6.3.3. Subjective measures

Studies measuring the impact of social ties during the COVID-19 pandemic have mainly looked at perceived social support, and clearly show that perceived social support is beneficial for wellbeing. Higher perceived social support is associated with lower loneliness (Bu et al., 2020; Groarke et al., 2020), less psychological distress (Hou et al., 2020; F. Li et al., 2021; Yu et al., 2020), lower depression (Sommerlad et al., 2021), lower anxiety (Qi et al., 2020), and higher levels of physical activity (Hailey et al., 2021). Perceived social support is linked to psychological resilience, and research from during the COVID-19 pandemic suggests that social support influences wellbeing through increasing resilience (Hou et al., 2020), and can ameliorate the deleterious impact of low psychological resilience on wellbeing (F. Li et al., 2021).

1.6.3.4. Objective measures

There have been fewer studies that examine the impact of objective measures of social ties, and those that do report mixed results. Bu et al. (2020) reported that having more close friends was associated with feeling less lonely; however, frequency of face-to-face social contact was not associated with loneliness. Conversely, Sommerlad et al. (2021) found that social contact face-to-face, by telephone, and by video-call were all associated with fewer depressive symptoms. Face-to-face contact had a stronger association with depression than telephone or video contact, although perceived social support still had the strongest association with depression. The different findings between these studies may arise due to different ways of measuring social contact. Interestingly, two studies found that certain measures of social contact were associated with increased distress. Losada-Baltar et al. (2021) reported that social contact with relatives from the outside of the household was linked to less loneliness, but greater psychological distress. Ratschen et al. (2020) also found that more frequent remote social contact was associated with greater increases in loneliness from pre-pandemic to during the pandemic. It may be that virtual social contact could cause individuals to miss loved ones more when it is not possible to see them in-person. More research is needed to clarify the impact of frequency of social contact on mood during the COVID-19 pandemic.

1.7. Impact of Coping Strategies

1.7.1. What is Coping?

Coping has been defined as the interplay between environmental and personal factors (Greenaway et al., 2015), in an attempt to manage the demands created by stressful events (Lazarus & Folkman, 1984). Coping is a process, rather than an outcome, and can involve behavioural, cognitive, and intrapsychic processes (S. E. Taylor & Stanton, 2007). The available coping resources (for example, social support, money, optimism, self-esteem, and self-efficacy) will influence the coping processes that are used. Note that, in these terms, coping processes are distinct from the specific or concrete activities that people might use to help them cope (e.g. gardening or going for walks).

1.7.2. Categorising and Measuring Coping

Different theories and measures of coping categorise coping processes in diverse ways. One key way of categorising coping processes is in terms of ‘approach versus avoidance’ coping (Roth & Cohen, 1986); that is, whether a person is oriented towards or away from stressors. Other researchers have used similar categories, for example ‘engagement’ versus ‘disengagement’ (Compas et al., 2001); ‘active’ versus ‘passive’ coping; and ‘control’ versus ‘escape’ coping (Latack & Havlovic, 1992).

Another key distinction is between strategies that attempt to change the stressful situation, and strategies that aim to manage emotions and cognitions in response to the stressful situation. These strategies have been variously termed: ‘problem-focused’ versus ‘emotion-focused’ coping (Lazarus & Folkman, 1984), ‘assimilation’ versus ‘accommodation’ (Brandtstädter & Renner, 1990), and ‘alloplastic’ versus ‘autoplastic’ coping (Perrez & Reicherts, 1992). Additionally, there are distinctions between cognitive coping (using mental strategies) versus behavioural coping (doing things), as well as social versus solitary coping processes (Latack & Havlovic, 1992).

Measures of coping tend to group coping strategies based on these broad distinctions. For example, the Coping Inventory for Stressful Situations (CISS; Endler & Parker, 1990) is divided into task-oriented, emotion-oriented, and avoidance-oriented subscales; whereas the Coping Strategy Indicator (Amirkhan, 1990) has subscales distinguishing problem-solving, avoidance, and seeking social support.

However, there is ambiguity in these distinctions, as sometimes the same actions could fall under different categories (Skinner et al., 2003). Therefore, whilst this kind of broad distinction can be useful, the varied nature of coping requires that measures assess a wide range of ways of coping. Accordingly, the COPE scale (Coping Orientation to Problems Experienced; Carver, 1997; Carver et al., 1989) measures a range of coping processes, grouped into 15 subscales on the long-form version, and 14 subscales on the brief COPE version (Carver, 1997). The authors recommend that if researchers want to reduce this into fewer broader subscales, they can perform factor analysis to see how items cluster together. Through this method, Carver et al. (1989) derived four second-order factors:

- *Problem-focused coping*, including active coping, planning, and suppression of competing activities;
- *Emotion-focused coping*, including acceptance, restraint, positive reinterpretation, and growth;
- *Seeking social support*, including instrumental and emotional social support; and
- *Avoidant coping,* including denial and disengagement.

Litman (2006) derived four similar factors to Carver et al. (1989), in a sample of undergraduate students. Using the brief version of the COPE scale in a sample of participants with cancer and caregivers, Baumstarck et al. (2017) also derived a similar four-factor solution, with factors termed ‘problem-solving,’ ‘social support,’ ‘avoidance,’ and ‘positive thinking.’ Conversely, using a modified version of the brief COPE scale, Eisenberg et al. (2012) derived two core factors in patients with heart failure: approach coping and avoidant coping.

It is important to note that subscales with similar names on different questionnaires might measure different things. For example, the ‘emotion-focused’ coping factors derived from the COPE scale by Carver et al. (1989) and Litman (2006) comprise generally positive, adaptive processes, whereas the ‘emotion-oriented’ subscale from CISS measure (Endler & Parker, 1990) measures more dysfunctional processes including anger, self-blame, rumination, and daydreaming.

1.7.3. Trait versus State Measures of Coping

Coping can be measured as coping *styles* or coping *strategies*. Coping *style* refers to dispositional traits, thought to be relatively stable over time and across situations, whereas coping s*trategies* refer to dynamic states used within a particular time-period or situation. Greenaway et al. (2015) argue that both trait and state measures of coping are important, as people will develop a particular style of coping related to their personality type (Connor-Smith & Flachsbart, 2007; Litman, 2006) and depending on what coping strategies have worked well for them previously, but people also respond differently depending on the situational demands and available coping resources. The uniqueness of the COVID-19 pandemic means that people may not be able to use their usual methods of coping, therefore state measures may be more appropriate for assessing coping during the pandemic.

1.7.4. Coping and Wellbeing pre-COVID-19

Research suggests that more active approaches to coping are linked to better wellbeing, whereas passive and avoidant coping is linked to higher levels of distress (S. E. Taylor & Stanton, 2007). Endler and Parker (1990) showed that avoidance-oriented coping and emotion-oriented coping (measured with the CISS, including anger and self-blame) were both associated with greater depression and anxiety, whereas task-oriented coping (including problem-solving and cognitive restructuring) was associated with fewer symptoms of depression and anxiety. Similarly, Litman (2006) assessed coping with the COPE inventory and showed that avoidant coping was associated with behavioural inhibition, anxiety, depression, and anger; whereas problem-focused coping, socially-supported coping, and emotion-focused coping (which included acceptance, restraint, positive reinterpretation, and growth) were associated with behavioural activation and ‘positive’ personality traits including extraversion and curiosity. A meta-analysis of 27 studies showed that approach-oriented and emotion-focused coping (including venting, positive reinterpretation, and seeking emotional social support) were linked to positive adjustment in cancer patients; whereas avoidant coping was linked to reduced positive adjustment (Roesch & Weiner, 2001). This gives convincing support to the idea that ‘active’ coping is associated with positive outcomes, and ‘avoidant’ coping is associated with negative outcomes. However, it is important to note that studies included in this meta-analysis were limited to those investigating patients with physical health problems, so results are not necessarily generalisable to coping with other difficulties.

There appears to be stronger evidence for the relationship between passive/avoidant coping and distress, than there is for a relationship between active coping and better wellbeing (Eisenberg et al., 2012; Rayburn et al., 2005;

S. E. Taylor & Stanton, 2007). One explanation for this is that approach-oriented coping often involves strategies such as problem solving, which is only effective when the stressor is controllable and changeable (S. E. Taylor & Stanton, 2007). This is particularly salient during the COVID-19 pandemic, where the situation is not controllable. Studies have suggested that as people get older they move from favouring problem-focused coping to favouring emotion-focused coping (Brandtstädter & Renner, 1990; Chen et al., 2018; Martin et al., 2008). This may be another reason why older adults appear less negatively impacted by the COVID-19 pandemic.

1.7.5. Coping and Wellbeing during COVID-19

Recent studies suggest that passive, avoidant, or ‘maladaptive’ coping is associated with distress during the COVID-19 pandemic (Dawson & Golijani-Moghaddam, 2020; Fukase et al., 2021; Rettie & Daniels, 2020; Shamblaw et al., 2021; Yu et al., 2020), whereas emotion-focused coping and socially-supported coping are associated with better wellbeing (Fluharty et al., 2020; Yu et al., 2020; Zacher & Rudolph, 2021).

There have been mixed results regarding active coping. Active strategies, such as safety planning, engaging in enjoyable or distracting activities, and having a routine, were associated with fewer symptoms of trauma (A. L. Park et al., 2020; C. L. Park et al., 2021). A second-order ‘approach coping’ factor derived from the brief COPE scale was associated with better quality of life and lower levels of depression (Shamblaw et al., 2021). Studies also showed that the active coping subscale from the brief COPE was associated with reduced depression (Fukase et al., 2021), and the planning subscale associated with higher life satisfaction and positive affect (Zacher & Rudolph, 2021). However, a second-order ‘problem-focused coping’ factor from the brief COPE (Fluharty et al., 2020), and the planning subscale from the brief COPE (Zacher & Rudolph, 2021) have also been linked to poorer mental health and lower life satisfaction. As with pre-COVID-19 studies, the association between passive/maladaptive coping and distress seems to be stronger than the association between active/adaptive coping and wellbeing (Dawson & Golijani-Moghaddam, 2020;

Rettie & Daniels, 2020; Yu et al., 2020). ‘Avoidance coping’ also appears to have more predictive power than ‘approach coping’ (Shamblaw et al., 2021).

Few studies investigate coping in older adults during the COVID-19 pandemic. A qualitative study (Verhage et al., 2021) reported that participants in a sample of Dutch older adults spoke more about emotion-focused coping strategies, which included distraction, temporary acceptance, and self-enhancing comparisons; than they spoke about problem-focused strategies, which included attaining a sense of control through following guidance as they felt appropriate. Skapinakis et al. (2020) reported that older adults were more likely than younger adults to use planning as a coping strategy, and less likely to use venting and instrumental social support. At first glance, this appears to conflict with studies reporting that people move from using more problem-focused to more emotion-focused strategies with age. However, ‘planning’ does not necessarily refer to attempts to change the stressful situation (i.e. problem-focused coping), and could refer to other things such as planning one’s day and maintaining structure and routine. To my knowledge, no studies have investigated the association between coping and mood in a sample of older adults during COVID-19.

1.8. Impact of Social Cognition

1.8.1. What is Social Cognition?

Another factor that may be linked to emotional distress and wellbeing during the pandemic is social cognition. One definition of social cognition is that it involves the attribution of mental states to other people, in order to make sense of behaviours and interactions, and generate appropriate responses (Alcalá-López et al., 2019; Green et al., 2008). This is thought to be important for developing social skills, interacting with others, and forming relationships (Alcalá-López et al., 2019; Cutting & Dunn, 2006).

Social cognition, more widely defined, is a broad area of research and theory, ranging from basic perceptual abilities such as detection of biological motion (Pavlova, 2012), to complex higher-order processes such as social contract reasoning and cooperation (Barrett et al., 2010). There are different domains within the field of social cognition; however, there is not always agreement between authors regarding definitions of concepts (Pinkham et al., 2014; Schurz et al., 2021). For the purposes of this study, I will be focusing on the aspects of social cognition that are generally used within clinical psychology, namely the ability to recognise, attribute, and identify with the mental states of others (Alcalá-López et al., 2019; Green et al., 2008).

It is generally agreed that affect perception and recognition is a key perceptual aspect of human social cognition (Penn et al., 2008; Pinkham et al., 2014). Schurz et al. (2021) state that two other key concepts are:

- Empathy, generally thought of as an *affective* way of understanding others through experiencing the emotions of others; and
- Theory-of-Mind (ToM), generally thought of as a *cognitive* way of understanding others through cognitively modelling mental states.

The distinction is complex, because there is overlap between these concepts, and there are also affective and cognitive sub-divisions within both ToM and empathy. ToM involves making inferences about cognitive mental states (cognitive aspect) and also about the desires and emotions of others (affective aspect); (Henry et al., 2013; Schurz et al., 2021). Similarly, the ability to mentalize and take another's perspective is described as the cognitive aspect of empathy, whereas the ability to vicariously feel the emotions of other people is an affective element to empathy (Reniers et al., 2011; Schurz et al., 2021; Tully et al., 2016). Cognitive empathy is sometimes referred to as 'perspective-taking,' while affective empathy is described as 'empathic concern' (Tully et al., 2016).

There is also a distinction between possessing ability in an area of social cognition versus using this ability in everyday life (Grazzani & Ornaghi, 2012; Lecce et al., 2017, 2019). For many tests of social cognition, test performance does not necessarily represent a person's day-to-day level of social cognitive competence. Self-report measures that ask participants about their daily interactions, e.g. the Questionnaire of Cognitive and Affective Empathy (Reniers et al., 2011), may be more likely to tap into use of social cognitive abilities in everyday life; however, they are subject to the limitations of self-report measures (Haeffel & Howard, 2010).

As with general cognition, social cognition appears to decline with age (Alcalá-López et al., 2019; Bailey et al., 2008; Bailey & Henry, 2008; Birmingham et al., 2018; Halberstadt et al., 2011; Henry et al., 2013; Natelson Love & Ruff, 2016; Ruffman et al., 2008), therefore it is important to consider this when approaching work with older adults. Research suggests that the cognitive elements of ToM and empathy decline with age, whereas affective elements are preserved (Beadle & De La Vega, 2019; Z. Wang & Su, 2013).

1.8.2. Social Cognition and Social Networks

Social cognition is important for developing social skills, interacting with others, and forming relationships (Alcalá-López et al., 2019; Cutting & Dunn, 2006), and accordingly, studies have suggested that social cognition is associated with the size and quality of social networks. For example, differences in ToM in older adults have been associated with differences in quality of friendships and frequency of social contact (Lecce et al., 2017, 2019), and age-related decline in ToM ability has been linked to reduced social participation (Bailey et al., 2008).

Social cognition is also associated with loneliness: lonely individuals are more likely to attribute negative intentions to other people, and form negative impressions of their actions (Cacioppo & Hawkley, 2009). In turn, this may make it harder for lonely individuals to form relationships.

As well as being important for social relationships, it is also possible that social cognitive skills could be associated with a person’s drive or motivation to socialise, such that those with higher social cognitive ability obtain greater pleasure and benefit from socialising, and socialise more actively, resulting in increased size and quality of social networks. This idea is consistent with findings that people may not necessarily experience a drop in wellbeing as a result of diminishing social networks in older age (Carstensen, 1992; Litwin & Stoeckel, 2013).

The association between social cognition and social networks also appears to be bi-directional: as well as social-cognitive ability impacting people's social networks, the amount of social contact that a person experiences also affects their social-cognitive ability. Reduced social interaction due to the COVID-19 pandemic appears to have affected emotion recognition ability, with socially isolated people showing reduced recognition of happy faces and increased recognition of sad faces (Bland et al., 2020, 2021; Meléndez et al., 2020). This makes sense, since social isolation also affects more general aspects of cognition (Kuiper et al., 2015), and it follows that lack of opportunity to practice social skills would lead to a reduction in these abilities.

1.8.3. Social Cognition and Wellbeing pre-COVID-19

Since social networks are associated with physical and emotional wellbeing, and social cognition is important for social networks, this suggests that social cognition plays an important role in wellbeing. Difficulties with social cognition in certain groups are associated with difficulties in social functioning which can affect quality of life (Henry et al., 2013), including in autistic people (C. C. Peterson et al., 2009), and people with diagnoses of schizophrenia (Brüne et al., 2007; Couture, 2006; Pinkham et al., 2014) and PTSD (Couette et al., 2020). Deficits in ToM have been identified in individuals with diagnoses of depression compared to non-depressed individuals (Bora & Berk, 2016; Ladegaard et al., 2014), and training individuals in social cognitive skills (including emotion perception, ToM, and attributions) results in reduced severity of depression, suggesting that impaired social cognition may be a risk factor for depression (Zhu et al., 2018).

Empathy is thought to be generally associated with wellbeing. For example, possessing higher empathetic ability is a protective factor against burnout in healthcare professionals (Taleghani et al., 2017), and empathy is important in friendships (Chow et al., 2013). Additionally, perspective-taking ability (i.e. cognitive empathy) is associated with reduced depressive symptoms and improved life satisfaction in caregivers (H. S. Lee et al., 2001). However, there are mixed results in the literature. For example, O'Connor et al. (2007) reported that high empathic concern (affective empathy) was associated with symptoms of depression, related to feeling greater distress in empathy with people. Tully et al. (2016) reported slightly different results, reporting that individuals with very high or very low perspective-taking ability (i.e. cognitive empathy) experienced elevated depression, whereas high affective empathy (empathic concern) was associated with elevated symptoms of depression only when this occurred alongside poor ability to regulate emotions.

It is not clear whether social cognition deficits are precursors to mental health difficulties, or whether social cognition deficits arise as a result of mental health problems and associated social isolation. It is likely that this relationship is bi-directional.

1.8.4. Social Cognition and Wellbeing during COVID-19

Recent studies have noted that individuals with higher empathy are more likely to follow social distancing guidance (Carvalho & Machado, 2020; Nosratabadi & Halvaiepour, 2021; Pfattheicher et al., 2020). This could have implications for wellbeing, as strictly following social distancing guidance may mean spending less time outdoors and seeing fewer people, which could affect wellbeing. Increased empathic concern for those vulnerable to COVID-19 could also lead to associated empathic distress. On the other hand, people who follow social distancing guidance due to empathy with vulnerable individuals might find more reason and meaning in social distancing, which might buffer the deleterious effects of loss of social contact and daily routines.

As noted above, social cognition is generally associated with size and quality of social networks, and may also be linked to a person’s propensity or motivation to socialise. That is, social contact may be more important to individuals with higher social cognitive interest and ability. Therefore, whilst better social cognition appears to be generally associated with better wellbeing, people with higher social cognitive ability may be more negatively impacted by social distancing during COVID-19.

Few studies have examined the impact of social cognitive ability on mood during the COVID-19 pandemic. A study of healthcare workers working with COVID-19 in Italy (Barello et al., 2020) reported that increased perspective taking and empathic concern for COVID-19 patients was associated with increased psychological distress, in contrast to reports that empathy is a protective factor against burnout in healthcare staff in pre-COVID-19 times (Taleghani et al., 2017). However, this study is less relevant to thinking about the impact of social distancing in people from the general population. In a large UK sample, Sommerlad et al. (2021) showed that the association between face-to-face social contact and reduced depression was stronger in people with higher social cognition (empathic concern and perspective taking). They suggest that social contact may be more important and beneficial for people with higher social cognition, and that those with higher social cognition may be more negatively impacted by the lack of social contact brought by social distancing. The authors also suggest that this result could be explained by higher empathy leading to increased empathic distress, particularly in people with lower levels of social contact (i.e. where there is less of a buffering effect of social support).

1.9. Aims, Rationale, and Hypotheses

1.9.1. Aims

The present study aimed to investigate psychological distress, and factors associated with psychological distress, in older adults in the UK during the COVID-19 pandemic. The study employed three quantitative measures of psychological distress: depression, measured with the PHQ8 questionnaire (Kroenke et al., 2009; Shin et al., 2019); anxiety, measured with the GAD7 questionnaire (Spitzer et al., 2006); and loneliness, measured with the De Jong Gierveld Loneliness Scale (De Jong Gierveld, 1987; De Jong Gierveld & Kamphuls, 1985).

This study investigated the effects of three independent variables on psychological distress. Firstly, the effects of social contact were investigated. This included participants’ weekly levels of social contact with people from outside of their household (both in-person social contact, virtual or telephone contact, and attendance of organised groups), and whether participants lived alone or with others. Secondly, the study investigated participants’ coping strategies, measured with the brief COPE scale (Carver, 1997). Thirdly, the study investigated participants’ social cognition, using three measures: the Affect Naming Test (ANT, Pearson, 2009); the Social Stories Questionnaire (SSQ, Lawson et al., 2004); and the Questionnaire of Cognitive and Affective Empathy (QCAE, Reniers et al., 2011). Associations were tested using hierarchical regressions, adjusted for age and sex (see section 2.8.1).

In addition to quantitative measures, qualitative data on participants’ mood and ways of coping was collected through use of free-text questions, to allow participants to elaborate on their experiences, provide richer data, and feel heard.

For further description of the measures used, see Section 2.5.

1.9.2. Rationale and Clinical Utility

It is important to understand factors that influence wellbeing in older adults during situations such as the COVID-19 pandemic, to identify people who are likely to be most affected. This allows resources to be developed and allocated to appropriately support people.

Previous studies have measured the influence of demographic factors on the wellbeing of older adults during the COVID-19 pandemic. However, few studies have examined the roles of level of social contact, social cognition, and coping strategies, in older adults. To my knowledge, this is the first study to explicitly examine the impact of social contact, coping strategies, and social cognition on psychological distress in older adults during the COVID-19 pandemic.

1.9.3. Hypotheses

This study had several hypotheses. Firstly, it was predicted that participants who live with someone would experience less psychological distress than those who live alone, in line with studies described in section 1.6.3.1 (Ferreira et al., 2021; Groarke et al., 2020; Jia et al., 2020; L. Z. Li & Wang, 2020; Okely et al., 2021; Pierce et al., 2020), except in cases where the participant is a carer for or is cared-for by someone that they live with, in line with studies described in section 1.6.3.2 (Adelman et al., 2014; E. Y. Y. Chan et al., 2020; García-Alberca et al., 2011; Giebel, Lord, et al., 2021; Giebel, Pulford, et al., 2021; Litwin & Stoeckel, 2013; Pinquart & Sörensen, 2003).

Secondly, it was hypothesised that higher levels of social contact with people outside of one's household would be associated with less psychological distress (Courtin & Knapp, 2017; Golden et al., 2009; Lubben & Gironda, 2003; Sommerlad et al., 2021; Steptoe et al., 2013).

Thirdly, it was hypothesised that the association between social contact outside of the household and psychological distress would be moderated by living situation (whether a person lives alone versus with someone), such that social contact would be more strongly associated with (reduced) psychological distress when the individual resides alone. Whilst no studies have explicitly tested this, this hypothesis was made on the basis that social contact is important for wellbeing (Courtin & Knapp, 2017; Golden et al., 2009; Lubben & Gironda, 2003; Steptoe et al., 2013). Therefore, it was hypothesised that people who live alone would benefit more from social contact outside the home, and suffer more from lack of social contact outside the home, than people who live with others and thus already have social contact with their living partner(s).

The fourth hypothesis predicted that use of passive or avoidant coping strategies (as measured by the brief COPE scale) would be associated with greater psychological distress; whereas active, emotion-focused, and socially-supported coping strategies would be associated with less psychological distress (Dawson & Golijani-Moghaddam, 2020; Fluharty et al., 2020; Fukase et al., 2021; Rettie & Daniels, 2020; Shamblaw et al., 2021; Yu et al., 2020; Zacher & Rudolph, 2021).

The fifth hypothesis predicted that participants with higher social cognitive ability (as measured by the ANT, SSQ, and QCAE) would experience greater psychological distress than those with lower social cognitive ability. As discussed in section 1.8.2, social cognition is associated with the size and quality of people’s social networks (Lecce et al., 2017, 2019), therefore may be associated with a person’s propensity or motivation to socialise. Whilst under usual circumstances, social cognition appears to be positively associated with wellbeing, it may be that people with higher social cognitive ability are more negatively impacted by social distancing and isolation during the COVID-19 pandemic (see section 1.8.4), thus meaning that during the COVID-19 pandemic, higher social cognitive ability may be associated with higher psychological distress levels.

Finally, it was hypothesised that social cognitive ability would moderate the association between social contact and psychological distress, such that social contact would have a stronger negative relationship with psychological distress in participants with higher social-cognitive ability than in those with lower social-cognitive ability, as reported by Sommerlad et al. (2021).

2. METHOD

2.1. Epistemology

Ontology refers to the nature of reality, and epistemology refers to the study and acquisition of knowledge (Ponterotto, 2005). Ontology and epistemology are key to scientific enquiry, and a researcher's epistemological position should be made explicit, since this will influence their research methodology and methods, as well as interpretation of the study (Willig, 2012).

A positivist position states that the external world is real, and that this objective reality exists regardless of the researcher's knowledge of it. Since external phenomena are assumed to be real, it is assumed that results of research are generalisable (L. A. Hudson & Ozanne, 1988). In contrast, interpretivism or constructivism assumes a relativist position that states that there can be multiple different realities, as reality is individually and socially constructed (Ponterotto, 2005).

Critical realism (Houston, 2001; McEvoy & Richards, 2003) offers an alternative to positivist and interpretivist paradigms. Critical realism states that the world is real, and entities exist independently from humans' observation, knowledge, identification, and construction of these entities. However, critical realism acknowledges that it is impossible to observe, describe, or interpret the world and remain theory-neutral, and our perceptions and knowledge of entities are shaped by our existing concepts, discourses, and theoretical interests. Therefore, knowledge and understanding of reality is said to be conceptually-mediated, and is individually and socially constructed (Fleetwood, 2005; McEvoy & Richards, 2006).

In this study I take a critical realist perspective, in that I attempt to measure factors that I believe exist independently from our perception, including social cognition and psychological distress, the results of which I hope can be generalised to be relevant to other older adults in the context of the COVID-19 pandemic. However, it is important to note that human experiences and understanding of these phenomena are socially constructed, and that attempts to measure these phenomena will be impacted by this.

2.2. Design

This study takes a cross-sectional design, aiming to explore relationships between variables. It is noted that causality cannot be inferred from a cross-sectional design, and relationships between variables may be bi-directional. Data was collected through an online survey, which collected both quantitative data and qualitative data. Mixed-methods designs are advocated by many authors (Johnstone, 2004; McEvoy & Richards, 2006). Quantitative questions were employed due to the nature of the variables that the study aimed to investigate, and the fact that the study aimed to investigate and provide reliable descriptions of relationships between variables (Ackroyd, 2005; McEvoy & Richards, 2006). Qualitative data was also collected through free-text questions, as it was felt that a purely quantitative methodology could not satisfactorily capture the finer details of participants' experiences in the new context of the COVID-19 pandemic. Qualitative methods can enhance our knowledge (Harper & Thomson, 2011), and can pick up on themes that may not be captured by standardised quantitative measures, and that may not have been anticipated *a priori* (McEvoy & Richards, 2006). As noted by Feilzer (2010), one of the assumptions in surveys with quantitative (i.e. tick-box) answers, is that participants understand the questions in the same way as the researcher. Employing qualitative questions in addition to quantitative questions allows participants' answers to be clarified and elaborated, with regard to the participants' reasoning and phenomenological experiences.

When using mixed-methods approaches it is important to consider ontological and epistemological positions. Some authors argue that using mixed-methods approaches involves switching between different paradigms (Johnson & Onwuegbuzie, 2004; McEvoy & Richards, 2006). An anti-conflationist perspective, on the other hand, argues that differences between qualitative and quantitative methods are not as extreme as they are sometimes made out to be, and that ontological and epistemological positioning can and should be sustained whilst using mixed-methods approaches. The content analysis conducted on the qualitative data in this study is consistent with critical realism, therefore critical realism, within an anti-conflationist approach, is appropriate for the current mixed-methods study.

2.3. Public Involvement

Early ideas for this study were discussed with two consulting service users from Age UK Lambeth. They reviewed the draft information sheet, consent form, and debrief sheet, and gave feedback. We discussed preferred terminology to refer to older adults as a group, and there was agreement that “older adults” was the preferred term. We also discussed ways to make participation more comfortable for participants: I shared my concern that participants would feel ‘tested’ or ‘evaluated’ by the formal nature of some of the questionnaires, and I was advised to be as transparent as possible regarding the purpose of these tests.

The study was later discussed with the Research Ambassador from the National Research Sub-Committee of University of the Third Age (U3A). She emphasised the importance of allowing participants to feel heard, by including qualitative free-text questions alongside the more closed quantitative questionnaires, and that richer data could be gained through free-text questions. We also discussed ways to measure levels of social contact and agreed on breaking the questions down into two sections, with the first section asking about number of weekly social contacts, followed by the second asking about total length of time of weekly contacts, to make this easier for participants to consider. She also made suggestions about question wording, namely that some people dislike the word “carer,” and that questions about caring responsibilities could be better worded as: *“Do you look after anyone?”*

2.4. Ethical Considerations

2.4.1. Ethical Approval

Ethical approval was secured from University of East London. Minor amendments were required and made (see Appendix E). The study was also reviewed by the Ethics Working Party from U3A and approved (no formal approval letter).

2.4.2. Risk Assessment and Management

This study took the form of an online survey, therefore no negative effects for the researcher were anticipated. The study did not involve deception of participants, and no negative effects of participation were anticipated. However, it was noted that asking participants to reflect on their wellbeing during the COVID-19 pandemic might remind participants of any difficulties that they were experiencing. The debrief letter at the end of the survey (Appendix F) provided signposting information to several community organisations offering practical and emotional support for older adults.

To combat fatigue, the participant information page at the beginning of the survey (Appendix G) informed participants that they were invited to take breaks and that they could leave the survey at any point and return to it within two weeks, as the survey platform saved incomplete survey progress for up to two weeks.

2.4.3. Confidentiality and Anonymity

All data was confidential. Participant data was stored on the UEL OneDrive, a secure online service. Participants were not required to give their name; however, for those who did give their name, data was pseudo-anonymised by assigning a numerical code. For up to three weeks after participants completed the survey, a separate document was kept which linked participant names to numerical codes. The purpose of this document was in case participants chose to withdraw their data from the study during this three-week window. After this three-week window, participant names were deleted from the document, meaning data were completely anonymised. If participants indicated that they wanted to receive a copy of the study results or be entered into the prize draw, their names and contact details were stored in a separate encrypted file that was not linked to study data.

2.4.4. Informed Consent and Right to Withdraw

As this study was an online survey, the researcher and participants did not necessarily speak with each other, either virtually or in-person. This meant that it was more difficult for participants to ask questions of the researcher, and harder to ensure informed consent. The invitation email and the recruitment post circulated via social media invited people to contact the researcher (myself) with any questions. Participants were required to read an information page (Appendix G) before proceeding to the online survey. The information page stated that if participants had any questions, they were welcome to contact the researcher or research supervisor, and the online consent form (Appendix H) re-iterated this point. Additionally, each survey page contained a header and footer with the researcher's contact details and a reminder that participants could contact the researcher with any questions.

The information page explained the purpose of the research, what to expect from the survey, confidentiality, online data protection, data management, and right to withdraw. Participants were informed that they could withdraw from the survey at any point, without having to give any reason. Participants were also informed that if they gave their name, they could withdraw their data for up to three weeks after submitting their survey, and that after three weeks their name would no longer be stored on the document linking names to data. Therefore, they were informed that after three weeks it would not be possible to withdraw data as their data would not be identifiable, and their anonymised data would be included in the study analysis.

2.5. Tests and Measures

2.5.1. Measures of Social Ties

2.5.1.1. Living situation

Participants were asked whether they lived with anybody; and whether they were a caregiver for anybody they live with, and vice versa.

2.5.1.2. Social contact

Participants were asked to estimate their average weekly amount of social contact with people from outside of their household during the COVID-19 pandemic, both by *number* of social contacts per week, and by *time* (hours) per week. This was done separately for face-to-face social contacts; virtual social contacts (i.e. telephone or video calls); and attendance of organised online groups, including clubs, learning spaces, religious spaces, or other organised online social events.

Participants were also asked the same questions about their level of social contact prior to COVID-19. When asking about groups attended prior to COVID-19, the wording of the question was altered to ask about both online and in-person events.

2.5.2. Measures of Coping Strategies

2.5.2.1. The brief COPE scale

The COPE scale (Coping Orientation to Problems Experienced; Carver et al., 1989) was developed with the aim of creating a coping scale that was more theoretically grounded than other scales that were available. The scale includes 60 items, forming 15 subscales (four items in each subscale). Due to the length of the long-form COPE scale, and the fact that there was redundancy among the items, Carver (1997) created a shortened, 28-item version: the brief COPE scale. This has 14 subscales, each comprising two items. The subscales are: active coping, planning, self-distraction, emotional social support, instrumental social support, positive reframing, acceptance, religion, humour, denial, substance use, behavioural disengagement, venting, and self-blame. As described above (Section 1.7.2), the authors recommend that researchers perform factor analysis to explore underlying latent factors, if they want to reduce the number of subscales. Psychometric properties of the brief COPE were measured on a sample of 168 participants recovering from a natural disaster (Carver, 1997), demonstrating improved factor structure compared to the long-form version, and improved internal consistency (Cronbach's alpha of 0.50-0.820).

The brief COPE was chosen because it is a widely-used scale with good psychometric properties, and reduced time burden compared to the long-form COPE scale. Additionally, the wording of items is appropriate to the context of the COVID-19 pandemic, whereas many other coping measures include items that do not make sense in the context of the pandemic, such as "I think of how I solved similar problems," "I go out for a meal," and "I try to be with other people" (Coping Inventory for Stressful situations; Endler and Parker, 1990).

Items on the brief COPE scale are rated using a four-point Likert scale. There are both 'trait' and 'state' versions: on the 'trait' version, answer options are worded in terms of what a person *usually* does, whereas on the 'state' version, answers are worded in terms of what a person *has been* doing: "I haven't been doing this at all," "I've been doing this a little bit," "I've been doing this a medium amount," or "I've been doing this a lot." The 'state' version was used in the current study, as this has more relevance to the specific situation being studied.

