



Activating and Guiding the Engagement of Seniors through Social Media

Final Report



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The report does not necessarily reflect the opinion of the European Commission, Directorate General for Employment, Social Affairs and Equal Opportunities.

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1. Preface

When, over 2 years ago, the project AGES 2.0 idea came up, it immediately seemed an excellent opportunity to explore something innovative and different. The project aimed to develop and test innovative approaches to promote a better quality of life and improve social interaction for the elderly population in two countries: Italy and the United Kingdom (UK). In particular, researching the subject of new communication technologies, social media and their ability to meet the social and aggregation needs of the elderly and promote innovative ways of socialising among this group of people. The central idea of the project is that giving vulnerable older adults the opportunity to use a modified computer package developed specifically for them – the Easy PC – and training and supporting them to use this package to engage socially with others via the Internet, could have significant benefits for cognitive and mental health and well-being. Although some previous research has considered the psychosocial impact of the Internet and social media (e.g., Facebook) among the general population, rarely have vulnerable older adults been considered. Also, whereas some previous studies have examined the impact of computer training on older adults, the focus has rarely been on the use of computers as tools for social engagement. Bringing these ideas together is what we found innovative and interesting.

Obviously, computer use and social engagement among older adults is increasing with time. For example, data from Istat (the National Institute of Statistics) show that in Italy in 2013, 37% of people aged between 60 and 64 browsed the web, as did 20% of people aged between 65 and 74. Ten years ago these figures were just over 12% and 4% respectively. Likewise in the UK, where the Office for National Statistics shows that the number of adults who use the Internet increased from 35% in 2006, to 73% in 2013. Similar increases were observed among those over 65, whose computer use has increased from 9% in 2006 to 37% in 2013.

Notwithstanding these positive trends, the Marche Region – along with the rest of Italy, the UK, and the whole of Europe – is facing various challenges, including the changing demographic composition of society that threatens the sustainability of the health systems, the limited availability of resources to invest in healthcare, increasing of health inequalities, and an increase in the prevalence of chronic diseases. The Marche Region has the characteristic of being among the longest-lived regions in the world - 2nd place for life expectancy in Europe. Because of these issues, active ageing is necessarily at the heart of its policies for growth and cohesion of the community and the Region has been very active in participating in European projects in the social and health sector that facilitate cross-border, transnational and interregional cooperation. This all led to undeniable advantages to the health system of our Region.

The use of technology – and access to the information and resources of the Internet – is part of the landscape of changing health care. And despite the positive trends, access to computers and the Internet remains problematic for older citizens, especially for those in sheltered housing / care homes, or who live in remote contexts and therefore suffer from a higher level of social isolation due to physical or cognitive disability, for whom the situation is even more complex. The results of the current project suggest that training older adults to use computers can promote social interaction, feelings of competence and feed into positive health outcomes.

For the future, we hope that this project will contribute to the understanding and facilitation of active ageing and improving digital inclusion of vulnerable older citizens.

I wish to take the opportunity to sincerely thank all our partners involved in this fascinating study, for their valuable contribution and very hard work that made this project successful.

Our Italian partners:

- Fondazione Giacomo Brodolini - an Italian research centre and a cultural institution, working in the field of labour and social policies;
- Labirinto Cooperativa Sociale - a social cooperative working in the care and health sector, rehabilitation, animation, and training.

And our UK partners:

- University of Exeter - a top UK university which combines world leading research with high levels of student satisfaction;
- Somerset Care Group - one of the major care providers in Southern England and among the largest not-for-profit care companies in the UK;
- Torbay and Southern Devon Health and Care NHS Trust - an integrated health and adult social care organization, responsible for providing and commissioning services.

The report that follows begins with an overview of the main EU policy documents and trends which the AGES project tackles. This is followed by a description of the context of the elderly population and of how the care systems are structured in Italy and in the United Kingdom. Then, the theoretical and empirical backdrop of the research, and the links between social connections and individual health, are explained. From here follows a description of the methods and findings of the UK and Italian studies. The report concludes with a list of policy recommendations coming from the findings of the research, as well as from lessons learnt during the implementation of other project activities parallel to the training, including feedback from the personnel involved in the study and the stakeholders who were engaged throughout the project.

It is with great pleasure that I present to you the final report of the European project 'AGES 2.0'. I hope that you will find this reading as interesting and promising as I did.

Dr Lucia Di Furia

Agenzia Regionale Sanitaria Regione Marche

Coordinator of the project

2. AGES in the framework of EU social policy innovation programmes

The AGES 2.0 project addresses one of the major challenges facing European societies: demographic ageing. It does so by assessing the extent to which the Internet and social media offer a tool for promoting active ageing and addressing the social isolation that is too often a feature of older age.

The case for promoting active ageing in Europe emerges clearly from the demographic data. It is expected that between 2010 and 2060, the number of people aged 65 and over across Europe will grow from 17.4% to 29.5% of the total population. This ageing of society is driving concerns about old-age dependency ratios, pension costs and the capacity of current social security and care systems to cope. There is a recognised need for reform; for the development of new models focused on active integration, prevention and community resilience and rehabilitation. There is also a need for a better understanding of the role that ICT, tele-health and tele-care can play within these models.

By examining the scope that the Internet and social media offer for promoting the active inclusion of older people, the AGES 2.0 project aligns and supports delivery of a number of EU policies and frameworks.

The *European platform against poverty and social exclusion* – one of the two flagships of the Europe 2020 strategy – aims to tackle inequalities affecting the most vulnerable groups in our societies, including older people, through a multi-faceted approach comprising, among others: the promotion of evidence-based social innovation; harnessing the potential of social economy; and improved policy coordination among the Member States.

Elderly people are also specifically targeted by the *European Innovation Partnership (EIP) on Active and Healthy Ageing*, launched in July 2011 by the European Commission, and focusing on:

- improving the health and quality of life of older Europeans,
- supporting the long-term sustainability and efficiency of health and social care systems,
- enhancing the competitiveness of EU industry through business and expansion in new markets, such as tele-health and tele-care.

AGES 2.0 responds to these policy goals by bringing actors from the public, private and research sectors together to deliver an innovative social experiment exploring the extent to which active use of the Internet and social media, as part of a wider package of care delivery, improves the health and quality of life of senior Europeans. It is an experiment with wide implications for the development of sustainable and efficient models of social care delivery and for businesses involved in the delivery of care or with an interest in the expanding global tele-care market.

Within the European Union framework, AGES 2.0 is a classic social innovation, aligned with the Social Investment Package (SIP), adopted by the European Commission on 20th February 2013, which calls on Member States to strengthen citizens' current and future capacities, to improve their opportunities to participate in society and the labour market, and to focus on integrated packages of benefits and services that help people at all stages of life to achieve lasting positive social outcomes.

The European Commission's 2013 Guide to Social Innovation identifies social innovation as consisting of four primary elements:

- The **identification** of new/unmet/inadequately met social needs;
- The **development** of new solutions in response to these social needs;
- The **evaluation** of the effectiveness of new solutions in meeting social needs;
- The **scaling up** of effective social innovations.

AGES 2.0 addresses each of these elements. It **identifies** and supports a social group, older people, who disproportionately experience social isolation. It **develops** a new solution and response to this need, through the delivery of a social media training programme specifically designed for this group. It **evaluates** the impact of this intervention using rigorous scientific methods, and it delivers findings that can inform future policy and **up-scaling** of AGES 2.0 or similar approaches in other territories or wider populations.

The design of AGES 2.0 also responds to the European Commission's call for a focus on social policy experimentation, meant to test the validity of new innovative policies by collecting evidence about the real impact of measures on people. These "experiments":

- bring innovative answers to social needs
- are small-scale probing interventions to test impact
- are made in conditions where their impact can be measured
- can be scaled up if the results prove convincing.

The social experimentation proposed with this project is in line with this definition, involving:

- The development of a unique IT interface and training package (Easy PC) designed to engage older people in the use of social media;
- The training of a team of 'Care Technologists', professional carers capable of supporting vulnerable older adults to become social media users for the first time;
- The recruitment of older people living in both community and residential care settings and their control and intervention groups;
- Delivery of the Easy PC support / training package to members of the intervention group over a period of four months;
- Use of scientific methods to assess the impact of the Easy PC intervention using recognised measures of social connectedness, well-being and cognition.

A further innovative dimension of AGES 2.0 is its transnationality, designed to allow comparison of results in both Italy and the UK, countries in which contexts relating to demography, care policy and ICT use differ considerably, in order to learn lessons relating to the generalization and uptake of results across international settings.

3. The context of elderly population and care in Italy and the UK

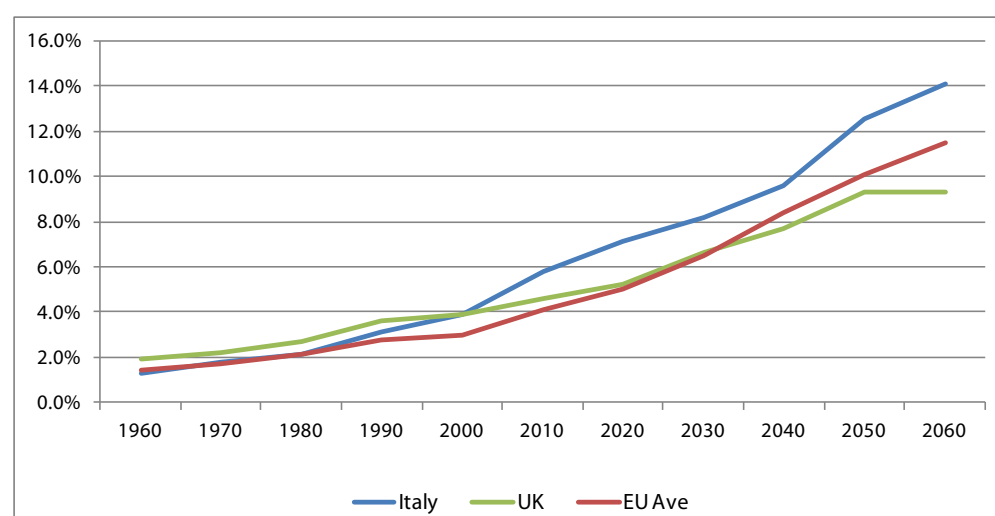
Although the UK and Italy are both European countries facing the challenges of an ageing society, there are notable differences in the demographic trends and in care provision in the two EU member states. The UK model has been described as an example of a liberal welfare regime, characterised by minimal public intervention and based on the assumption that a majority of citizens will obtain adequate welfare from the market; while the Italian model, alongside other southern European / Mediterranean welfare regimes (Gal, 2010; Ferragina, Seeleib-Kaiser, 2011; Powell, Barrientos, 2004; Minas et al., 2014), has been described as conservative (Esping-Anderesen, 1990), with primary welfare responsibilities resting with family members.

These differences in demographics, care policies, care provision, social attitudes about ageing and social inclusion and in uptake of technology provide important context for our research findings.

3.1 Socio-demographic trends in the UK and Italy

As is the case across Europe, the demographic profile of both the UK and Italy is ageing. Italy is already an 'older' country than the UK, with 20.3% of the residents aged 65 or over, compared to 16.5% in the UK. Driven by higher life expectancy (20.8 years at age 65 in Italy, compared to 19.8 in the UK¹) and lower fertility rates, Italian society is also ageing 'faster' than both the UK and the EU average.

Figure 1. % of population aged 80 years or over.



Source: Eurostat Population Projections, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Population_projections

¹ *Database "Health for All", ISTAT (2013); ** World Health statistics, WHO (2014)

Looking forwards, between 2010 and 2060, the proportion of Italians aged 80 and over is projected to rise by 8.3 percentage points, from 5.8% of the population to 14.1%. In the UK the rise is projected to be 4.7 percentage points, from 4.6% to 9.3% of the population. As a result, old-age economic dependency ratios² will roughly double in Italy between 2010 and 2060 and rise by two thirds in the UK (from 0.25 to 0.42) (Eurostat Population Projections).

Of course, not all older people need care. When they do, the majority of their care is provided informally, by partners, family and friends. However, this data has important implications for the provision of both formal and informal care.

3.2 Social Isolation and wellbeing in the UK and Italy

Underlying differences in attitudes towards ageing, social inclusion and care are evident between the UK and Italy. The important role that extended families play as care providers in Italy is evident in the fact that 25% of adults aged 65 and over in Italy live in 'another type of household' (i.e. not as a single adult or as a couple), compared to 11% in the UK. In the UK, 95% of people aged 75 years and over live either alone, in a single household, or in a couple household. This is considerably higher than the 84% of older people who live in such households in Italy (Eurostat / LFS, Household Composition). Similarly, in Italy almost 54% of adults aged 55 and over provide regular care (at least once a week) for children and grandchildren, compared to 27% in the UK (Active Ageing Index³).

While these differences in living arrangements clearly emerge from the data, differences in older people's subjective perceptions of their social connectedness and well-being are much less evident.

The 'Social Connectedness' measure within the Active Ageing Index suggests that 68% of the people aged 55 or older in the UK meet socially with friends, relatives or colleagues outside the home several times a week, compared to 55% in Italy. Some might argue that this is 'compensatory' behaviour, in the sense that where households are large, with multiple generations living together, the bulk of social contacts may take place within the household, rather than outside the home. However, compensatory or not, older people's subjective assessment of their mental well-being in both countries is extremely similar.

Scores in Italy (68) relating to the proportion of older people who feel: cheerful and in good spirits; calm and relaxed; active and vigorous; fresh and rested; and living a daily life filled with things that interest them, are almost indistinguishable from those for the UK (67). The much larger differences within this measure is that men in both Italy (73) and the UK (74) report higher levels of mental well-being than women in both countries (64 in Italy and 61 in the UK) (Active Ageing Index, 2013).

² The ratio between the total number of elderly persons of an age when they are generally economically inactive (aged 65 and over) and the number of persons in working age (from 15 to 64).

³ Within the European Active Ageing policy framework, in 2012 the Active Ageing Index has been developed as tool for policy makers to devise evidence-informed strategies in dealing with the challenges of population ageing and its impact on society. The Active Ageing Index has been defined with the support of the Population Unit of the UNECE, the EC's Directorate General for Employment, Social Affairs and Inclusion and the European Centre for Social Welfare Policy and Research. Active Ageing Index, 2013.

3.3 Demographics of residential care

In 2011, 3.2% of the population of England and Wales aged 65 and over were living in care homes (ONS 2014). Italian data (which is not directly comparable) suggests an equivalent figure for Italy of 2.3%. This is, however, a figure that masks enormous regional variation, ranging from 3.3% in Northern regions to 0.9% in Southern regions (Istat, 2013).

The greater prevalence of residential care in the UK is also evident from the fact that the UK has over twice as many nursing beds and elderly home beds per 100,000 population than Italy. That said, over the last eight years the number of beds per 100,000 population has grown rapidly in Italy, while falling marginally in the UK.

Table 1. Nursing and elderly home beds⁴ per 100 000, 2013

Countries	2004	2005	2006	2007	2008	2009	2010	2011	2012
Italy	275.24	292.96	306.45	317.41	319.94	334.23	351.96	371.7	...
United Kingdom	894.28	879	874.84	865.35	859.38	863.49	866.64	828.21	865.65

Source: World Health Organisation Health for All Data Base. <http://data.euro.who.int/hfad/>

The stable UK care home population combined with growth in overall elderly population means that the population living within residential care is ageing. In 2011, 59.2% of care home residents in England and Wales were aged 85 or over, a figure 2.7 percentage points up on 2001 when it was 56.5%. Over the same period, the number of people providing unpaid care in informal settings rose by 600,000 (ONS, 2014).

Although men make up a growing proportion of care home residents, the care home population remains predominantly female, with 2.8 women aged 65 and over in residential care for each man in the UK in 2011. In Italy, women constitute about 75% of those in residential care: out of 1,000 female residents over 64 years old, 29 are hosted in care homes, whereas the ratio for men is 13 out of 1,000.

Looking forward, the number of older people in the UK with moderate or severe disabilities who are likely to require residential care is projected to rise by 60% by 2030, while the number receiving informal care in their own household is projected to rise by 84% in the UK by 2030, respectively (Wittenberg et al, 2011).

3.4 The organisation of care services

This ageing of society and increasing demand for care services has resulted in calls for reform in welfare systems across Europe.

The UK and Italy have both been identified as having yet to radically reform their long-term care systems (Ranci & Pavolini, 2013) and as having well-structured national health services operating alongside more fragmented, and locally managed, social care.

Arrangements for paying for social care are complex and means-tested in both Italy and the UK, with both countries focusing subsidies on those least able to pay for their own care.

In Italy, responsibility for health and social care for the elderly lies between the health system and the municipalities facing the challenge of integrated care. Health care is free through the

⁴ Definition: Beds available for people requiring long-term care in institutions (other than hospitals).

National / Regional Health Service, while social care costs are in part means-tested. Currently means-testing is applied only to the assets of the elderly person who needs assistance, though recently this principle has been questioned (Gioncada *et al.* 2011; Pesaresi, 2013). Responsibility for determining indicators of individual capacity and ability to pay are devolved to municipal and regional government.

In the UK state funding for social care costs has been means-tested since 1948, unlike health care which is free through the National Health Service. Until the 1980's, a large proportion of state funded social care provision was delivered through local authority owned care homes. These structures have been progressively outsourced, and as a consequence of this, Local Authorities now only provide 5% of residential care places in the UK. Currently, 92% of residential care places and 89% of domiciliary care hours are delivered by private and voluntary sector providers (Laing & Buisson, 2013).

Pressure on Local Authority budgets in the UK, and the progressive tightening of eligibility criteria, have resulted in an increasing number of older people being cared for by relatives or funding their own care costs, drawing on occupational pensions and rising property values (Local Government Association). Research by Laing & Buisson suggests that 43% of residents of independent care homes in the UK fund the entire cost of their care. Once top-up payments, required to plug the gap between local authority funding rates and the actual fees charged by care homes, are added the proportion contributing to their care costs rises to 57% (Laing & Buisson, 2013).

The market-orientated funding and delivery model operating the UK, which allows individuals to choose between care providers operating at different levels of cost, could be argued to be beneficial, incentivising individual homes to compete by offering higher quality environments and care services. National policy, focused on promoting individual choice, control and the personalisation of care budgets, is certainly predicated on this hypothesis, backed by quality assurance and improvement through regular inspection through the Care Quality Commission.

Table 2. Public Expenditure on LTC as % of GDP, by type of care

Country	Total	of which:		
		At home	In institutions	Cash benefits
Italy	1.91	0.49	0.55	0.86
United Kingdom	1.97	0.86	0.56	0.56
EU-27	1.84	0.53	0.80	0.52

Source: Commission services (DG ECFIN), based on 2012 AR.

The role that family plays in supplying care for older people has important impacts on the use of formal residential care services. It has been argued, (e.g by Callegaro & Passini, 2008) that in Italy *'family ties... induce adult children to think to formal care as something to avoid as long as family members are able to help their elderly relatives'*⁵. Others argue that such notions are based on an idealisation of family relationships, pointing to studies that show that the feelings of closeness and affection appear equally strong in Northern and Southern European states (Daatland & Lowenstein, 2005) and that data on attitudes towards care for elderly dependents⁶ are broadly similar in UK and in Italy.

Recent studies have also argued that the intergenerational solidarity characteristic of Mediterranean welfare regimes is a response to the low level of welfare state development (Moreno

⁵ Callegaro, L. & Pasini, G. (2008), p. 200

⁶ Such as Eurobarometer 2007 on the percentage of individuals who believe that children should provide care to dependent parents even if it means renouncing their career.

& Klose, 2013), and is supported by the low female employment rate and strongly gendered models of care provision. Moreover, as a result of changes in family relationships, the care has moved from traditional unpaid support to a grey area of poorly paid work often undertaken by female immigrant workers (Calzada & Brooks, 2013). One out of three families caring for older people relies on the support of migrant workers (NNA, 2013).

The recent economic crisis and austerity further threaten the tradition of intergenerational solidarity seen in Italy. Informal care is less expensive than residential care, resulting in a decreasing number of elderly people applying for residential care (NNA, 2013, p.61). Moreover, public services to support domiciliary care are residual: in Italy about 4% of elderly people receive domiciliary care for on average 20 hours in one year (NNA, 2013, p.17) and residential care is nowadays seen as a last resort for families who cannot provide the care of elderly relatives due to their high level of their mental or physical disability.

3.5 Future policy direction

It has been argued that the model for health and social care delivery found across much of Europe is skewed towards delivering episodes of acute health care in hospitals or providing permanent care in residential and nursing homes and will need to adapt to providing that: support is closer to home, care promotes independence and self-care and is co-ordinated across different services and professionals. Increased public funding will not, in itself, provide a solution. Priority needs to be given to reducing demand for formal services by promoting independence, boosting community capacity and promoting recovery and rehabilitation (Humphreys, 2013).

Within the AGES 2.0 partnership, the merger of the South Devon Healthcare NHS Foundation Trust and Torbay and Southern Devon Health and Care Trust has created England's first Integrated Care Organisation designed to deliver these objectives at local level. The aim is to *'support everyone in living well and ageing well'* by placing an emphasis on *'promoting healthy lifestyles, preventing ill-health and enabling self-care'*. (South Devon NHS Trust Website <http://www.sdhct.nhs.uk/hospitalandcommunitycare/>).