2.5.2.2. Free-text question: Coping

Participants were asked to give qualitative information about their coping behaviours during the COVID-19 pandemic, with the question: "Please write in here any other information you can, about things that you have been doing to cope during the COVID-19 period (write as much or as little as you'd like)."

2.5.3. Measures of Social Cognition

As discussed earlier (Section 1.8), the field of social cognition encompasses different abilities, therefore it makes sense to measure various aspects of social cognition. Indeed, a meta-analysis of age differences in *Theory-of-Mind* (Henry et al., 2013) critiques previous literature for not including multiple measures of social cognition. This study used three measures of social cognition (see below).

2.5.3.1. Affect Naming Test (ANT)

The ANT is part of the social perception subtest from the social cognition component of the Wechsler Advanced Clinical Solutions (WACS; Pearson, 2009). It addresses emotion recognition, a perceptual aspect of social cognition, and is one of a class of measures with a long history of use in emotion recognition research, including the Ekman 60 Faces Test (Ekman60; Young et al., 2002) and the Reading the Mind in the Eyes Test (RMET; Baron-Cohen et al., 2001). In the ANT, participants view photographs of faces and select an emotion word to describe the affect shown in the picture, from a list of: happy, sad, angry, afraid, surprised, disgusted, or neutral.

The social cognition component of the WACS was validated on a normative sample of 800 adults (Pearson, 2009), showing moderate-to-high internal consistency (Cronbach’s alpha 0.69-0.94) and good interscorer agreement (>98%). Studies report that the ANT has good convergent validity through correlations with the Ekman60 and RMET (Kandalaft et al., 2012), and divergent validity through low correlations with tests of general cognition, memory, and Theory-of-Mind (Kandalaft et al., 2012).

2.5.3.2. Social Stories Questionnaire (SSQ)

The SSQ (Lawson et al., 2004) measures Theory-of-Mind (ToM), the ability to cognitively model the mental states of others. The SSQ was developed for use in neurotypical adults, as a more subtle alternative to the Faux-Pas Test (Baron-Cohen et al., 1999), which was designed for use in children. The SSQ was developed and tested using a sample including both neurotypical and autistic adults.

In the SSQ, participants read ten short stories describing interactions between people. Each story is split into three sections. After each section, participants are asked to indicate whether anything was said that could have upset someone, and, if so, in which line the utterance occurred. Each story section contains either a ‘blatant’ offensive item, a ‘subtle’ offensive item, or no offensive item. In total there are ten sections with a blatant offense, ten sections with a subtle offense, and ten sections with no offense.

Due to the length of the SSQ, five of the ten stories were selected for the current study. Stories 1, 3, 6, 7, and 10 were selected, as together these contain five blatant and five subtle offenses, adhering to the same proportions of blatant and subtle offenses as the full questionnaire. The shortening of the questionnaire means that participants' results in the current study cannot be compared to test norms; however, the intention in the current study was to use the five SSQ stories as a measure in its own right, comparing study participants to each other rather than to the population mean.

2.5.3.3. Questionnaire of Cognitive and Affective Empathy (QCAE)

The QCAE (Reniers et al., 2011) is a self-report questionnaire that measures the construct of empathy, encompassing both (a) cognitive empathy, the ability to mentalize and take the perspectives of others; and (b) affective empathy, the ability to vicariously appreciate the emotional experiences of others. The questionnaire consists of 31 statements (e.g. "I sometimes find it difficult to see things from the 'other guy's' point of view") and participants rate their agreement with each statement on a four-point Likert scale: "strongly agree," "slightly agree," "slightly disagree," or "strongly disagree."

It was developed using a sample of 640 adults, and tested on a separate sample of 318 adults (Reniers et al., 2011). This verified the two-factor structure (i.e. the cognitive and affective subscales) and demonstrated good psychometric properties. There was moderate-to-high internal consistency (Cronbach's alpha of 0.65-0.85), and good convergent validity through high correlations with the affective and cognitive subscales from the Basic Empathy Scale (BES; Jolliffe & Farrington, 2006). Construct validity was demonstrated through positive correlations with measures of empathetic anger, and negative correlations with Machiavellianism and psychopathy.

The QCAE was chosen over other measures of empathy due to the psychometric properties of the scale and the clarity of definitions of cognitive and affective empathy.

2.5.4. Measures of Psychological Distress

2.5.4.1. The PHQ8 (Patient Health Questionnaire 8)

The PHQ8 questionnaire (Kroenke et al., 2009; Shin et al., 2019) is an adapted version of the PHQ9 (Kroenke et al., 2001), a common, brief self-report measure of symptoms of depression, based on the criteria for diagnosing depression from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association [APA], 2000). The PHQ9 is shown to have good reliability and validity (Kroenke et al., 2001). It asks respondents to rate how frequently they have been bothered by particular symptoms/experiences in the past two weeks, by rating each of nine statements on a four-point Likert scale (“not at all,” “several days,” “more than half the days,” or “nearly every day”). The ninth question of the PHQ9 questionnaire asks about suicidal ideation and thoughts of self-harm (“in the past two weeks how often have you had thoughts that you would be better off dead, or of hurting yourself in some way?”). This item is omitted in the PHQ8 questionnaire; all other items in the PHQ8 and PHQ9 are the same.

The PHQ8 is useful in research settings. In research settings it is not always appropriate to ask about suicidal or self-injurious thoughts, as it is difficult to provide adequate intervention if participants disclose these thoughts through telephone or online surveys (Kroenke et al., 2009). Additionally, the highly personal nature of this item may have the potential to be distressing when asked in an online survey, particularly with a sample of older adults who may be less familiar with thinking about their mental and emotional wellbeing due to stigma (Conner et al., 2010). The PHQ8 is used for large-scale surveys of health in the USA (Strine et al., 2008).

Studies have shown that omission of this ninth item has only a minor impact of the scoring of the scale, as it is the least likely item on the PHQ9 to be endorsed by respondents (Kroenke et al., 2009; Kroenke & Spitzer, 2002); therefore, the PHQ8 is scored in the same way as the PHQ9: scores of ≥5, ≥10, ≥15, and ≥20 represent mild, moderate, moderately-severe, and severe levels of depression symptoms, respectively. The PHQ8 is shown to have good reliability (Cronbach's alpha 0.88) and convergent validity (correlation of 0.62 with the Hamilton Depression Rating Scale; Hamilton, 1967), and to be as useful as the PHQ9 for screening for depression (Shin et al., 2019). A cut-off score of ≥10 is suggested to indicate presence of probable depression, with sensitivity of 0.83 and specificity of 0.53 (Shin et al., 2019).

2.5.4.2. *The GAD7 (Generalised Anxiety Disorder 7)*

The GAD7 questionnaire (Spitzer et al., 2006) is a common, brief self-report tool measuring symptoms of generalised anxiety disorder, based on the symptom criteria for generalised anxiety disorder from the DSM-IV (APA, 2000). Similarly to the PHQ8 and PHQ9, the GAD7 asks respondents to indicate how frequently they have been bothered by particular symptoms/experiences in the past two weeks, by rating each of the seven statements on a four-point Likert scale ("not at all," "several days," "more than half the days," or "nearly every day"). Scores of ≥5, ≥10, and ≥15 on the GAD7 represent mild, moderate, and severe levels of anxiety symptoms, respectively (Spitzer et al., 2006).

The GAD7 was developed and tested on a sample of 2739 participants (Spitzer et al., 2006). This showed high internal consistency (Cronbach's alpha of 0.92) and criterion validity (correlation of 0.72 with the Beck Anxiety Inventory; Beck et al., 1988). Construct validity was demonstrated through positive correlations with disability days and physician visits, and negative correlations with health-related quality of life. A threshold of ≥10 is often used to indicate the presence of probable anxiety, with sensitivity of 0.89 and specificity of 0.82 (Spitzer et al., 2006).

2.5.4.3. Loneliness: The De Jong Gierveld Loneliness Scale

Loneliness was measured using The De Jong Gierveld Loneliness Scale (De Jong Gierveld, 1987; De Jong Gierveld & Kamphuls, 1985). This is widely-used measure, considered appropriate for use with older adults (Penning et al., 2014). This 11-item scale consists of statements (e.g. “I miss having a really close friend”) and asks participants to rate how often they agree with each statement, on a five-point Likert scale (“none of the time,” “rarely,” “some of the time,” “often,” or “all of the time”). The scale can be applied in a unidimensional way and can also be divided into the subscales ‘social loneliness’ and ‘emotional loneliness.’ Social loneliness is related to lack of a social network, whereas emotional loneliness is related to lack of close attachments (Russell et al., 1984; Weiss, 1973). Scores of ≥3, ≥9, and 11 represent the categories ‘moderately lonely,’ ‘severely lonely,’ and ‘very severely lonely,’ respectively.

The scale was developed and validated using a sample of 1201 adults (De Jong Gierveld & Kamphuls, 1985), and was designed to conform to a Rasch model (Rasch, 1960), which is thought to have advantages over classical approaches (Boone, 2016). In a sample of 544 adults (De Jong Gierveld, 1987) it was shown to have high internal consistency (Cronbach’s alpha of 0.86) and convergent validity (correlations of 0.66 with self-reported loneliness on a four-point scale).

2.5.4.4. Free-text question: Mood and wellbeing

Participants were asked to write about how the COVID-19 pandemic had affected them, with the free-text question: “Please write in here any other information you can, about how you feel your mood or wellbeing has been impacted as a result of the COVID-19 pandemic and social distancing (write as much or as little as you like).”

2.6. Procedure

Data was collected from 25th September to 30th November 2020. This was during the second wave of the COVID-19 pandemic, with the second national lockdown beginning on November 5th 2020. Participants completed an online survey hosted on the survey platform Qualtrics (https://www.qualtrics.com). The survey included a downloadable participant invitation/information page (Appendix G), and a consent page (Appendix H). Participants were asked to enter their age, and, if they were below 70 years old, were taken to a different page of the survey thanking them for their time and informing them that they were not eligible for the study, thus screening out those who did not meet the age criteria. The survey was estimated to take 45-60 minutes to complete. As mentioned (Section 2.4.2), participants were invited to take breaks, and were informed that they could leave the survey and return to it within two weeks. The virtual recruitment flyer (Appendix I) and participant information page included the researcher's contact details, and participants were invited to contact the researcher if they had any questions. Each page of the survey had a header and footer that also stated this. At the end of the survey, participants were taken to a downloadable debrief page (Appendix F) that reminded participants of how their data would be treated and their right to withdraw their data within three weeks of participation; and gave details of support organisations to utilise if they were experiencing emotional difficulties or were adversely affected in any way by taking part in the survey.

2.7. Participants

Participants were 114 adults, both men and women, aged seventy and above (see below for description of sample).

2.7.1. Recruitment

Participants were recruited through U3A, an organisation dedicated to education, stimulation, and socialising, for individuals in their 'third age' of life (i.e. retirement). Participants were also recruited through word-of-mouth and social media (Facebook and Twitter). A recruitment flyer is shown in Appendix I. Participants were offered the opportunity to be entered into a prize draw to win one of two £50 Amazon vouchers.

2.7.2. Inclusion and Exclusion Criteria

It felt important not to impose too stringent exclusion criteria, since all older adults have been impacted by the COVID-19 pandemic. Velasco (2012) warns against using stringent exclusion criteria, which can decrease sample size and impact the internal validity and external generalisability of the study. Additionally, ethical issues are raised by excluding individuals from research based on demographic or clinical characteristics.

2.7.2.1. Age

Participants were adults aged 70 and over. This age bracket was chosen because, as discussed above (Section 1.3) social distancing guidance in the UK during COVID-19 has been stricter for individuals aged 70 and over than for younger people, and several concerns have been raised for the wellbeing of older adults during the pandemic.

2.7.2.2. Language

The online survey was written in English, therefore it was important that participants had the ability to read and write in English. It was assumed that participants with very low ability to read English would self-exclude, either by not volunteering in the first instance, or when confronted with the rather text-heavy participant information page at the beginning of the survey. The survey asked participants to state their primary language. It was decided that if participants did not state their primary language as English, their free-text questions would be examined: if their writing indicated a low standard of written English (such that the researcher was not able to understand what they had written), their results would be excluded from the analysis, on the basis that, if their written English was of low standard, they were also likely to have difficulty understanding the survey questions and thus their results might be anomalous. All participants who answered the question about language gave their primary language as English. Fifteen participants did not answer the question about primary language. For these participants, their free-text answers indicated a good standard of written English.

2.7.3. Description of Sample

Participants with majority missing data (those who completed only the measures of psychological distress or less) were removed from the analysis.

Regarding the *Living Situation* variable, only one participant was being cared-for (i.e. received care from someone they lived with), therefore it was not possible to look at experiences of cared-for people separately in any statistical analysis. There were seven participants who were carers for someone that they lived with, five of whom provided data on sex, meaning that in any statistical analysis only five people from this group would be represented/included (since analyses were adjusted for age and sex). This small number means that carers also could not be included as a separate group in analyses looking at *Living Situation*.

It did not make sense to collapse the *carers* and *cared-for* participants into the 'Lives with Someone' category of the *Living Situation* variable. Firstly, life is qualitatively different for carers and cared-for participants than for those who live with someone and do not provide or receive care, and these different experiences should not be represented by the same category. Secondly, mean scores on the distress measures were very different for carers and cared-for participants than for others who lived with someone (see Table 1), confirming that these represent distinct experiences. Therefore, the carers and the one cared-for participant were removed from the dataset for the purposes of the current analysis; see Section 4.2.1.1 for more consideration of the rationale for this.

After removal of the participants described above, this left a sample of 114 participants. Participant characteristics are provided in Table 2. The mean age was 75.53 years, minimum = 70, maximum = 93, *SD* = 4.99. Of the people who reported sex, the majority were female (72.8%). Just over half of the sample lived alone (52.6%). The majority of participants identified as White British (85.5%), and all participants who reported primary language gave this as English, with two participants reporting being bilingual with English and another language. Implications of these demographic features are discussed in Section 4.2.1.2.

The sample for the qualitative analysis was slightly different to the sample for the quantitative analysis. Data from 105 participants was included in the content analysis for the question about mood/wellbeing, and data from 91 participants was included in the content analysis for the question about coping.

Table 1

Scores on the Different Measures of Psychological Distress, in Different Living Situations

Measure	Lives Alone (n=60)	Lives with Someone (n=52)	Caregiver (n=7)	Care Receiver [b] (n=1)
Patient Health Questionnaire 8 (PHQ8)	3.78 (4.00)	2.88 (2.93)	6.71 (5.47)	2
Generalised Anxiety Disorder 7 (GAD7)	2.75 (3.71)	2.69 (3.26)	7.00 (5.66)	5
De Jong Gierveld Loneliness Scale	5.25 (3.46)	3.85 (2.90)	8.00 (2.71)	0
Distress Composite Score [a]	25.53 (18.13)	19.93 (14.99)	44.68 (23.08)	10.71

Note. Values are reported as mean (*SD*).
[a] Scores on the three measures of distress were combined into a ‘Distress Composite’ score, see section 3.1 for details.
[b] There is only one participant in this category, therefore these values represent single observations, not mean scores.

Table 2

Participant Demographic Information

Variable	Value N (%)
Sex	
Female	83 (72.8%)
Male	17 (14.9%)
Living Situation	
Live Alone	60 (52.6%)
Live with someone	52 (45.6%)
Ethnicity	
White British	94 (82.5%)
White Irish	4 (3.5%)
White Other	3 (2.6%)
Mixed White & Black African	1 (0.9%)
Primary Language	
English	104 (91.2%)

Note. Missing values: Sex, 14; Living Situation, 2; Ethnicity, 12; Primary Language, 10.

2.8. Data Analysis

2.8.1. Quantitative Data

Quantitative data were analysed using IBM SPSS Statistics (Version 26). Analyses were performed according to the *a priori* hypotheses.

The brief COPE scale has fourteen subscales in the original format. I wanted to produce a smaller number of scales from this data that could more easily be used in statistical analysis, as recommended by Carver et al. (1989). Therefore, an exploratory factor analysis (Principal Axis Factoring with direct oblimin rotations) was performed to investigate whether items loaded onto broader factors. Oblique rotations were chosen because all the items on the COPE scale measure aspects of coping, therefore factors extracted were expected to be distinct but not orthogonal (independent).

Relationships between predictors and outcomes of interest were explored using hierarchical multiple linear regressions. Age and sex were included as covariates in all analyses, to adjust for their effects, since age and sex have theoretical associations with all the variables of interest (see Appendix J). All significance values reported are two-tailed.

2.8.1.1. A priori sample size calculation

Studies often use *a priori* sample size calculations to estimate the sample size required to achieve a certain level of statistical power. It was not possible to conduct sample size calculations for all the relationships tested in this study, since this requires an estimate of effect size (R^2 or f^2) from previous studies. At the time that this study was designed, few studies had investigated these combinations of variables in older adults during the COVID-19 pandemic, and of those that did, not all presented effect sizes. *Post-hoc* power calculations based on sample size and effect sizes from this study are discussed in section 4.2.1.3.

The relationship between coping strategies (measured by the brief COPE) and psychological distress (measured by the PHQ9 and GAD7) during COVID-19 was investigated by Dawson and Golijani-Moghaddam (2020). Using effect sizes reported in this study, sample-size calculations were performed using predictions for multiple linear regressions, using G*Power 3.1.9.4 (Erdfelder et al., 1996; Faul et al., 2007). R^2 values were converted to f^2 values for input into G*Power, using Cohen's (1988) formula: $f^2 = R^2/(1 – R^2)$. This suggested a sample size of at least 41 participants was required to achieve statistical power of 0.8 when investigating the association between coping strategies and distress.

It was not possible to conduct *a priori* sample size calculations for analyses exploring relationships between living situation and distress, level of social contact and distress, or social cognition and distress.

Due to the larger degree of subjectivity involved, calculating the minimum sample size required for an exploratory factor analysis is less straightforward than for a regression analysis (Pearson & Mundfrom, 2010). Authors have proposed varied recommendations of the sample sizes required for the factor loadings in an exploratory factor analysis to approximate the ‘true’ population loadings, with recommended absolute ranges from 100 to 1000 participants (Gorsuch, 1988; Kline, 2014), and recommended participants-to-variables ratios ranging from three to ten participants per variable (Cattell, 1978; Everitt, 1975; Gorsuch, 1988; Nunnally, 1978). Using principles from Mundfrom et al. (2005), it was decided that a minimum sample size of 75-100 should be aimed for.

2.8.2. Qualitative Data

Qualitative data from the free-text items in the survey were analysed using a quantitative content analysis. Quantitative content analysis is described as a way of quantitatively analysing the content of messages and communications, in an objective and systematic way, adhering to scientific method. In a quantitative content analysis, information is coded into categories, and the frequencies of occurrences within each category are counted (Neuendorf, 2017a).

The free-text items in the survey asked participants about their mood/wellbeing, and ways of coping. These items mapped onto the research questions regarding understanding how participants' psychological wellbeing has been impacted by COVID-19 and social distancing, and understanding factors that help people to cope and mitigate negative impact on wellbeing. The content analysis was driven by these questions. Data were examined separately for each of the free-text items, but holding both research questions in mind, so that if, for example, a participant gave information relevant to the *coping* question when answering the *wellbeing* question, this information was included in the content analysis for the *coping* question. Some parts of the responses provided were not included under either analysis due to not relating to either research question.

Answers to the free-text items were read several times before assigning initial codes to individual data items (for a sample of coding see Appendix K). Individual codes were then grouped into higher-order clusters. To enhance reliability, data were coded twice, at two separate time-points three weeks apart, then compared. Codes and clusters developed at each time point were very similar, suggesting that the intra-coder reliability was acceptable (Neuendorf, 2017b).

3. RESULTS

3.1. Exploratory Data Analysis

It was noted that the data distributions (see Appendix L) for the PHQ and GAD7 were positively skewed, which is to be expected in a non-clinical sample. Data distributions for age and for the social contact variables were also positively skewed, which again is expected. There were more female than male participants (17 males, 83 females). The distribution for ANT score was slightly negatively skewed.

The *Emotional Loneliness* and *Social Loneliness* subscales of the De Jong Gierveld Loneliness Scale were highly correlated, Pearson $r(112) = .59$, $p < .001$. Therefore, the Loneliness scale was treated as a whole, rather than treating the subscales separately.

The three distress measures (PHQ8, GAD7, and Loneliness scale) were highly correlated (see Table 3), therefore a single composite measure was created, termed 'Distress Composite.' To achieve equal weighting of each of the three distress measures in the composite score, scores were first converted into percentages; then a mean percentage score for the three measures was computed for each participant.

The three measures of weekly social contact during the COVID-19 pandemic (face-to-face hours, virtual hours, groups hours) were not strongly correlated (see Table 4).

The Cognitive and Affective scales that comprise the QCAE were only moderately correlated, $r(105) = .29$; $p = .003$. Therefore, the QCAE Cognitive and Affective scales were treated separately.

With the exception of the QCAE Cognitive Scale and the QCAE Affective Scale, the measures of social cognition (QCAE Cognitive Scale, QCAE Affective Scale, ANT, and SSQ) were not correlated with one another (see Table 5), suggesting that they measure disparate aspects of social cognition and therefore should be treated separately.

Table 3

Pearson Correlations between Distress Measures

Measure	1.	2.	3.
1. Patient Health Questionnaire 8 (PHQ8)	—		
2. Generalised Anxiety Disorder 7 (GAD7)	0.77**	—	
3. De Jong Gierveld Loneliness Scale	0.43**	0.45**	—

** Significance < .001.

Table 4

Pearson Correlations between Measures of Social Contact (hours) during the COVID-19 pandemic

	1.		**2.**		**3.**	
Measure	**r**	**Sig.**	**r**	**Sig.**	**r**	**Sig.**
1. Face-to-face (hours)	—	—				
2. Virtual (hours)	0.14	.137	—	—		
3. Groups (hours)	0.08	.041	0.14	.145	—	—

Table 5

Pearson Correlations between Social Cognition Measures

	1.		**2.**		**3.**		**4.**	
Measure	***r***	**Sig.**	***r***	**Sig.**	***r***	**Sig.**	***r***	**Sig.**
1. QCAE Cognitive Scale	—	—						
2. QCAE Affective Scale	0.29	.003	—	—				
3. Affect Naming Scale (ANT)	0.08	.438	0.14	.147	—	—		
4. Social Stories Questionnaire (SSQ)	0.10	.333	0.04	.662	0.09	.352	—	—

Abbreviations: QCAE, Questionnaire of Cognitive and Affective Empathy.

3.2. Deriving Subscales from the Brief COPE Scale

Principal Axis Factoring with direct oblimin rotations was performed on the data from the COPE scale, in order to produce a smaller number of subscales, as recommended by Carver et al. (1989).

First, the correlation matrix of COPE items was examined (see Appendix M), and items with high collinearity (correlations greater than 0.7) were removed from the dataset (Field, 2018, p.799). One item from each highly correlated pair was removed. In deciding which item from a correlated pair to remove, the broader item was retained; for example, with the highly correlated items 22 (“I've been trying to find comfort in my religion or spiritual beliefs,” *Religion* subscale) and 27 (“I've been praying or meditating,” *Religion* subscale), item 22 was retained. This led to items 4 (“I've been using alcohol or other drugs to make myself feel better,” *Substance Use* subscale) and 27 (“I've been praying or meditating,” *Religion* subscale) being removed.

To determine the number of factors that could reasonably be drawn from the COPE scale data, a *Parallel Analysis* (Horn, 1965) was performed in SPSS, using published syntax available (O’Connor, 2000). The number of parallel datasets to be examined was set to 1000. Comparison of the raw data eigenvalues with the mean eigenvalue 95th percentiles from the parallel analysis suggested that up to five factors could be drawn from the COPE data (see Appendix N).

Principal Axis Factoring was then performed; however, the determinant value was zero, suggesting that there was still multicollinearity within the dataset. Therefore, the correlation matrix was re-examined, and items with correlations of above 0.6 were also removed. This led to items 14 (“I've been trying to come up with a strategy about what to do,” *Planning* subscale), 15 (“I've been getting comfort and understanding from someone,” *Emotional Support* subscale), and 18 (“I've been making jokes about it,” *Humour* subscale) also being removed from the dataset.

Following this, the *Parallel Analysis* was re-run (see Appendix O). This suggested five factors to keep; however, for the fifth factor, the eigenvalues from the raw data and the parallel analysis 95th percentile were very similar. Given that parallel analyses of adjusted correlation matrices (as with Principal Axis Factoring and other Common Factor Analysis) are thought to suggest more factors than are necessarily warranted (Buja & Eyuboglu, 1992), I decided to run Principal Axis Factoring forcing both five factors and four factors, to compare outputs. Items with factor loadings greater than 0.3 were retained.

When *Principal Axis Factoring* was run forcing a five-factor solution (Appendix P), only two items loaded onto the fifth factor with loadings greater than 0.3, both with moderate negative loadings; however, one of these also loaded more strongly onto a different factor. Additionally, the elbow in the scree plot (see Figure 1) suggested that a four-factor solution was preferable to a five-factor solution, therefore I accepted at the four-factor solution.

Table 6 shows the pattern matrix for the *Principal Axis Factoring* with a four-factor solution. The Kaiser-Meyer-Olkin measure was above the accepted threshold of 0.5 (Kaiser & Rice, 1974), KM0 = 0.69. Items 2, 7, 1, and 25 loaded onto factor 1; items 10, 5, and 23 loaded onto factor 2; items 13, 8, 6, 3, and 26 loaded onto factor 3; and items 17, 12, 24, and 22 loaded onto factor 4. Items 9, 11, 16, 19, 20, 21, and 28 did not have any notable factor loadings (i.e. loadings greater than 0.3), therefore were not included in the final factor solution. This four-factor solution accounted for 32.4% of the common variance among COPE items. The structure matrix (Appendix Q) showed a similar solution.

Factor 1 was termed “Active Coping,” factor 2 “Socially Supported Coping,” factor 3 “Negative Coping,” and factor 4 “Emotion-focused Coping.” As predicted, these factors were not orthogonal. Active Coping was moderately correlated with Socially Supported Coping, $r(112) = .30$, $p = .002$, and with Emotion-focused Coping $r(112) = .42$, $p < .001$. Socially Supported Coping was not correlated with Emotion-focused Coping, and Negative Coping was not correlated with any of the other factors. Pearson correlation coefficients are provided in Table 7.

Figure 1

Scree Plot of Factor Eigenvalues from Data from the COPE Scale (omitting COPE Scale items 4, 27, 14, 15, and 18)

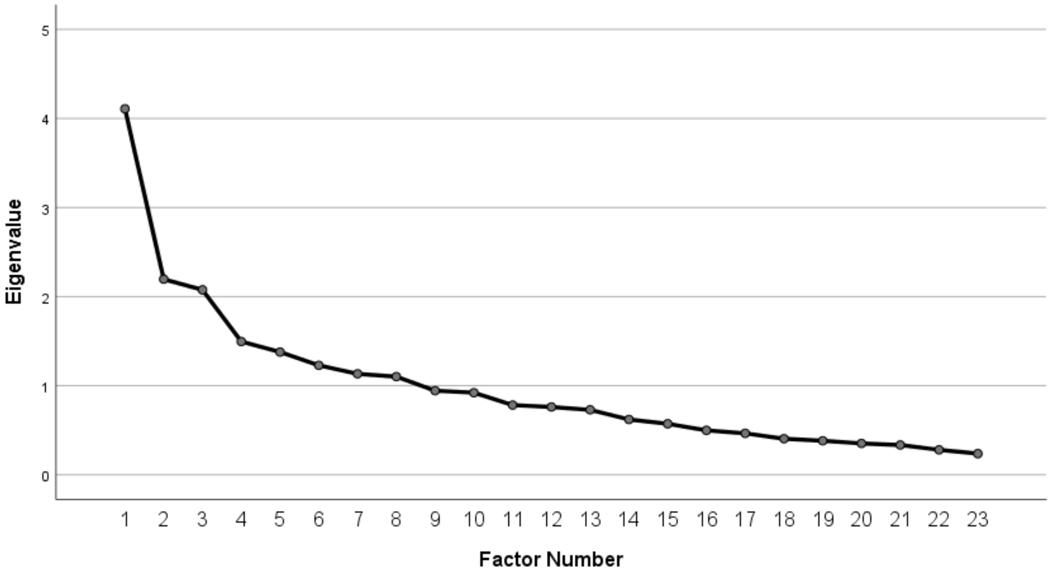


Table 6

Pattern Matrix from Principal Axis Factoring of COPE Scale Data, Four Factor Solution, omitting items 4, 27, 14, 15, and 18

COPE Items			Factor			
Item No.[a]	**Description**	**Original subscale (Carver, 1997)**	**1**	**2**	**3**	**4**
2	"I've been concentrating my efforts on doing something about the situation I'm in."	*Active coping*	0.783			
7	"I've been taking action to try to make the situation better."	*Active coping*	0.726			
1	"I've been turning to work or other activities to take my mind off things."	*Self-distraction*	0.658			
25	"I've been thinking hard about what steps to take."	*Planning*	0.489			0.331
9	"I've been saying things to let my unpleasant feelings escape."	*Venting*				
21	"I've been expressing my negative feelings."	*Venting*				
20	"I've been accepting the reality of the fact that it has happened."	*Acceptance*				
10	"I've been getting help and advice from other people."	*Instrumental support*		0.713		
5	"I've been getting emotional support from others."	*Emotional support*		0.701		
23	"I've been trying to get advice or help from other people about what to do."	*Instrumental support*		0.558		
11	"I've been using alcohol or other drugs to help me get through it."	*Substance use*				
19	"I've been doing something to think about it less, such as watching TV, reading, daydreaming, sleeping, or shopping."	*Self-distraction*				
13	"I've been criticizing myself."	*Self-blame*			0.680	
8	"I've been refusing to believe that it has happened."	*Denial*			0.494	
6	"I've been giving up trying to deal with it."	*Behav. disengagement*			0.421	
3	"I've been saying to myself 'this isn't real'."	*Denial*			0.401	
26	"I've been blaming myself for things that happened."	*Self-blame*			0.327	
16	"I've been giving up the attempt to cope."	*Behav. disengagement*				
17	"I've been looking for something good in what is happening."	*Positive reframing*				0.761
12	"I've been trying to see it in a different light, to make it seem more positive."	*Positive reframing*				0.706
24	"I've been learning to live with it."	*Acceptance*				0.413
22	"I've been trying to find comfort in my religion or spiritual beliefs."	*Religion*				0.398
28	"I've been making fun of the situation."	*Humour*				

[a] Items removed due to collinearity (correlations of >0.6): item 4 ("I've been using alcohol or other drugs to make myself feel better," *Substance Use* subscale), 27 ("I've been praying or meditating," *Religion* subscale), 14 ("I've been trying to come up with a strategy about what to do," *Planning* subscale), 15 ("I've been getting comfort and understanding from someone," *Emotional Support* subscale), 18 ("I've been making jokes about it," *Humour* subscale).

Table 7

Pearson Correlations between Factors Derived from the COPE Scale

	1.		2.		3.		4.	
Factor	***r***	**Sig.**	***r***	**Sig.**	***r***	**Sig.**	***r***	**Sig.**
1. Active Coping	—	—						
2. Socially Supported Coping	.30	.002	—	—				
3. Negative Coping	.06	.545	.02	.813	—	—		
4. Emotion-Focused Coping	.42	.000	.15	.112	-.06	.951	—	—

3.3. Descriptive Statistics

Table 8 displays the mean scores and frequencies on the variables of interest, including measures of distress, weekly estimated social contact (hours), COPE factors, and social cognition measures. Data for these variables separated by sex and by living situation, and including measures of social contact by *number* (as well as by *hours*) are shown in Appendix R.

The mean PHQ8 score was 3.40 out of 24, *SD* = 3.53. Thirty-seven participants (32.5%) met the threshold for mild depression symptoms or above, 7 participants (6.1%) met the threshold for moderate depression symptoms or above, and 2 participants (1.8%) met the threshold for moderately-severe depression. The mean GAD7 score was 2.75 out of 21, *SD* = 3.47. Twenty-seven participants (23.7%) met the threshold for mild symptoms of anxiety or above, 6 participants (5.3%) met the threshold for moderate anxiety symptoms or above, and 3 participants (2.6%) met the threshold for severe anxiety symptoms. Mean loneliness score was 4.68 out of 11, *SD* = 3.32. Seventy-six participants (66.7%) met the threshold for moderate loneliness or above, 19 participants (16.7%) met the threshold for severe loneliness or above, and 6 participants (5.3%) met the threshold for very severe loneliness.

The mean estimated weekly face-to-face social contact during COVID-19 was 4.24 hours, *SD* = 4.89, compared to 10.98 hours per week before COVID-19, *SD* = 9.20, a statistically significant difference, *t*(103) = -8.05, 95% CI [-8.05, -4.90], *p* = .000, *d* = -0.80. The mean estimated weekly virtual social contact during COVID-19 was 4.99 hours, *SD* = 4.50, compared to 3.40 hours per week before COVID-19, *SD* = 3.99, also statistically significant, *t*(101) = 3.22, 95% CI [1.53, 4.80], *p* = 0.002, *d* = 0.32.

The mean QCAE score was 88.97 out of 124, *SD* = 12.51, the mean ANT score was 18.73 out of 24, *SD* = 2.60, and the mean SSQ score was 5.77 out of 10, *SD* = 1.87.