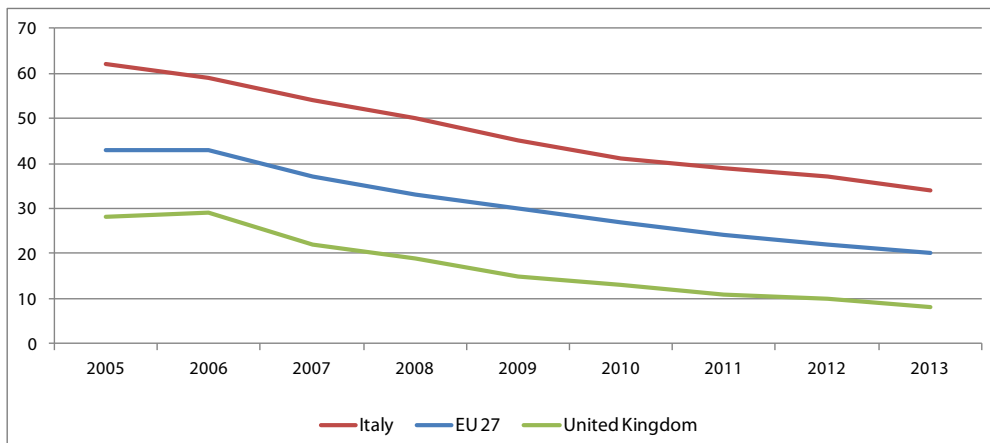
In Italy, constitutional reform in 2001 redefined the relationship between State and regions, through the devolution of administrative, legislative and budgetary responsibilities to the regional level. Although the reform is not yet complete, this growing federalism has resulted in responsibility for health care management, social assistance and labour policy being entirely devolved to regional governments. More than 70% of regional budgets are now allocated to health care management. This devolution of responsibility for health and social policies has resulted in increasing differentiation in the nature and depth of services for elderly people. These differences are expected to increase in future, with Northern Regions having better coverage and quality of services than those in the South.

3.6 Digital inclusion

The Internet is increasingly central to the fabric of all European societies. People who lack access to the Internet or digital skills increasingly face barriers to finding and maintaining employment, participating in learning, accessing public services, being able to buy cheap goods and to participating in on-line social interaction.

Figure 2 shows that although the proportion of individuals who have never used the Internet is falling rapidly across the EU, in 2013 there were still 34% of people in Italy and 8% of people in the UK who had never used the Internet.

Figure 2: % of individuals who have never used the Internet, 2005 - 2013



Source: Eurostat Digital Inclusion http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_bdek_di&lang=en

This pattern is also evident in older people. In Italy, 77% of people aged 65 to 74 had never used the Internet, compared to 30% in the UK (Eurostat Digital Inclusion).

Older Internet users in the UK are most likely to use it for 'Sending and receiving emails' and 'Finding out about or buying goods and services' and least likely to engage in 'Posting messages to chat sites', 'Using blogs & instant messaging' or 'Creating websites or blogs'. In the UK, just 10% of UK adults aged 65 and over reporting using the Internet for social networking, compared to nearly 90% of 16 to 24 year olds (ONS 2013).

Given that the proportion of all adults who use social media in the UK (57%) is considerably higher than the proportion found in Italy (29%) (ONS 2013), it is reasonable to assume that use of social media among older Italians is extremely low.

Recognising its benefits, governments across Europe are focused on supporting digital inclusion across all elements of the population. The UK Government has set the goal of ensuring that 'everyone who can be digitally capable will be, by 2020'. Given that 83% of those who are 'willing and able' of becoming digitally literate are already aged 45 and over, delivering this policy will involve addressing the issues of access, confidence and skills that deter older people from going online (Cabinet Office).

3.7 Tele-care

Information and communication technologies have the potential to transform many aspects of care provision, while generating efficiencies in service delivery and helping people to live independently.

As with care services generally, responsibility for development and delivery of tele-care strategy sits at the regional level in both Italy and England. The devolution of responsibility for health and social care means that there is no national tele-care policy in Italy and that regions are taking different approaches. The Veneto region has been at the forefront of many of these developments.

In the UK, Central government provides periodic grants to local authorities, e.g. a one-off £80 million grant to provide alarm technology to 160,000 vulnerable older people (http://www.ict-ageing.eu/?page_id=1617). Challenge funds, such as Innovate UK's £23m DALLAS programme

(Delivering Assisted Living Lifestyles at Scale) are also periodically used to promote innovation and to further assess the potential of tele-care and tele-health⁷.

Despite the existence a range of innovative and tele-care services (Ayres 2013), the role of technology, including social media, in the delivery of social care remains under-developed. (Humphreys, 2013).

⁷ www.innovateuk.org/content/competition/dallas-delivering-assisted-living-lifestyles-at-sc.ashx.

4. Intervening in social connections to improve health

Loneliness and social isolation are issues of increasing public and policy concern. A number of high-profile reports in the UK have suggested that rates of social isolation and felt loneliness are rising. For example, a range of societal indicators of potential isolation have increased substantially over the last 50 years, including single occupancy households, being unmarried or divorced, and moving away from family and communities of origin. Based on an 'anomie index' incorporating many of these indicators, a recent study estimated that across Britain the percentage of people likely to be experiencing social isolation had risen from around 19% in 1971 to over 25% in 2001 (Dorling et al., 2008). In addition to demographic indicators, there is evidence that the increase in social fragmentation is experienced subjectively. For example, a representative survey conducted by the Mental Health Foundation with over 2,000 respondents found that around 11% of people felt lonely often, 42% had experienced depression because of being alone, and 48% felt that society was becoming lonelier in general. On the basis of statistics like these (see also *Measuring National Well-being: European Comparisons*, 2014), the UK has been characterised as one of the loneliest countries in the European Union (e.g., Orr, 2014). However, the UK is not alone in this regard, and similar evidence of significant and increasing levels of loneliness has been reported elsewhere in the western world (e.g., see Cacioppo & Patrick, 2008).

Loneliness is a concern not just because of its obvious link to mental health conditions like depression (Cacioppo et al., 2006). A considerable body of work across the physical and social sciences has established that the size and quality of people's social networks has implications that span across indicators of mental, cognitive and physical health. For example, landmark studies have established that people with access to more social connections show reduced levels of morbidity (Boden-Albala et al., 2005, Everson-Rose & Lewis, 2005, Ell et al., 1992) and mortality (House et al., 1988; Berkman & Syme, 1979). Impressively, the effects of social connections on the latter are comparable to those associated with quitting smoking, and exceed those for obesity, high blood pressure, and physical inactivity (Holt-Lunstad, et al., 2010).

Although rates of loneliness and social isolation are an issue across all sections of the community, they are a particular concern for older adults. This is partly because ageing is associated with various factors that can also impact on social connectedness, including bereavement, moving into care, restrictions of physical mobility and diminished communicative capacity. As such, older adults are potentially at greater risk of becoming socially isolated, and of experiencing the negative health consequences of this. Indeed, social isolation and subjective loneliness have been implicated in various conditions related to ageing, including dementia (Bennett et al., 2006; Dodge et al., 2014; Holwerda et al., 2012; Wilson et al., 2007).

Moreover, even though older adults might not necessarily feel lonelier than their younger counterparts (Cacioppo et al., 2006), to the extent that they do report loneliness they are more vulnerable in the face of this. Studies have shown stronger relationships between felt loneliness and important health indicators among older versus younger populations (e.g., Hawkey et al., 2010; Hawley et al., 2006; Ong et al., 2012). To explain these patterns, it is assumed that younger people experience social isolation negatively, just as older people do, but that the youngsters have additional physical and psychological resources that can buffer them against the effects of this. Thus, when it comes to understanding – and intervening in – the detrimental effects

of social isolation and loneliness, older adults represent an especially important population for study.

For all of the above reasons, it has been argued that finding ways to support people to make and maintain social connections should be a priority for public health (Caccioppo & Hawley, 2003), and a particular priority in the area of aged care (Hawley & Caccioppo, 2007). Nonetheless, health interventions continue to target the 'usual suspects' of smoking, exercise, diet and drinking behaviour. Partly, this may reflect the fact that encouraging people to 'exercise more and drink less', for example, seems easier than asking them to 'be more social'. Human beings might be generally adept at making social connections (Baumeister & Leary, 1995), but developing and maintaining the kind of social bonds that support mental, cognitive and physical health – at first glance – seems neither simple nor straightforward. Yet, a number of recent studies do point to simple and effective ways of incorporating group interaction into everyday activities in ways that promote demonstrable health benefits. For example, intervention studies that increased social engagement in care homes via the establishment of 'gentleman's clubs' (Gleibs et al., 2011a), 'water clubs' (Gleibs et al., 2011b) and participatory design teams (Haslam et al., 2014; Knight et al., 2010) have observed elevated well-being and improved cognitive health in response.

One novel intervention that is often discussed, especially in relation to improving the connectedness of physically restricted older adults, is the use of social networking technologies and the Internet. Indeed, a representative of the UK policy think tank Policy Exchange recently argued that:



'[b]eing able to simply write an email or access a social networking site could provide older people with a way to stay connected to their friends and families, who may live hundreds of miles away. Maintaining these important relationships will help an ageing society vulnerable to loneliness and disconnection from a fast moving modern world' (<http://www.policyexchange.org.uk/media-centre/press-releases/category/item/target-loneliness-by-encouraging-pensioners-online> 27th May, 2014).

Similar sentiments were expressed in an earlier report by the International Longevity Centre UK (Mason, Sinclair, & Berry, 2012). This report noted that a significant proportion of the UK population (15%) had never been online and was, therefore, at risk of 'digital exclusion' from wider society. Those who were limited Internet users, or who were offline altogether, were more likely to be older as well as disabled and economically disadvantaged. Interestingly, and consistent with the arguments of Policy Exchange, the report quoted evidence from the English Longitudinal Survey of Ageing, a large-scale representative survey of older adults in England, showing that Internet use was correlated with a greater likelihood of belonging to a social group, reduced feelings of loneliness, increased feelings of control in one's life, and reduced anxiety.

While the above patterns point to the potential for mental health benefits to flow from digital inclusion via feelings of social inclusion, others have expressed scepticism about the value of increasing Internet connectivity as a means to address social isolation in ageing. For one thing, correlations between Internet use and indicators of social and personal well-being do not speak to causal effects of the former on the latter. It is equally possible that those who are more socially engaged are also more able, and supported, to use Internet technology. Writing in the UK's Guardian newspaper, Ros Coward further argued that although increasing digital inclusion was a worthy goal, online social networking should not be seen as a replacement for real human contact or a solution to the complex problems of social isolation and loneliness ("Loneliness is not a bug with a technological solution", 28th May, 2014).

In terms of the evidence base that could inform such debates, research findings about the potential value of improving Internet connectivity and skills among older adults are, at best, mixed. For example, some early studies report increases in cognitive and mental health after training older adults in care to use online computing facilities (McConatha et al., 1994, 1995). However, these studies were very small scale, in both cases involving only 14 trainees. More recently, larger-scale, and better-controlled, studies suggest fewer benefits. For example, White and colleagues (2002) conducted a trial in which 100 residents of supported housing and

nursing home communities were randomly assigned to either receive a computer, Internet connection and training or to a waiting-list control group. Although these authors observed decreases in loneliness and depression as a function of their intervention, these decreases did not approach statistical significance. An even larger study randomly assigned 191 older adults living in the community to receive either (1) brief training on computers and Internet use (12 hours over 2 weeks) and a personal computer and Internet connection to use in private for 1 year; (2) brief training only; (3) neither training nor a computer to use. The findings of this investigation revealed that although those in the intervention group (training + computer) reported acquiring new skills to a greater degree than the other groups, there were no further discernable emotional, mental health or social benefits of the intervention (Slegers et al., 2008). A final experimental study involving 83 older adults provided a training group with fortnightly classes on computer and Internet use spread across 6 months (Woodward et al., 2011). This study found that self-efficacy to use computers, and self reported use, increased significantly across time, but effects on social network indicators were mixed and did not change significantly. And, like the other recent studies, there were no significant impacts across time on mental health indicators.

The wider literature on the health and well-being benefits of online versus offline social networks is equally mixed. For example, in a recent experimental study, university undergraduates were asked to either increase their Facebook activity by posting more updates than usual or to maintain their normal level of Facebook activity (Deters & Mehl, 2012). Measures taken before and after revealed significant reductions in self-reported loneliness as a function of the experimental induction. Thus, this suggests that online social networking can have benefits for people's experience of social connectedness. However, other studies are more skeptical about the value of online social networking. For example, a longitudinal study (Kross et al., 2013) found that young adults' reported Facebook activity at one time point predicted *reduced* well-being and life satisfaction at a later time point: the more people engaged with online social networking the worse they subsequently felt. Using data from large population surveys, Helliwell and Huang (2013) compared the value of online versus offline friends. These authors found that the typical effect of social connections on improved subjective well-being was limited to offline (i.e., 'real') friends, and that there were no additional well-being benefits of reporting more online social connections (i.e., 'Facebook friends').

In evaluating this mixed evidence, at least two points seem relevant. First, although recent, well-controlled and larger-scale experimental studies assessing the impact of online social networking specifically on older adults suggest limited effects beyond skills acquisition and associated feelings of confidence, these studies were mostly conducted at a time prior to the explosion of online social networking associated with "Web 2.0", which came to public attention after 2004 (the year in which Facebook was launched) and steadily increased prominence in the years after that. Indeed, with the exception of the most recent study (Woodward et al., 2011), inspection of the methods suggests that the training provided was more focused on teaching older adults to simply use computers than to use these *as a social tool*. To the extent that social networking was represented in these trainings, it seems limited to email rather than alternative forms such as Skype and Facebook, perhaps reflecting the fact that these were not widespread at time these studies were conducted. It is also noteworthy that the level of support provided in these studies was quite limited – in two of the three cases, training only extended to 2 weeks and was delivered in group settings (although personalised support was available outside of this time and setting), the exception again being the most recent study (Woodward et al., 2011: fortnightly classes for 6 months). Earlier studies provided a considerably greater frequency of training and support than the contemporary research (e.g., bi-weekly sessions extending across 6 months: McConatha et al., 1995).

Second, while there is some indication that online social networking can be neutral or even negative with respect to mental health, the studies reporting these findings have drawn on mostly younger samples. As stated above, younger adults are generally more immune to the negative impacts of social isolation, but also they are likely to have a greater physical ability to engage in productive social networking offline. The existence of neutral or negative effects in this group does not preclude the possibility of more positive effects among specific popula-

tions, like older adults, for whom the benefits of online social activity might outweigh any costs. The exception to this is the research by Helliwell and Huang (2013), which drew on large, representative and therefore diverse samples. However, in this study the unique well-being benefits of online and offline social networks were each assessed while controlling for the other. Given the overlap between online and offline social networks, it is not surprising that once the latter is controlled there is no additional benefit of the former – however it should also be noted that in supplementary analyses in which alternative sources of social networks were not simultaneously controlled, the effect of online networks was still neutral with respect to well-being. This, however, does not preclude the possibility that ‘real friends’ might sometimes provide their support remotely via the Internet, a benefit that would be attributed to the former but is nonetheless enabled by the latter. For all these reasons, and given the apparent interest in the use of Internet technology to address the needs of older adults, it seems worthwhile revisiting some of these effects via new research. That was the aim of the present study.

5. The AGES 2.0 project: methods and findings in the UK and in Italy

The aim of the AGES 2.0 project was to provide a contemporary, experimental test of the contribution of online social networking to improving social connectedness among vulnerable older adults and, through this, to improved mental and cognitive health over time. To that end, we recruited 240 people aged 65 or over with physical or cognitive limitations and assigned them equally to an experimental and to a control group.

The experimental group was trained with a PC training package (Easy PC), characterised by a simplified user interface and by a manual and a set of lessons about 7 chapters: Mails, Skype, Facebook, Forget-me-not book, Internet, Games and Photos. The Easy PC package was delivered by professional carers in both countries and was orientated to equip elderly people with skills most useful to use the PC as an instrument of social connection. In order to assess its impact, a counterfactual analysis was run by comparison with a control group not being trained, i.e. by assessing for both the groups various indices of social connectedness, cognitive capacity, mental health and computer attitudes before and after the treatment to track changes across time.

Our key prediction was that, relative to the control group, the training group would show more positive attitudes about computers, growing feelings of competence, and increased social activity across time, reflecting the intention of the treatment. To the extent that the latter effect is observed, we also expected to see improved mental and cognitive health across time, effects that should be mediated through increasing social connectedness. Finally, given the perspective of previous socially driven interventions (e.g. Jetten et al., 2010; Jones et al., 2011), we were also interested in the role of self and identity in these relationships. Specifically, past research has suggested that maintaining a coherent sense of self is something that is a) supported by one's social connections with others and b) something that contributes to positive health and well-being outcomes across time. Accordingly, we expected that the capacity to maintain coherent personal identity might also mediate any positive effects on cognitive and mental health outcomes across time.

The training and research activities were accompanied by other project phases, namely those aimed at addressing the project's proper implementation and its ability to reach the foreseen results (monitoring and evaluation) and those aimed at disseminating the results and at discussing with policy-makers and with public and private stakeholders the possibility to transfer or up-scale the initiative (dissemination and up-scaling). Although these activities were not part of the research, they resulted in the production of additional documents and qualitative feedback (see paragraphs 5.3.6 and 5.5.8) which we have drawn on to provide a more complete picture of the Easy PC package and to inform the policy suggestions set out in Section 7.

5.1 Research contexts

To provide some indication of the generalisation of effects across different cultural contexts, the intervention study was run simultaneously in the United Kingdom and Italy. Given the goal of comparison, the same procedures were followed at each site (with some important exceptions detailed below). The same measures were taken from research participants, either using official Italian versions of the test measures or by translating original English items into Italian for the purposes of this research. However, because of the different cultural context, and more specifically the different context of care (as explained in Chapter 3), and because of the slight variations in procedure (detailed below), methods and results are reported separately for UK and Italian samples.

5.2 UK Methods

5.2.1 Participants

121 participants (78 female, 43 male) originally agreed to take part in the study. All potential participants were vulnerable older adults, between the ages of 60 and 95, who were receiving support from Somerset Care Limited – one of the main not-for-profit care organisations based in the South of England. These recruits were drawn equally from two care contexts: those receiving domiciliary care in the community (either in their own home or in supported housing), and those living in any of Somerset Care's 26 residential care homes.

Somerset Care staff initially identified interested potential participants. In order to be included in the project, interested participants were required (1) to be willing to be engaged in the project for a period of four months, (2) to have the space and infrastructure for Internet access and use, and (3) to have sufficient cognitive ability to engage with the training they would receive during the project. With respect to the latter, staff involved in recruitment used an initial 6-item screener to check basic cognitive capacity (Callahan et al., 2002). Those who passed this test received a baseline interview, but to be included in the project participants had to score over 19/30 on the Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) to ensure sufficient capacity to cope with training if assigned to that group⁸. In addition, we limited participation to clients who did not currently have their own private Internet access in order to better isolate the impact of Easy PC training. Participation was voluntary and the only rewards were receiving temporary use of a computer and training package for those in the experimental group, or going into the draw to win one of two computer packages and training (outside of the project) for those in the control group.

Following initial recruitment, 22 participants chose to discontinue their involvement in the study prior to a baseline assessment. A further 23 dropped out of the study after completing the baseline assessment but before having completed a follow-up assessment (total drop-out of 45). The reasons for dropping out of the study ranged from ill health or death, to a lack of ongoing interest in the project. Excluding these drop-outs left a total useable sample of 76 participants who completed all phases of the research (i.e., a baseline assessment, assignment to condition, and follow-up assessment). Of these participants, the majority was female (50; 26 male), and was aged between 60 and 95 years old (M age = 80.71). Of the final sample, 32 participants were receiving residential care and 44 were receiving domiciliary care, and the mean length of time receiving care was approximately 5.68 years. The majority of participants were widowed (60%), single (15%), or divorced (9%), with only 15% being currently married. Of those living in their own home, 75% lived alone. Finally, the mean age at leaving full time education was 15.34 years.

⁸ There were three cases in which participants were still included in the project although the MMSE threshold at baseline was not met. The inclusion of these cases was allowed because the overall MMSE performance of these individuals was clearly compromised by stroke-related physical impairment (e.g., loss of speech, inability to write) rather than compromised cognitive function. After being accepted, these cases were randomised to condition like all other participants.

5.2.2 Design

The study had a 2 (treatment: Easy PC, care as usual) x 2 (level of care: domiciliary, residential) x 2 (time: baseline, follow up) design. After initial screening, half of the participants were randomly assigned to receive Easy PC training and the other half were assigned to a control group who received care-as-usual. Stratified randomization was used to assign participants to condition, with separate randomization of domiciliary and residential participants, to ensure balanced allocation to condition across the two levels of care. Assessment sessions at baseline and follow-up were carried out using paper and pencil tests and questionnaires, which were administered verbally by trained research assistants. The ethics committee of The University of Exeter gave approval for the study.

The package. The Easy PC package involved installing a touch screen PC computer and keyboard in the participants' home, as well as setting up the necessary infrastructure for broadband Internet access. Participants were able to keep this computer for a period of 12 months, including the three-month training period. Participants allocated to receive the training were assigned a 'Care Technologist', who was an employee of the care organization specifically trained to deliver the Easy PC to clients. Each Care Technologist delivered the same package to ensure consistency in delivery of training. This was modified only slightly on a case-by-case basis, depending on individual participant needs.