Table 8

Descriptive Statistics: Frequencies and Means for Variables of Interest, Including Distress Measures, Social Contact Measures, COPE Factors, and Social Cognition Measures

Variable	**n**	**Mean**	***SD***
Distress Measures			
PHQ8 (max score 24)	114	3.40	3.53
Mild depression (≥5)	37 (32.5%)	—	—
Moderate depression (≥10)	7 (6.1%)	—	—
Moderately severe depression (≥15)	2 (1.8%)	—	—
Severe depression (≥20)	0 (0%)	—	—
GAD7 (max score 21)	114	2.75	3.47
Mild anxiety (≥5)	27 (23.7%)	—	—
Moderate anxiety (≥10)	6 (5.3%)	—	—
Severe anxiety (≥15)	3 (2.6%)	—	—
DJV Loneliness Scale (max score 11)	114	4.68	3.32
Moderately lonely (≥3)	76 (66.7%)	—	—
Severely lonely (≥9)	19 (16.7%)	—	—
Very severely lonely (11)	6 (5.3%)	—	—
Distress Composite Score (max score 100)	114	23.29	16.99
Social Contact during COVID-19 (weekly estimated)			
Face-to-face (hours)	110	4.24	4.89
Virtual (hours)	108	4.99	4.50
Organised groups (hours)	111	2.41	2.51
Pre-COVID-19 social contact (weekly estimated)			
Face-to-face (hours)	105	10.98	9.20
Virtual (hours)	105	3.40	3.99
Organised groups (hours)	108	5.43	4.20
COPE Factors			
Active coping (max score 16)	114	10.17	3.23
Social support (max score 12)	114	5.45	2.01
Negative coping (max score 20)	114	6.88	2.21
Emotional coping (max score 16)	114	9.28	2.78
Social Cognition			
QCAE cognitive subscale (max score 76)	107	56.70	9.81
QCAE affective subscale (max score 48)	107	32.27	5.43
ANT (max score 24)	105	18.73	2.60
SSQ (max score 10)	104	5.77	1.87

Abbreviations: PHQ8, Physical Health Questionnaire 8; GAD7, Generalised Anxiety Disorder 7, DJV, De Jong Gierveld; QCAE, Questionnaire of Cognitive and Affective Empathy; ANT, Affect Naming Test; SSQ, Social Stories Questionnaire.

3.4. Hypothesis Testing

Analyses were performed according to the *a priori* hypotheses. Hierarchical multiple regressions were performed to investigate the associations between predictors of interest and the *Distress Composite* scores. All analyses were adjusted for age and sex, since age and sex have theoretical associations with all of the variables of interest (see Appendix J). Residuals did not violate the normality assumption of linear regression.

As I was interested in the effects of particular predictor variables (rather than the overall model), I report values for the predictors of interest, and not for the covariates. I report the change in R^2 (ΔR^2) when the predictor of interest is added to the regression model. Where there is just one predictor of interest in a model, I report the unstandardised regression coefficient (B). Where there are multiple predictors of interest in the same model (as with the analyses investigating moderation effects), I also report the standardised coefficients (β) for ease of comparison of the effects of different variables.

3.4.1. Association between Living Situation and Distress

Results showed evidence for a weak, near-significant association between *Living Situation* (*Live Alone vs Live with Someone*) and Distress Composite score, mean difference = -7.37, 95% CI [-14.76, 0.03], p = .051. After adjustment, mean Distress Composite score was 7.37 points lower in participants who live with someone than participants who live alone (Table 9).

Table 9

Regression Analysis showing Association between Living Situation and Distress Composite Score, Adjusted for Age and Sex

n	ΔR^2	Mean Difference (B)[a]	SE of B	95% CI	Sig.
99	.038	-7.37	3.73	[-14.76, 0.03]	.051

[a] Reference group: Live alone.

3.4.2. Associations between Social Contact and Distress

Multiple linear regression addressed the association between the different measures of social contact and Distress Composite score. Results (Table 10) showed an association between hours of weekly face-to-face social contact and Distress Composite score, coefficient = -0.95, 95% CI [-1.66, -0.23], *p* = .010, such that with each 1-hour increase in weekly face-to-face socialising, the conditional mean Distress Composite score decreases by 0.95. Virtual social contact and organised groups were each not associated with Distress Composite score.

These analyses were conducted using a measure of *time* for social contact (hours). Analyses examining the relationship between Distress Composite score and weekly *number* of social contacts showed similar results (provided in Appendix S). Analyses adjusted for pre-COVID levels of social contact also showed similar results (provided in Appendix T).

Table 10

Regression Analyses showing Associations between Different Measures of Social Contact and Distress Composite Score, Adjusted for Age and Sex

Predictor of Interest	n	ΔR²	Coefficient (B)	SE of B	95% CI	Sig.
Face-to-Face contact (hrs)	99	.064	-0.95	0.36	[-1.66, -0.23]	.010
Virtual contact (hrs)	97	.000	-0.05	0.38	[-0.80, 0.71]	.905
Organised groups (hrs)	100	.004	-0.47	0.72	[-1.90, 0.96]	.517

3.4.3. Moderation Effect of Living Situation on Social Contact.

As well as the effect of social contact on Distress Composite score (regardless of living situation), I predicted that *Living Situation* (Live alone vs Live with someone) would moderate the association between social contact and Distress Composite score. To test this, hierarchical multiple regressions were performed with the covariates *Age* and *Sex* entered at block one, the variables of interest (*Social Contact* variable and *Living Situation*) entered at step 2, and the interaction term between the variables of interest entered at step three. To create the interaction term, the continuous *Social Contact* variables were mean-centred, and the binary *Living Situation* variable was centralised by coding groups as -1 and +1. This analysis did not yield any statistically significant interaction terms (Appendix U).

Despite the non-significant interaction terms (Appendix U), the nature of any possible moderation effects was further investigated with follow-up tests, examining the associations between the social contact variables and Distress Composite score in the different *Living Situation* groups, adjusted for age and sex (Table 11).

The association between face-to-face social contact and Distress Composite score was stronger for people who live with someone, coefficient = -1.76, 95% CI = [-2.75, -0.76], *p* = .001, than for people who live alone, coefficient = -0.58, 95% CI = [-1.61, 0.44], *p* = .258. In the *Live with Someone* group, for each 1-hour increase in face-to-face social contact, conditional mean Distress Composite score decreased by 1.76 (a relationship that was statistically significant), whereas in the *Live Alone* group this relationship was weaker and did not reach statistical significance.

Figure 2 shows the predicted Distress Composite scores at different levels of weekly face-to-face social contact (hours), from the regression models in the different *Living Situation* groups. Graphs were created using syntax generated by the *PROCESS* Macro for SPSS (Hayes, 2017).

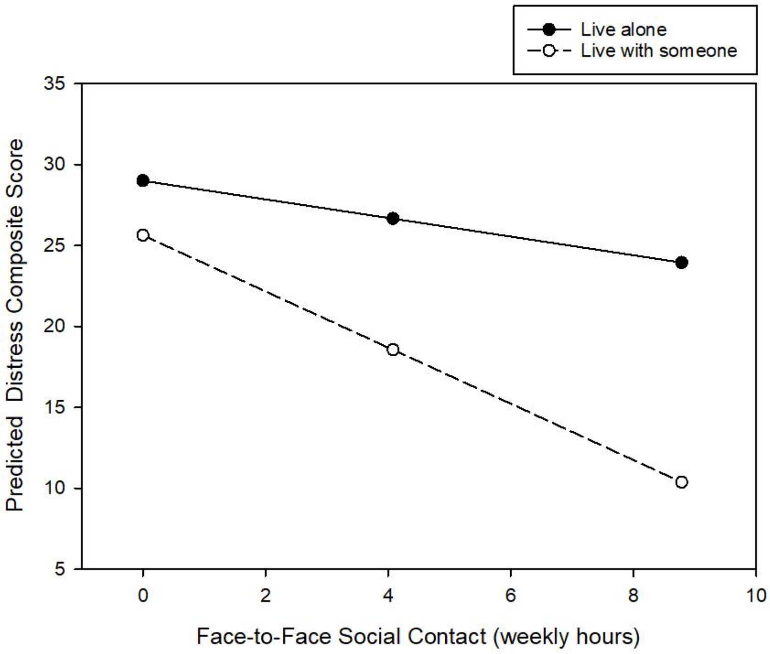
Table 11

Regression Analyses showing Relationships between Social Contact and Distress Composite Score in Different Living Situation Groups

Social Contact Measure	Living Situation	n	ΔR²	B	SE of B	95% CI	Sig.
Face-to-face contact (hrs)							
	Alone	51	.025	-0.58	0.51	[-1.61, 0.44]	.258
	With Someone	47	.214	-1.76	0.49	[-2.75, -0.76]	.001
Virtual contact (hrs)							
	Alone	49	.007	0.32	0.54	[-0.78, 1.41]	.564
	With Someone	47	.044	-0.86	0.59	[-2.05, 0.33]	.153
Organised groups (hrs)							
	Alone	52	.005	-0.64	1.30	[-3.24, 1.97]	.626
	With Someone	47	.000	0.00	0.82	[-1.64, 1.65]	.997

Figure 2

Predicted Distress Composite Scores from Face-to-Face Social Contact (weekly hours), from Regression Models by Living Situation



3.4.4. Associations between Coping Strategies and Distress

Multiple linear regressions, adjusted for covariates age and sex (Table 12), showed evidence for an association between the *Negative Coping* COPE factor and Distress Composite score, coefficient = 5.36, 95% CI [3.93, 6.80], *p* < .001. For each one-point increase in Negative Coping, conditional Distress Composite score increased by 5.36. There was no evidence for associations between the other three factors (Active Coping, Socially Supported Coping, Emotion-Focused Coping) and Distress Composite score.

Table 12

Regression Analyses showing Associations between COPE Factors and Distress Composite Score, Adjusted for Age and Sex

Second-Order COPE Factor	n	ΔR^2	Coefficient (B)	SE of B	95% CI	Sig.
Active Coping	100	.003	-0.32	0.56	[-1.44, 0.80]	.574
Socially Supported Coping	100	.007	-0.71	0.85	[-2.39, 0.98]	.409
Negative Coping	100	.349	5.36	0.73	[3.93, 6.80]	.000
Emotion-Focused Coping	100	.024	-0.99	0.63	[-2.24, 0.27]	.123

3.4.5. Associations between Social Cognition and Distress

Multiple linear regressions, adjusted for covariates age and sex (Table 13), showed evidence for a weak association between QCAE Cognitive Scale score and Distress Composite score, coefficient = -0.38, 95% CI [-0.75, -0.00], *p* = .049. For each 1-point increase in QCAE Cognitive Scale score, Distress Composite score decreased by 0.38. There was also an association between SSQ score and Distress Composite score, coefficient = -1.99, 95% CI [-3.81, 0.17], *p* = .033, such that for every 1-point increase in SSQ score, Distress Composite score decreased by 1.99. There was no evidence for associations between QCAE Affective Scale score and Distress Composite score, or between ANT score and Distress Composite score.

Table 13

Regression Analyses showing Associations between Social Cognition Measures and Distress Composite Score, Adjusted for Age and Sex

Social Cognition Measure	n	ΔR²	Coefficient (B)	SE of B	95% CI	Sig.
QCAE Cognitive	100	.038	-0.38	0.19	[-0.75, -0.00]	.049
QCAE Affective	100	.003	0.19	0.33	[-0.47, 0.84]	.575
ANT	100	.001	-0.18	0.71	[-1.60, 1.23]	.795
SSQ	100	.045	-1.99	0.92	[-3.81, -0.17]	.033

3.4.6. Moderation Effect of Social Cognition on Social Contact.

It was hypothesised that social cognitive ability would moderate the association between social contact and Distress Composite score, such that social contact would have a stronger negative relationship with Distress Composite score in those with higher social-cognitive ability.

To test this, hierarchical multiple regression analyses were performed with the covariates *age* and *sex* entered at block one, the variables of interest (*Social Cognition* and *Social Contact*) entered at step 2, and the interaction term between the variables of interest entered at step three. To create interaction terms, variables were mean-centred. Results showed that the interaction term between face-to-face social contact and *QCAE Affective Scale* score was statistically significant, coefficient = 0.19, 95% CI [0.03, 0.35], *p* = .022, ΔR² = .048. There was also a weak, non-statistically-significant interaction between attendance of organised online groups and *QCAE Cognitive Scale* score, coefficient = -0.11, 95% CI [-0.23, 0.01], *p* = .061, ΔR² = .034. None of the other combinations of *Social Cognition* measures and *Social Contact* measures showed notable interaction effects (see Table V1, Appendix V).

Follow-up analyses (Table V2, Appendix V) tested the strength of the relationship between measures of social contact and Distress Composite score, at different levels of the social cognition variables. These were conducted using the *PROCESS* Macro for SPSS (Hayes, 2017). Note that the PROCESS Macro does not give estimates of effect size (i.e. *ΔR²*). These showed that the relationship between face-to-face social contact and Distress Composite score was stronger in participants with lower QCAE Affective Scale scores, coefficient = -2.53, 95% CI [-3.73, -0.98], *p* = .001, than in participants with higher QCAE Affective scores, coefficient = -0.32, 95% CI [-1.21, 0.58], *p* = .485 (see Figure V1, Appendix V). The negative relationship between attending organised online groups and Distress Composite score was stronger in participants with higher QCAE Cognitive Scale scores, coefficient = -2.48, 95% CI [-4.68, -0.27], *p* = .028, than in those with lower QCAE cognitive scores, coefficient = -0.27, 95% CI [-1.83, 1.30], *p* = .738 (see Figure V2, Appendix V).

3.5. Qualitative Data

3.5.1. Participants

Free-text data from 105 participants was included in the content analysis for the question about *wellbeing*, and data from 91 participants was included in the content analysis for the question about *coping*.

3.5.2. Content Analysis

Results of the content analysis examining *impact on wellbeing* are displayed in Table 14, and results for the content analysis examining *ways of coping* are displayed in Table 15. Examples of texts allocated under each category are provided in Appendix K.

Table 14

Content Analysis of Free-Text Answers to the Question: "Please write… about how you feel your mood or well-being has been impacted as a result of the COVID-19 pandemic and social distancing"

Category	Subcategory	*Sub-subcategory*	**N (n = 105)**	**%**
Missing Things			**57**	**54.3**
	Missing Activities		43	41.0
		Non-specific mentions of missing activities	*18*	*17.1*
		Missing classes/societies/organised groups	*9*	*8.6*
		Missing exercise	*7*	*6.7*
		Missing holidays and special occasions	*6*	*5.7*
		Missing theatre/cinema/concerts/galleries	*6*	*5.7*
		Missing going to cafes/restaurants	*6*	*5.7*
		Missing spontaneity	*5*	*4.8*
		Missing volunteering	*3*	*2.9*
	Missing Socialising		36	34.3
		Missing family	*16*	*15.2*
		Missing friends	*13*	*12.4*
		Non-specific mentions of missing socialising	*12*	*11.4*
		Missing meeting in larger groups	*4*	*3.8*
		Missing physical contact	*3*	*2.9*
		Virtual contact not the same as face-to-face	*3*	*2.9*
Wellbeing Negatives			**43**	**41.0**
	Anxiety		21	20.0
		Anxious about COVID (for self and others)	*16*	*15.2*
		Physical symptoms of anxiety	*5*	*4.8*
		General mentions of anxiety	*2*	*1.9*
	Low mood/ helplessness		9	8.6
	Concern for world in general		9	8.6
	Loneliness		6	5.7
	Frustration/annoyance		6	5.7
	Low motivation		4	3.8
	boredom		4	3.8
	Non-specific mentions of difficulty		3	2.9
Wellbeing Positives			**22**	**21.0**
	Wellbeing not worse/ coping well		19	18.1
	Less anxious about non-COVID-19 things		2	1.9
Stressors			**32**	**30.5**
	Directly related to COVID-19		12	11.4
		Uncertainty	*6*	*5.7*
		No end in sight	*5*	*4.8*
		Masks	*3*	*2.9*
	Indirectly related to COVID-19		24	22.9
		Pre-COVID-19 bereavement	*7*	*6.7*
		Practicalities of social distancing	*6*	*5.7*
		Governmental incompetence	*5*	*4.8*
		Conscious of age	*4*	*3.8*
		People not obeying the rules	*3*	*2.9*
		Caring responsibilities	*2*	*1.9*
Positives/ things that help			**24**	**22.9**
	More time		15	14.3
	Impact of good weather		11	10.5
	Comfortable being alone		4	3.8

Table 15

Content Analysis of Free-Text Answers to the Question: "Please write… about things that you have been doing to cope during the COVID-19 period"

Category	Subcategory	*Sub-subcategory*	**N (n = 91)**	**%**
Hobbies/Pastimes/Interests			**73**	**80.2**
	Gardening		27	29.7
	Reading		17	18.7
	Virtual groups/ classes		15	16.5
	Keeping busy/ structure/ routine		14	15.4
	Arts and crafts		14	15.4
	Food and cooking		10	11.0
	Being outdoors/ appreciating nature		10	11.0
	TV		9	9.9
	Crosswords/puzzles/board games		8	8.8
	Trying new things		7	7.7
	Days out/ trips away		6	6.6
	Surfing the internet		5	5.5
	Writing		4	4.4
	Listening to music		4	4.4
	Relaxing		4	4.4
	Pets		3	3.3
	Life story and family history		3	3.3
	Playing piano		2	2.2
Social Contact			**52**	**57.1**
	In-person contact		23	25.3
	Telephone calls		15	16.5
	Video calls		15	16.5
	Non-specific mentions		9	9.9
	Supporting others		8	8.8
	Email		6	6.6
	Text messaging		5	5.5
	Support from others		3	3.3
	Social media		3	3.3
	Getting to know neighbours		2	2.2
	Letters		28	30.8
Exercise			**42**	**46.2**
	Walking		29	31.9
	Non-specific mentions		9	9.9
	Exercise classes		9	9.9
		Virtual	*8*	*8.8*
		In-person	*1*	*1.1*
	Cycling		2	2.2
	Tennis		1	1.1
	Swimming		1	1.1
Jobs/Tasks			**33**	**36.3**
	Organising & home improvement		25	27.5
	Working/ Volunteering		11	12.1
Emotional and Cognitive Strategies			**20**	**22.0**
	Thinking of the positives		11	12.1
	Acceptance and adjustment		3	3.3
	Patience		3	3.3
	Religion		3	3.3
	Reassessing priorities		2	2.2

For the question examining *impact on wellbeing*, just over half the sample (54%) mentioned things that they were missing as a result of COVID-19 which were significant for their mood. Examples included attending classes and groups, exercise, holidays and other special occasions, going to the theatre and cinema, cafes and restaurants, and volunteering. As well as mentioning specific activities, some participants also mentioned the lack of spontaneity that came with lockdown. Just over a third of participants (34%) discussed missing socialising, including mentioning friends, family, and larger groups. Some participants noted missing physical contact, for example, touch and hugs, or that virtual contact was not the same.

A large minority of participants (41%) explicitly discussed the negative impact on their wellbeing, mentioning issues including anxiety, low mood, concern for the world, loneliness, frustration, low motivation, and boredom. Also, around a third of participants (30%) discussed various specific stressors brought about by COVID-19, including uncertainty and not knowing when the pandemic would end, mask-wearing, other people not following social distancing guidance, practical tasks such as online shopping, distrust of the government, and caring responsibilities. People also mentioned that social distancing made it harder to use their pre-existing coping strategies to cope with difficulties such as bereavements that occurred prior to the pandemic, and some discussed feeling aware of their age and concerned that they would not live long enough to see the end of the pandemic.

Interestingly, around a fifth of participants (21%) mentioned that the pandemic had not had a strong deleterious impact on their wellbeing, and had even had some positive effects. Almost a quarter (23%) wrote about things that helped their wellbeing during the pandemic, including having more time to do other things (since the pandemic made it impossible to do many of the things that people were doing prior to the pandemic, thus freeing up time), and when the weather was nice. Some participants also mentioned that they felt the pandemic impacted them less because they felt comfortable spending time on their own.

For the question examining *ways of coping,* the majority of participants (80%) mentioned various hobbies and interests, which included: gardening; reading;

virtual groups and classes; arts and crafts; cooking; television; crosswords, puzzles, and board games; surfing the internet; writing; and listening to and playing music. Several discussed the importance of having a routine and keeping busy, as well as spending time outdoors and having days out. As well as engaging in pastimes, over a third of participants (36%) mentioned doing other jobs and tasks, including organising things around the home, and working/ volunteering.

Over half of participants (57%) discussed the importance of social contact. People mentioned various modes of social contact, with the largest number (25%) discussing in-person social contact. Other modes of social contact mentioned were telephone and video calls, emails, text-messaging and social media. Some people also mentioned that they had been helping to support people, or had been receiving emotional or practical support from others.

Almost half of participants (46%) also discussed the protective effect of exercise. The majority of these people (32%) mentioned walking, followed by exercise classes (10%). Other modes of exercise mentioned included cycling, tennis, and swimming.

As well as the activities discussed above, around a fifth of participants (22%) mentioned cognitive or emotional coping strategies. The majority of these (12%) involved thinking of the positives and trying to make the most of the situation, for example *"I am trying to use the time positively"* (participant 8), *"I go along with how things are and make the most of things*" (participant 45). Other participants mentioned acceptance of the situation, adjusting their priorities, having patience, and religion as a source of comfort.

4. DISCUSSION

This study aimed to investigate factors associated with psychological distress (here referring to symptoms of depression, symptoms of anxiety, and loneliness; as measured in this study) in older adults during the COVID-19 pandemic. Specifically, this study investigated the effects of social contact (including whether people lived alone or with others, and amount of contact with people from outside of the household), coping strategies, and social cognition. Results showed that people who lived alone had higher levels of distress than those who lived with someone else (who were not caregivers for the person they lived with). Higher weekly face-to-face social contact with people from outside of one's household was associated with lower levels of distress, and this relationship varied according to living situation: the relationship between face-to-face social contact and distress was significant in participants who lived with someone, but not in participants who lived alone.

Virtual social contact (i.e. via telephone or video calls) and attendance of organised online groups were not associated with distress. In this sample, coping strategies were divided into four latent factors: *Active Coping, Socially Supported Coping, Negative Coping,* and *Emotion-Focused Coping*. Use of strategies included in the *Negative Coping* factor were associated with higher distress levels, whereas *Active Coping, Socially Supported Coping,* and *Emotion-Focused Coping* were not associated with distress. Higher scores on two of the measures of social cognition, the SSQ and QCAE Cognitive Scale, were associated with lower distress. Affective empathy (measured by the QCAE Affective Scale) appeared to moderate the relationship between face-to-face social contact and distress, and cognitive empathy (measured by the QCAE Cognitive Scale) appeared to moderate the relationship between attendance of online groups and distress. Interpretations and implications of these results are discussed.

4.1. Interpretation of Results

4.1.1. Overall Distress and Wellbeing

4.1.1.1. Self-reported symptoms

Regarding symptoms of depression, 6% of participants met the caseness cut-off for ‘moderate depression’ (PHQ8 score of ≥10). For anxiety, 5% of participants met the caseness cut-off for ‘moderate anxiety’ (GAD7 score of ≥10). These values are similar to the levels of depression and anxiety reported by other studies of UK older adults in the UK during the COVID-19 pandemic, using the same measuring instruments (Giebel, Lord, et al., 2021; Jia et al., 2020) However, it is important to remember that these thresholds are somewhat arbitrary and may not reflect clinical or diagnostic levels of distress.

4.1.1.2. Qualitative data: Wellbeing

Participants were asked to write about the impact of the pandemic on their mood and wellbeing in the free-text sections of the survey. Analysis of responses suggested that answers grouped into five key categories: missing things, wellbeing negatives, wellbeing positives, stressors, and positives/things that help. Over half of participants wrote about *missing things*, including various activities, exercise, and socialising, as well as missing being able to do things as spontaneously as they could do before the pandemic. Several participants wrote that they felt that virtual social contact was not the same as face-to-face.

A large minority talked about the negative impact of the pandemic on their wellbeing, explicitly mentioning particular negative psychological states. Of these, anxiety was the most commonly mentioned, followed by ‘feeling low’ or ‘helpless,’ then by a sense of general concern for the world. Things that participants said made the pandemic more difficult included: the uncertainty of not knowing what will happen and the ongoing nature of the pandemic; the practicalities of daily living during the pandemic, e.g. arranging shopping online; lack of guidance from the government; and caring responsibilities. A few participants mentioned that they found masks uncomfortable to wear and this caused them to go out less, and others said it was stressful going outside due to other people not obeying social distancing guidance. Several people said that bereavement prior to COVID-19 had made the pandemic much harder, due to feeling even more lonely; and moreover the pandemic made bereavement more difficult due to the lack of available activities and social support. People also reflected on their age, for example feeling that they might not live long enough to see the end of the pandemic, and that their remaining time was being “frittered away.”

Perhaps surprisingly, participants also reported that the pandemic had some positive effects. Around one fifth of participants wrote that they were coping well, or at least that the pandemic had not caused their wellbeing to get worse. Several mentioned that the pandemic had given them more time to focus on things that they would ordinarily not have had time for. Several also mentioned the positive impact of good weather, and some were concerned about what would happen in the winter when the weather was poor, as this would make it harder to spend time outdoors.

4.1.2. Impact of Living Situation

As expected, Living Situation was (weakly) associated with distress levels. Participants who lived with someone (who were not caregivers for the person they lived with) reported lower levels of distress than participants who lived alone, a finding which approached statistical significance.

This is consistent with literature suggesting that wellbeing and mental health are generally better in people who cohabit with a partner, both before the COVID-19 pandemic (De Jong Gierveld et al., 2012; Tamminen et al., 2019; Theeke, 2009) and during the pandemic (Ferreira et al., 2021; Groarke et al., 2020; Jia et al., 2020; L. Z. Li & Wang, 2020; Okely et al., 2021; Pierce et al., 2020).

Due to the small number of caregivers and care-receivers in the sample, it was not possible to include these participants in the statistical analysis. However, the descriptive statistics (Table 1 and Appendix R) showed that carers appeared to experience higher levels of distress (low mood, anxiety, and loneliness) than other participants. This is consistent with research both during the pandemic (E. Y. Y. Chan et al., 2020; Giebel, Lord, et al., 2021; Giebel, Pulford, et al., 2021; Tsapanou et al., 2021) and before the pandemic (Adelman et al., 2014; García-Alberca et al., 2011; Litwin & Stoeckel, 2013; Pinquart & Sörensen, 2003).

4.1.3. Impact of Social Contact

In the current study, face-to-face social contact with people from outside of the household was negatively related to distress; that is, spending more time socialising with people in-person each week was associated with lower levels of overall distress. Interestingly, virtual social contact, including telephone/video calls and attending online groups and classes, was not associated with distress levels, suggesting that participants in this study received some benefit from face-to-face contact that they did not get from virtual social contact. This is consistent with the qualitative data on wellbeing, where a few participants said that socialising or attending classes virtually was not the same as doing things in-person. This is also consistent with results from Giebel, Hanna, et al. (2021), where carers and people with dementia discussed that adapted online services were unsuitable and lower-quality than face-to-face services and contact. These findings are also in line with results from before the pandemic, which report that in-person social contact is associated with reduced risk of depression, whereas telephone contact is not (Teo et al., 2015). Additionally, pre-pandemic studies provided little evidence that video-call interventions were effective in reducing loneliness and depression (Noone et al., 2020; Williams et al., 2021).

This suggests that there is something qualitatively different about speaking to people in-person, compared to socialising virtually. Another possibility is that it is not that face-to-face social contact is *qualitatively* different *per se*, but that face-to-face social contact is more likely to involve additional activities that may positively affect mood. For example, during the pandemic, face-to-face social contact may involve leaving the house and going for a walk. The relationships here may also be bi-directional; as well as face-to-face social contact and leaving the house having a positive impact on mood, it may be that those who already have better wellbeing are more likely to be able to leave their houses and see people face-to-face.

This is not to say that virtual social contact is not helpful: in a large sample of over 70,000 participants, Sommerlad et al. (2021) reported that daily virtual social contact (telephone and video) was associated with improved mood. Nevertheless, even in that study, the relationship between virtual social contact and mood was weaker than the relationship between face-to-face contact and mood.

This also does not mean that virtual interventions cannot be helpful for supporting older adults during the COVID-19 pandemic. More research is needed on the impact of virtual interventions on mood during the pandemic; as the studies cited above (Noone et al., 2020; Williams et al., 2021), which report that virtual interventions have limited effectiveness, were conducted prior to the pandemic and focus mostly on loneliness and social isolation. Whilst it is possible that virtual interventions may not result in large changes to loneliness and isolation, there may be other beneficial effects. For example, studies have shown that telephone and online therapy is an effective alternative to face-to-face therapy for difficulties such as depression (Irvine et al., 2020; Nigatu Haregu et al., 2015).

The current study also found that levels of pre-pandemic social contact did not alter the relationship between during-pandemic social contact and distress. This is in contrast to other studies, for example, Dahlberg (2021) posed the idea that people who are more socially active pre-pandemic might experience more loneliness during the pandemic; and Sommerlad et al. (2021) reported that, during the pandemic, there was a stronger relationship between social contact and mood in people who were more socially active prior to the pandemic (i.e. people who socialised more pre-pandemic were more likely to experience symptoms of depression when social contact was restricted during the pandemic). However, in the current study it seems that a person’s current level of social contact was more relevant to their current mood than prior levels of social contact or the change in social contact resulting due to the pandemic. One possible reason is that the current survey was conducted in October-November 2021, later on in the pandemic than the study by Sommerlad et al. (2021) which collected data from March-August 2020. Therefore, perhaps changes in social contact from pre-pandemic to during-pandemic may have had more of an impact on mood towards the beginning of the pandemic, and by the time the current study was conducted people may have adjusted more to their current situations, meaning that pre-pandemic levels of social contact were less relevant to their mood.

The current study focused mainly on social contact as measured by time (weekly hours). *Number* of weekly social contacts were also recorded, and the results of parallel statistical analyses are recorded in the appendices. There was little difference between the effects of the *time* versus *number* measures of social contact. The rationale for focusing on the *time* measures of social contact was the 'naïve theory' that, as an example, an hour-long conversation and a five-minute conversation would likely have different value; however, these differences are lost when social contact is measured as *number* of contacts.

4.1.4. Impact of Living Situation on the Relationship between Social Contact and Distress

A discussed, this study found a negative relationship between face-to-face social contact with people from outside of the household and distress. This relationship varied depending on living situation: the relationship was significant in participants who lived with someone, whereas there was no evidence for a relationship between face-to-face social contact and distress in those who lived alone.

This effect was in the opposite direction to hypothesised: it was hypothesised that there would be a stronger negative relationship between social contact and distress in people who lived alone, than in people who lived with others. The hypothesis was based on the idea that people who lived alone would benefit more from social contact (and suffer more from lack of social contact) than those who lived with someone and therefore already had frequent social contact with the person with whom they lived. However, this was not the case, as results suggest that face-to-face social contact is not associated with distress levels in people who live alone.

Explanations for this could be that some people who live alone are less sociable, i.e. that these are people who live alone by choice or have become more used to not being around people, and as such social contact might be less important for the wellbeing of people who live alone. Conversely, some people who live with others may be more sociable, such that social contact with people from outside the household is more associated with distress and wellbeing. A different explanation could be that, since those who live alone reported higher levels of psychological distress, it might be more difficult for social contact to exert positive influence upon mood. This is something that future studies will need to investigate further. It is also important to note that participants who lived alone reported more diverse scores on measures of distress and face-to-face social contact (as shown in scatterplots in Appendix W), which may account for the lack of a statistically significant relationship in participants who lived alone. This is something that future studies will need to investigate further.

4.1.5. Impact of Coping Strategies

4.1.5.1. Factor analysis of brief COPE

To investigate the impact of coping strategies on distress, Exploratory Factor Analysis (EFA) was first performed on data from the brief COPE scale (Carver, 1997) to see how items from Carver's (1997) original 14 subscales loaded onto broader latent factors. This revealed four latent factors. The first factor, *Active Coping*, included items from the 'active coping,' 'self-distraction,' and 'planning' subscales of the brief COPE. The second factor, *Socially Supported Coping*, included items from the 'instrumental support' and 'emotional support' subscales. The third factor, *Negative Coping*, included items from the 'self-blame,' 'denial,' and 'behavioural disengagement' subscales. Finally, the fourth factor, *Emotion-Focused Coping,* included items from the 'positive reframing,' 'acceptance,' and 'religion' subscales. None of the items from the original subscales of 'humour,' 'substance use,' or 'venting' loaded substantially onto any latent factors.

The factor solution derived from EFA should be interpreted as one of several possible solutions, rather than as an absolute (Darlington, 1997; Pearson &

Mundfrom, 2010). Nonetheless, the similarity of the current four-factor solution to factor solutions derived from the COPE scale by other authors (Baumstarck et al., 2017; Carver et al., 1989; Litman, 2006; see Section 1.7.2) gives validity to this structure of the COPE scale.

One key difference between the factor solution in the current study, and the factor solutions derived by Carver et al. (1989), Litman (2006), and Baumstarck et al. (2017), is in the *problem-focused/problem-solving* factors from the aforementioned authors, versus the *Active Coping* factor in the current study. The *problem-focused/problem-solving* factors from the above authors include items from the ‘active coping’ and ‘planning’ subscales, as well as the ‘suppression of competing activities’ subscale (part of the long-form COPE scale, not included in the brief version), suggesting that strategies that form this factor focus on attempts to alter the stressful situation. The *Active Coping* factor in the current study includes items from the ‘active coping’ and ‘planning’ subscales, but also includes self-distraction. It makes sense that, in the context of COVID-19, the most ‘active’ factor would include non-problem-focused activities such as distraction, as there is little that can be changed about the situation of the pandemic itself; however, people can still take an active approach to coping and alter their own individual situations, for example by spending time on other meaningful activities.

Several items from the brief COPE scale were not included in the final four-factor solution, some because they were removed from the dataset due to high correlations with another item (making them unsuitable for factor analysis), and others because they did not load substantially onto any of the four factors. It is important to note that, just because an item doesn’t load substantially onto any latent factors, this does not mean that the item is not useful or important. For example, a non-loading item might represent a separate construct (Osborne et al., 2005). However, given the similarity to other factor solutions derived from the COPE scale, and that the hypothesis in the current study was specifically around testing the effects of different, broader, ways of coping, the four-factor solution in the current study represents the optimal approach.

4.1.5.2. *Associations with distress*

The *Negative Coping* factor was associated with psychological distress: people who used more of the strategies in this factor (including self-blame, denial, and behavioural disengagement) reported higher levels of distress. This is to be expected, since things like self-blame and behavioural disengagement are features of depression (Dickson et al., 2016; C. Peterson et al., 1981). Interestingly, the more ‘positive’ aspects of coping, measured in the *Active Coping*, *Socially Supported Coping*, and *Emotion-Focused Coping* factors, were not associated with distress.

Whilst literature has suggested links between active coping strategies and improved wellbeing, this relationship appears weaker than the relationship between passive/avoidant coping and distress (S. E. Taylor & Stanton, 2007), therefore the result in the current study, that *Active Coping* was not associated with distress, is in line with previous research. S. E. Taylor and Stanton (2007) suggest that this is because ‘active coping’ constructs usually include problem-focused items, and problem-focused coping is only really effective when the situation is amenable to change. In the context of the COVID-19 pandemic, it follows that this approach would not necessarily be helpful for wellbeing. Zacher and Rudolph (2021) measured coping strategies during the COVID-19 pandemic and reported differing effects of emotional social support and instrumental social support: emotional social support was associated with higher positive affect, whereas instrumental support was associated with increased life satisfaction but higher negative affect. Therefore, the fact that emotional and instrumental social support are both included in the *Socially Supported Coping* factor in the current study, may mean that their differential effects ‘cancel’ each other out.

4.1.5.3. *Qualitative data: Coping*

The majority of participants talked about having hobbies and interests that helped them to cope with the pandemic. Others talked about filling their time with tasks such as organising the home, working, and volunteering; and some talked explicitly about the importance of keeping busy and having a routine.

Over half the participants talked about the importance of maintaining social contact, both in-person and virtually. Just under half talked about the importance of various types of exercise (mainly walking) for their mood and wellbeing. In addition to these behavioural strategies, around a fifth of participants talked about some form of cognitive or emotional strategies, which included thinking of the positives, acceptance of the situation, having patience, gaining comfort from religion, and re-framing their priorities.

4.1.6. Impact of Social Cognition

This study suggests a negative relationship between certain elements of social cognition and distress: participants with higher ToM and cognitive empathy (measured by the SSQ and QCAE Cognitive Scale, respectively) reported lower levels of psychological distress.

This result is contrary to expected, as it was hypothesised that people with higher social cognitive ability might be people with greater motivation or propensity to socialise (Lecce et al., 2017, 2019); and therefore would experience greater distress as a result of social distancing measures (section 1.8.2, section 1.8.4).

To my knowledge, this is the first evidence of direct associations between social cognition and distress in older adults during the COVID-19 pandemic, and is consistent with pre-pandemic studies which report that social cognition, particularly perspective-taking (cognitive empathy) and ToM, are associated with better mood (H. S. Lee et al., 2001; Tully et al., 2016; Zhu et al., 2018). Therefore, this result suggests that even when social contact is restricted, ToM and cognitive empathy are protective factors for wellbeing.

There are good theoretical reasons why this would be the case. ToM and cognitive empathy both refer to the ability to understand the cognitions and take the perspectives of other people. In Cognitive Therapy, taking alternative perspectives is a key facet of ‘cognitive restructuring’ or ‘positive reframing’ (D. A. Clark, 2013), an important factor in helping people to cope with difficult situations and emotions. Perhaps participants with better ToM and cognitive empathy may be able to use this perspective-taking ability to reframe negative thoughts and find meaning in difficult situations. The ability to take perspectives other than one's own also suggests a degree of cognitive flexibility, which is shown to be protective for wellbeing and adapting to new situations (Ionescu, 2012; Nadler et al., 2010).

4.1.7. Moderation of the effect of Social Contact by Social Cognition

It was hypothesised that, since social cognition may represent a person's propensity to socialise, social cognition would moderate the relationship between social contact and distress, such that there would be a stronger relationship between social contact and distress in those with better social cognition. This hypothesis is in line with the finding by Sommerlad et al. (2021), who reported that the relationship between social contact and reduced depression was stronger in participants with higher empathic concern and perspective-taking.

The current study yielded mixed results regarding this hypothesis. Affective empathy (measured by the QCAE Affective Scale) appeared to moderate the relationship between face-to-face social contact and distress, but in the opposite direction to expected: there was a stronger negative relationship between face-to-face social contact and distress at lower levels of affective empathy. Cognitive empathy (measured by the QCAE Cognitive Scale score) also appeared to moderate the relationship between attending organised online groups and distress: the negative relationship between attending online groups and distress was stronger in participants with higher cognitive empathy (i.e. this moderation effect was in the direction hypothesised).

However, it is difficult to interpret these effects. There is not consistency between the measures of social cognition that act as moderators, or the measures of social contact that are moderated, and additionally the effect sizes in analyses testing interaction effects are very small. Future studies will need to investigate these associations with larger samples to clarify findings.

4.2. Critical Review

4.2.1. Sample

4.2.1.1. Inclusion and exclusion criteria

This study did not use strict inclusion and exclusion criteria for participants, since all older adults have potentially been impacted by the COVID-19 pandemic. Despite this aim, several participants had to be excluded from the inferential statistics, since there were only seven carers and one care-receiver in the sample recruited, which was not enough to include as a separate category in the analysis.

It did not make sense to collapse carers and the cared-for participant into the 'Lives with Someone' category of the *Living Situation* variable, since life is very different for carers and cared-for people than for others (Giebel, Lord, et al., 2021; Giebel, Pulford, et al., 2021). Additionally, initial descriptive statistics for the distress measures were very different for carers compared to non-carers, suggesting that these categories represent distinct experiences.

There was a question around whether to remove caregivers and the care-receiver from the whole dataset (i.e. for every analysis), or just from the analyses that examined the *Living Situation* variable. It was decided to remove these eight participants from the whole dataset, so that there was consistency of participants in the analyses. Had carers been retained in the other analyses, it would have meant that different datasets were being used to examine different hypotheses, which could have implications for interpretation of results.

Since it seems that carers have fundamentally different experiences to non-carers, including this small number of carers in the analysis would mean that the experiences of this group would be 'buried' in the non-carer data. Instead, I prefer to be explicit about the fact that this study was not able to examine the experiences of carers and care-receivers. Further research needs to attend to the experiences of caregivers and care-receivers during the COVID-19 pandemic. Caregivers and care-receivers are a vulnerable group, and have experienced greater difficulties than non-carers during the COVID-19 pandemic, including the closure of social support services, reduced social interaction, and increased reasons to feel anxious about COVID-19 and physical health (Giebel, Cannon, et al., 2020; Giebel, Hanna, et al., 2021; Giebel, Lord, et al., 2021; Giebel, Pulford, et al., 2021; Hanna et al., 2021).

In order to obtain accurate measures of social cognition, it was important that participants were able to read English sufficiently well, especially for the highly verbal SSQ and QCAE measures. It was decided that, for participants who did not state their primary language as English, their free-text answers on the written section of the survey would be examined, and participants would be excluded if they gave answers that I was not able to understand. This is rather subjective, as written answers were not compared to an external standard or criteria. However, it was not necessary to exclude any participant on the basis of their written English.

This study did not ask participants to state whether they considered themselves to be experiencing a current mental health problem. Perhaps this should have been an exclusion criterion, as the presence of an existing mental health difficulty might confound the interpretation of results. Mental health difficulties are related to social cognitive ability, for example individuals with depression score lower on tests of ToM than non-depressed individuals (Bora & Berk, 2016; Ladegaard et al., 2014). Additionally, it is difficult to know whether participants who scored highly on measures of distress did so due to distress caused by the COVID-19 pandemic, or due to a pre-existing mental health difficulty, or some combination. Mental health difficulties, particularly depression, are likely to affect a person’s level of motivation to socialise (Fussner et al., 2018; Setterfield et al., 2016; Treadway et al., 2012), which is relevant to the current study which measured participants’ levels of social contact. Therefore, as with all studies, we must be cautious when interpreting these results.

4.2.1.2. Recruitment and data collection

The COVID-19 pandemic impacted recruitment and data collection for this study. The pandemic necessitated online methods of recruitment, through social media and emails, as opposed to using, for example, flyers in community centres. Data were collected online as opposed to using paper questionnaires, since earlier in the pandemic there was concern about transmission of the virus by contact or even via paper, which was a particular concern when recruiting older adults who are more vulnerable to COVID-19. This presents several issues.

Collecting data online means excluding people who do not have access to the internet, introducing an ‘under-coverage error’ in sampling. This is always an issue when the target population includes older adults, since older adults are less likely to have access to and/or make use of the internet than younger adults (Hunsaker & Hargittai, 2018). Internet use is associated with socio-economic status (SES), with internet users being more likely to have higher levels of education and income than people who do not use the internet (Hunsaker & Hargittai, 2018; Wangberg et al., 2008; Yoon et al., 2020). Higher SES is associated with improved physical health and reduced mental distress, both pre-COVID-19 (Adler & Newman, 2002; Pinquart & Sörensen, 2001; Stewart-Brown et al., 2015) and during the COVID-19 pandemic (Ferreira et al., 2021; Y. Wang et al., 2020), therefore this has implications for the current study sample.

Additionally, people with access to the internet may be more likely to be able to contact others and access social support (Shaw & Gant, 2002), for example through social media and video-calling applications such as Skype and Zoom. This is especially relevant in the context of the pandemic, where face-to-face social contact is restricted. Indeed, it has been suggested that internet use may mediate the relationship between SES and subjective health, through the association between internet use and social support (Wangberg et al., 2008). It has also been suggested that internet use could be related to increased self-efficacy, which could mediate the relationship between SES and subjective health (Wangberg et al., 2008). Some of the recruitment for this study was done through social media, again suggesting that participants in this sample were likely to be socially connected and have access to social support (Lu & Hampton, 2017).

Participants were also recruited through University of the Third Age (U3A), an organisation that promotes lifelong learning and hosts interest groups, classes, and other activities for people who are retired or semi-retired. Adults who are active within such an organisation are likely to be more busy, proactive, cognitively stimulated, and socially active, which is very likely to have a positive impact on wellbeing (Hirst et al., 2016; Merriam & Kee, 2014). Accordingly, members of such an organisation might be more likely to use more *active coping* strategies, due to generally being more proactive. Members of U3A are also likely to be of higher SES, since people who are involved in an organisation that focuses on education and learning are likely have higher levels of formal education themselves, due to having an interest in learning. Individuals who are involved in a social organisation such as U3A may also have higher levels of social skills than people who are not involved in social or community groups.

This does not mean that the results of the current study are not helpful; however, it does mean that one must be careful when generalising the results, since the sample of respondents may include people who are more active, with generally higher SES, greater access to social support and social networks, and higher levels of social skills. As these factors are all associated with improved wellbeing, this survey is likely to not represent the experiences of the most vulnerable or disadvantaged members of society.

Participation in the current study was voluntary, therefore there is a self-selection bias in participants who chose to respond. Using more purposive sampling methods such as stratified sampling was beyond the scope of this study, given time and resource constraints. It is possible that people who choose to respond to voluntary surveys may be more open to experiences, or willing to engage in activities outside of their normal routine, than people who choose not to respond. Whilst it is difficult to know for sure, since the characteristics of non-responders are often not known (D. Hudson et al., 2004), this has implications for studies investigating wellbeing, since openness to experience is associated with better wellbeing in older adults (B. C. L. Chan et al., 2018). Women are more likely than men to take part in voluntary surveys, and additionally, white people are more likely to participate than non-white people (W. G. Smith, 2008). This is consistent with the sample in the current survey, where participants were majority women and almost entirely white.

The fact that participants in the current study were almost all white is important to consider, since individuals from racialised groups are likely to have different experiences during the COVID-19 pandemic than white individuals. People from racialised groups are more likely to become seriously ill and die as a result of COVID-19, with Black African, Black Caribbean, Bangladeshi, and Pakistani people experiencing the highest mortality rates (Office for National Statistics, 2020a). There are many theories about this. People from certain ethnic groups are more likely to have jobs that put them in greater contact with other people, be financially impacted by the pandemic, live in larger households, live in more deprived areas, not have access to a garden, and experience mental distress resulting from the pandemic, all of which increase the risk of mortality from COVID-19 (Office for National Statistics, 2020b). Furthermore, COVID-19 precipitated an increase in racism and discrimination, particularly towards Chinese people (Devakumar et al., 2020).

For results of a study to be generalisable, there needs to be an unbiased and representative sample of the target population (Velasco, 2010). The sample in the current study was a group of white, British, predominantly middle-class older adults, who did not have caring responsibilities, therefore it is hard to generalise results beyond people of this particular demographic.

4.2.1.3. Sample size

This study had 114 participants; however, due to some missing data points, most of the statistical analyses included around 100 participants, with the exception of the analyses examining the association between social contact and distress separately in participants who lived with someone compared with those who lived alone, which had 47 and 51 participants, respectively. *Post-hoc* power analyses using G*Power 3.1.9.4 (Erdfelder et al., 1996; Faul et al., 2007) show that the analyses examining associations between face-to-face social contact and distress (both in the whole sample and in only participants who live with someone), and the analysis examining the relationship between the *Negative Coping* factor and distress, had adequate statistical power to detect the significant results that were found. However, tests examining the effects of *Living Situation* and social cognition on distress, and those investigating the moderating effects of social cognition on the relationship between social contact and distress, were low on statistical power (see Appendix X for results of *post-hoc* power calculations).

Whilst these results cannot be considered definitive due to the small sample size, they are nonetheless instructive, and demonstrate that future research should continue to investigate the impact of these variables in larger samples.

4.2.2. Measures

4.2.2.1. Self-report

The majority of the measures in this study were self-report measures, requiring participants to introspect about their mood and ways of coping, and recall their recent levels of social contact. Self-report measures are often critiqued as inaccurate (Haeffel & Howard, 2010), dating back to Nisbett and Wilson (1977) who pointed out that people are often unaware of their mental processes. Self-report measures also may lead to inaccurate responding due to social desirability biases (Latkin et al., 2017). Responses on self-report measures of mood and wellbeing may also be affected by pressure to conform to perceived societal norms (Sandvik et al., 2009).

However, the argument that individuals struggle to report mental processes due to lack of awareness is complicated with respect to mood, since mood is a subjective experience and there is no objective ‘truth’ to how someone feels. There are also limited alternatives to self-report measures of mood, since there are limited observable correlates of mood that could be used as objective measures (Sandvik et al., 2009).

Observational assessment of mood levels was not possible in this study. Data-collection strategies such as asking participants for daily reports (Sandvik et al., 2009) might help circumvent issues with response bias caused by memory problems and social desirability effects, and may have provided more accurate reports of distress and social contact; however, this was beyond the scope of this study.

4.2.2.2. Measures of psychological distress

This study employed three measures of distress: the PHQ8, the GAD7, and the De Jong Gierveld Loneliness Scale. All are thought to be appropriate for using with older adults (Levis et al., 2019; Penning et al., 2014; Wild et al., 2014). The three measures of distress in this study had moderate-to-high correlations with each other, therefore for the purposes of the statistical analysis they were combined into a single ‘distress composite’ measure. Combining depression and anxiety scores makes theoretical sense: depression and anxiety are closely linked (Jenkins et al., 2020; Kaufman & Charney, 2000), and are suggested to both load onto a more general “negative affectivity” factor (L. A. Clark & Watson, 1991). Loneliness is also shown to be closely linked to depression (Cacioppo et al., 2006). Whilst this reduces the specificity of the results, in that it is no longer possible to tell *which type* of distress (i.e. loneliness, low mood, or anxiety) is most impacted by the various predictor variables, it did simplify the statistical analysis.

It is important to note that there are two ways of reporting answers on the De Jong Gierveld Loneliness Scale. One version uses a five-point Likert scale with the response options “*none of the time,*” “*rarely,*” “*some of the time,*” “*often,*” and “*all of the time,*” and the other version has response options “*yes!*”, “*yes,*” “*more or less,*” “*no,*” and “*no!*”. I chose to use the former set of response options as these appeared less ambiguous; however, this means that results of this study may be less comparable with studies that use the other response options.

4.2.2.3. Measures of social contact

Studies measuring the impact of social ties during the pandemic have commonly measured perceived social support, and there is strong evidence that perceived social support is associated with wellbeing (Bu et al., 2020; Groarke et al., 2020; Hou et al., 2020; F. Li et al., 2021; Qi et al., 2020; Sommerlad et al., 2021; Yu et al., 2020). The evidence is less clear regarding the impact of more objective measures, such as the amount of social contact that a person has (Bu et al., 2020; Losada-Baltar et al., 2021; Ratschen et al., 2020; Sommerlad et al., 2021). I chose to measure the amount of social contact that participants had (as opposed to perceived social support), because social contact is directly impacted by social distancing and lockdown. Perceived social support is likely to also be affected by level of social contact, therefore it will be interesting for future studies to see how these variables are linked during the COVID-19 pandemic. By measuring levels of social contact, this study also helps to resolve the ambiguity in results from other studies.

This study asked participants to give estimates of the average amount of time spent socialising each week during the pandemic; however, levels of social contact may not be stable from week to week, therefore this may have been difficult to estimate in some cases. This study did not look at differences in social contact with different types of people, for example contact with friends compared to family. This will be interesting for future studies to investigate, since research suggests that social contact from friends and family may have differential effects for wellbeing. (Secor et al., 2017; Teo et al., 2015). However, in the current study it was felt that the task of differentiating between level of contact with friends and family separately would place too many demands on participants in an already-lengthy survey.

4.2.2.4. Measures of social cognition

Data was collected remotely, meaning that testing conditions were not standardised between different participants. This may have affected performance on the various measures, particularly the ANT, which is normally conducted under experimental conditions (i.e. in a quiet room with minimal distractions). This means that ANT scores in the current study are less comparable with other studies using the ANT. This is less of an issue for the SSQ, which was designed to be administered remotely; and the QCAE, since the QCAE measures empathy by measuring perceptions of everyday experiences of social interactions, rather than ‘testing’ empathy directly.

The SSQ and ANT measure social cognition in particular, artificial situations: the ANT measures recognition of emotions from faces in photographs, and the SSQ measures ToM relating to characters in written stories. Therefore, they only approximate the ways that these abilities are used in real-life interactions in everyday life. In this regard, the QCAE may be a more informative measure of everyday use of social cognition as it asks about everyday experiences involving empathy (rather than measuring empathy performance at one particular time), although it is subject to the limitations of self-report measures.

The SSQ measures ToM by asking participants to make mental state inferences about fictional characters in ten different stories. Due to the length of the original SSQ, for the purposes of the current study, five of the original ten stories were selected, maintaining the same proportions of ‘blatant’ and ‘subtle’ items as the original measure. Whilst this means that results of the SSQ from this study cannot be compared with SSQ norms or with results of studies using the full measure, it nonetheless is still a useful measure of ToM ability in the current study. However, the SSQ has some limitations, as some of the items are ambiguous, and participants’ ability to correctly identify ‘offensive’ items depends on awareness of particular social norms. This critique can be applied to many tests of social cognition, particularly those that assess detection of social mis-steps and *faux pas*. Performance on the ANT may also be influenced by cultural norms.

4.2.3. Statistics

There are several points relating to statistical procedures in this study that bear commenting on.

Data for several of the variables was not normally distributed: distributions for PHQ8, GAD7, age, and the measures of social contact were all positively skewed. This is less of an issue for linear regression than for other statistical tests, as in linear regression it is the normality of residuals that is most important. Normality of residuals was judged to be within reasonable limits.

This study used parametric statistical tests. Strictly speaking, questionnaire data is ordinal, therefore some might argue that non-parametric tests are more appropriate. However, the use of parametric tests for questionnaire data is widely used and accepted, for example, all of the studies included in the scoping review (Section 1.5) that addressed the association between predictors of interest and distress measures (measured through self-report questionnaires), used parametric tests to do so.

Since the statistical tests presented in the current study were planned analyses stemming from the hypotheses, *p*-values are not corrected for multiple testing (Perneger, 1998; Rothman, 1990). Statistical significance is arbitrary and has limitations: ‘statistically significant’ findings can arise from noise in data, and, conversely, potentially useful findings may be overlooked if they do not reach the threshold for determining significance (Wasserstein et al., 2019). McShane et al. (2019) recommend dropping the concept of a threshold for statistical significance, and recommend that researchers consider *p*-values without thresholds, alongside other relevant factors such as study design, data quality, prior evidence, and the plausibility of the mechanism investigated. In this regard, it is helpful to consider effect sizes rather than relying on statistical significance. It is also important to remember that *statistical significance* may not necessarily imply *clinical significance*, and vice versa (Jaeschke et al., 1989). Therefore, we must always hold in mind the purpose of the research and the individuals who are affected.

A strength of this study’s statistical analysis was that a factor analysis was performed to derive second-order factors from the brief COPE scale (Carver, 1997). This is recommended by Carver et al. (1989); however, many authors instead use factors derived from previous studies rather than performing their own factor analysis on their data. For the purposes of the current study, it was determined that it was more appropriate to perform factor analysis, so that the factors used in the statistical analysis were relevant to this particular sample at this particular time. The factor analysis was performed using SPSS, which uses the Pearson Corelation matrix. As discussed earlier with regard to parametric tests, strictly speaking the brief COPE scale is ordinal data, since the questionnaire responses are scored on Likert scales for each item. This means that factor analysis should technically be done using the polychoric matrix, rather than the Pearson correlation matrix. However, this was not an option with SPSS, and nonetheless, studies suggest it is still possible to obtain realistic estimates of parameter values using Pearson correlations (Lubke & Muthén, 2004).

4.2.4. Approach of the Study

One important critique of this study is that it takes a negative perspective on the experiences of older adults during the pandemic. At the beginning of the pandemic (March 2020), when this study was conceived, there was a great deal of concern for the wellbeing of older adults, especially given the increased vulnerability of older adults to COVID-19 (CDC, 2020; WHO, 2020), the increase in ageism highlighted by the pandemic (Ayalon, 2020; Beckett, 2020), and the stricter social distancing guidance given to older adults (GOV.UK, 2020a, 2020b).

However, since then, studies have suggested that older adults seem to be faring better than initially expected, and that older adults experience smaller changes in mood as a result of the pandemic than younger people.

Therefore, studies that focus solely on the negative impact of the pandemic on older adults risk reinforcing the same stereotypes that many authors were concerned about in the first instance, namely, the portrayal of older adults as a homogeneous group, combined with stereotypes of older adults as being frail or helpless (Ayalon, 2020; Monahan et al., 2020; Webb, 2021). As one respondent wrote to me by email (included with their consent): “[questionnaires like this] seem to treat us as victims rather than resilient people…by their very nature, they place us in a category and undermine the infinite variation of the individual.” On reflection, even the term ‘coping,’ which is used throughout this research, and much of the similar literature, may imply a pre-existing negative impact on mood that must be ‘coped with.’ In this regard, one of the positive attributes of the current study is the inclusion of qualitative free-text items in the survey, which allowed participants to elaborate on the positive as well as the negative effects of the pandemic on emotional wellbeing.

Future research should undertake a more holistic assessment of the impact of the pandemic on individuals, with opportunities for participants to report on positives as well as negatives.

4.3. Clinical Implications

Results of this study found that Theory-of-Mind and perspective-taking ability could be a protective factor for wellbeing during the pandemic. Furthermore, the coping strategies of denial and self-blame (included in the ‘negative coping’ factor) were associated with increased distress during the pandemic. This suggests that providing training to people in cognitive restructuring and taking alternative perspectives could help to improve people’s wellbeing during the pandemic, for example by helping to re-frame negative thoughts, find meaning in difficult situations, and encourage cognitive flexibility.

This study also found that behavioural disengagement (included in the ‘negative coping’ factor) was associated with increased distress. This suggests that wellbeing during the pandemic could be improved by providing psychoeducation on the deleterious impact of behavioural disengagement, and providing education and training around behavioural activation and engagement in activities. This could include scheduling opportunities for social contact, particularly face-to-face social contact in a safe and socially distanced way, as this was shown to be associated with wellbeing. Behavioural activation strategies could also emphasise the importance of hobbies, exercise, and maintaining a sense of routine, all of which were reported to be helpful in the qualitative data from participants in this study.

This psychoeducation and training could be delivered as a skills-based intervention, therefore might work better virtually than other interventions; for example, interventions centred around forming relationships with befrienders may not work as well virtually (Williams et al., 2021).

In addition to these recommendations, it is important to note that several participants cited the general uncertainty of the pandemic and lack of faith in the government as sources of distress, therefore the government should strive to provide clear and concise guidance regarding social distancing and lockdown, and any changes in governmental strategy should be accompanied by explanation and rationale to help individuals maintain faith in governmental advice.

4.4. Recommendations for Future Research

This study provides useful insights, and now further research with larger samples is needed to clarify these effects.

This study found that face-to-face social contact with people from outside of the household was associated with wellbeing in people who lived with someone, but not in those who lived alone. Therefore, future research will need to further investigate the factors that are associated with mood and wellbeing in people who live alone, in order to provide useful practical and emotional support for people who live alone.

At the beginning of the pandemic, many authors recommended offering virtual interventions to support older adults and combat loneliness. In this study, face-to-face social contact was associated with reduced distress, but virtual contact was not. Larger studies have found associations between virtual contact and mood; however, these are still weaker than associations between face-to-face contact and mood. Therefore, it will be important to understand more about the factors that make face-to-face contact helpful and meaningful, to see if it is possible to include any of these elements in a virtual format, whilst face-to-face contact is still difficult during the pandemic.

Future research could also explore whether there are differential impacts of social contact with friends compared with family. Additionally, future studies need to focus more on the experiences of carers and cared-for individuals, and explore factors which could support carers and cared-for people during the COVID-19 pandemic.

4.5. Key Messages

This study shows that older adults experience many challenges as a result of the COVID-19 pandemic, but show resilience and are able to find positives in their experiences

This study found that, in general, face-to-face social contact was important for wellbeing during the COVID-19 pandemic. Participants who lived with someone, i.e. had higher levels of face-to-face social contact inside the home, experienced lower levels of distress than those who lived alone, and higher levels of face-to-face social contact with people from outside of the household were also associated with reduced distress. However, in people who lived alone there was not evidence for a significant relationship between face-to-face social contact and distress.

This study also suggests that the ability to think flexibly and take alternative perspectives are important for wellbeing during the COVID-19 pandemic. Namely, higher Theory-of-Mind and perspective-taking ability were associated with lower distress levels, and higher levels of denial and self-blame (which may suggest a lack of ability to think flexibly and take alternative perspectives) were associated with higher distress levels.

This study also highlighted that certain behaviours are associated with wellbeing during the COVID-19 pandemic. In particular, behavioural disengagement (i.e. giving up attempting to cope with the situation) was associated with higher distress levels, and, conversely, many participants noted the beneficial effects of engaging in hobbies, exercise, social contact, and maintaining a sense of routine.

This suggests that offering psychoeducation and training around perspective-taking and behavioural activation may be beneficial to wellbeing during the COVID-19 pandemic.

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Appendix A

Summary of Government COVID-19 Safety Guidance Over Time, Including Lockdowns, Social Distancing, and Shielding Restrictions. Summarised from Dunn et al. (2020), Institute for Government Analysis (2021).

Date	Summary	For Who?	Description
12/03/2020	Self-isolation guidance introduced.	General population.	People with symptoms of COVID-19 told to stay at home for 7 days from when the symptoms appeared.
16/03/2020	Government announces new social distancing and self-isolation measures.	General population.	- Anyone with symptoms of COVID-19 or living in a house with someone with symptoms should stay home for 14 days (except for exercise and those who can't receive deliveries at home). - All people advised against unnecessary social contact and travel. - All people advised to work from home if possible, and avoid pubs, clubs, cinemas and restaurants. - Government advises against large gatherings. - People in 'vulnerable groups' (including people with certain illness, people age ≥70, and people who are pregnant) are strongly advised against face-to-face contact with others.
20/03/2020	Further social distancing measures introduced.	General population	Some businesses and venues including all pubs, bars, restaurants, entertainment venues (cinemas and theatres), and indoor leisure premises are closed.
22/03/2020	Government announces shielding measures for people who are 'clinically extremely vulnerable' (CEV).	People who are CEV	People who are CEV identified as people at higher risk of severe illness if they catch COVID-19 (up to 1.5 million people in England). Targeted group advised to stay at home and avoid face-to-face contact with people outside of their household for at least 12 weeks.

23/03/2020	First lockdown announced (comes into force legally on 26th March 2020)	General population.	- All people required to stay at home, except for very limited purposes. - Further closures of certain businesses and venues. - Gatherings of more than 2 people in public are not allowed. - Parks remain open for individuals and households to exercise once a day. Communal spaces within parks (e.g. playgrounds, football pitches) are closed.
16/04/2020	Government announces that lockdown will be extended for 'at least 3 weeks.'	General population.	
11/05/2020	Government publishes a list of principles for people to follow when outside of the home.	General population.	People advised to: - Remain socially distanced from people outside of their household. - Regularly wash hands, face, and clothes. - Work from home if possible, and remain socially distanced when in a work setting. - Avoid crowds. - Plan travel carefully to remain socially distanced, if travel is unavoidable. - Keep indoor places ventilated. - If possible, wear a face covering in enclosed spaces.
01/06/2020	Phased lifting of lockdown begins.	General population.	- Rule of 6 outdoors: people can meet outdoors in groups of up to 6 people from different households, remaining socially distanced (2 metres apart). - People are required to maintain social distancing of 2 metres with people outside of their household. - People to go to work if they cannot work from home. - Shops begin to reopen.
01/06/2020	Phased lifting of lockdown: for CEV.	People who are CEV.	People who are CEV can go outside with members of their household, remaining socially distanced. CEV people who live alone can meet outside with one person from another household.
13/06/2020	New rule on 'support bubbles.'	General population.	People who live alone can form a ‘support bubble’ with one other household, spending time together indoors and overnight, without needing to stay 2 meters apart.

15/06/2020	Non-essential shops re-open in England.	General population.	
15/06/2020	Face-coverings mandatory on public transport.	General population.	Government announces face coverings on public transport to become mandatory from 15 June .
04/07/2020	Further easing of lockdown (except for areas with local lockdown measures).	General population.	- The 2-metre social distancing guidance changes to 1 metre. - Restaurants, pubs and cafes in England reopen, with table service only indoors. Hairdressers reopen. Places of worship reopen for services. - Holiday accommodation (including hotels and campsites) reopen. - Entertainment venues (including museums, galleries, cinemas, libraries, community centres, themes parks, and children's playgrounds reopen. - Rule of 6 lifted: Two households of any size can meet indoors or outside, and stay overnight, remaining socially distanced (doesn't need to be the same households each time). - People from multiple households can meet in groups of six outdoors. - Nightclubs, casinos, bowling alleys, spas, swimming pools, indoor gyms and soft play centres remain closed - Theatres and concert halls cannot host live performances.
04/07/2020	Local lockdown in Leicester and parts of Leicestershire begins. This is the first local lockdown.	General population.	- Certain 'non-essential' businesses and venues required to close. Schools close (with the exception of children of key workers and children classed as vulnerable). - People are allowed to meet in groups of 6 from different households outdoors. People who live alone can form support bubbles with other households. People advised to stay home as much as possible. - Relaxing of shielding cannot take place.
06/07/2020	Advice for shielding people changed.	People who are CEV.	People who are shielding can gather in groups of 6, outdoors. People who are shielding can form a 'support bubble' with another household. (Shielding not relaxed in areas with local lockdown.)
18/07/2020	Lockdown restrictions lifted in some areas of Leicestershire	General population.	- Additional restrictions continue in areas with higher prevalence of COVID-19, but plans for some restrictions to be lifted on 24th July. - Shielding remains in place in the Leicester area, even in places where other restrictions have eased.

30/07/2020	Self-isolation guidance amended.	General population.	The self-isolation period for people COVID-19 symptoms or a positive test result is amended to 10 days.
01/08/2020	Shielding paused across England.	People who are CEV.	CEV people are no longer advised to shield, but advised to continue to follow strict social distancing measures where possible. CEV people who need to work and cannot work from home are advised to return to work if their workplace adheres to COVID-19 safety guidance.
03/08/2020	Eat out to help out scheme	General population.	The 'eat out to help out' scheme begins in the UK: a 50% discount is offered on meals up to £10 per person.
14/09/2020	New social distancing measures come into place in England.	General population.	Rule of 6 brought back: people can meet with people from other households in groups of up to 6 (both indoors and outdoors), but not more than 6. Exceptions include COVID-19 secure venues e.g. education and work settings. Individual households or support bubbles with more than 6 people can still meet.
22/09/2020	New restrictions announced in England.	General population.	- People advised to return to working from home where possible - 10pm curfew for hospitality sector.
14/10/2020	Three-tiered system of local COVID-19 Alert Levels introduced in England.	General population.	- Tier 1 'Medium' alert level: national lockdown measures, including the rule of 6 and 10pm curfew for hospitality venues. - Tier 2 'High' alert level: for 'areas with a higher level of infections.' Mixing between different households or support bubbles not allowed indoors. Rule of 6 continues to apply outdoors. - Tier 3: 'very high' alert level: for 'areas with a very high level of infections.’ Involves tighter restrictions. Liverpool City Region is initially the only area in Tier 3.