The training. The training program was administered over a three-month period. To ensure broad consistency of experience across individuals, the training schedule was manualised (Haslam & Morton, 2013a) and 3 Care Technologists (all qualified carers and employees of Somerset Care) were trained in the delivery of this schedule. The schedule was broken down into each of the 3 months of the training period, and across these three time periods the training stepped down in its intensity and frequency. The first month was the most intensive and involved face-to-face training sessions (3 per week; 4 hours each) in basic computer use, and then progressively through the specific applications of email, Skype, Facebook and other Internet resources. In addition, across sessions participants were helped to develop an individual life story folder, containing materials (e.g., photographs, music, video, family and work histories) that could be shared with online communities to facilitate introduction and ongoing relationships. Homework tasks were arranged with participants to consolidate learning in between training sessions (e.g., e-mailing the Care Technologist). In the second month of training, face-to-face contact was reduced to fortnightly sessions, and supplemented with telephone and e-mail contact in order to monitor progress and engagement with social media. In month three, participants were encouraged to continue using Easy PC independently, with telephone and e-mail support from Care Technologists as required. Participants were also provided with a user manual for the Easy PC to support their training.

Although the goal of the training was, as much as possible, to deliver a standardised experience, Care Technologists were also told to be flexible with training and responsive to the needs and interests of their client. If participants were not interested in a specific application (e.g., Facebook) they were not required to persist with it, provided they had received the basic training in how to use that application if they wanted to. In this way, the goal was to instill competencies with computer use, and with the more specific use of social media, rather than to force participants to use things that did not meet their needs and interests. Accordingly, while all participants received similar levels of information and attention from the training program, their specific computer use was free to vary.

5.2.3 Procedure

Participants were recruited by Somerset Care staff, who advertised the study with flyers and word-of-mouth to clients receiving residential or domiciliary care. In total 121 clients of Somerset Care passed an initial screening for eligibility (based on inclusion criteria) and applied to take part in the project. Potential participants were then contacted by a researcher from

the University of Exeter, who scheduled individual baseline (pre-intervention) assessments. Prior to administering the dependent measures at T1, the researcher explained again about the project so that participants were fully informed, and understood both that they could withdraw at any point, and that the randomisation process entailed the possibility that they might not receive the computer and training. If participants were still happy to take part, demographic details were taken, and all primary and secondary assessments were administered. Most sessions took between one and two hours depending on the individual, and care was taken to manage any distress or discomfort whilst conducting the interview, by arranging short breaks or refreshments for the participant.

Following the T1 interview (detailed below), participants were randomised equally to condition (either to receive the computer training intervention, or to receive care-as-usual) within each care context (domiciliary and residential). Allocation occurred once a month for all participants who had completed a baseline interview since the preceding allocation and was achieved via an online randomization program. Participants who were allocated to the control condition continued to receive care-as-usual and were informed that in the interim period they did not need to do anything on account of the project. They were then sent a small gift (e.g., a 'University of Exeter' embossed pen, bookmark, or key-ring) and a letter expressing gratitude for their continued involvement, and their value to the project, and to invite them to participate in a follow-up interview after three months. They were also informed that on completing the second interview, they would be entered into a lottery draw to win one of two Easy PC computers as an incentive to remain in the project. Those who were allocated to the training group received a computer package and broadband connection and were assigned a Care Technologist who delivered the training package (detailed above).

On completing the Easy PC training program, or in the case of control group participants after an equivalent three-month period of care-as-usual, a University of Exeter researcher scheduled the follow-up assessment. Although the repeat assessment was targeted to occur shortly after the end of the three-month period, for some participants the interim period was longer, due to health issues, or delays/difficulties in training. Once all primary and secondary measures had been administered at T2, participants were informed that their participation in the project was complete, and they were again thanked.

5.2.4 Measures

Measures were administered during the assessment sessions with participants at Time 1 (T1: baseline) and Time 2 (T2: follow-up). After initial demographic information was taken at T1 (e.g., age, sex, medical history, length of time in receipt of care), participants were then asked to complete a number of tests and to respond to a series of questions at both time points (for full details see Haslam & Morton, 2013b).

Cognitive and mental health. General cognitive ability was measured using the *Addenbrookes Cognitive Examination Revised* (ACE-R; Mioshi et al, 2006), assessing ability in the areas of attention/orientation, memory, verbal fluency, language, and visuo-spatial ability. Scores in all these domains were summed to provide a total score out of 100, with higher scores indicative of better ability.

Current mental health was assessed via a variety of indicators. The 12-item version of the *General Health Questionnaire* (GHQ-12; Goldberg & Williams, 1978) assessed global feelings of mental health. On a four-point scale, participants indicated the frequency (e.g., 1 = Not at all, 2 = No more than usual, 3 = Rather more than usual, 4 = Much more than usual) and the extent to which they had been experiencing a range of mental health symptoms (e.g., 'Have you recently... felt that you are playing a useful part in things' / ... felt constantly under strain'). Higher scores on this measure indicated more frequent negative mental health symptoms.

Participants were also asked to complete the 8 items from the *CES Depression Scale* (CES-D; Radloff, 1977), which asked them to indicate how often they experienced a variety of depres-

sion symptoms in the past week on a four-point scale (e.g., 'I felt sad', 'I could not get "going"'); 1 = None of the time, 2 = Some or a little of the time, 3 = Occasionally or a moderate amount of time, 4 = Most or all of the time). Anxiety was measured using the *Geriatric Anxiety Inventory – Short form* (GAI-SF; Byrne & Pachana, 2011). Participants were asked to indicate whether they agreed or disagreed that they had experienced 5 symptoms of anxiety in the last week (e.g., 'I worry a lot of the time', 'little things bother me'). These scales were scored following standard criteria such that higher scores indicated more depression and more anxiety.

General well-being was indexed using 4 additional measures. The first of these, the *Satisfaction with Life Scale* (Diener, 1985), comprised five items (e.g., 'in most ways my life is close to ideal', 'the conditions of my life are excellent'), which participants responded to on a 5-point scale (1=strongly disagree, 5=strongly agree). In addition we assessed the *autonomy and competence* subscales from the basic needs satisfaction questionnaire (Gagne, 2008; the third basic need of relatedness was not measured since this is covered elsewhere). This measure included 13 statements (e.g., 'I generally feel free to express my ideas and opinions', 'Often I do not feel very competent') to which participants indicated the degree to which that was true for them (1= not at all true, 5= very true). Subjective loneliness was assessed with 8 items from the *UCLA Loneliness Scale* (Russell, 1996). Participants were asked to indicate how often each statement (e.g., 'How often do you feel that you lack companionship?') applied to them using a four-point response scale (1 = never, 4 = always). These scales were all scored according to standard guidelines such that higher scores indicated more satisfaction with life, stronger feelings of self-competence and autonomy, and greater felt loneliness.

Social relationships. Several scales were used to index the nature and quality of participants' social relationships. The *social network diversity* scale (Cohen et al., 1997) assessed the degree to which participants were active in their social network. Specifically, participants were asked to report for each of 10 different types of people (e.g., spouse, children, grandchildren, other family, friends, close neighbours, people in my local community) whether they had been in contact with at least once every two weeks. The higher the number of targets the participant had been in contact with indicated a more diverse (or more active) social network. Separately, participants also indicated their satisfaction with the amount of contact they had with each of these 10 targets (1 = very dissatisfied, 5 = very satisfied). These responses were averaged to provide a general index of satisfaction with one's social network activity.

Next, participants were then asked to list groups they belonged to or had contact with (following Haslam et al., 2008). 'Groups' was defined for participants very broadly to include small interactive groups, groups they has some official membership in, or more diffuse groups they felt part of. After listing up to 6 groups they belonged to, participants rated the importance of each of these groups to them (1 = Not at all important, 5 = Very important) and the degree of fit between each group membership and their wider social network (1 = Not well, 5 = Very well). To facilitate answers to the second question, a definition of fit was offered as the degree to which different groups were similar or complementary (high fit) or were very different or unconnected (low fit). From these responses, the number of groups listed (up to 6), the overall importance of these groups (averaged) and the overall fit of group memberships (averaged) were calculated.

Consistent with past research in this area, we also assessed feelings of *personal identity strength*. This involved 6 items, adapted from the self-concept clarity scale by Campbell et al. (1996) and a personal identity strength scale devised by Baray et al. (2009). Participants were asked to respond to 6 statements (e.g., 'I have strong beliefs', 'I know what I want from life', 'I have a clear picture of who I am and what I am') on a 5-point scale (1 = Not at all true, 5 = Very true). Responses to these items were averaged such that higher scores indicated a stronger sense of one's self.

Computer attitudes and use. Computer usage and attitudes towards personal computers were measured. Regularity and duration of computer use was measured on five-point scales, with higher scores indicating greater regularity and duration of use. Computer use was also indexed by measuring how often participants used a computer for specific purposes (e.g., looking at photos, entertainment, communicating with people), on a scale of 1 (never) to 5 (a lot).

General attitudes towards computers were assessed using 13 items from the original Jay and Willis (1992) questionnaire (e.g., 'I feel comfortable with computers', 'computers make my life easier', 'I think I am capable of learning to use a computer'). Responses to each item were made using a 5-point scale (1=strongly disagree, 5= strongly agree).

The T2 follow-up interview repeated all of the above measures. In addition, participants in the intervention condition were asked further questions about their training experiences. Specifically, they were asked to provide an assessment of the training itself (3 items; e.g., 'How did you find the pace of the training you received?' 1 = Too slow, 3 = Just right, 5 = Too fast); the quality of the relationship with their trainer (4 items; e.g., 'Across the training programme, how did you find the quality of your interactions with the Care Technologist?' 1 = Very Negative, 3 = Neutral/ unsure, 5 = Very positive), and their feelings of connection with other people in the training group (3 items; e.g., 'To what extent did participating in this training make you feel as though you were part of a larger group of people doing something together?' 1 = No, not at all, 3 = Uncertain/ unsure, 5 = Yes, very much).

5.3 UK findings

5.3.1 Initial checks

Before testing the key hypotheses, we first compared training and control groups at baseline (i.e., Time 1) in order to check whether randomisation had been successful. A series of t-tests confirmed that there were no significant differences between those assigned to the training versus control groups on any of the assessed variables at baseline, $t < 1.83$, $p > .07$. In addition, there was no evidence that the training and control groups differed significantly in terms of their age, $t < 1$, $p = .85$, or gender $\chi^2 = .30$, $p = .67$. On this basis, the initial randomisation procedure appeared to be successful.

As noted above, however, dropouts due to ill-health, death and a lack of ongoing interest in the project were an (expected) issue by Time 2. To check whether this attrition was systematic, and therefore a potential source of bias, we conducted a drop-out analysis that compared those who dropped out with those who completed participation on the key variables of interest at baseline. A series of t-tests revealed no significant differences at baseline between those who stayed in the project versus those who dropped out, $t < 1.39$, $p > .17$, as did additional tests conducted within each of the training and control sub-samples, all $t < 1.75$, $p > .09$. Finally, there was no indication that the training or control groups differed significantly in terms of the frequency of drop out, $\chi^2 = 1.50$, $p = .22$. Thus, although there were significant numbers who dropped out of the project before Time 2, patterns of drop out were not systematic and therefore did not compromise the random allocation of participants to condition. For these reasons, it is appropriate to consider training and control groups as initially equivalent and to interpret any effects of training that emerge in the analyses that follow as arising from the training itself rather than from pre-existing differences between training and control participants.