15/10/2020	Guidance for the CEV updated to correspond to the 3-tier system.	People who are CEV.	- Tier 1: strictly observe social distancing; work from home where possible; meet others outside where possible; limit unnecessary travel; children should attend school. - Tier 2 High alert level: reduce the number of people met outside; only travel if essential; work from home if possible; reduce number of shopping trips and shop at quiet times of day; children should attend school. - Tier 3 Very high alert level: work from home where possible; stay at home as much as possible; only travel if essential; use online delivery for shopping as much as possible; go outside for exercise. Government states that formal shielding will only be reintroduced in the worst affected areas, and that people should not follow formal shielding unless they receive a new shielding letter or notification.
04/11/2020	Guidance for the CEV is updated.	People who are CEV.	- Formal shielding is reintroduced from 5th November 2020. The key message is to ‘stay at home at all times, unless for exercise or medical appointments.’ Government states: 'this is not a return to the very restrictive shielding advice you may have followed earlier in the year' but people are strongly advised against going to shops and encouraged to ask others to shop for them. - People over the age of 70 or ‘with more general underlying health conditions’ are advised to stay home and minimise contact with others as much as possible.
05/11/2020	Second national lockdown begins.	General population.	- People must ‘stay at home.’ Exceptions include: work/volunteering that cannot be done from home, essential activities such as obtaining food or medicine, or accessing critical public services. Travel should be avoided and overnight stays away from a main home are not permitted. - People must ‘avoid meeting people you do not live with.’ Exceptions include: work, fulfilling legal obligations, exercising outdoors, funerals, and ‘some weddings.’ - ‘Non-essential’ businesses close.
24/11/2020	Government announces plans for Christmas arrangements.	General population.	Government announces easing social restrictions between 23 December and 27 December, and publishes guidance on making a ‘Christmas bubble’ with friends and family - up to 3 households to be able to meet in these 5 days over Christmas.

02/12/2020	Second lockdown ends. England moves back to a (stricter than previous) tiered system of local restrictions	General population.	England returns to a stricter-than-previous three-tier system. - Tier 1 (Medium alert): people can socialise indoors and outdoors in groups of up to 6. Hospitality venues have a 10pm curfew for last orders, but can remain open until 11pm. The public can attend indoor and outdoor events, but limited to either: 50% capacity, or 4,000 people outdoors/ 1,000 indoors. Areas in Tier 1 include Isle of Wight, Cornwall, Scilly Isles. - Tier 2 (High alert): mixing between different households or support bubbles indoors is not allowed. Rule of 6 applies outdoors. Hospitality venues must operate as restaurants (i.e. alcohol can only be served with 'substantial meals'). The public can attend indoor and outdoor events, but limited to either: 50% capacity, or 2,000 people outdoors/ 1,000 indoors. Areas in Tier 2 include East of England and London,. - Tier 3 (Very High): social mixing not allowed indoors and in most outdoor spaces (exceptions: parks, beaches and the countryside, where the Rule of Six applies). Hospitality settings can only open for takeaway and delivery services. Indoor entertainment venues close, and large outdoor events not permitted. Indoor leisure centres remain open, but organised indoor sport is not permitted. Areas in Tier 3 include all areas within North East England. Regions in England including the Midlands, North West, South East and Yorkshire have some towns and cities in Tier 2 and some in Tier 3.
02/12/2020	Guidance for CEV updated to reflect the move back to a 3-tier system.	People who are CEV.	Formal shielding is lifted (but still advised to minimise social interaction and stay socially distanced if possible). Unlike guidance in place since 5 November, government no longer advises people on the clinically extremely vulnerable list to stay away from work or school but to minimise social interaction and reduce time spent in settings where they cannot follow social distancing.
20/12/2020	Tier 4 'stay at home' restrictions introduced for parts of England.	General population.	The new tier 4 alert level: 'stay at home' comes into place across parts of England. Several areas previously in Tier 3 move to Tier 4, including areas in London, the South East and the East of England. - People in Tier 4 areas must 'stay at home' except for exercise or other legally permitted reasons. - Non-essential retail, indoor leisure and entertainment facilities, and personal care sectors in Tier 4 close. - Social contact limited to meeting one other person for exercise in a public space outdoors (support and childcare bubbles and communal worship can continue). This includes on Christmas Day; rules allowing Christmas bubbles do not apply in Tier 4 areas.

20/12/2020	Formal shielding re-introduced in Tier 4 areas.	People who are CEV.	Formal shielding re-introduced: CEV people advised to work from home and stay at home except for ‘careful’ outdoors exercise and health appointments.
26/12/2020	More areas of England enter Tier 4.	General population.	More areas of England enter Tier 4.

Abbreviations: CEV, Clinically Extremely Vulnerable.

Appendix B

Search Terms Used for Scoping Review

“(mental OR mood OR wellbeing OR depress* OR anxi* OR stress OR distress OR lonel*) AND (pandemic OR "social distancing" OR "physical distancing" OR quarantine OR COVID-19 OR coronavirus) AND (older OR senior OR elderly OR "over 70" OR geriatric OR pensioner*) AND (England OR Britain OR “United Kingdom” OR UK OR British)”

Appendix C

Full-Text Articles Screened and Not Included in Scoping Review: Numbers and Reasons

Reason for Non-Inclusion	**n**
Not an observation study	20
Study doesn't report mood separately by age groups, nor use age as a predictor in statistics	17
Sample not from UK, or only a very small proportion or participants from UK	15
Study not looking at community-dwelling older adults	12
Study not looking at mood	2
Outcomes reported are dependent on help-seeking behaviour rather than mood	2
Age is compared between working-age adults, not between working-age and older adults	2
Data not collected during the COVID-19 pandemic period	1

Appendix D

Summary of the 25 Studies Included in the Scoping Review

Authors	**Date of data collection**	**Type of study**	**Sample**	**n**	**Outcomes Measured**	**Results**
Généreux et al. (2020)	May-June 2020	Cross-sectional, quantitative	General population (including older adults)	8806 (1041 from UK) 1672 age 65+, 237 age 65+ in UK	Depression (PHQ9), anxiety (GAD7), Sense of Coherence (SOC-3)	Overall prevalence of anxiety (GAD7 score of 10+) = 21.0%. Overall prevalence of depression (PHQ9 score of 10+) = 25.5%. Risk factors for anxiety and depression (descending order): low sense of coherence, younger age, false beliefs about COVID-19, self-isolation due to symptoms, high perceived risk to self or family, low trust in authorities, being a victim of stigma, financial losses. Older adults less likely to experience anxiety or depression than younger adults. Percentages with anxiety or depression by age: 18-24 = 44.5%, 25-34 = 42.5%, 35-44 = 37.3%, 45-54 = 28.8%, 55-64 = 17.8%, 65+ = 16.2%).
Jia et al. (2020)	April 2020	Cross-sectional, quantitative	General population (including older adults)	3097 (306 age 65+)	Depression (PHQ9), anxiety (GAD7), stress (PSS-4)	PHQ9 overall mean = 7.69; GAD7 overall mean = 6.48; PSS-4 overall mean = 6.48. Risk factors for depression: female, younger age, living alone, being at higher risk of COVID-19. Risk factors for anxiety: younger age, higher risk for COVID-19, key worker. Risk factors for stress, younger age, female, living alone, non-white background, having higher risk of COVID-19. PHQ9, GAD7, and PSS-4 scores decrease with age (with the exception of PHQ9 scores for participants age 75+, who score slightly higher than participants age 65-74). For people over age 65 there was no significant difference between PHQ9 and GAD7 scores and population norms for that age group. For younger adults, PHQ9 and GAD7 scores were significantly higher than population norms. Mean PHQ9 scores in different age groups: 18-24 = 11.24, 25-34 = 8.74, 35-44 = 8.23, 45-54 = 7.32, 55-64 = 6.35, 65-74 = 3.83, 75+ = 4.39. Scores for people over age 65 showed no significant difference to population norms for that age group. For younger adults, scores were significantly higher than population norms.

						Mean GAD7 scores in different age groups: 18-24 = 9.02, 25-34 = 7.73, 35-44 = 7.25, 45-54 = 6.28, 55-64 = 5.43, 65-74 = 3.32, 75+ = 2.92. Scores for people over age 65 showed no significant difference to population norms for that age group. For younger adults, scores were significantly higher than population norms. Mean PSS-4 scores in different age groups: 18-24 = 8.13, 25-34 = 6.94, 35-44 = 6.47, 45-54 = 6.16, 55-64 = 5.94, 65-74 = 5.07, 75+ = 4.80.
Ben-Ezra et al. (2020)	March-April 2020	Cross-sectional, quantitative	General population (including older adults)	1293 (not specified by age group, mean age 51)	WHO non-recommended behaviours (e.g. using alternative medicines to protect against COVID-19). Psychological distress (K6 scale).	Distress (K6 scale score of 13+) associated with: female gender, presence of health conditions, living in London, practicing non-recommended behaviours (distress increased with the number of non-recommended behaviours practiced), younger age. (Distress scores not presented separately by age group)
L. Smith et al. (2020)	March 2020	Cross-sectional, quantitative	General population (including older adults)	932 (170 age 65+).	Anxiety (BAI), Depression (BDI), wellbeing (SWEMWBS).	BAI overall mean = 21.1; BDI overall mean = 11.8; SWEMWBS overall mean = 20.8. Anxiety and depression decrease with age. - Anxiety (mean BAI scores), by age group: 18-24=17.3, 25-35=15.2, 35-44=12.8, 45-54=11.5, 55-64=10.4, 65-74=7.2, 75+=6.5. - Depression (mean BDI scores), by age group: 18-24=16.9, 25-35=14.3, 35-44=12.8, 45-54=10.4, 55-64=10.4, 65-74=6.3, 75+=6.7. Wellbeing increases with age, with the exception of age 75+ who have slightly lower wellbeing than those age 65-74. - Wellbeing (mean SWEMWBS scores), by age group: 18-24=18.9, 25-35=19.3, 35-44=20.1, 45-54=21.1, 55-64=21.6, 65-74=23.9, 75+=22.8.
Shevlin et al. (2020)	March 2020	Cross-sectional, quantitative	General population (including older adults)	2,016 (287 age 65+)	Perceived risk of COVID-19 infection (single item), depression (PHQ9), anxiety (GAD7), traumatic stress (ITQ), COVID-19 related anxiety (single item)	Overall prevalence of COVID-related anxiety (score of 80+ on 0-100 scale) = 21.3%. Overall prevalence of anxiety (GAD7 score of 10+) = 21.6%. Overall prevalence of depression (PHQ9 score of 10+) = 22.1%. Overall prevalence of traumatic stress (endorsement of 1+ symptom from each cluster of the ITQ) = 16.8%. Risk factors for COVID-related anxiety: older age (above 45), female gender, having more than one child, pre-existing health conditions, having a loved one with a pre-existing health condition, not having had COVID-19, feeling that their personal risk of catching COVID-19 is high. Risk factors for depression/anxiety: younger age, female, living in a city (as

						opposed to rural, town, or suburb), having children, lower income, lost income due to COVID-19, pre-existing health condition/s, loved one with pre-existing health condition/s, having had COVID-19, loved one who has had COVID-19, feeling that your risk of COVID-19 is high. Risk factors for traumatic stress: younger age, male, living in a city, having children, lost income due to COVID-19, having had COVID-19, loved one having had COVID-19, feeling your risk of getting COVID-19 is high. Older participants had higher COVID-19-related anxiety than younger people. COVID-19 anxiety by age group: 8-24 = 17.1%; 25-34 = 17.4%; 35-44 = 21.2%; 45-54 = 23.4%; 55-64 = 24.1%; 65+ = 23.7%. Older participants had lower general anxiety or depression than younger people. Anxiety/depression by age group: 18-24 = 49.2%; 25-34 = 40.0%; 35-44 = 27.5%; 45-54 = 23.4%; 55-64 = 19.5%; 65+ = 9.8%. Older people had lower traumatic stress than younger people. Traumatic stress by age group: 18-24 = 24.0%; 25-34 = 28.7%; 35-44 = 24.9%; 45-54 = 12.9%; 55-64 = 6.9%; 65+ = 2.4%.
Groarke et al. (2020)	March-April 2020	Cross-sectional, quantitative	General population (including older adults), from the COVID-19 psychological wellbeing study	1964 (61 age 65+)	Loneliness (UCLA-3).	Risk factors for loneliness: younger age, being separated or divorced, depression or emotional regulation difficulties. Protective factors for loneliness: married/cohabiting, living with a higher number of adults, higher perceived social support. Overall prevalence of loneliness (score above 6): 26.6%. Loneliness by age group: 18–24 = 41.0%, 25–34 = 28.2 %, 35–44 = 22.0 %, 45–54 = 25.2 %, 55–64 = 20.6 %, 65+ = 3.3%. Odds of loneliness were 5.3x higher in people age 18-24 than in people age 65+.
Groarke et al. (2021)	March-June 2020	Longitudinal (data collected three times, 1m apart), quantitative	General population, (including older adults) from the COVID-19 Psychological Wellbeing Study	1958 (63 age 65+)	Loneliness (UCLA-3), Depression (PHQ9), difficulties in emotion regulation (short DERS)	33.8% of whole sample met threshold for depression (PHQ9 score of 10+), and 26.8% met criteria for loneliness (UCLA-3 scores of 6+). (Scores not presented separately by age group). Longitudinally, loneliness predicted depression 1m later, and depression predicted loneliness 1m later. Emotion regulation difficulties did not mediate these associations. Emotion regulation difficulties predicted depression 1m later, and depression predicted emotion regulation difficulties 1m later. Cross-sectionally, older age was associated lower loneliness, lower depression, and lower problems in emotional regulation.

						Age did not predict change in mood over time, and was not associated with the relationship between mood and loneliness over time.
Niedzwiedz et al. (2021)	2015 to April 2020.	Longitudinal (data collected at 4 time-points), quantitative	General population (including older adults), from the UK Household Longitudinal Study	9748 (2934 age 65+)	Psychological distress (GHQ-12), loneliness (single item) cigarette smoking, alcohol consumption.	Overall prevalence of distress (GHQ-12 score of 4+) during pandemic = 30.6% Overall prevalence of loneliness (score of ‘often’ or higher) during pandemic = 8.5% Psychological distress across the sample increased from pre-pandemic (19.4%) to during-pandemic (30.6%). Distress increased for all age groups, but as age increases, the size of the change from pre-pandemic to during-pandemic reduces. Distress by age group: - 18-24: 24% pre-pandemic, 45% during-pandemic. - 25-44: 22% pre-pandemic, 38% during-pandemic. - 45-64: 20% pre-pandemic, 28% during-pandemic. - 65+: 12% pre-pandemic, 19% during-pandemic. Loneliness (people who answered "often" regarding frequency of loneliness) across the whole sample did not change from pre-pandemic to during-pandemic, but varied by age: Age 18-24, loneliness increased. Age 25-44, loneliness remained stable. Age 45-64, loneliness decreased. Loneliness decreases as age increases, both pre- and during-pandemic. Loneliness by age group: - 18-24: 12% pre-pandemic, 20% during-pandemic. - 25-44: 10% pre-pandemic, 10% during-pandemic. - 45-64: 8% pre-pandemic, 7% during-pandemic. - 65+: 6% pre-pandemic, 4% during-pandemic. Alcohol: older adults (65+) more likely than younger people to drink alcohol 4 or more times per week than younger people, both pre-pandemic and during-pandemic.
Pierce et al. (2020)	2016 to April 2020.	Longitudinal (data collected at 6 time-points), quantitative	General population (including older adults), from the UK Household Longitudinal Study	17,452 (2633 age 70+)	Psychological distress (GHQ-12)	Overall prevalence of distress (GHQ-12 score of 4+ from max score 12) during pandemic = 27.3% Overall mean GHQ-12 score (max score 36) during pandemic = 12.6 Risk factors for distress: GHQ-12 scores higher in women, younger people, urban populations, low-income households, people who don't cohabit with a partner. Older adults had lower distress levels both before and during the pandemic. Percentage meeting threshold for distress (GHQ-12 score of 4+ from max score 12) pre-pandemic and during-pandemic, by age: - 16-24 yr olds: pre-pandemic = 24.5%; during-pandemic = 36.7% - 25-34 yr olds: pre-pandemic = 21.6%; during-pandemic = 35.0%

						- 35-44 yr olds: pre-pandemic = 21.0%; during-pandemic = 30.6% - 45-54 yr olds: pre-pandemic = 21.5%; during-pandemic = 26.3% - 55-69 yr olds: pre-pandemic = 17.0; during-pandemic = 24.7% - 70+ yr olds: pre-pandemic = 10.8; during-pandemic = 17.6% Mean distress scores increased slightly from pre- to during pandemic in participants age 16-44. Increases in mean distress scores from pre-pandemic to during-pandemic were smaller in participants age 45+. Mean GHQ-12 scores pre-pandemic and during-pandemic, by age (max score 36): - 16-24 yr olds: pre-pandemic = 12; during-pandemic = 14.7 - 25-34 yr olds: pre-pandemic = 12.1; during-pandemic = 14.2 - 35-44 yr olds: pre-pandemic = 11.7; during-pandemic = 13.4 - 45-54 yr olds: pre-pandemic = 12.0; during-pandemic = 12.5 - 55-69 yr olds: pre-pandemic = 11.2; during-pandemic = 12.0 - 70+ yr olds: pre-pandemic = 10.1; during-pandemic = 10.9
L. Z. Li and Wang (2020)	April 2020	Cross-sectional, quantitative	General population (including older adults), from the UK Household Longitudinal Study	15,530 (numbers not specified by age group)	Loneliness (single item), general psychiatric disorders (GHQ-12)	Overall prevalence of distress (GHQ-12 score of 4+ from max score 12) = 29.2%. Overall mean GHQ-12 score (max score 12) = 2.73. Overall prevalence of loneliness (score of 'often' or higher) = 7.22%. Risk factors for distress: being female, younger age, having had COVID-19, living alone, unemployed. Protective factors for distress: having a job, living with a partner. GHQ12 'caseness' (score of 4+ from max score 12) and mean GHQ-12 score decreased as age increased. GHQ12 caseness by age group: 18-30 = 42.36%, 31-40 = 37.56%, 41-50 = 31.26%, 51-65 = 27.34%, 65+ = 19.11%. Mean GHQ-12 scores by age group (max score 12): 18-30 = 3.71, 31-40 = 3.37, 41-50 = 2.86%, 51-65 = 2.61, 65+ = 2.00. Prevalence of loneliness (score of "often" or more) decreased as age increased. Loneliness by age group: 18-30 = 16.01%, 31-40 = 9.12%, 41-50 = 6.09%, 51-65 = 6.06%, 75+ = 4.11%.
Bu et al. (2020)	March-May 2020	Longitudinal (data collected weekly for 7 weeks), quantitative	General population (including older adults), from the COVID-19 Social Study	38,217 (no. by age group not given)	Loneliness (UCLA-3), social relationships (number of close friends), frequency of F2F social contact, perceived social	Identified 4 different trajectories of loneliness: for each trajectory, loneliness was generally stable over 7 weeks of lockdown, but at different levels. The trajectory with the highest initial loneliness had a slight increase in loneliness from week 1-5, then a decrease in week 6. The trajectory with the lowest initial loneliness had a slight decrease in week 5, followed by a rebound in week 6.

					support (brief form of PSSS)	Risk factors for loneliness: younger age, female gender, low income, economically inactive, pre-existing mental health conditions, low social support, living alone, living in urban areas. Adults age 60+ had 6x lower odds of being in the highest loneliness class than adults age 18-29. (Loneliness scores not presented separately by age group).
Saunders et al. (2020)	March - July 2020	Longitudinal, quantitative	General population (including older adults), from the COVID-19 Social Study	21,938 (8072 age 60+)	Depression (PHQ9) and anxiety (GAD7)	Overall GAD7 mean = 4.11, overall PHQ9 mean = 5.4. 5 classes of symptom trajectory for PHQ9 and GAD7: 1) Low symptoms throughout, gradual improvement over time 2) Moderate symptoms, getting more severe over time 3) Moderate symptoms, remaining constant over time 4) Symptoms get worse over lockdown but improve after lockdown ends 5) (GAD7 only) Severe anxiety which decreases over the course of lockdown. Older people were more likely to be in class 1 (low symptom severity, gradually improving over time). (Scores not presented separately by age group)
Fancourt et al. (2021)	March-August 2020	Longitudinal, quantitative	General population (including older adults), from the COVID-19 social study	36,520 (11093 age 60+)	Anxiety (GAD7), depression (PHQ9)	Overall mean GAD7 score in week 1 = 5.7. Overall prevalence of anxiety (GAD7 score of 10+) in week 1 = 22.6% Overall mean PHQ9 score in week 1 = 6.6. Overall prevalence of depression (PHQ9 score of 10+) in week 1 = 25.1% Depression and anxiety were highest towards the beginning of lockdown and then declined, for people of all ages. The fastest decreases were seen between weeks 2 and 5 (the initial strict lockdown period). Participants age 60+ consistently had lower depression and anxiety scores, and lower prevalence of depression (PHQ9 score of 10+) and anxiety (GAD7 score of 10+) than younger adults. Anxiety in week 1, by age group: 18-29 = 34.4%, 30-45 = 30.4%, 46-59 = 21.4%, 60+ = 9.6%. Mean GAD7 score by age group: 18-29 = 7.6, 30-45 = 7.2, 46-59 = 5.8, 60+ = 3.2. Depression in week 1, by age group: : 18-29 = 32.7%, 30-45 = 30.9%, 46-59 = 27.8%, 60+ = 13.3%. Mean PHQ9 score, by age group: 18-29 = 8.3, 30-45 = 7.5, 46-59 = 6.9, 60+ = 4.2.

Shah et al. (2020)	Not specified. Article received June 2020	Cross-sectional, quantitative	Doctors working in Obs.& Gyn. (including older adults)	207 (21 aged 50-69)	Anxiety (GAD2), depression (PHQ2)	Overall prevalence of anxiety (GAD2 score of 3+) = 24.6% Overall prevalence of depression (PHQ2 score of 3+) = 15.94% Proportion of participants who meet criteria for anxiety increases with age group. Anxiety by age group: 20-34=23.7%, 35-49=24.7%, 50-69=28.6%. Proportion of 50-69yr olds meeting criteria for depression was lower than that in 20-34yr olds, but slightly higher than that in 35-49yr olds. Depression by age group: 20-34=19.4%, 35-49=12.9%, 50-69=14.3%
Harris et al. (2020)	March-August 2020	Cross-sectional, quantitative	Patients with Inflammatory Bowel Disease (including older adults)	685 (118 age 65+)	Stress (single item, 10-point scale), self-rated change in Quality of Life.	Overall stress scores increased from pre-lockdown to during lockdown: - mean stress score pre-lockdown (reported retrospectively) = 4.0. - mean stress score during-lockdown = 5.5. 42.8% reported negative impact on quality of life. 10.2% reported very negative impact on quality of life. 12.3 % reported a positive impact on quality of life. 4% reported a very positive impact on quality of life. Patients over 55 were more likely to report a positive impact of the pandemic on quality of life than those under 55 (scores not presented separately by age group).
Varatharaj et al. (2020)	April 2020	Cross-sectional, case-descriptions	Patients with COVID-19	153 patients (82 age 60+)	Medical and psychiatric diagnoses	Older adults with COVID-19 suffered more cerebrovascular events than younger patients (82% of patients with cerebrovascular events were age 60+). Older adults with COVID-19 were not more likely to experience altered mental status (e.g. encephalopathy, neurocognitive issues, psychiatric diagnoses) (51% of patients with altered mental status were age 60+).
Thombs et al. (2020)	April 2020	Longitudinal, quantitative	Scleroderma patients (including older adults), from the SPIN Cohort study	Canada 98, France 159, UK 50, USA 128 (mean UK age 59.2)	Anxiety (PROMIS anxiety scale), Depression (PHQ8).	UK mean anxiety score pre-pandemic = 53.6, UK mean anxiety score during-pandemic = 56.7 (6.2 point increase). UK mean depression score pre-pandemic = 7.2, UK mean depression score during-pandemic = 7.5 (negligible change). Older age was associated with smaller increases in anxiety from pre-pandemic to during-pandemic (scores not presented by age group).
Brooke and Clark (2020)	April 2020	Cross-sectional, qualitative	Older adults (70+)	19	Questions about experiences of shielding, self-isolation, and social distancing.	3 themes: 1) Protective measures: change of activities, frustration at others not sticking to the rules, conducting own risk analysis rather than everyone adhering to the same recommendations. 2) Current and future coping plans: wanting to challenge society's assumptions about older people, supporting others, the need to keep living

						and importance of quality of life, time to complete activities and tasks, importance of social media 3) Acceptance of a life well lived and still to be lived: feeling fortunate compared to others, possibility of death if they contract COVID-19 and not ready/willing to die, although not afraid of death.
Brown et al. (2021)	May 2020	Cross-sectional, mixed-methods	Older adults (75+)	142	Health anxiety (selected item from HAI), general health (selected item from RAND SF-36), physical activity, depression (PHQ8), anxiety (GAD2), loneliness (single item), access to services. Open questions about challenges and positives	Health anxiety: 52.1% did not worry about their health. General health: 35.2% rated health as 'good,' 28.9% as 'very good,' 12% as 'excellent'. Physical activity: 68.9% did physical activity every day or most days. 42.3% less active than pre-lockdown. 16.9% more active than pre-lockdown. Depression: 9.1% met criteria for major depression (10+ on PHQ8). Anxiety: 7% met criteria for anxiety (3+ on GAD2). Loneliness: Around 25% were lonely at least some of the time. Less than 5% were lonely most/all the time. Challenges and concerns: absence of social relationships, managing activities of daily living, well-being and lifestyle priorities, managing wellbeing and health, anxiety about COVID-19 and precautions, sense of (un)safety in public, impact of lockdown on personal life and livelihood. Positives: increased sense of community, break from routine, life simpler with less pressure, gardening, hobbies.
A. M. Taylor et al. (2020) [PREPRINT]	2017-2018, and May 2020	Longitudinal, quantitative	Older adults from the Lothian Birth Cohort 1936 (mean age 84)	190	Self-reported physical health (single item), self-reported mental health (COVID-19 related stress/anxiety, perceived mental health, loneliness); physical activity (increase/decrease) hobbies/pastimes	Over lockdown participants had less face-to-face social contact but more virtual social contact (including telephone/video calls and texting). Participants reported declines in physical and mental health due to lockdown: - 55.8% rated their physical health before lockdown as very good or above, which fell to 47.8% during lockdown. - 48.2% did less physical activity during lockdown than before lockdown, 17.5% did more. - 85.1% rather their mental health before lockdown as very good or above, which fell to 68.6% during lockdown. Loneliness was associated with higher anxiety and living alone. COVID-19-related stress was associated with lower emotional stability. Decreased physical activity during lockdown was associated with being in a less professional occupational class and lower general cognitive ability.
Okely et al. (2021)	2017, May-June 2020	Longitudinal (measures completed 2yrs pre-	Older adults, from the Lothian Birth Cohort 1936	137	Physical activity (single item), sleep quality (single item),	Loneliness increased during lockdown: percentage scoring "none of the time" decreased (81% pre-lockdown, 73% during-lockdown). Amount scoring "some of the time" increased (16% pre-lockdown, 23% during-

		pandemic, and during national lockdown), quantitative	study (mean age 84)		mental wellbeing (WEMWBS), loneliness (single item), perceived social support (PSSS), changes in subjective memory (single y/n item, follow-up questions if yes), neighbourhood cohesion (8-item questionnaire adapted from the NCS).	lockdown, not statistically significant). Decrease in wellbeing (not statistically significant): (mean WEMWBS score 37.5 pre-lockdown, 36.5 during-lockdown). Physical activity reduced during lockdown on average: those doing minimal activity (only household chores) increased slightly (10% pre-lockdown, 19% during-lockdown). Increase in perceived social support: (mean PSSS score 12.8 pre-lockdown, 13.1 during-lockdown). Correlations between: loneliness and wellbeing (negative), memory problems and wellbeing (negative), social support and wellbeing (positive), memory problems and social support (negative). History of cardiovascular problems was associated with reduced wellbeing and reduced neighbourhood cohesion. Higher emotional stability was associated with increased wellbeing. Higher intellect and being in a manual occupational class (relative to a professional occupational class) were associated with increased social support. Extraversion was associated with positive changes in physical activity. Anxiety and living alone were associated with increased loneliness.
Corley et al. (2021)	May-June 2020	Cross-sectional, quantitative	Older adults, from the Lothian Birth Cohort 1936 study (mean age 84)	171	Self-rated physical health (single item), self-rated mental health (single item), anxiety about COVID-19 (single item), sleep quality (single item). Participants asked about current and pre-lockdown.	Spending more time in the garden during lockdown compared to pre-lockdown was associated with better self-rated physical health, emotional health, and sleep quality. Frequency of garden usage not associated with COVID-19 related anxiety. Gardening was not associated with perceived change in health outcomes (pre-pandemic to current).

McKinlay et al. (2020) [PREPRINT]	May-September 2020	Cross-sectional, qualitative	Older adults age 70+, from the COVID-19 Social Study	20	Questions about wellbeing, social life, social distancing.	2 superordinate themes 1) Threats to wellbeing: concerns about mortality, concerns about COVID-19, grief, loss of normal routine and activities, restricted access to services. 2) Protective factors: slower pace of life, having a routine, socialising, utilising coping skills used in the past.
Giebel, Lord, et al. (2021)	April-May 2020	Cross-sectional, quantitative	Older adults 65+ (mean age 72), people with dementia (mean age 70), and carers (mean age 61)	569 (61 PLWD, 285 carers, 223 older adults	Quality of life (SWEMWBS), depression (PHQ9), anxiety (GAD7)	People with dementia had highest levels of distress (anxiety 33%, depression 48%). Carers also had high levels of distress (28% anxiety, 20% depression). Older adults distress levels were lower (5% anxiety, 5% depression). Closure of support services linked to increased anxiety in people with dementia, and reduced wellbeing in carers and OAs. Bigger differences in hours of support accessed before and during the pandemic were linked to higher anxiety and lower wellbeing.
Giebel, Pulford, et al. (2021)	April-August 2020	Longitudinal (data collected 3x during pandemic, 5 and 6 weeks apart), quantitative	PLWD, carers, older adults (65+)	377 (152 older adults, 37 PLWD, 149 current carers, 39 former carers)	Weekly hours of social support services received (pre-pandemic and during-pandemic), depression (PHQ9), anxiety (GAD7), wellbeing (SWEMWBS).	Social support services received dropped during the pandemic. Use of social activities dropped the most, followed by day-care, then support groups. Use of paid carers dropped the least. Current carers support: 85% accessed support pre-pandemic, 55% during pandemic. Former carers support: 51% accessed support pre-pandemic, 33% during pandemic. Older adults support: 45% accessed support pre-pandemic, 20% during pandemic. People with dementia: 63% accessed support pre-pandemic, 49% during pandemic. Levels of support gradually rose as pandemic progressed. Across the whole sample, anxiety reduced and depression increased during the pandemic. Anxiety (defined as GAD7 score of 10+) reduced during the pandemic: 16% of sample met threshold at T1 (during pandemic), 14% at T2. Depression (defined as PHQ9 score of 10+) increased during pandemic: 14% of sample met threshold at T1 (during pandemic), 18% at T3. People with dementia had the worst mental health (GAD7 median around 7, PHQ9 median around 7), followed by current carers (GAD7 median around 5, PHQ9 median around 5). Older adults had the best mental health (GAD7 median around 1, PHQ9 median around 2).

Abbreviations: BAI (Beck Anxiety Inventory), BDI (Beck Depression Inventory), DERS (Difficulties in Emotion Regulation Scale), GAD2 (Generalised Anxiety Disorder-2), GAD7 (Generalised Anxiety Disorder-7), GHQ-12 (General Health Questionnaire-12), HAI (Health Anxiety Inventory), ITQ (International Trauma Questionnaire), K6 (Kessler Psychological Distress Scale), NCS (Neighbourhood Cohesion Scale), PHQ-2 (Patient health Questionnaire-2), PHQ8 (Patient Health Questionnaire-8), PHQ9 (Patient Health Questionnaire-9), PLWD (Persons Living With Dementia), PROMIS Anxiety Scale (Patient-Reported Outcomes Measurement Information System Anxiety Scale), PSS-4 (Perceived Stress Scale-4), PSSS (Perceived Social Support Scale), RAND SF-36 (RAND corporation 36-Item Short Form Survey), SOC-3 (Sense of Coherence-3), SWEMWBS (Short Warwick-Edinburgh Mental Well-Being Scale), UCLA-3 (UCLA 3-Item Loneliness Scale), WEMWBS (Warwick-Edinburgh Mental Wellbeing Scale).

Appendix E

Ethical Approval and Minor Amendments

E1

Confirmation of UEL Research Ethics Approval and Minor Amendments Made

School of Psychology Research Ethics Committee

NOTICE OF ETHICS REVIEW DECISION

For research involving human participants
BSc/MSc/MA/Professional Doctorates in Clinical, Counselling and Educational Psychology

REVIEWER: Elley Wakui

SUPERVISOR: **Matthew Jones Chesters**

STUDENT: Amelia Presman

Course: Professional Doctorate in Clinical Psychology

Title of proposed study: Investigating the impact of social cognition, social contact, and coping strategies, on loneliness and psychological distress in Older Adults during Covid-19: an online survey.

DECISION options

1. **APPROVED:** Ethics approval for the above named research study has been granted from the date of approval (see end of this notice) to the date it is submitted for assessment/examination.

2. **APPROVED, BUT MINOR AMENDMENTS ARE REQUIRED BEFORE THE RESEARCH COMMENCES** (see Minor Amendments box below)**:** In this circumstance, re-submission of an ethics application is not required but the student must confirm with their supervisor that all minor amendments have been made before the research commences. Students are to do this by filling in the confirmation box below when all amendments have been attended to and emailing a copy of this decision notice to her/his supervisor for their records. The supervisor will then forward the student's confirmation to the School for its records.

3. **NOT APPROVED, MAJOR AMENDMENTS AND RE-SUBMISSION REQUIRED** (see Major Amendments box below)**:** In this circumstance, a revised ethics application must be submitted and approved before any research takes place. The revised application will be reviewed by the same reviewer. If in doubt, students should ask their supervisor for support in revising their ethics application.

DECISION ON THE ABOVE-NAMED PROPOSED RESEARCH STUDY
(Please indicate the decision according to one of the 3 options above)

Minor amendments required *(for reviewer)*:

4.4. Will the data be stored anywhere other than One Drive? E.g. a personal, password-protected computer for analysis?
- Yes, data will be downloaded onto a personal password-protected computer before being uploaded onto the UEL OneDrive for storage. Data will also be analysed on this same personal password-protected computer.

Invitation Letter: You will not be identified by the data collected -amend, as if names are entered on Qualtrics, this is not correct at point of collection?
- Information sheet details changed:
“After completing the survey, your name (if you choose to leave your name) will be entered into a prize draw to win two £50 Amazon vouchers.”
“You are not required to leave your name, and if you choose not to, you will not be identified by the data collected”

Please include the additional information required for collecting data online (example attached) and also the consent form for online version.

- Online data protection section added to information sheet as suggested:
“Online data protection
The online version of this questionnaire has been constructed as an anonymous survey, meaning no emails, IP addresses and/or geolocation data will be identified in the responses. HTTPS survey links (also known as secure survey links) have been used, giving Secure Sockets Layer (SSL) Encryption while a questionnaire is being completed. During the study data collected online will be stored on an EU-based server and will be subject to EU Data Protection acts. All online data will be completely destroyed following completion of data collection.”

Information sheet and Consent form incorporated into online survey

Major amendments required *(for reviewer):*

Confirmation of making the above minor amendments *(for students)*:

I have noted and made all the required minor amendments, as stated above, before starting my research and collecting data.

Student’s name *(Typed name to act as signature):* Amelia Presman
Student number: u1826651

Date: 03.09.2020

(Please submit a copy of this decision letter to your supervisor with this box completed, if minor amendments to your ethics application are required)

ASSESSMENT OF RISK TO RESEACHER *(for reviewer)*

Has an adequate risk assessment been offered in the application form?

YES / NO

Please request resubmission with an adequate risk assessment

If the proposed research could expose the <u>researcher</u> to any of kind of emotional, physical or health and safety hazard? Please rate the degree of risk:

☐ HIGH

Please do not approve a high risk application and refer to the Chair of Ethics. Travel to countries/provinces/areas deemed to be high risk should not be permitted and an application not approved on this basis. If unsure please refer to the Chair of Ethics.

☐ MEDIUM (Please approve but with appropriate recommendations)

☒ LOW

Reviewer comments in relation to researcher risk (if any).

Reviewer *(Typed name to act as signature)*: Elley Wakui

Date: 02/09/2020

This reviewer has assessed the ethics application for the named research study on behalf of the School of Psychology Research Ethics Committee

<u>RESEARCHER PLEASE NOTE:</u>

For the researcher and participants involved in the above named study to be covered by UEL’s Insurance, prior ethics approval from the School of Psychology (acting on behalf of the UEL Research Ethics Committee), and confirmation from students where minor amendments were required, must be obtained before any research takes place.

For a copy of UELs Personal Accident & Travel Insurance Policy, please see the Ethics Folder in the Psychology Noticeboard

E2

Request for Title Change to an Ethics Application (1)

University of East London Psychology

REQUEST FOR TITLE CHANGE TO AN ETHICS APPLICATION

FOR BSc, MSc/MA & TAUGHT PROFESSIONAL DOCTORATE STUDENTS

Please complete this form if you are requesting approval for proposed title change to an ethics application that has been approved by the School of Psychology.

By applying for a change of title request you confirm that in doing so the process by which you have collected your data/conducted your research has not changed or deviated from your original ethics approval. If either of these have changed then you are required to complete an Ethics Amendments Form.

HOW TO COMPLETE & SUBMIT THE REQUEST

1. Complete the request form electronically and accurately.
2. Type your name in the ‘student’s signature’ section (page 2).
3. Using your UEL email address, email the completed request form along with associated documents to: Psychology.Ethics@uel.ac.uk
4. Your request form will be returned to you via your UEL email address with reviewer’s response box completed. This will normally be within five days. Keep a copy of the approval to submit with your project/dissertation/thesis.

REQUIRED DOCUMENTS

1. A copy of the approval of your initial ethics application.

Name of applicant: Amelia Presman

Programme of study: Doctorate in Clinical Psychology

Name of supervisor: Dr Matthew Jones Chesters

Briefly outline the nature of your proposed title change in the boxes below

Proposed amendment	Rationale
Old Title: Investigating the impact of social cognition, social contact, and coping strategies, on loneliness and psychological distress in Older Adults during Covid-19: an online survey	More clarity, and to match the title on PhD manager
New Title: Investigating the impact of social cognition, social contact, and coping strategies, on loneliness and psychological distress in Older Adults during COVID-19 social distancing: an online survey	

Please tick	YES	NO
Is your supervisor aware of your proposed amendment(s) and agree to them?	X	
Does your change of title impact the process of how you collected your data/conducted your research?		X

Student's signature (please type your name): Amelia Presman

Date: 08.06.2021

<table>
<tr><th colspan="3">TO BE COMPLETED BY REVIEWER</th></tr>
<tr><td>Title changes approved</td><td>YES</td><td></td></tr>
<tr><td colspan="3">Comments</td></tr>
</table>

Reviewer: Trishna Patel

Date: 16/06/2021

E3

Request for Title Change to an Ethics Application (2)

University of East London Psychology

REQUEST FOR TITLE CHANGE TO AN ETHICS APPLICATION

FOR BSc, MSc/MA & TAUGHT PROFESSIONAL DOCTORATE STUDENTS

Please complete this form if you are requesting approval for proposed title change to an ethics application that has been approved by the School of Psychology.

By applying for a change of title request you confirm that in doing so the process by which you have collected your data/conducted your research has not changed or deviated from your original ethics approval. If either of these have changed then you are required to complete an Ethics Amendments Form.

HOW TO COMPLETE & SUBMIT THE REQUEST

1. Complete the request form electronically and accurately.
2. Type your name in the ‘student’s signature’ section (page 2).
3. Using your UEL email address, email the completed request form along with associated documents to: Psychology.Ethics@uel.ac.uk
4. Your request form will be returned to you via your UEL email address with reviewer’s response box completed. This will normally be within five days. Keep a copy of the approval to submit with your project/dissertation/thesis.

REQUIRED DOCUMENTS

1. A copy of the approval of your initial ethics application.

Name of applicant: Amelia Presman Programme of study: Doctorate in Clinical Psychology Name of supervisor: Dr Matthew Jones Chesters

Briefly outline the nature of your proposed title change in the boxes below

Proposed amendment	Rationale
Old Title: Investigating the impact of social cognition, social contact, and coping strategies, on loneliness and psychological distress in Older Adults during COVID-19 social distancing: an online survey	Grammar edited (incorrect comma removed, 'older adults' uncapitalised, 'An' following colon capitalised) Clarity ("COVID-19 social distancing" changed to "COVID-19 pandemic) Order of variables changed to reflect the order that they are presented in the thesis
New Title: Investigating the impact of social contact, coping strategies, and social cognition on loneliness and psychological distress in older adults during the COVID-19 pandemic: An online survey	

Please tick	YES	NO
Is your supervisor aware of your proposed amendment(s) and agree to them?	X	
Does your change of title impact the process of how you collected your data/conducted your research?		X

Student's signature (please type your name): Amelia Presman

Date: 11.08.2021

TO BE COMPLETED BY REVIEWER		
Title changes approved	YES	

Reviewer: Glen Rooney

Date: 11/08/2021

Appendix F

Participant Debrief Letter

PARTICIPANT DEBRIEF LETTER

Thank you for participating in my research study on the impact of COVID-19 and social distancing on wellbeing. This letter offers information that may be relevant now that you have now taken part.

What will happen to the information that you provide?

All of the information you provide will be kept strictly confidential. Your data will be stored on the UEL OneDrive, which is a secure and encrypted service. Your data will be anonymised by being assigned a numerical code instead of your name. For up to 3 weeks after you submit your survey data, a separate document will be kept to link your name to your numerical code (this is in case you decide you want to withdraw your data from the study during this period), and after 3 weeks your name will be deleted from this document so there will no longer be anything linking your name to your data. Your name will continue to be stored on our records for the purposes of entering you in the prize draw and providing you with results of the study, however if you would like us to delete your name from our records completely then please let us know by contacting me (contact details below).

Your anonymous data will be seen by myself and my supervisor. Group data will be incorporated into my thesis which will be read by examiners and will be made available to the public. If the study is published it will appear in an academic journal. No individual or identifiable information will be included in any report or publication.

After the study has been completed, your data will continue to be stored in a secure location, only accessible by the research team, for 10 years, as recommended by the UK Research and Innovation (UKRI) guidelines. After this, all data will be destroyed.

If you wish, I can provide you with a copy of the results of this study.

What if you want to withdraw?

You may request to withdraw your data even after you have participated, provided that this request is made within **3 weeks** of the data being collected. After 3 weeks, your name and other identifiable information will be deleted and your data will only be referred to by a numerical code, meaning we will no longer be able to identify which is your data.

What if you have been adversely affected by taking part?

We do not anticipate that you will be adversely affected by taking part in the research, and all reasonable steps have been taken to minimise potential harm. Nevertheless, it is still possible that your participation – or its after-effects – may have been challenging, distressing or uncomfortable in some way. If you have been affected in any way, you may find the following resources/services helpful in relation to obtaining information and support:

Age UK

Age UK is dedicated to helping everybody to make the most out of later life. The provide practical advice, emotional support, and companionship for older adults. They also run a programme of various activities and social events for older adults. Contact

Tel: 0800 678 1602 – Advice line is open 8am-7pm, 365 days a year
Website: www.ageuk.org.uk

Friends of the Elderly

Friends of the Elderly provides support for older people, including residential care homes, day clubs, dementia care, home support, and a telephone befriending service.

Tel: 020 7730 8263 – Telephone line open Monday-Friday 9am-5pm
Website: www.fote.org.uk
Email: enquiries@fote.org.uk

The Silver Line

This is a confidential, free helpline for older people across the UK. They aim to offer information, friendship and advice; link callers to local groups and services; and protect and support older people who are suffering abuse and neglect. They offer a ‘telephone friendship’ service where callers are matched with volunteers; and group calls where callers can speak to others with shared interests.

Tel: 0800 470 8090 - open 24 hours a day, seven days a week, 365 days of the year
Website: www.thesilverline.org.uk

Independent Age

Independent age is a charity that supports older adults to live independently. They offer practical support and advice on topics including money, future planning, support & social care, health, and housing. They also offer a befriending service (both in-person or via telephone), various activities and clubs, and volunteering opportunities for older people.

Tel: 0800 319 6789 – open Mon-Fri 8:30am-6:30pm; Saturdays 9am-1pm
Website: www.independentage.org

You are also very welcome to contact me or my supervisor if you have specific questions or concerns (see contact details below).

Contact Details

If you would like further information about my research or have any questions or concerns, please do not hesitate to contact me:

- Amelia Presman, email: u1826651@uel.ac.uk

If you have any questions or concerns about how the research has been conducted please contact:

- The research supervisor:
  Dr Matthew Jones-Chesters,
  School of Psychology, University of East London, Water Lane, London E15 4LZ
  Email: m.h.jones-chesters@uel.ac.uk

or

- Chair of the School of Psychology Research Ethics Sub-committee:
  Dr Tim Lomas
  School of Psychology, University of East London, Water Lane, London E15 4LZ.
  Email: t.lomas@uel.ac.uk

Appendix G

Participant Invitation and Information Sheet

PARTICIPANT INVITATION LETTER

Study Title:

Investigating the impact of social cognition, social contact, and coping strategies, on loneliness and psychological distress in Older Adults during COVID-19 social distancing: an online survey.

You are being invited to participate in a research study. Before you agree it is important that you understand what your participation would involve. Please take time to read the following information carefully.

Who am I?

I am an postgraduate student in the School of Psychology at the University of East London and am studying for a Doctorate in Clinical Psychology. As part of my studies I am conducting the research you are being invited to participate in.

What is the research?

I am conducting research into the impact of COVID-19 and social distancing on people's wellbeing, in older adults (people aged 70+). The reason for asking people aged 70+ to participate is that social distancing guidance is stricter for people aged 70+ than it is for the rest of the population. This study also investigates other things that may impact on wellbeing during social distancing, including coping strategies, level of social contact, and 'social cognition' (which refers to the various psychological processes that help people to understand and socialise with others).

My research has been approved by the School of Psychology Research Ethics Committee. This means that my research follows the standard of research ethics set by the British Psychological Society.

Why have you been asked to participate?

You have been invited to participate in my research as someone who fits the kind of people I am looking for to help me explore my research topic. I am looking to involve people who are age 70 or older.

I emphasise that I am not looking for 'experts' on the topic I am studying. You will not be judged or personally analysed in any way and you will be treated with respect.

You are quite free to decide whether or not to participate and should not feel coerced.

What will your participation involve?

Participation involves completing an online survey. This survey should take around 1hr to complete. You are welcome to take as many breaks as you like whilst completing the survey.

The survey will ask you to answer questions about your level of social contact, your coping strategies for social distancing, loneliness, wellbeing, and social cognition.

Your participation will be valuable in helping to develop knowledge and understanding about wellbeing in older adults during social distancing, which may go on to help others in the future.

After completing the survey, your name (if you choose to leave your name) will be entered into a prize draw to win two £50 Amazon vouchers.

Your taking part will be safe and confidential

Your privacy and safety will be respected at all times. You are not required to leave your name, and if you choose not to, you will not be identified by the data collected. You will not be identified in any write-up of the research. You do not have to answer all questions asked of you, and can stop your participation at any time. We do not anticipate that you will be adversely affected by taking part in the research, however if you feel affected in any way by taking part then we have provided a list of resources that might be helpful in the debrief sheet, and you are welcome to contact me or my supervisor if you would like to discuss anything.

Online data protection

The online version of this questionnaire has been constructed as an anonymous survey, meaning no emails, IP addresses and/or geolocation data will be identified in the responses. HTTPS survey links (also known as secure survey links) have been used, giving Secure Sockets Layer (SSL) Encryption while a questionnaire is being completed. During the study data collected online will be stored on an EU-based server and will be subject to EU Data Protection acts. All online data will be completely destroyed following completion of data collection.

What will happen to the information that you provide?

All information you provide will be kept strictly confidential. Your data will be stored on the UEL OneDrive, which is a secure and encrypted online service. Your data will be anonymised by assigning a numerical code instead of your name. For up to 3 weeks after you complete the survey, a separate document will be kept which links your name to your numerical code (this is in case you decide you want to withdraw your data from the study during this period), and after 3 weeks your name will be deleted from this document so that there is no link between your name and your survey responses. If you have ticked the box indicating that you would like to be entered for the prize draw to win vouchers, or that you would like to receive a copy of the results of this study, then I will continue to store your name and contact details (however these will not be linked with your survey responses).

Your anonymised data will be seen by myself and my supervisor. Group data will be incorporated into my thesis, which will be read by examiners and will be made available to the public. If the study is published it will appear in an academic journal. No individual or identifiable information will be included in any report or publication.

After the study has been completed, your data continue to be stored in a secure location, only accessible by the research team, for 10 years, as recommended by the UK Research and Innovation (UKRI) guidelines. After this, all data will be destroyed.

If you wish, I can provide you with a copy of the results of this study.

What if you want to withdraw?

You are free to withdraw from the survey at any time before completing it, without explanation, disadvantage or consequence.

Separately, you may also request to withdraw your data even after you have completed the survey, provided that this request is made within **3 weeks** of submitting the survey. After 3 weeks, your name and other identifiable information will be deleted and your data will only be referred to by a numerical code, meaning we will no longer be able to identify which is your data.

Contact Details

If you would like further information about my research or have any questions or concerns, please do not hesitate to contact me:

- Amelia Presman, email: u1826651@uel.ac.uk

If you have any questions or concerns about how the research has been conducted please contact:

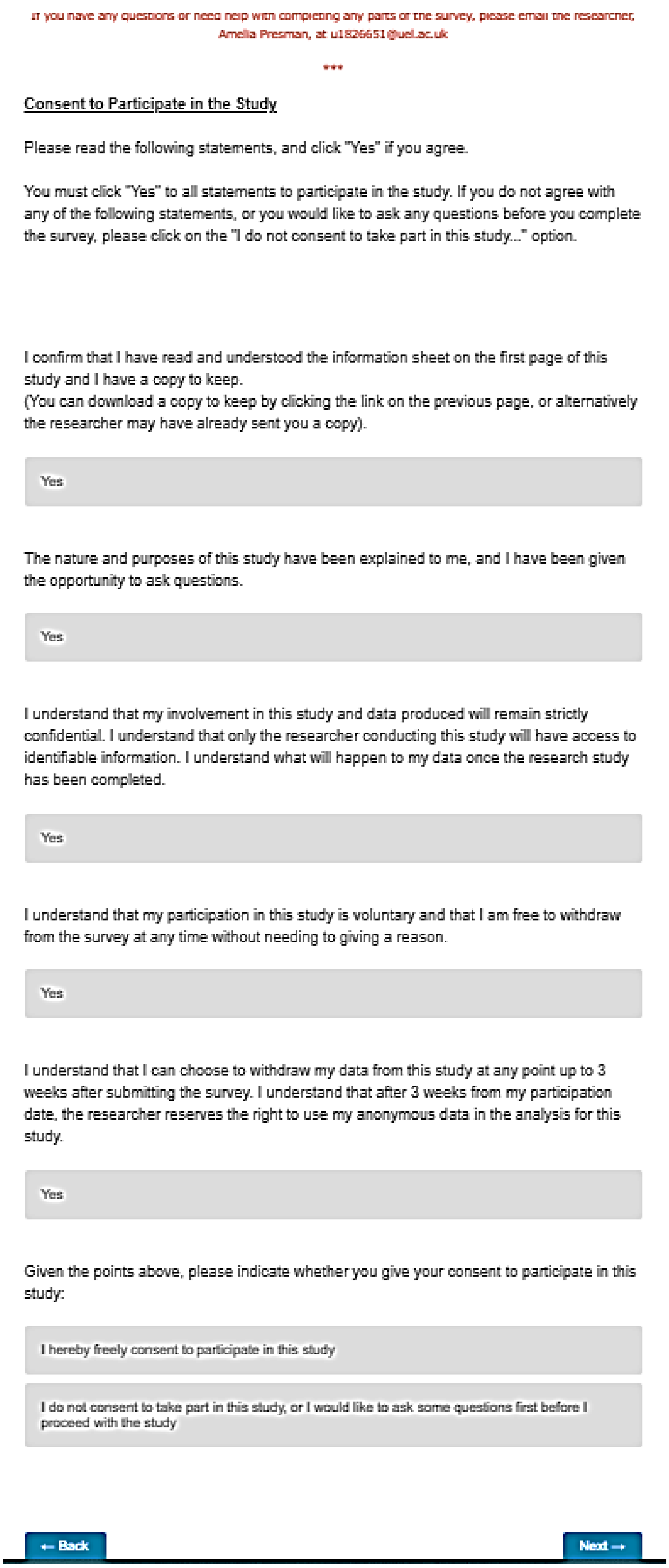
- The research supervisor:
  Dr Matthew Jones-Chesters,
  School of Psychology, University of East London, Water Lane, London E15 4LZ
  Email: m.h.jones-chesters@uel.ac.uk

or

- Chair of the School of Psychology Research Ethics Sub-committee:
  Dr Tim Lomas
  School of Psychology, University of East London, Water Lane, London E15 4LZ.
  Email: t.lomas@uel.ac.uk

Appendix H

Online Consent Form



If you have any questions or need help with completing any parts of the survey, please email the researcher,
Amelia Presman, at u1826651@uel.ac.uk

***

Consent to Participate in the Study

Please read the following statements, and click "Yes" if you agree.

You must click "Yes" to all statements to participate in the study. If you do not agree with any of the following statements, or you would like to ask any questions before you complete the survey, please click on the "I do not consent to take part in this study..." option.

I confirm that I have read and understood the information sheet on the first page of this study and I have a copy to keep.
(You can download a copy to keep by clicking the link on the previous page, or alternatively the researcher may have already sent you a copy).

Yes

The nature and purposes of this study have been explained to me, and I have been given the opportunity to ask questions.

Yes

I understand that my involvement in this study and data produced will remain strictly confidential. I understand that only the researcher conducting this study will have access to identifiable information. I understand what will happen to my data once the research study has been completed.

Yes

I understand that my participation in this study is voluntary and that I am free to withdraw from the survey at any time without needing to giving a reason.

Yes

I understand that I can choose to withdraw my data from this study at any point up to 3 weeks after submitting the survey. I understand that after 3 weeks from my participation date, the researcher reserves the right to use my anonymous data in the analysis for this study.

Yes

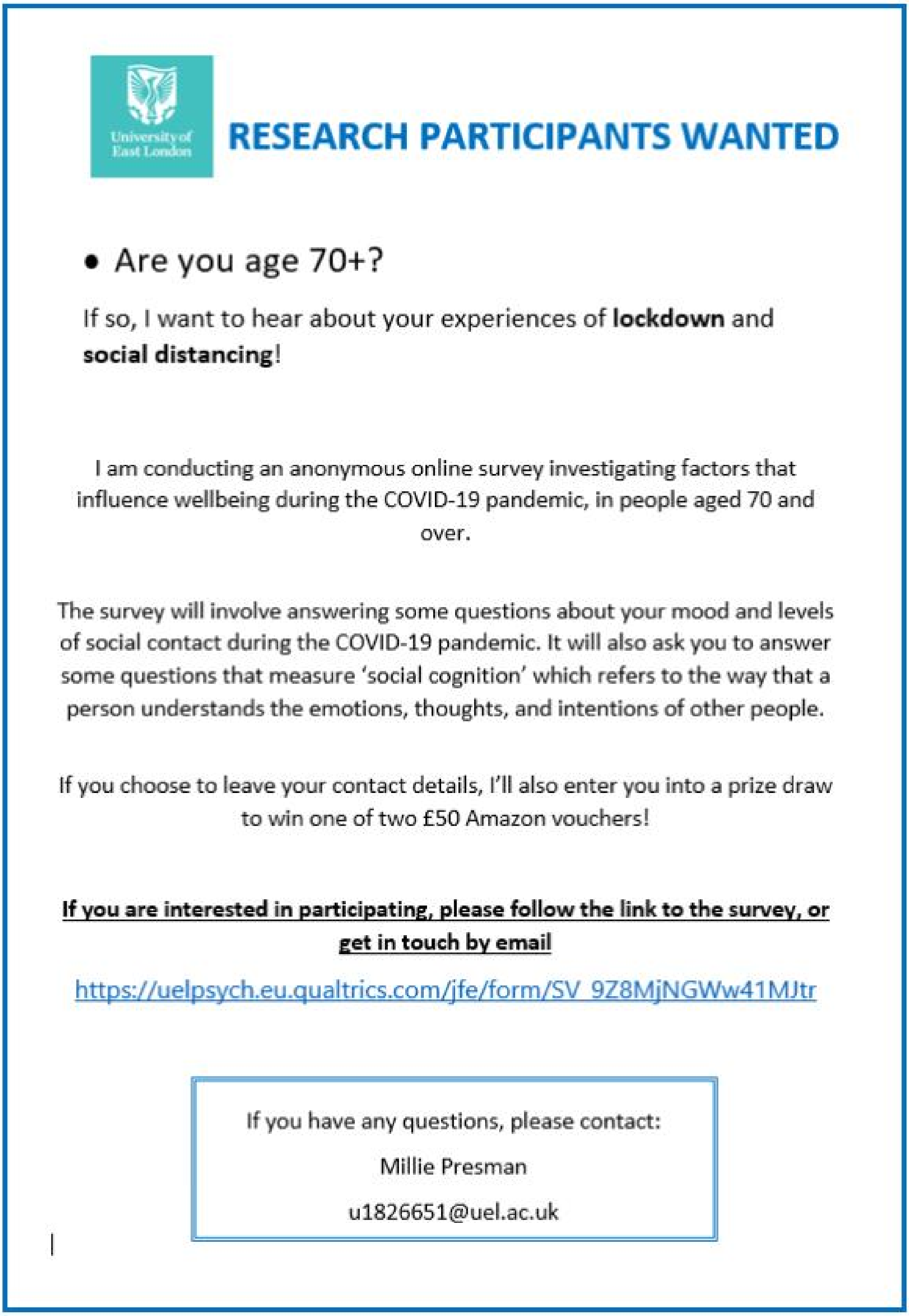
Given the points above, please indicate whether you give your consent to participate in this study:

I hereby freely consent to participate in this study

I do not consent to take part in this study, or I would like to ask some questions first before I proceed with the study

Appendix I

Virtual Recruitment Flyer



RESEARCH PARTICIPANTS WANTED

- Are you age 70+?

If so, I want to hear about your experiences of **lockdown** and **social distancing**!

I am conducting an anonymous online survey investigating factors that influence wellbeing during the COVID-19 pandemic, in people aged 70 and over.

The survey will involve answering some questions about your mood and levels of social contact during the COVID-19 pandemic. It will also ask you to answer some questions that measure 'social cognition' which refers to the way that a person understands the emotions, thoughts, and intentions of other people.

If you choose to leave your contact details, I'll also enter you into a prize draw to win one of two £50 Amazon vouchers!

If you are interested in participating, please follow the link to the survey, or get in touch by email

https://uelpsych.eu.qualtrics.com/jfe/form/SV_9Z8MjNGWw41MJtr

If you have any questions, please contact:

Millie Presman

u1826651@uel.ac.uk

Appendix J

Theoretical Associations between Age, Sex, and Variables of Interest

Variable of interest	Covariate	Theoretical association
Mood	Age	Many studies report age differences in depression (Hasin et al., 2005), anxiety (Brenes, 2006), and general mood and emotion (Nolen-Hoeksema & Aldao, 2011; Stanley & Isaacowitz, 2011).
	Sex	Mental health difficulties are more common in women than in men (Boyd et al., 2015). There is higher prevalence of depression (Golden et al., 2009) and anxiety (Vasiliadis et al., 2020) in older women than in older men.
Living Situation	Age	Individuals are more likely to live alone as age increases (Esteve et al., 2020).
	Sex	Older women are more likely to live alone than older men due to differences in mortality ages, meaning that in heterosexual relationships women are more likely to outlive their partner (Esteve et al., 2020).
Social Contact	Age	There are age differences in social interaction and social relationships. Older people generally report more frequent social interactions with family than younger adults (Zhaoyang et al., 2018), and size of social networks declines with age in the size of social networks (Kalmijn, 2012).
	Sex	Evidence suggests that men and women socialise differently (Cudjoe et al., 2020; Henning-Smith et al., 2018; Steptoe et al., 2013). Older women tend to have larger social networks, and are more likely to experience changes in social networks with age (Zhaoyang et al., 2018). Older men are more likely to be socially isolated than older women (Cudjoe et al., 2020).
Coping behaviours	Age	As age increases people are less likely to use problem-focused coping strategies to cope with challenges (Brandtstädter & Renner, 1990; Chen et al., 2018; Martin et al., 2008).
	Sex	Women are more likely than men to use most types of coping strategies, and especially those involving emotional expression (Tamres et al., 2002).
Social Cognition	Age	Social cognitive ability declines with age (Henry et al., 2013; Ruffman et al., 2008).
	Sex	Studies suggest sex differences in social cognition (Proverbio, 2017). Women show better emotion recognition and also express emotions more easily than men (Kret & De Gelder, 2012).

Appendix K

Sample of Coding for Content Analysis

Free Text Question: *“Please write in here any other information you can, about things that you have been doing to cope during the COVID-19 period (write as much or as little as you'd like)”*		
P no.	Free Text Answer	Code
3	being involved with my U3A	1. Volunteering/ working 2. Organised groups.
4	Walking.	3. Walking
4	Writing daily journal.	4. Writing/journaling
4	Zoom pilates and reading group.	2. Organised groups. 5. Virtual exercise classes
4	Daily What's App contact with family.	6. Social contact - Texting.
4	Socially distanced garden visits to family who live nearby	7. In-person social contact.
5	I joined several on line dance classes;	2. Organised groups. 5. Virtual exercise classes
5	I have used Zoom and FaceTime to stay in contact with friends and close relatives	8. Virtual calls
7	I've completed a novel for my creative writing group over during the Cov period	9. Writing. 2. Organised groups.
7	- plus going for walks and playing tennis	3. Walking. 10. tennis
8	I am trying to use the time positively,	11. Making the most of it
8	such as catching up with phone calls,	12. Telephone calls
8	sorting out paperwork &	13. Sorting/organising
8	making photo albums for my nephews.	14. Creative projects
10	Zooming with family and friends	8. Virtual calls
10	walking with a small group	3. Walking 7. In-person social contact.
10	meeting in people’s gardens	7. In-person social contact.
11	I have been trying to keep busy and	15. Keeping busy.
11	luckily as the weather has been good I have been doing a lot of gardening.	16. Gardening 17. good weather helps – relevant for mood question
11	I have also been reading a lot.	18. reading.
11	and doing crosswords to keep my mind occupied	19. crosswords/puzzles
12	Taken up cycling and	20. Cycling
12	try to emotionally support my family and friends	21. Supporting others
14	It is very hard when you are on your own. You have no one to discuss how you feel or help you think through your feelings when you are feeling them. Covid has made this worse.	22. Loneliness – relevant for mood question
15	watching box sets and	23. TV
15	doing jigsaws	19. crosswords/puzzles
16	Keeping in touch with children and grandchildren both in real life and via phone/skype etc. Seeing friends when possible.	7. In-person social contact. 12. Telephone calls 8. Virtual calls
16	Working in the garden	16. Gardening
16	going for walks.	3. Walking.
16	Reading a lot but not [interestingly] watching TV - I hardly do that at all.	18. reading
16	emailing people.	24. Email
16	Teaching classes of teenage musician by Zoom and preparing the classes and enjoying them despite their weird 'otherness'.	1. Volunteering/ working 2. Organised groups.
17	DIY. Decorating.	25. home improvement
17	Gardening.	16. Gardening
17	Decluttering	13. Sorting/organising

18	As soon as we entered Lockdown, my two neighbours and I decided to have walks from 11-12.30 every day and the met in our front gardens for homemade cakes from 4-5 everyday which gave us the chance to speak with other neighbours and people going past to go to the park..	3. Walking. 7. In-person social contact.
18	Since it has been possible for the three of us to travel in a car together, we have a day out every week, sometimes to a country village but during August and September, we have been going to a different beach on the Kent and Sussex coasts one day each week	25. Days out 26. appreciating nature 7. In-person social contact.
21	Gardening,	16. Gardening
21	walking and	3. Walking.
21	have taken up piano playing again after 20 years.	27. Playing piano 28. Taking up an old hobby
24	I have been trying to do a particular activity every day, instead of just sitting around (both me and my husband are retired).	15. Keeping busy.
24	We play scrabble,	19 - Crosswords/puzzles/board games
24	do drawing and painting and so on.	29. Art
26	As above, volunteering a lot,	1. Volunteering/ working
26	catching up on things at home,	13. Sorting/organising
26	gardening,	16. Gardening
26	updating my scrap book,	14. Creative projects
26	keeping in contact with friends and relatives here and abroad,	30. Social contact - non-specific mentions
26	intending to write an essay for my grandchildren on my background and family history,	14. Creative projects 9. Writing
26	cooking and baking a lot,	31. Food and cooking
26	helping disabled friends when allowed, etc.	21. Supporting others
26	Generally keeping very busy to take my mind off things, and	15. Keeping busy
26	when we can we have met friends for meals out and	7. In-person social contact.
26	even taken short trips to hotels	32. Trips away
28	walking,	3. Walking.
28	cooking,	31. Food and cooking
28	having virtual cocktails with friends in other countries (the cocktails are real),	8. Virtual calls