Finally, we also explored the presence of any baseline differences between participants recruited via residential versus domiciliary care. Consistent with what might be expected, compared to those living in their own home, participants in residential care were significantly older, $t = 2.04$, $p = .045$, and performed worse on the ACE-R, $t = -2.87$, $p = .005$. They also felt less autonomous, $t = -2.17$, $p = .03$, slightly less competent, $t = -1.91$, $p = .06$, and reported a less diverse social network, $p = -5.40$, $t < .001$. However, residential participants also reported belonging to more groups, $t = 2.16$, $p = .03$, and showed fewer signs of depression, $t = -2.12$, $p = .04$, than participants living in their own home. No other baseline differences between these groups were significant, all remaining $|t| < 1.33$, $p > .19$. Contrary to expectations, then, there was no clear evidence that participants receiving domiciliary care were at greater risk for social isolation. Instead, the degree to which this was apparent dependent on the measure of isolation (group-based, versus interpersonal connections) and each group displayed their own unique deficits

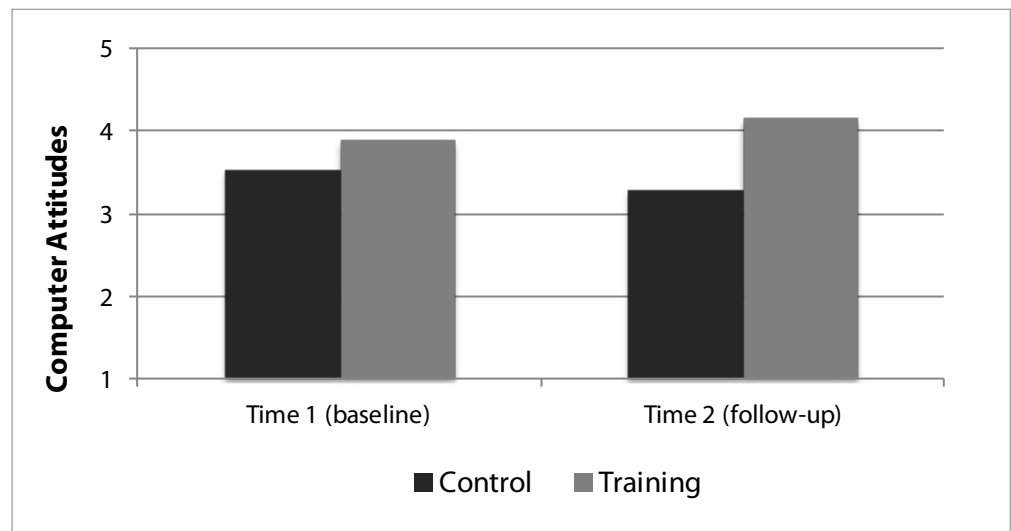
of cognitive and mental health. However, it is also worth noting that many of apparent differences between groups were reduced when the basic age difference was controlled, except for differences in social network diversity and felt autonomy, which both remained significant even after controlling age.

5.3.2 Effects of intervention on immediate targets

The above checks confirm that it is appropriate to treat the data as experimental: there were no baseline differences between groups, and attrition did not appear to be selective in terms of the key variables of interest. Having established this, our first interest was in the degree to which the intervention affected the variables it was most immediately expected to – that is, the degree to which the intervention affected variables that were the immediate focus of the training.

Given the form of the intervention, the most immediate expected impact would be on improved attitudes to computers. To test this expectation, a 2 (condition: training, control) x 2 (population: residential, domiciliary) x 2 (time: 1, 2) mixed analysis of variance was performed on computer attitudes. This revealed a significant effect of condition, $F(1, 70) = 18.79, p = .001, \eta^2_p = .21$, which was qualified by a significant interaction with Time, $F(1, 70) = 6.24, p = .02, \eta^2_p = .08$. Follow-up tests confirmed that although there was already a small difference between training and control groups at Time 1, $F(1, 70) = 5.68, p = .02, \eta^2_p = .08$, this difference was considerably larger at Time 2, $F(1, 70) = 19.11, p < .001, \eta^2_p = .21$. Moreover, participants who received the training reported significantly improved attitudes about computers across time, $F(1, 70) = 3.83, p = .054, \eta^2_p = .05$, whereas the attitudes of those in the control group did not change over time, $F(1, 70) = 2.59, p = .11, \eta^2_p = .04$ (Figure 3).⁹

Figure 3. Positive attitudes about computers in control and training groups across time.



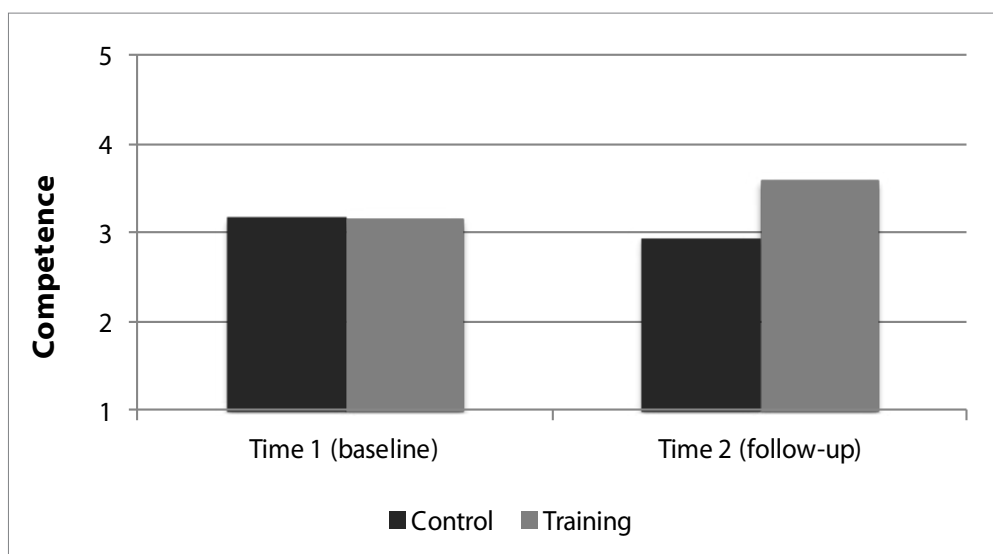
Unexpectedly, there was also a significant effect of population group, $F(1, 70) = 4.30, p = .04, \eta^2_p = .06$, and a significant interaction between condition and population group, $F(1, 70) = 6.11, p = .02, \eta^2_p = .08$. Follow-up tests of this interaction revealed a significant difference between training and control participants' attitudes within the residential care group, $F(1, 70) = 20.23, p < .001, \eta^2_p = .22$, but not in the domiciliary care group, $F(1, 70) = 2.03, p = .16, \eta^2_p = .03$. Residential participants who received the training had significantly more positive attitudes than those who did not. Although the three-way interaction was not significant, further probing revealed that

⁹ The significance of the treatment condition at Time 1 reflects the effects of differential attrition. Although this could suggest that Time 2 effects are also a reflection of this, supplementary analyses confirmed the effect of training on Time 2 attitudes controlling for existing differences at Time 1, $F(1, 69) = 13.33, p = .001$.

the previously described Condition x Time interaction was more apparent in the residential, $F(1, 29) = 3.83, p = .06, \eta^2_p = .12$, than the domiciliary group, $F(1, 41) = 1.92, p = .17, \eta^2_p = .05$. Thus, the intervention did seem to improve computer attitudes, but especially among those living in a care home rather than their own home.

The immediate impact of the intervention was also apparent on subjective feelings of competence. The analysis performed on this measure also revealed a significant effect of condition, $F(1, 70) = 4.72, p = .03, \eta^2_p = .06$, and a significant Condition x Time interaction, $F(1, 70) = 9.52, p = .003, \eta^2_p = .12$. On this measure, although there were no baseline differences between groups at Time 1, $F < 1$, by Time 2, the training group was experiencing substantially heightened feelings of competence relative to the control group, $F(1, 70) = 10.86, p = .002, \eta^2_p = .13$. Moreover, participants who received the training reported significantly improved feelings of competence across time, $F(1, 70) = 9.52, p = .003, \eta^2_p = .12$, whereas the self-competence of those in the control group did not change over time, $F(1, 70) = 1.91, p = .17, \eta^2_p = .03$. In this analysis, there were no further main or interactive effects of the variables, $F_s < 2.24, p_s > .13$.

Figure 4. Feelings of self-competence in control and training groups across time.

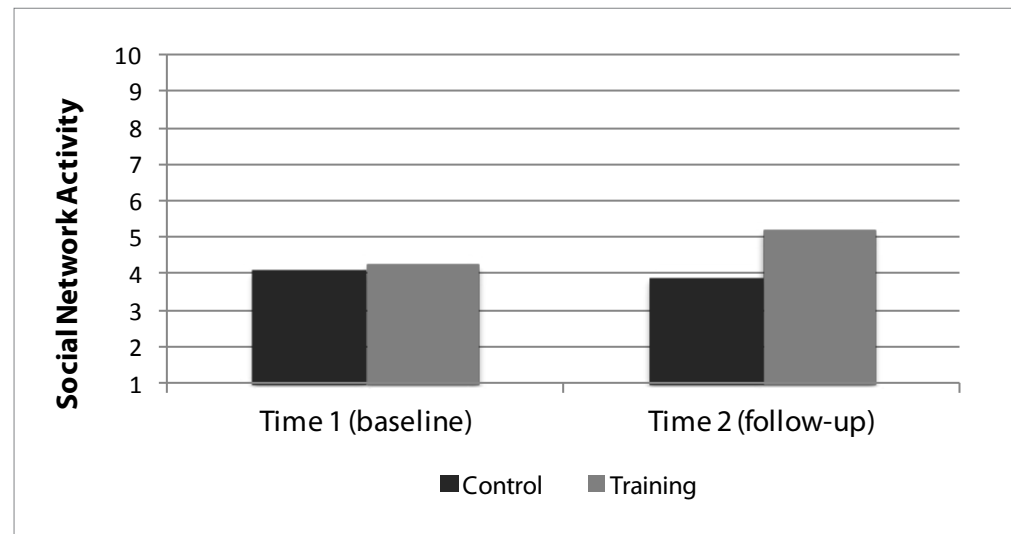


It is also notable that this pattern was limited to feelings of competence rather than autonomy. On the latter variable there was an effect of population group already described in the baseline checks, $F(1, 70) = 8.29, p = .005, \eta^2_p = .11$, a difference that was more apparent in the control group rather than the training group, as evidenced by a significant Condition x Group interaction, $F(1, 70) = 4.55, p = .04, \eta^2_p = .06$. However, this interaction was not modified by time of measurement, $F < 1$, indicating that it was equally apparent at Time 1 as at Time 2. As such, this particular pattern should only be interpreted with caution.

Finally, the expected pattern was also evident on the measure of social network diversity. The analysis of this variable again revealed a (weak) effect of condition, $F(1, 71) = 3.01, p = .09, \eta^2_p = .04$, which was qualified by a significant Condition x Time interaction, $F(1, 71) = 5.05, p = .03, \eta^2_p = .07$. Consistent with the pattern emerging across the previous variables, although there were no differences between training and control groups at Time 1, $F < 1$, at Time 2 there was a significant difference, $F(1, 71) = 7.88, p = .006, \eta^2_p = .10$. Participants who received the training reported significantly increased social network activity across time, $F(1, 71) = 7.91, p = .006, \eta^2_p = .10$, whereas the social network activity of those in the control group did not change over time, $F < 1$. Other than a significant difference between residential and domiciliary participants, $F(1, 71) = 34.74, p < .001, \eta^2_p = .33$, such that domiciliary participants reported more expansive social networks, there were no other effects on this variable, $F_s < 2.12, p_s > .14$. Here it is also interesting to note that the effect of training on indicators of social connectedness was confined

to the measure of network diversity rather than relationship satisfaction, all condition $F_s < 1.32$, $p_s > .26$, and also did not extend to number of group memberships, all condition $F_s < 1$, group importance, all $F_s < 2.44$, $p_s > .12$, or group fit, all condition $F_s < 1.28$, $p_s > .26$.¹⁰

Figure 5. Social network activity in control and training groups across time.



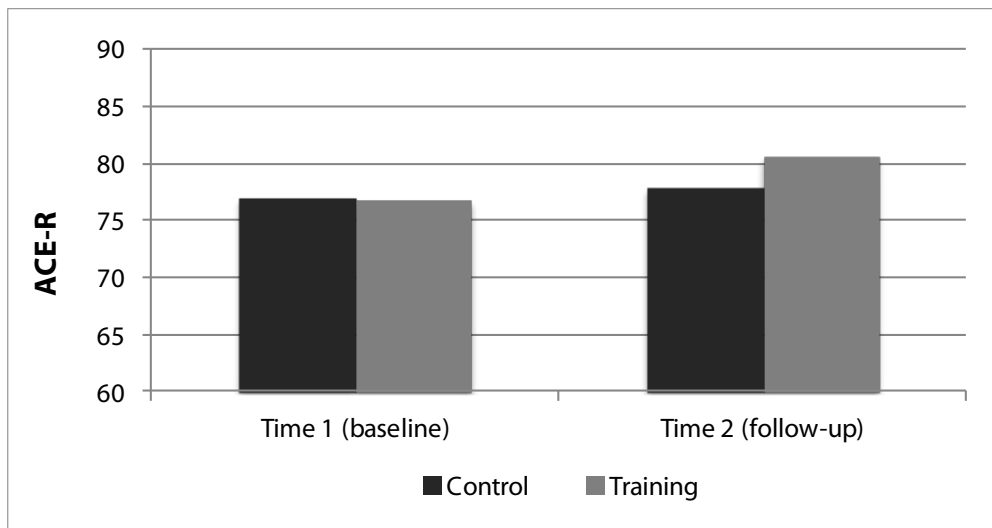
Summary. On the basis of the above analyses, we can say that there is evidence that the intervention did what it was designed to do: across time, participants who received the training developed more positive attitudes about computers, felt themselves to be more competent as a person, and were engaged more actively with their social network relative to those who did not receive the training. Given the above evidence that the intervention “worked”, at least on the variables it should most directly impact given the form of the training, it is interesting to consider whether there were any deeper consequences of the intervention for cognitive and mental health, either directly or as a result of the processes triggered by the intervention (i.e., feelings of competence and social activity). It is to each of these questions that we turn in the next sections.

5.3.3 Direct effects of intervention on cognitive and mental health

Cognitive health. To examine the direct impact of the intervention on cognitive health, we performed the above analysis on participants’ ACE-R scores. Aside from the already reported significant difference between residential and community participants, $F(1, 72) = 11.80, p = .001, \eta_p^2 = .14$, the only other significant effect was for time, $F(1, 72) = 6.74, p = .01, \eta_p^2 = .09$, indicating that performance on the cognitive assessment *improved* from baseline to follow-up testing. Although the interaction with time did not reach significance, $F(1, 72) = 2.56, p = .11, \eta_p^2 = .03$, given the general expectation of cognitive decline in this population, and as such the unusual nature of improvement, we explored the apparent time effect in more detail. Follow-up tests revealed that the significant effect of time was confined to the training group, $F(1, 72) = 10.34, p = .002, \eta_p^2 = .13$, and not at all significant in the control group, $F < 1$. All other effects were non-significant, $F_s < 1$.

¹⁰ There were some effects involving participant group (residential versus domiciliary) and time on these measures. However, because these are not focal to the current analyses, and these effects did not interact with experimental condition, they are not reported in detail here.

Figure 6. Cognitive capacity (ACE-R scores) in control and training groups across time.



Mental health. To explore possible mental health consequences of the intervention, we examined scores on the UCLA loneliness, CES-D, GAI, GHQ and SWL scales. From these analyses, the only effects to emerge were a weak effect of training on CES-D (depression), $F(1, 72) = 3.36, p = .07, \eta^2_p = .05$, and a significant effect on GHQ scores, $F(1, 72) = 5.10, p = .03, \eta^2_p = .07$, indicating that training participants experienced slightly better well-being than control participants. However, these condition effects were independent of time of measurement and therefore hard to interpret specifically as a product of the training. There were no significant main or interactive effects of the variables on any of these measures.

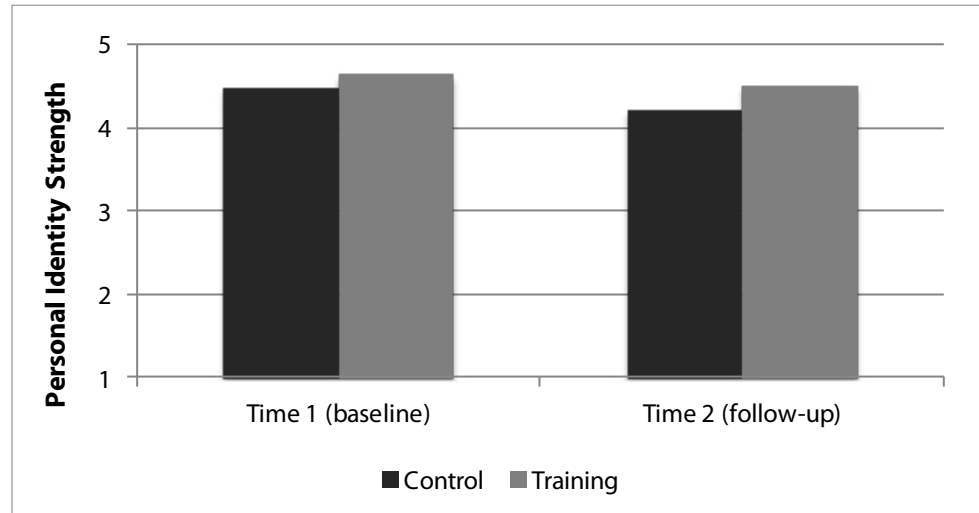
Additional outcomes. In addition to measures of individual mental health, there were various measures relevant to the healthy functioning of the self-concept. These include feelings of competence and autonomy, both of which are thought to be essential for a healthy self. Analysis of these measures have already been reported, and provide evidence that the basic need for competence was being satisfied to a greater degree among participants who received training.

We also assessed strength of personal identity, measures of which have also been related to a healthy self-concept (Campbell et al., 1996), and have been found to be an important mediating variable in previous studies investigating the impact of social processes on healthy functioning among older adults (e.g., Jetten et al., 2010; Jones et al., 2011). The analysis of this variable revealed a significant effect of condition, $F(1, 71) = 4.06, p = .05, \eta^2_p = .05$, indicating that participants in the training condition had a stronger sense of self than control participants. There was also a significant effect of time, $F(1, 71) = 10.53, p = .002, \eta^2_p = .13$, indicating that strength of personal identity declined over time, as might be expected in an ageing population. A significant Time x Population interaction, $F(1, 71) = 6.22, p = .02, \eta^2_p = .08$, indicated that this decline was evident only among participants in residential care, $F(1, 71) = 14.17, p < .001, \eta^2_p = .17$, rather than those living in their own home, $F < 1$.

Although no other effects were significant, we nonetheless probed the condition and time effects further. This revealed that the apparent decline in personal identity strength was limited to the control group, $F(1, 71) = 8.47, p = .005, \eta^2_p = .11$, and was not apparent to the same degree in the training group, $F(1, 71) = 2.56, p = .11, \eta^2_p = .04$. Moreover, this accelerated decline resulted in a significant difference between training and control groups at Time 2, $F(1, 71) = 4.23, p = .04, \eta^2_p = .06$, that was not apparent at Time 1, $F(1, 71) = 1.92, p = .17, \eta^2_p = .03$. Finally, this pattern was especially apparent among participants receiving residential care rather than care in their own home. Among the former, decline was especially evident in the control, $F(1, 71) = 12.61, p = .001, \eta^2_p = .15$, relative to the training group, $F(1, 71) = 2.85, p = .10, \eta^2_p = .04$. Among the latter, there was no evidence of across time decline in either group, $F_s < 1$. Thus, on

this measure, participation in the training seemed to be especially beneficial for those residing in care because it helped them to maintain a sense of self in the face of decline.

Figure 7. Personal identity strength in control and training groups across time.

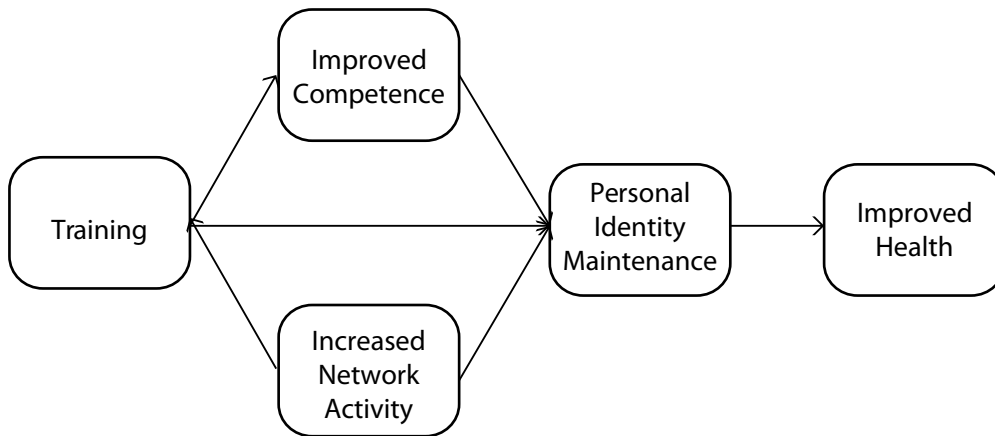


5.3.4 Indirect effects of intervention on cognitive and mental health:

The above analyses suggest some immediate and predictable effects of the training – training improved attitudes about computers, fostered feelings of self-competence and increased reported activity within participants’ social networks. To the extent that there were population differences, the training seemed to particularly help the most vulnerable participants – those residing in care – to maintain a sense of their self in the face of decline. Interestingly, a pattern of improvement rather than decline among training participants was also evident on measures of cognitive capacity, although there were no clear direct effects of the intervention on mental health indicators.