Appendix L

Data Distributions for Variables of Interest

Figure L1

Data Distribution for Age

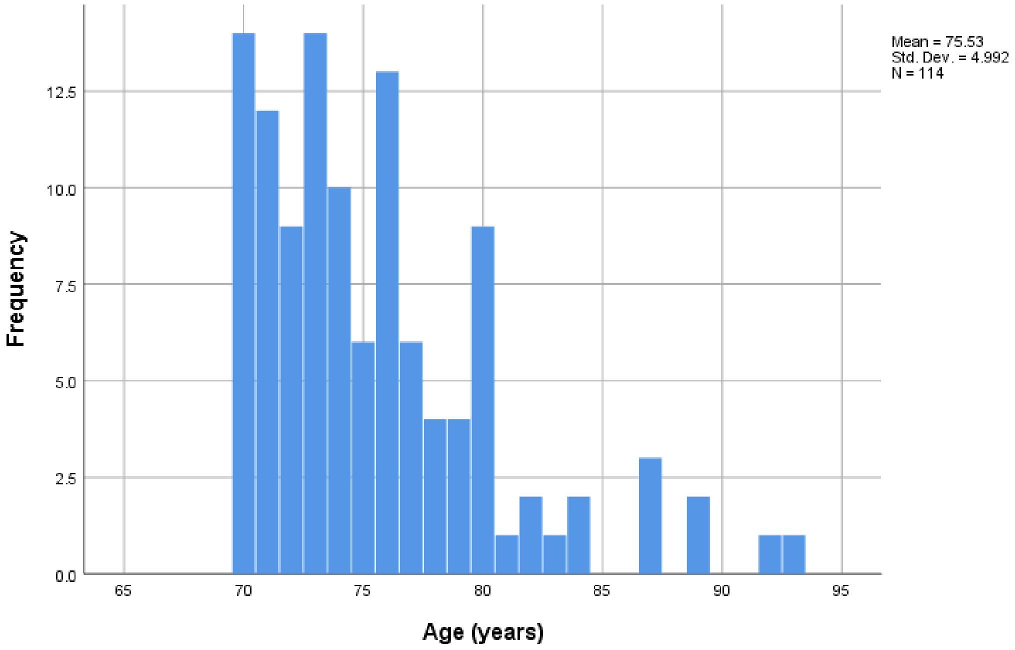


Figure L2

Data Distribution for PHQ8 Score

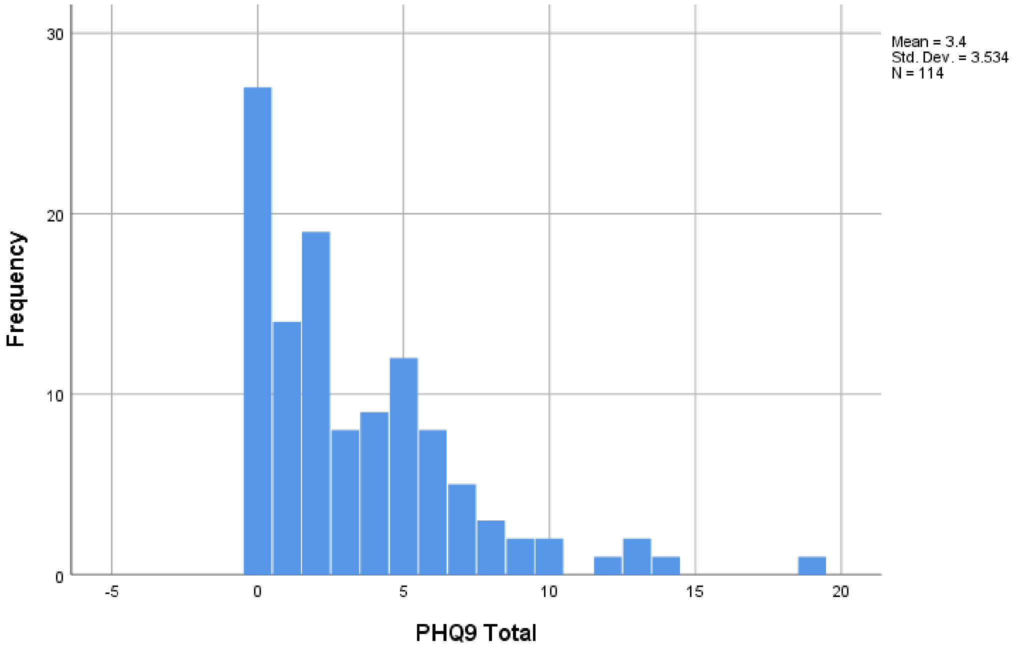


Figure L3

Data Distribution for GAD7 Score

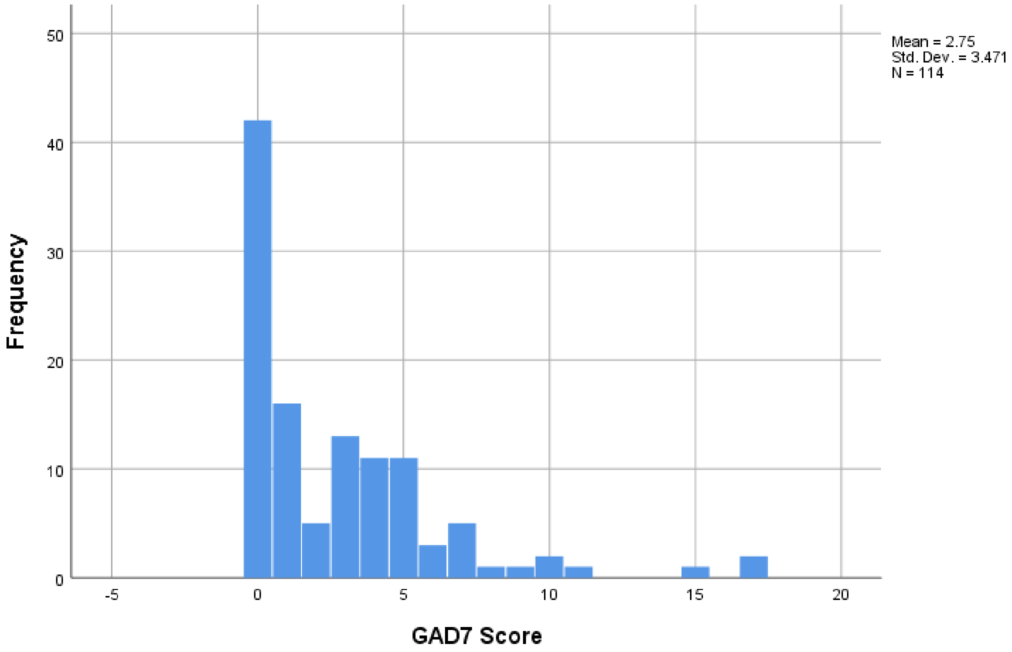


Figure L4

Data Distribution for Loneliness Scale Score

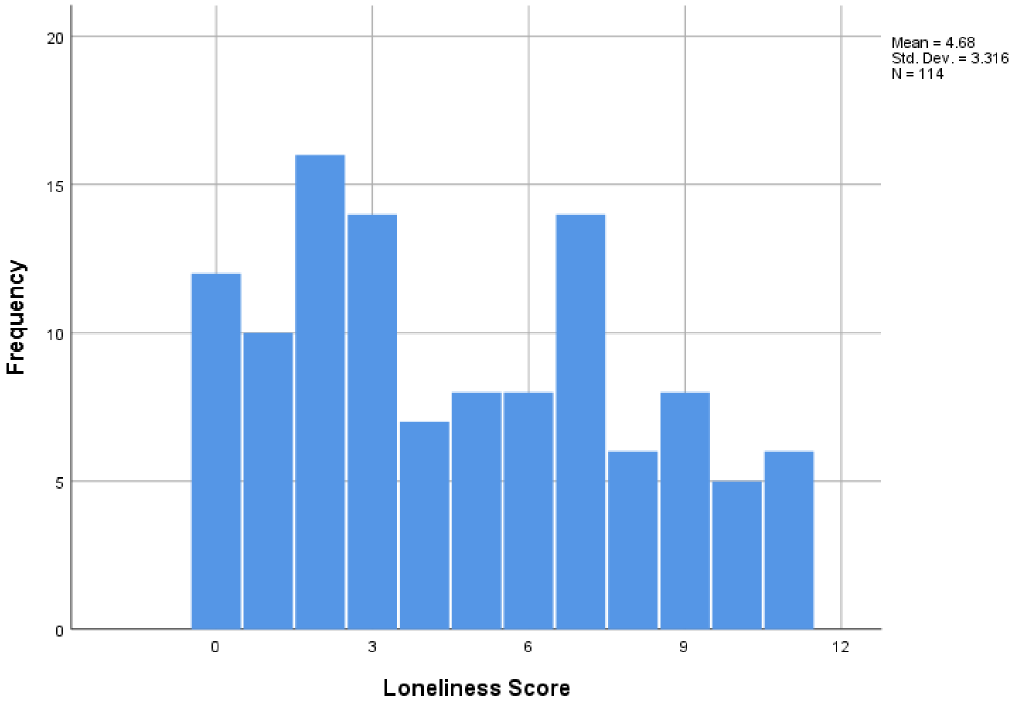


Figure L5

Data Distribution for Weekly Hours of Face-to-Face Social Contact during the COVID-19 Pandemic

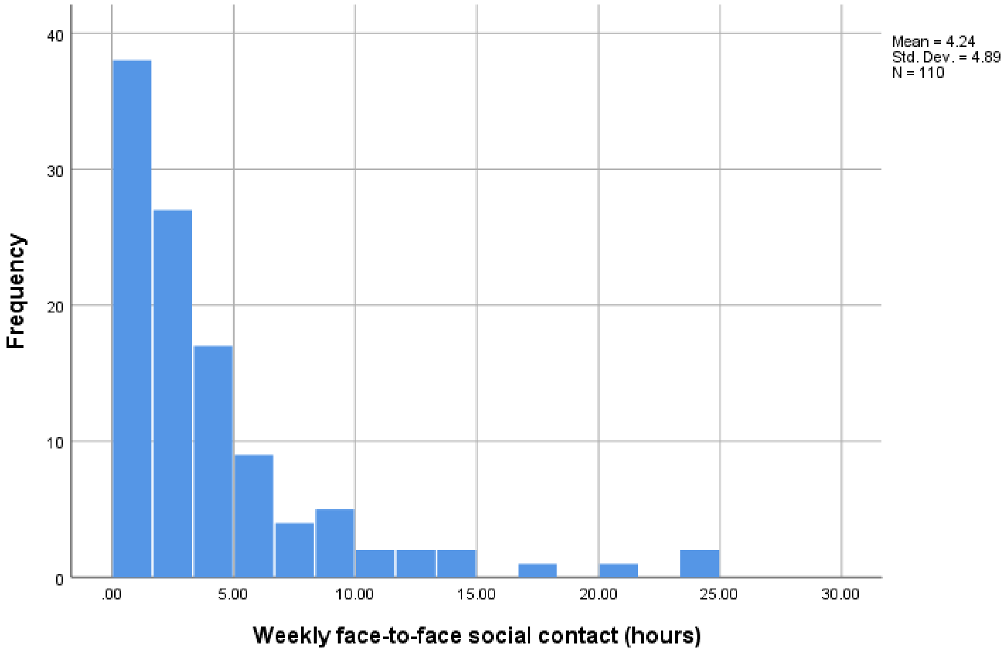


Figure L6

Data Distribution for Weekly Hours of Virtual Social Contact during the COVID-19 Pandemic

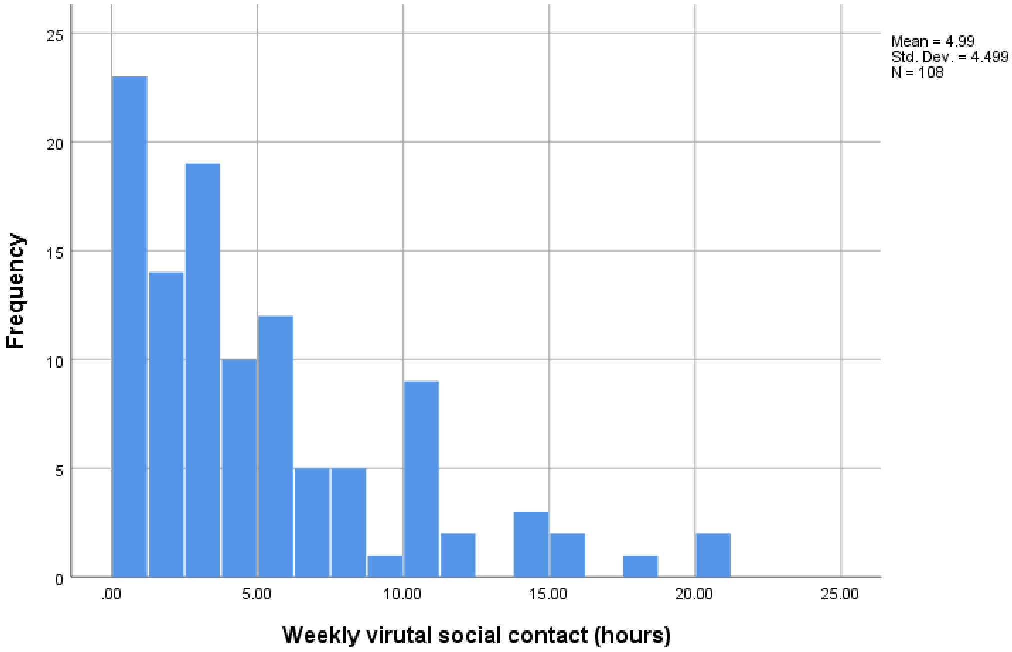


Figure L7

Data Distribution for Weekly Hours of Social Contact through Organised Online Groups during the COVID-19 Pandemic

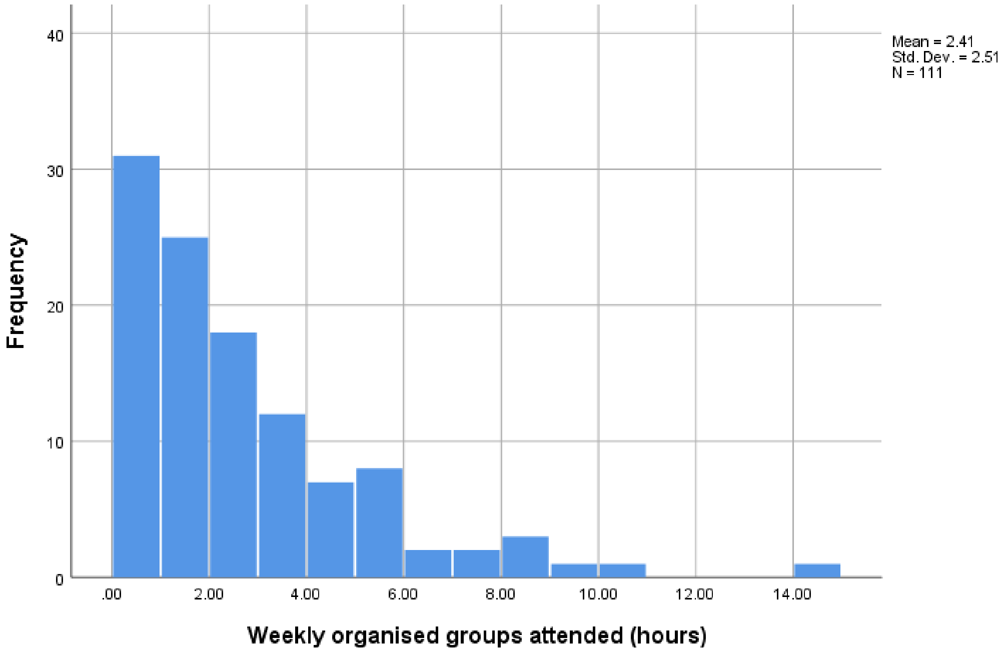


Figure L8

Data Distribution for COPE Scale Active Coping Factor Score

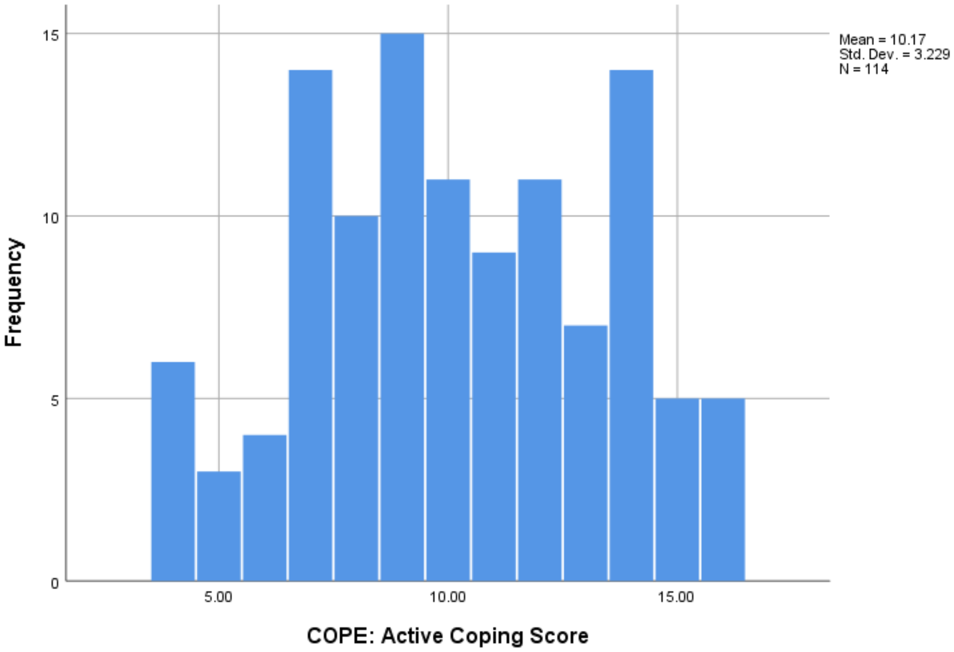


Figure L9

Data Distribution for COPE Socially Supported Coping Factor Score

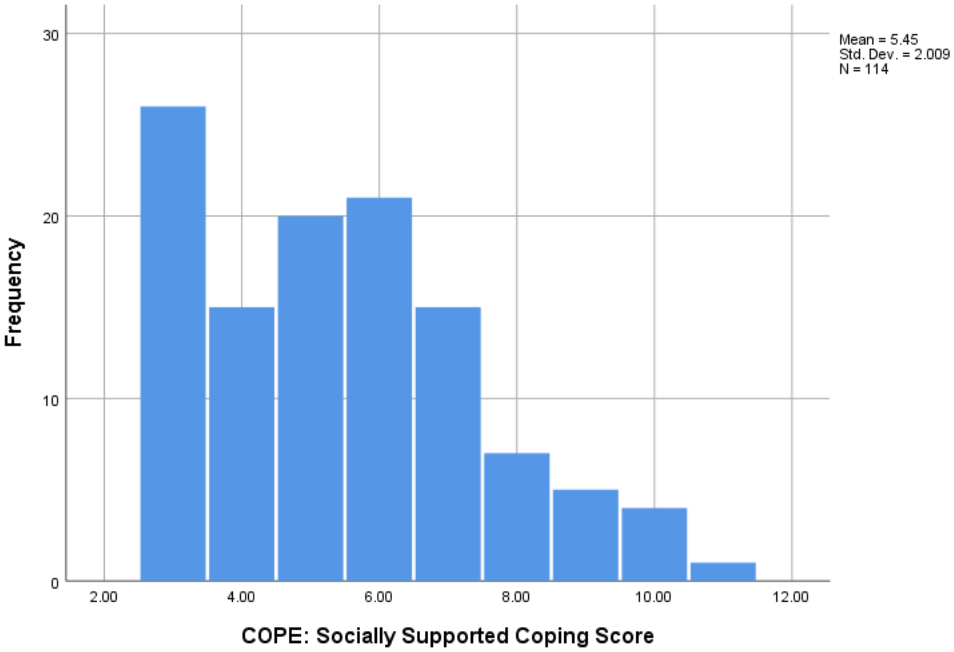


Figure L10

Data Distribution for COPE Negative Coping Factor Score

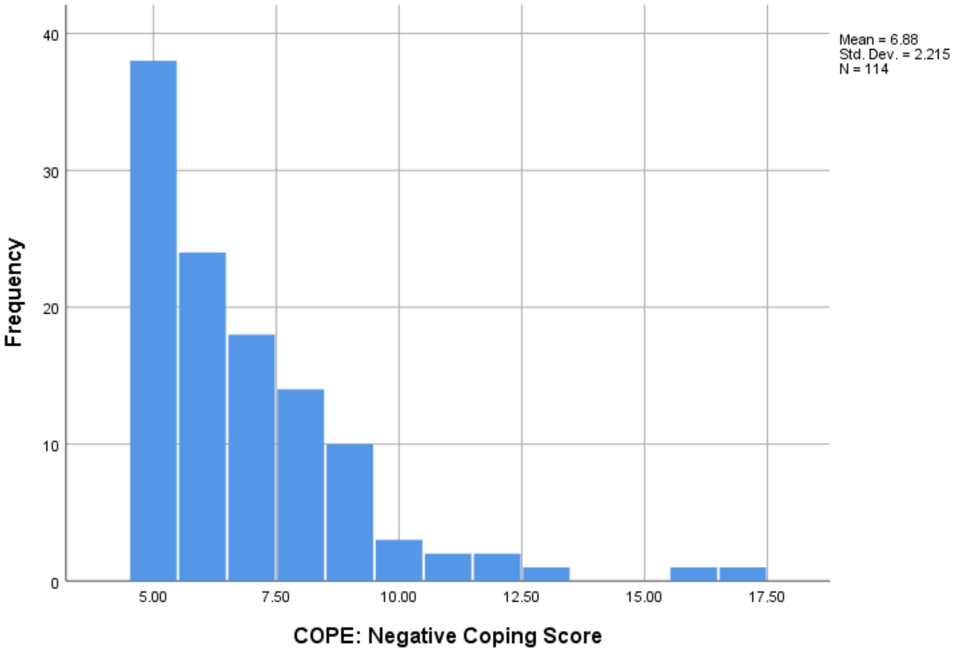


Figure L11

Data Distribution for COPE Negative Coping Factor Score

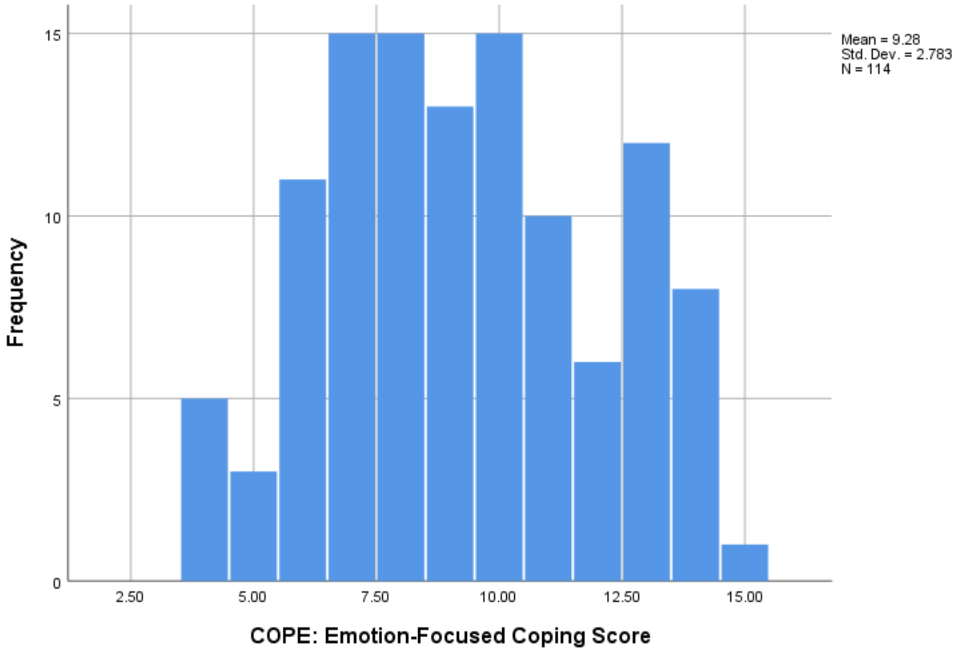


Figure L12

Data Distribution for QCAE Cognitive Scale Score

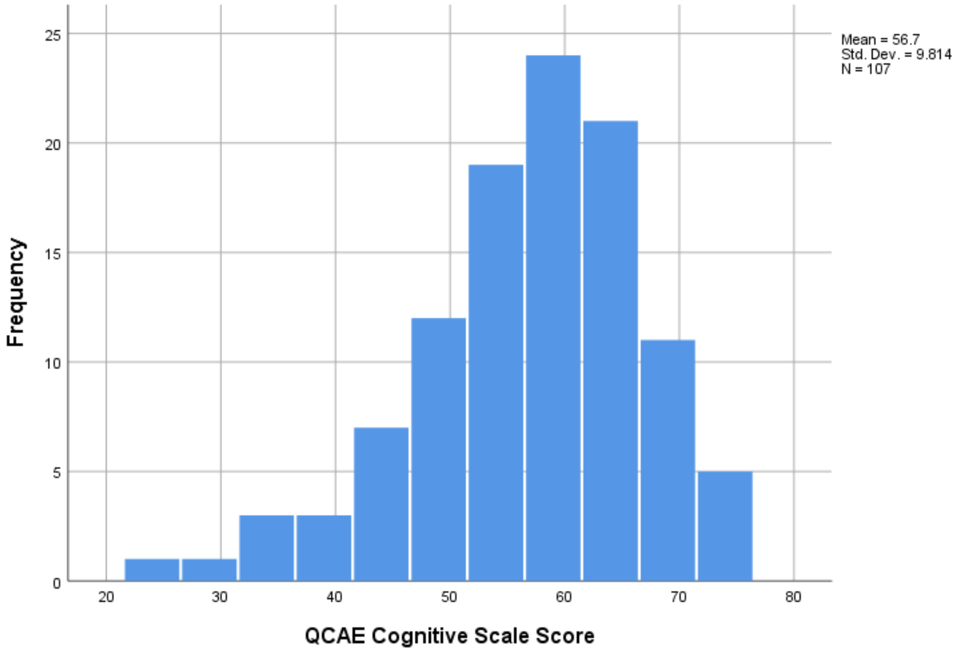


Figure L13

Data Distribution for QCAE Affective Scale Score

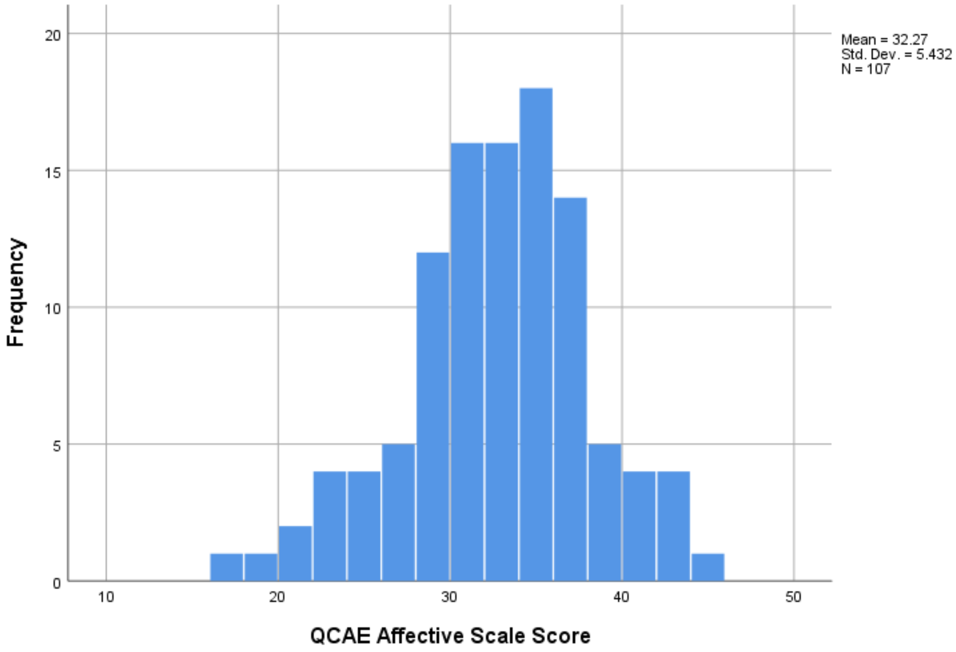


Figure L14

Data Distribution for Affect Naming Test (ANT) Score

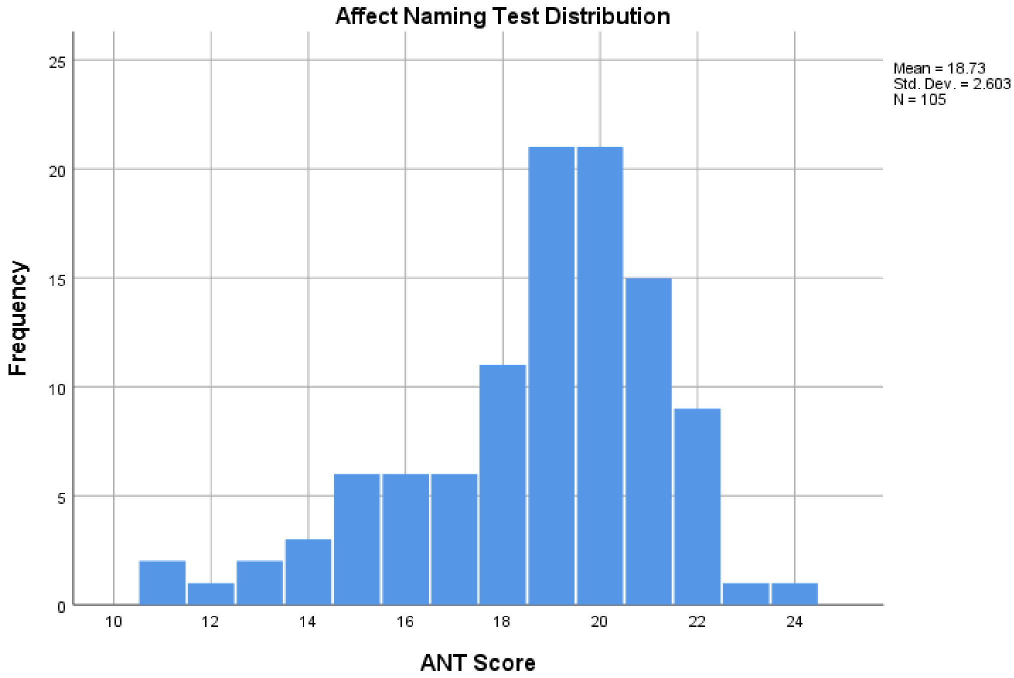
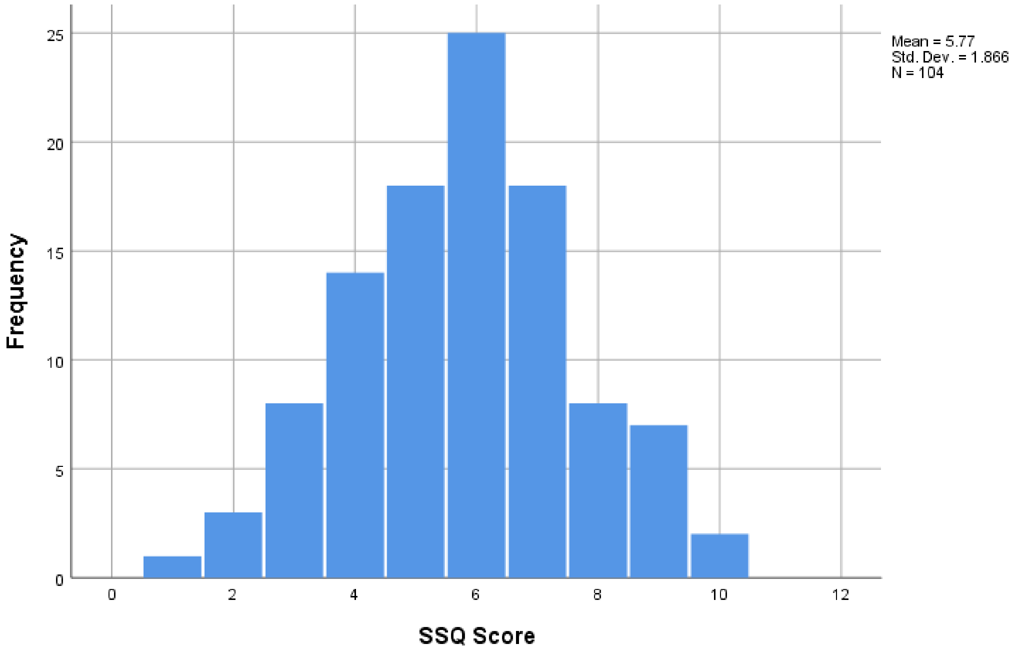


Figure L15

Data Distribution for The Social Stories Questionnaire (SSQ) Score



Appendix M

Correlation Matrix of Items from the COPE Scale

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	1.00	—																										
2	0.54	1.00	—																									
3	0.13	0.06	1.00	—																								
4	0.03	-0.07	0.07	1.00	—																							
5	0.15	0.12	0.09	0.21	1.00	—																						
6	0.01	-0.04	0.15	-0.09	-0.12	1.00	—																					
7	0.56	0.57	0.16	-0.08	0.15	-0.08	1.00	—																				
8	-0.01	-0.01	0.34	-0.08	-0.14	0.28	0.02	1.00	—																			
9	0.17	0.22	-0.03	-0.03	0.15	0.05	0.18	-0.02	1.00	—																		
10	0.28	0.20	0.14	0.08	0.59	-0.09	0.25	-0.06	0.09	1.00	—																	
11	0.10	0.02	0.14	0.89	0.18	-0.06	0.00	-0.10	-0.06	0.09	1.00	—																
12	0.26	0.16	0.04	0.03	0.13	-0.01	0.35	0.11	0.02	0.24	0.08	1.00	—															
13	0.05	0.11	0.25	-0.05	0.05	0.21	-0.01	0.26	0.07	0.14	-0.04	0.14	1.00	—														
14	0.35	0.48	0.04	0.10	0.37	-0.26	0.61	-0.02	0.20	0.26	0.14	0.29	0.01	1.00	—													
15	0.07	0.13	0.00	0.14	0.64	-0.17	0.20	-0.11	0.14	0.52	0.15	0.19	0.01	0.31	1.00	—												
16	-0.03	0.04	0.05	-0.04	-0.12	0.26	0.01	0.00	0.13	-0.11	-0.02	0.06	0.18	-0.03	-0.14	1.00	—											
17	0.18	0.16	-0.13	-0.06	0.08	-0.15	0.34	0.00	0.06	0.01	-0.10	0.53	-0.04	0.27	0.10	0.11	1.00	—										
18	0.13	0.02	0.03	0.18	0.29	-0.07	0.11	-0.07	0.00	0.33	0.19	0.27	-0.10	0.25	0.25	-0.07	0.14	1.00	—									
19	0.28	0.11	0.21	0.13	0.08	0.09	0.15	0.06	0.05	0.32	0.13	0.21	0.18	0.09	0.12	0.04	-0.02	0.23	1.00	—								
20	0.23	0.13	-0.12	-0.23	-0.02	0.04	0.20	-0.02	0.11	0.02	-0.20	0.09	0.03	0.20	-0.03	0.04	0.22	0.04	0.09	1.00	—							
21	0.16	0.22	0.07	0.12	0.26	0.09	0.27	-0.10	0.27	0.23	0.12	0.04	0.13	0.22	0.29	-0.07	0.02	0.22	0.11	0.11	1.00	—						
22	0.09	0.13	0.01	-0.06	0.05	0.04	0.27	0.04	0.09	0.05	-0.08	0.29	0.19	0.12	0.06	0.10	0.36	0.00	0.21	0.07	0.14	1.00	—					
23	0.22	0.24	0.14	0.13	0.41	-0.11	0.26	-0.08	0.12	0.46	0.12	0.27	0.19	0.31	0.38	-0.06	0.05	0.15	0.22	-0.03	0.32	0.27	1.00	—				
24	0.23	0.14	0.06	-0.05	-0.13	-0.09	0.30	-0.04	0.04	-0.01	-0.02	0.32	-0.02	0.18	0.01	0.01	0.35	0.10	0.19	0.37	0.17	0.16	0.03	1.00	—			
25	0.34	0.45	0.00	-0.03	0.01	-0.02	0.55	0.18	0.17	0.13	0.00	0.35	0.19	0.47	0.11	0.13	0.35	0.11	0.10	0.19	0.19	0.23	0.27	0.35	1.00	—		
26	-0.08	-0.05	0.10	0.01	0.02	0.04	-0.13	0.16	0.10	-0.05	-0.06	-0.14	0.34	-0.09	-0.05	0.07	0.00	-0.18	-0.10	-0.01	0.05	-0.01	-0.07	-0.18	-0.06	1.00	—	
27	-0.02	0.06	0.02	-0.05	0.07	-0.04	0.24	0.01	0.06	0.08	-0.08	0.24	0.27	0.08	0.10	-0.07	0.22	-0.03	0.21	0.03	0.15	0.77	0.22	0.07	0.21	0.10	1.00	—
28	0.03	-0.09	-0.03	0.27	0.15	0.02	0.04	-0.01	0.02	0.12	0.23	0.15	-0.14	0.24	0.09	-0.10	0.18	0.64	0.09	-0.01	0.14	-0.06	0.05	0.12	0.08	-0.06	-0.10	1.00

Appendix N

Parallel Analysis on COPE Scale Data, Items 4 and 27 Removed

		Parallel Analysis Eigenvalue	
Root	**Raw Data Eigenvalue**	**Mean**	**95th Percentile**
1	4.376866	1.248350	1.433915
2	2.058903	1.074295	1.203482
3	1.548973	0.944847	1.054752
4	1.178358	0.832683	0.932399
5	0.881112	0.736569	0.831480
6	0.658997	0.648671	0.734147
7	0.611856	0.568298	0.650008
8	0.410053	0.490385	0.565103
9	0.348556	0.419888	0.486318
10	0.263443	0.353211	0.419677
11	0.225163	0.289792	0.352761
12	0.200996	0.228005	0.289341
13	0.126135	0.169922	0.224527
14	0.030500	0.113789	0.169293
15	0.021610	0.058149	0.106878
16	-0.020139	0.007226	0.053938
17	-0.047870	-0.043265	0.003997
18	-0.064985	-0.091785	-0.049049
19	-0.122016	-0.138032	-0.095122
20	-0.159730	-0.182374	-0.145850
21	-0.168911	-0.225489	-0.190563
22	-0.231882	-0.266878	-0.234652
23	-0.240237	-0.307437	-0.279204
24	-0.269180	-0.347729	-0.320444
25	-0.308817	-0.388303	-0.359848
26	-0.338481	-0.434947	-0.401985

Appendix O

Parallel Analysis on COPE Scale Data, Items 4, 27, 14, 15, and 18 Removed

		Parallel Analysis Eigenvalues	
Root	**Raw Data Eigenvalues**	**Mean**	**95th Percentile**
1	3.563857	1.142206	1.315926
2	1.614619	0.964746	1.099895
3	1.398760	0.834471	0.943109
4	0.874474	0.724755	0.825296
5	0.731495	0.630000	0.720328
6	0.529713	0.542112	0.625925
7	0.432200	0.460552	0.542024
8	0.377710	0.384937	0.461523
9	0.300519	0.313833	0.386967
10	0.221438	0.244679	0.309741
11	0.176198	0.181157	0.242364
12	0.089405	0.121386	0.174217
13	0.012624	0.062680	0.118186
14	-0.043865	0.008200	0.057130
15	-0.090476	-0.045825	0.000511
16	-0.111718	-0.097115	-0.053389
17	-0.138440	-0.146698	-0.106637
18	-0.198113	-0.195155	-0.156853
19	-0.215566	-0.240983	-0.207078
20	-0.251807	-0.285879	-0.252308
21	-0.275070	-0.329507	-0.297405
22	-0.321198	-0.375039	-0.343397
23	-0.333355	-0.426356	-0.393258

Appendix P

Pattern Matrix from Principal Axis Factoring of COPE Scale Data, Items 4, 27, 14, 15, and 18 Removed; Five Factor Solution

COPE Items		Factor				
Item*	**Item Description**	**1**	**2**	**3**	**4**	**5**
2	"I've been concentrating my efforts on doing something about the situation I'm in."	0.753				
7	"I've been taking action to try to make the situation better."	0.722				
1	"I've been turning to work or other activities to take my mind off things."	0.665				
25	"I've been thinking hard about what steps to take."	0.492			0.315	
20	"I've been accepting the reality of the fact that it has happened."					
9	"I've been saying things to let my unpleasant feelings escape."					
5	"I've been getting emotional support from others."		0.783			
10	"I’ve been getting help and advice from other people."		0.690			
23	"I’ve been trying to get advice or help from other people about what to do."		0.582			
21	"I've been expressing my negative feelings."		0.322			
3	"I've been saying to myself 'this isn't real'."			0.551		
8	"I've been refusing to believe that it has happened."			0.520		
13	"I’ve been criticizing myself."			0.505		-0.423
6	"I've been giving up trying to deal with it."			0.401		
19	"I've been doing something to think about it less, such as watching TV, reading, daydreaming, sleeping, or shopping."			0.329		
17	"I've been looking for something good in what is happening."				0.822	
12	"I've been trying to see it in a different light, to make it seem more positive."				0.661	
22	"I've been trying to find comfort in my religion or spiritual beliefs."				0.414	
24	"I've been learning to live with it."				0.363	
26	"I’ve been blaming myself for things that happened."					-0.431
11	"I've been using alcohol or other drugs to help me get through it."					
28	"I've been making fun of the situation."					
16	"I've been giving up the attempt to cope."					

* Items removed due to collinearity (correlations of >0.6): item 4 (“I've been using alcohol or other drugs to make myself feel better”), 27 (“I've been praying or meditating”), 14 (“I've been trying to come up with a strategy about what to do”), 15 ("I've been getting comfort and understanding from someone"), 18 (“I've been making jokes about it”).

Appendix Q

Structure Matrix from Principal Axis Factoring of COPE Scale Data, Items 4, 27, 14, 15, and 18 Removed; Four Factor Solution

COPE Items		Factor			
Item*	**Description**	**1**	**2**	**3**	**4**
7	7. I've been taking action to try to make the situation better.	0.781			0.444
2	2. I've been concentrating my efforts on doing something about the situation I'm in.	0.740			
1	1. I've been turning to work or other activities to take my mind off things.	0.671			
25	25. I've been thinking hard about what steps to take.	0.608			0.498
21	21. I've been expressing my negative feelings.	0.329	0.317		
9	9. I've been saying things to let my unpleasant feelings escape.				
20	20. I've been accepting the reality of the fact that it has happened.				
10	10. I’ve been getting help and advice from other people.		0.738		
5	5. I've been getting emotional support from others.		0.710		
23	23. I’ve been trying to get advice or help from other people about what to do.	0.327	0.591		
11	11. I've been using alcohol or other drugs to help me get through it.				
19	19. I've been doing something to think about it less, such as watching TV, reading, etc				
28	28. I've been making fun of the situation.				
13	13. I’ve been criticizing myself.			0.674	
8	8. I've been refusing to believe that it has happened.			0.490	
6	6. I've been giving up trying to deal with it.			0.425	
3	3. I've been saying to myself "this isn't real."			0.406	
26	26. I’ve been blaming myself for things that happened.			0.318	
16	16. I've been giving up the attempt to cope.				
17	17. I've been looking for something good in what is happening.				0.763
12	12. I've been trying to see it in a different light, to make it seem more positive.				0.710
24	24. I've been learning to live with it.	0.338			0.490
22	22. I've been trying to find comfort in my religion or spiritual beliefs.				0.419

* Items removed due to collinearity (correlations of >0.6): item 4 (“I've been using alcohol or other drugs to make myself feel better”), 27 (“I've been praying or meditating”), 14 (“I've been trying to come up with a strategy about what to do”), 15 ("I've been getting comfort and understanding from someone"), 18 (“I've been making jokes about it”).

Appendix R

Descriptive Statistics for Variables of Interest, by Sex and Living Situation

		Sex		**Living Situation**			
Variable	**Total (n=114)**	**Female (n=83)**	**Male (n=17)**	**Live Alone (n=60)**	**Live with Someone (n=52)**	**Caregivers (n=7)**	**Caree* (n=1)**
Age	114 / 75.53 / 4.99	83 / 75.14 / 4.48	17 / 75.71 / 4.70	60 / 76.67 / 5.37	52 / 73.81 / 3.41	7 / 74.86 / 3.13	75
Mood change due to COVID-19							
Mood has become much better	2 (1.8%)	1 (1.2%)	0 (0.0%)	1 (1.7%)	1 (1.9%)	0 (0%)	—
Mood has become slightly better	8 (7.0%)	7 (8.4%)	1 (12.5%)	4 (6.7%)	4 (7.7%)	0 (0%)	—
Mood has not changed	52 (45.6%)	35 (42.2%)	9 (52.9%)	29 (48.3%)	22 (42.3%)	2 (28.6%)	—
Mood has become slightly worse	47 (41.2%)	35 (42.2%)	7 (41.2%)	22 (36.7%)	24 (46.2%)	4 (57.1%)	1
Mood has become much worse	5 (4.4%)	5 (6.0%)	0 (0.0%)	4 (6.7%)	1 (1.9%)	1 (14.3%)	—
Mood Measures							
PHQ8 (max. 24)	114 / 3.40 / 3.53	83 / 3.41 / 3.55	17 / 3.24 / 4.13	60 / 3.78 / 4.00	52 / 2.88 / 2.93	7 / 6.71 / 5.74	2
Mild depression (≥5)	37 (32.5%)	29 (34.9%)	3 (17.6%)	22 (36.7%)	13 (25.0%)	4 (57.1%)	—
Moderate depression (≥10)	7 (6.1%)	5 (6.0%)	2 (11.8%)	6 (10.0%)	1 (1.9%)	2 (28.6%)	—
Mod-severe depression (≥15)	1 (0.9%)	1 (1.2%)	0 (0%)	1 (1.7%)	0 (0%)	1 (14.3%)	—
Severe depression (≥20)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	—
GAD7 (max. 21)	114 / 2.75 / 3.47	83 / 3.14 / 3.78	17 / 1.53 / 2.18	60 / 2.75 / 3.71	52 / 2.69 / 3.26	7 / 7.00 / 5.66	5
Mild anxiety (≥5)	27 (23.7%)	22 (26.5%)	3 (17.6%)	12 (20.0%)	14 (26.9%)	4 (57.1%)	—
Moderate anxiety (≥10)	6 (5.3%)	6 (7.2%)	0 (0%)	4 (6.7%)	2 (3.8%)	1 (14.3%)	—
Severe anxiety (≥15)	3 (2.6%)	3 (3.6%)	0 (0%)	2 (3.3%)	1 (1.9%)	1 (14.3%)	—
Loneliness (max. 11)	114 / 4.68 / 3.32	83 / 4.92 / 3.31	17 / 3.82 / 3.45	60 / 5.25 / 3.46	52 / 3.85 / 2.90	7 / 8.00 / 2.71	0
Moderately lonely (≥3)	76 (66.7)	57 (68.7%)	9 (52.9%)	41 (68.3%)	33 (63.5%)	7 (100%)	—
Severely lonely (≥9)	19 (16.7%)	15 (18.1%)	2 (11.8%)	14 (23.3%)	4 (7.7%)	3 (42.9%)	—
Very severely lonely (11)	6 (5.3%)	5 (6.0%)	1 (5.9%)	4 (6.7%)	1 (1.9%)	2 (28.6%)	—
Distress Composite (max. 100)	114 / 23.29 / 16.99	38 / 24.62 / 17.60	17 / 18.51 / 17.54	60 / 25.53 / 18.13	52 / 19.93 / 14.99	7 / 44.68 / 23.08	10.71
Social contact (weekly estimated)							
Face-to-face (hours)	110/ 4.24 / 4.89	83 / 412 / 4.96	16 / 3.65 / 3.20	57 / 4.52 / 3.04	52 / 4.01 / 4.78	7 / 3.43 / 3.17	10
Face-to-face (number)	111 / 4.26 / 4.95	83 / 3.93 / 4.53	17 / 4.05 / 2.15	58 / 3.57 / 3.49	52 / 4.98 / 6.17	7 / 6.21 / 6.55	10
Virtual (hours)	108 / 4.99 / 4.50	81/ 5.15 / 4.39	16 / 4.22 / 5.23	55 / 6.03 / 4.90	52 / 3.97 / 3.81	7 / 4.54 / 3.55	5
Virtual (number)	107 / 7.46 / 6.59	80 / 7.27 / 6.05	16 / 6.11 / 4.96	55 / 8.45 / 7.59	51 / 6.34 /5.24	7 / 7.57 / 4.09	3
Organised groups (hours)	111 / 2.41 / 2.51	83 / 2.35 / 2.46	17 / 2.21 / 2.44	58 / 2.17 / 2.13	52 / 2.71 / 2.89	7 / 1.18 / 1.03	3
Organised groups (number)	111 / 2.18 / 3.44	83 / 1.89 / 1.96	17 / 1.61 / 1.99	58 / 1.92 / 2.18	52 / 2.47 / 4.48	7 / 1.18 / 1.03	4
COPE factors							

Active coping (max. 16)	114 / 10.17 / 3.23	83 / 10.35 / 3.24	17 / 8.88 / 2.62	60 / 10.18 / 3.36	52 / 10.52 / 3.09	7 / 10.00 / 3.46	19
Social support (max. 12)	114 / 5.45 / 2.01	83 / 5.48 / 2.07	17 / 5.23 / 2.11	60 / 5.58 / 2.06	52 / 5.35 / 1.97	7 / 5.29 / 2.21	10
Negative coping (max. 20)	114 / 6.88 / 2.21	83 / 6.84 / 2.03	17 / 6.24 / 1.48	60 / 6.92 / 2.26	52 / 6.62 / 1.68	7 / 6.57 / 1.51	5
Emotional coping (max. 16)	114 / 9.28 / 2.78	83 / 9.53 / 2.75	17 / 8.76 / 2.93	60 / 9.33 / 3.08	52 / 9.31 / 2.44	7 / 9.43 / 2.70	8
Social cognition							
QCAE Cog. Scale (max. 76)	107 / 56.70 / 9.81	85 / 57.84 / 9.93	20 / 54.20 / 9.37	56 / 57.30 / 10.49	50 / 55.90 / 9.11	7 / 63.86 / 10.25	62
QCAE Affect. Scale (max. 48)	107 / 32.27 / 5.43	85 / 32.69 / 5.54	20 / 30.70 / 4.41	56 / 32.70 / 5.62	50 / 31.76 / 5.28	7 / 33.86 / 4.63	29
ANT (max score 24)	105 / 18.73 / 2.60	83 / 18.87 / 2.50	17 / 17.88 / 3.20	55 / 18.38 / 2.98	49 / 19.12 / 2.10	7 / 20.86 / 1.35	19
SSQ (max score 10)	104 / 5.77 / 1.87	83 / 5.73 / 1.84	17 / 6.00 / 2.15	55 / 5.65 / 1.87	48 / 5.88 / 1.89	6 / 6.50 / 1.05	—

Values reported as n (% of group), or as n / mean / *SD*.

*There is only one participant in this category, therefore these values represent single observations, not mean scores.

Appendix S

Associations between Measures of Social Contact (Number) and Distress Composite Score, Adjusted for Age and Sex

Predictor of Interest	n	ΔR²	Coefficient (B)	SE of B	95% CI	Sig.
Face-to-Face contacts (number)	100	.076	-1.16	0.40	-1.95, -0.36	0.005
Virtual contacts (number)	96	.000	-0.13	0.29	-0.71, 0.45	0.662
Organised groups (number)	100	.000	-0.02	0.91	-1.82, 1.78	0.981

Appendix T

Associations between Measures of Social Contact and Distress Composite Score, Adjusted for Age, Sex, and Retrospective Measure of Pre-COVID-19 Social Contact.

Predictor of Interest	**n**	**ΔR^2**	**Coefficient (B)**	**SE of B**	**95% CI**	**Sig.**
Face-to-Face contact (time)	95	.059	-0.95	0.39	-1.71, -0.18	0.016
Virtual contact (time)	94	.002	-0.18	0.44	-1.04, 0.69	0.689
Organised groups (time)	99	.011	-0.79	0.75	-2.28, 0.70	0.296
Face-to-Face contacts (number)	98	.086	-1.23	0.41	-2.04, -0.42	0.003
Virtual contacts (number)	94	.008	-0.33	0.39	-1.09, 0.44	0.400
Organised groups (number)	99	.000	0.11	1.03	-1.92, 2.15	0.911

Appendix U

Interactions between Social Contact and Living Situation, in the effect on Distress Composite Score, Adjusted for Age and Sex.

Social Contact Measure	Variable in model	n	ΔR² *	B	SE	95% CI	β	Sig.
Face-to-face contact (time)		98	.023					
	Social Contact			-1.16	0.36	-1.88, -0.44	-.31	.002
	Living Situation			-4.15	1.79	-7.71, -0.59	-.24	.023
	Interaction term			-0.58	0.36	-1.30, 0.14	-.16	.111
Virtual contact (time)		96	.020					
	Social Contact			-0.26	0.40	-1.05, 0.52	-0.07	.509
	Living Situation			-2.67	1.88	-6.40, 1.06	-0.16	.158
	Interaction term			-0.56	0.40	-1.36, 0.23	-0.15	.159
Organised groups (time)		99	.009					
	Social Contact			-0.35	0.74	-1.82, 1.13	-.05	.644
	Living Situation			-3.57	1.89	-7.33, 0.20	-.20	.063
	Interaction term			0.36	0.74	-1.11, 1.84	-.05	.626

* ΔR² when the interaction term is introduced to the model.

Appendix V

Testing the Moderating Effect of Social Cognition Variables on Social Contact Variables

Table V1

Interactions between Social Contact (time) and Social Cognition, in the Effect on Distress Composite Score, Adjusted for Age and Sex.

Social Contact Measure	Social Cognition Measure	Variable in model	n	ΔR^2 [a]	B	SE	95% CI	β	Sig.
Face-to-face	QCAE Cognitive		99	.000					
		Social Contact			-0.89	0.37	[-1.63, -0.15]	-0.24	.020
		Social Cognition			-0.32	0.18	[-0.68, 0.05]	-0.17	.087
		Interaction			0.00	0.04	[-0.08, 0.09]	0.01	.949
Face-to-face	QCAE Affective		99	.048					
		Social Contact			-1.33	0.39	[-2.10, -0.56]	-0.36	.001
		Social Cognition			0.30	0.31	[-0.33, 0.92]	0.09	.347
		Interaction			0.19	0.08	[0.03, 0.35]	0.24	.022
Face-to-face	ANT		99	.003					
		Social Contact			-0.94	0.37	[-1.67, -0.20]	-0.25	.013
		Social Cognition			-0.19	0.73	[-1.63, 1.23]	-0.03	.798
		Interaction			-0.12	0.21	[-0.53, 0.30]	-0.06	.673
Face-to-face	SSQ		99	.000					
		Social Contact			-0.88	0.36	[-1.60, -0.15]	-0.24	.018
		Social Cognition			-1.81	0.89	[-3.58, -0.03]	-0.20	.046
		Interaction			-0.01	0.19	[-0.39, 0.38]	0.00	.969
Virtual	QCAE Cognitive		97	.001					
		Social Contact			-0.01	0.38	[-0.77, 0.75]	0.00	.985
		Social Cognition			-0.20	0.20	[-0.59, 0.19]	-0.11	.302
		Interaction			-0.01	0.04	[-0.08, 0.07]	-0.02	.823
Virtual	QCAE Affective		97	.002					
		Social Contact			-0.12	0.39	[-0.89, 0.66]	-0.03	.765
		Social Cognition			0.29	0.33	[-0.38, 0.95]	0.09	.392
		Interaction			0.04	0.08	[-0.12, 0.19]	0.05	.630
Virtual	ANT		97	.001					
		Social Contact			-0.02	0.39	[-0.78, 0.75]	0.00	.966
		Social Cognition			0.70	0.73	[-0.74, 2.14]	0.10	.338
		Interaction			-0.04	0.16	[-0.37, 0.28]	-0.03	.784
Virtual	SSQ		97	.005					
		Social Contact			-0.03	0.37	[-0.77, 0.72]	-0.01	.942
		Social Cognition			-1.67	0.89	[-3.44, 0.10]	-0.19	.063
		Interaction			0.16	0.22	[-0.28, 0.61]	0.07	.466
Groups	QCAE Cognitive		100	.034					
		Social Contact			-1.37	0.77	[-2.90, 0.15]	-0.19	.077
		Social Cognition			-0.39	0.19	[-0.77, -0.01]	-0.21	.046
		Interaction			-0.11	0.06	[-0.23, 0.01]	-0.20	.061
Groups	QCAE Affective		100	.006					
		Social Contact			-0.39	0.73	[-1.84, 1.06]	-0.05	.595
		Social Cognition			0.16	0.33	[-0.50, 0.82]	0.05	.626
		Interaction			0.10	0.12	[-0.15, 0.34]	0.08	.439
Groups	ANT		100	.026					
		Social Contact			-0.50	0.72	[-1.92, 0.93]	-0.07	.493
		Social Cognition			-0.18	0.71	[-1.59, 1.22]	-0.03	.796
		Interaction			-0.51	0.32	[-1.14, 0.12]	-0.16	.109
Groups	SSQ		100	.029					
		Social Contact			-0.10	0.27	[-1.52, 1.33]	-0.01	.894
		Social Cognition			-2.10	0.93	[-3.95, -0.25]	-0.23	.026
		Interaction			-0.68	0.39	[-1.45, 0.09]	-0.18	.083

[a] ΔR^2 when the interaction term is introduced to the model.

Table V2

Relationship between Social Contact (time) and Distress Composite Score at Different Levels of the Moderator (Social Cognition), Adjusted for Age and Sex

	Social Cognition Variable							
Social Contact Measure	**Measure**	**Level [a]**	**Value**	**n**	**B**	**SE of B**	**95% CI**	**Sig.**
Face-to-face	QCAE Cognitive			99				
		Low	47.01		-0.91	0.63	[-2.17, 0.34]	.152
		Medium	56.72		-0.89	0.37	[-1.63, -0.15]	.020
		High	66.42		-0.86	0.48	[-1.82, 0.10]	.080
Face-to-face	QCAE Affective			99				
		Low	26.79		-2.35	0.69	[-3.73, -0.98]	.001
		Medium	32.23		-1.33	0.39	[-2.11, -0.56]	.001
		High	37.67		-0.32	0.45	[-1.21, 0.58]	.485
Face-to-face	ANT			99				
		Low	16.24		-0.64	0.66	[-1.96, 0.68]	.337
		Medium	18.78		-0.94	0.37	[-1.67, -0.21]	.012
		High	21.32		-1.24	0.63	[-2.48, 0.00]	.051
Face-to-face	SSQ			99				
		Low	3.88		-0.86	0.56	[-1.97, 0.25]	.127
		Medium	5.78		-0.87	0.36	[-1.60, -0.15]	.018
		High	7.68		-0.89	0.47	[-1.83, 0.05]	.063
Virtual	QCAE Cognitive			97				
		Low	47.80		0.07	0.50	[-0.92, 1.06]	.892
		Medium	57.00		-0.01	0.38	[-0.77, 0.75]	.980
		High	66.20		-0.09	0.53	[-1.15, 0.98]	.871
Virtual	QCAE Affective			97				
		Low	26.92		-0.31	0.63	[-1.56, 0.93]	.616
		Medium	32.21		-0.12	0.39	[-0.90, 0.66]	.762
		High	37.49		0.08	0.49	[-0.90, 1.06]	.878
Virtual	ANT			97				
		Low	16.30		0.09	0.59	[-1.09, 1.27]	.878
		Medium	18.79		-0.02	0.38	[-0.78, 0.74]	.960
		High	21.29		-0.13	0.52	[-1.16, 0.90]	.802
Virtual	SSQ			97				
		Low	3.90		-0.34	0.58	[-1.48, 0.81]	.563
		Medium	5.80		-0.02	0.37	[-0.76, 0.72]	.954
		High	7.71		0.29	0.56	[-0.82, 1.40]	.603
Groups	QCAE Cognitive			100				
		Low	47.02		-0.27	0.79	[-1.83, 1.30]	.738
		Medium	56.68		-1.37	0.77	[-2.89, 0.15]	.077
		High	66.34		-2.48	1.11	[-4.68, -0.27]	.028
Groups	QCAE Affective			100				
		Low	26.84		-0.91	0.93	[-2.75, 0.94]	.333
		Medium	32.26		-0.39	0.73	[-1.84, 1.06]	.594
		High	37.68		0.12	1.04	[-1.94, 2.19]	.905
Groups	ANT			100				
		Low	16.06		0.87	1.10	[-1.32, 3.06]	.431
		Medium	18.70		-0.48	0.72	[-1.91, 0.95]	.506
		High	21.34		-1.83	1.10	[-4.02, 0.36]	.101
Groups	SSQ			100				
		Low	3.89		1.18	1.06	[-0.92, 3.28]	.269
		Medium	5.78		-0.10	0.72	[-1.53, 1.32]	.886
		High	7.67		-1.38	0.99	[-3.34, 0.57]	.164

[a] Level corresponds to: Low, 1 *SD* below conditional mean; medium, conditional mean; high, 1 *SD* above conditional mean.

Figure V1

Moderation of Effect of Face-to-Face Social Contact, by QCAE Affective Scale

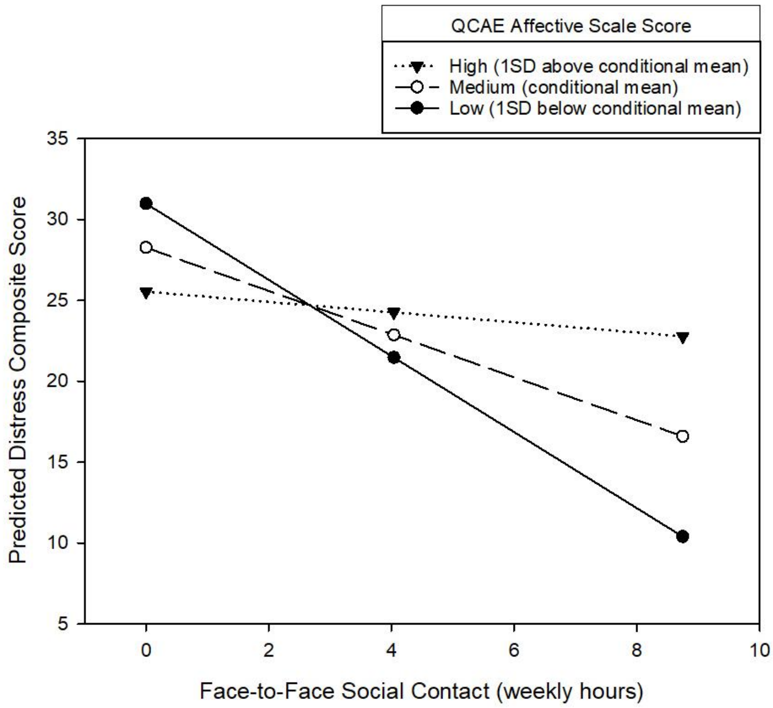
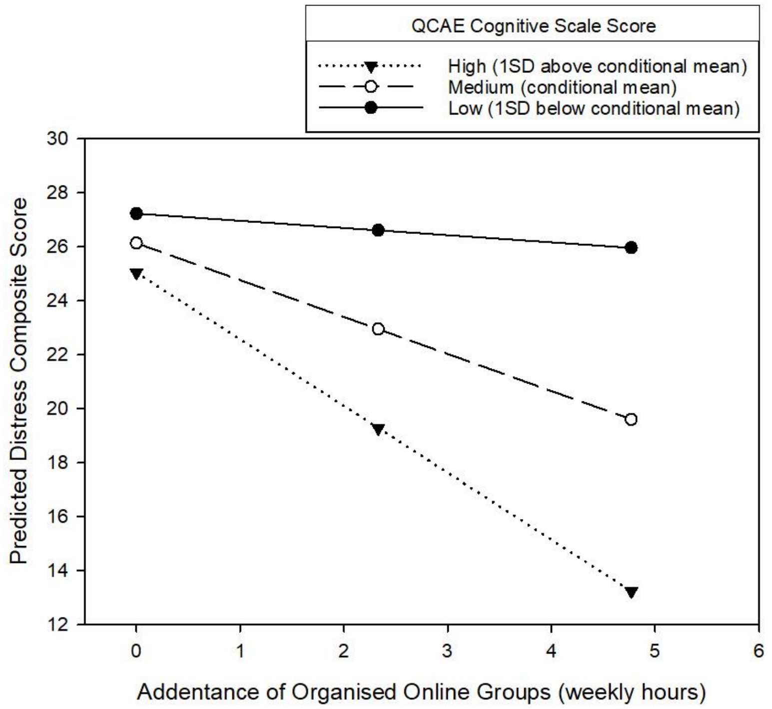


Figure V2

Moderation of Effect of Attending Online Groups, by QCAE Cognitive Scale



Appendix W

Scatterplots Displaying Distress Composite Score by Face-to-Face Social Contact during COVID-19 in the different Living Situation Groups

Figure W1

Distress Composite Score by Face-to-Face Social Contact in Participants who Live Alone

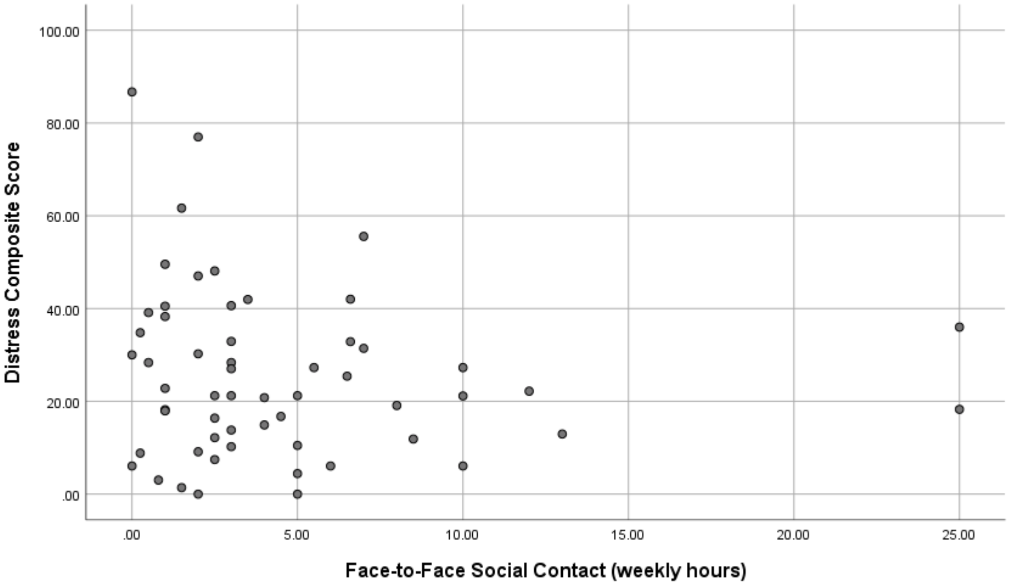
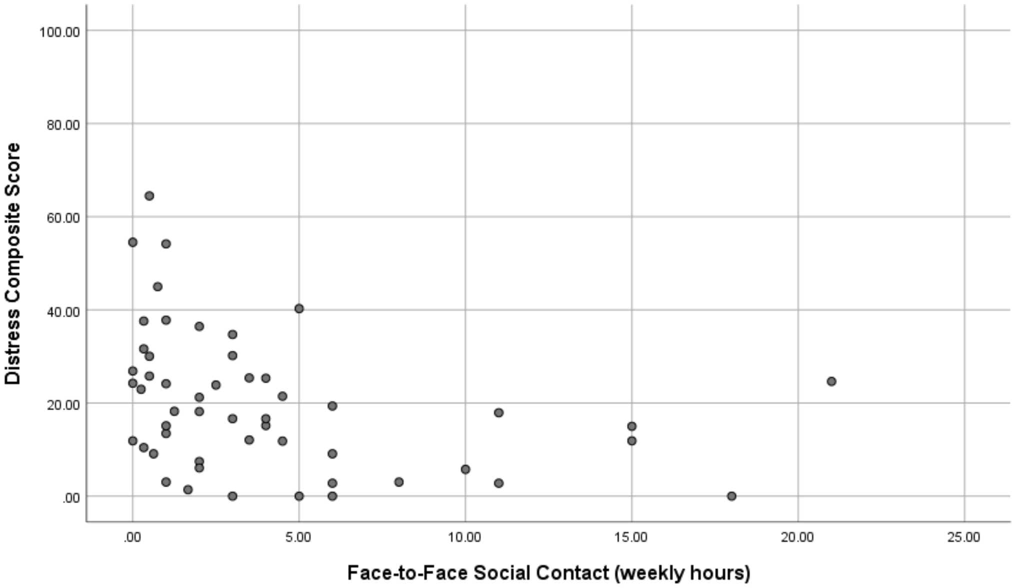


Figure W2

Distress Composite Score by Face-to-Face Social Contact in Participants who Live with Someone



Appendix X

Post-Hoc Power Calculations for the Statistically Significant Results

Relationship tested	ΔR^2	f^2 [a]	Sample size used	Power	Sample size required to achieve power of .80
Association between Living Situation (live alone vs live with someone) and distress	.038	.039	99	.494	204
Association between face-to-face social contact (weekly hours) and distress (in whole sample)	.064	.068	99	.729	118
Association between face-to-face social contact (weekly hours) and distress (in those who live with someone)	.214	.272	47	.938	32
Association between negative coping and distress	.349	.536	100	.999	18
Association between QCAE Cognitive Scale score and distress	.038	.039	100	.498	204
Association between SSQ score and distress	.045	.047	100	.574	169
Interaction between QCAE Affective Scale Score and face-to-face social contact (weekly hours), in effect on distress	.048	.050	99	.340	263
Interaction between QCAE Cognitive Scale Score and attendance of online groups (weekly hours), in effect on distress	.034	.035	100	.024	373

[a] R^2 values were converted to f^2 values for input into G*Power, using Cohen's (1988) formula: $f^2 = R^2/(1 - R^2)$.