As noted above, the measures of self – including competence and personal identity strength – are particularly interesting, since these are related to basic psychological needs and have been implicated as mediators of health outcomes in prior studies. The evidence of expanding social activity is also interesting for the same reason – past studies suggest that more diverse network activity can protect cognitive and physical health in the face of decline or infection. Given these precedents, we also explored the possibility of indirect effects on cognitive and mental health outcomes via the impacts on social network diversity, feelings of competence and personal identity strength. Specifically, we specified a series of PROCESS models (Hayes, 2013; Model 6) in which maintained personal identity strength was positioned as the proximal mediator of any indirect effects of training (coded: training = 1, control = 2) on across time cognitive and mental health outcomes (i.e., controlling for baseline), and in which each of improved competence and expanded social networks were (separately) specified as mediators of the training-personal identity link (again controlling for baseline measures of these mediators). This general model is depicted graphically in Figure 8.

Figure 8. Schematic model of indirect effects analysis. All mediator and outcome measures are Time 2 controlling for Time 1 (i.e., represent change).



Indirect effects on cognitive improvement. The model testing the serial links between training, increased competence, maintained personal identity strength and improved ACE-R scores was significant, as indicated by the 95% confidence intervals for the two-step mediational path not including zero [95%CIs = -2.35 & -.22]. Similarly, the model testing the serial links between training, expanded social networks, maintained personal identity strength and improved ACE-R scores was significant, as indicated by 95% confidence intervals for the two step mediation that did not include zero [95%CIs = -1.39 & -.09]. Thus receiving training was associated with improved cognition across time was because this improved feelings of competence and expanded social network activity, both of which fed into the maintenance of personal identity via which cognitive capacity improved.

Indirect effects on mental health. The analyses of CES-D (depression) scores revealed a similar pattern to the above. The model in which improved competence and maintained personal identity strength were included as serial mediators of any training-depression links revealed a significant indirect path mediated by competence alone [95%CIs = .06 & .43]. However, the model in which competence was replaced with social network activity revealed a significant two-step mediational path via network activity and personal identity strength [95%CIs = .002 & .0988].

Likewise on GAI and GHQ scores, there were significant indirect effects of training on across time outcomes via improved competence alone [GAI 95%CIs = .008 & .81; GHQ 95%CIs = .05 & .25]. On GAI scores, the two-step mediation via social network activity and personal identity strength was also significant [95%CIs = .0036 & .21]. However, this was not the case for GHQ scores, for which there was no indirect effect of either social network diversity or personal identity strength.

Finally, for the measures of general life satisfaction and subjective loneliness, there was evidence of significant two-step mediational pathways between training and improved outcomes across time via feelings of competence and personal identity strength [SWL: 95%CIs = -.21 & -.02; Loneliness: 95%CIs = .0011 & .16], and between training and improved outcomes via social network activity and personal identity strength [SWL 95%CIs = -.21 & -.01; Loneliness 95%CIs = .0005 & .11].

Thus, although there was limited evidence of direct effects of training on these indicators across time (reported above), there was evidence that training could indirectly contribute to improved mental health, increased life satisfaction and reduced loneliness via increasing feelings of competence, and separately though expanding individual social networks, which in turn supported the integrity of the individual's sense of self.

5.3.5 Computer use and experiences within training group

The above analyses reveal evidence that belonging to the training group was associated with certain benefits across time. Directly, being in the training group cultivated more positive attitudes about computers, increased feelings of self-competency, and expanded individual social network activity. There was also some evidence that training boosted cognitive capacity and stemmed the deteriorating sense of self, the latter being especially true among participants receiving residential care. Indirect effects analyses further showed that maintaining a sense of self was a) a consequence of improved self-competence and expanded network activity, and b) together with competence and social network activity contributed to unfolding cognitive and mental health benefits across time. These patterns suggest that training older adults in how to use computers specifically for social purposes might have a range of self-related, cognitive health, and mental health benefits.

As noted in the methods, although the training was developed to ensure a broad consistency of experience across trainees – at least in terms of the skills that they were taught during their training – individuals were free to pursue their own interests and needs and to use their computer independently. To gain further insight into what participants actually did with their computer, and how this might relate to the observed benefits of training, at Time 2 additional questions were asked to trainees about the specific applications they found useful as well as their thoughts and feelings about the training they received. This descriptive information is summarised in this section.

In the Time 2 follow-up interviews, we asked trainees a number of questions relating to the amount that they used their computer, and the specific programs and applications they used and found useful. A large proportion of the overall trainee sample reported using their computer every day (38.6%), with almost half the sample using the computer at least every couple of days (47.6%). Of course, this means that the remainder (around half) of the sample was using the computer relatively infrequently (once a week or less). In addition, 52.2% of the sample stated that they tended to use their computer for a period of more than one hour during each session, with the other half reporting using their computer for shorter periods of time at each sitting. Thus, within the training groups, there was considerable variability in how often and for how long people used their computers.

Participants were asked if they used their computer *never, rarely, sometimes, often, or always* in relation to each of the specific programs and applications they were trained in. Inspection of responses to these questions revealed that e-mail was particularly likely to be used – with 66% using it either often or always. Skype was also relatively popular, with 59% of participants using it at least sometimes or more. In comparison, Facebook appeared to be less popular, with 68% of trainees claiming to use it rarely or not at all. Similarly, 82% reported rare or no use of Forget-Me-Not, and finally 77% reported using of Internet forums rarely or never.

The pattern of use was mirrored by the perceived utility of each of these applications. Responding to the question of how useful they found each of these (on a scale ranging from *not useful at all, a little, somewhat useful, quite a lot, or a lot*), 60% of participants responded 'a lot' to the utility of email (with a cumulative 77% finding it at least somewhat useful). Similarly, just over half the sample (51%) answered 'a lot' with respect to the utility of Skype (with a cumulative 78% finding it at least somewhat useful). Conversely, the majority of trainees found no use at all for Facebook (58%), Forget-Me-Not (62%), and Internet forums (64%), with only a handful of people reporting a high utility for each of these programs. Hence overall, it appears that e-mail and Skype were the most popular and functional programs of those taught in the Easy PC package – being used regularly by trainees, and being found to have the greatest utility. On the other hand, Facebook, Forget-Me-Not, and Internet forums were in general used rarely and were not found to be useful.

Next, trainee participants were asked how much they used their computer independently for a range of general purposes, responding on a scale from 1 (never) to 5 (always). From this information it appears that trainees were most likely to use their computer for the purposes of: *finding information and advice* (34 % responding 'always'; a cumulative 75% using the computer

for this purpose at least 'sometimes'); *entertainment* (e.g., watching films, playing games, listening to music; 43% responding 'always'; a cumulative 71% using at least 'sometimes'); *looking at photographs* (75% used the computer for either 'often' or 'always' for this purpose); and *communicating with friends or family* (66% doing this 'often' or 'always'). At the other end of the spectrum using the computer for *shopping*, or *writing and reading documents*, was very unpopular, with 77% and 57% reporting they never used it for these purposes respectively. Using the computer to *meet new people* was also very unpopular, with 73% claiming to never use it for this purpose.

We also collected information from the training participants regarding their feelings about the training itself, their relationship with the trainer, and their sense of connection with other people in the project who were undergoing the training. In terms of the usefulness of the training, 80% of trainees found the training to be 'very useful' with only 4.5% finding it 'not useful at all'. Moreover, 85% of trainees found the clarity of the training to be 'clear' or 'very clear'. Finally, 82% of the trainees found the pacing of the training to be 'just right' (neither too slow nor too fast). With respect to their relationship with the Care Technologist, 89% expressed feeling a positive attitude towards their relationship with the trainer, of whom 52% expressed a very positive attitude. Finally, 41% of trainees reported feeling some sense of connection to other people within the project, with the remainder expressing no such feelings of connection. To summarise, based on their own self-reports, the participant experience of the training itself was overwhelmingly positive, with very little negativity or ambivalence expressed. Similarly, relationships with the Care Technologists were overwhelmingly positive.

5.3.6 Qualitative feedback

The observed benefits of training that emerged from the analysis of the quantitative data (reported above) were also reflected in qualitative feedback collected from Care Technologists, care home managers and other health professionals interacting with the trainees. For example, one health professional/ manager noted:



'[the training was] very positive. The ones that have done it have really enjoyed it. They didn't have a clue before starting and wouldn't have believed that they could learn anything, now they all have so the training must have been good.'

Feelings of improved self-confidence were also noted by some of the friends and family contacted and asked to reflect on their experiences with the person during the training. For example, one person said about their stepfather:

'It changed the way he talked about the Internet; he had always been so technophobic before.'

In addition to feelings of self-confidence, family and friends also noted the benefits of training for mental stimulation and activity. For example, the partner of one trainee noted:



'He has really enjoyed the opportunity and having the computer there is very positive as it is a good source of stimulation to him, even if he is just playing games [...] He had never used the computer before and it is very difficult for him to learn anything new as his memory is deteriorating and his short term memory is almost non-existent. But now he's doing something he always said he would never do and at 82, I think that's great, don't you?'

Reflecting the emphasis of the training on social media use and social participation, many family and friends pointed to benefits in terms of social engagement via the Internet:



'It's a very good idea, I would think that for any person who was alone, without a partner- it gives them the freedom to leave the flat without actually having to leave the flat.'

'It's been good, she's so isolated that the social media and email is a great help to her. It also helps because she can write things down that she would forget about and not mention otherwise. She loves to Skype my little sister [who lives abroad].'

'Being able to talk to her sister on Skype has been very positive.'

The specific value of social media, and Skype in particular, in bringing participants into more regular contact with family was also noted by the Care Technologists who delivered the training:



'She is in touch with friends on Skype and one contacted her ad hoc when I was there one day. She has become closer to her niece [who lives abroad] following long Skype calls and the niece has now come over and been staying with her.'

'[She] and her daughter have a common hobby now with email and can now email each other and other members of the family are keeping in better touch.'

'She has better relations with her family as they email news and photos regularly and she is keen to show others her large growing family.'

'[She] is in contact with family and friends via email, Facebook and Skype and uses her computer to make posters for group sessions and fund raisers that she organises and she posts and comments on Facebook daily and loves my posts and always likes or comments.'

'[Her] only son and daughter-in-law are based [overseas]. Although they spoke on the phone weekly, because of the Ages 2 project [she] was able to use email and Skype. She felt much more included in their lives than she had done before. She enjoyed them emailing photos and receiving little bits of news.'

'[She] said that she was reticent about joining project [sic] as she did not think she would manage with her very limited sight but after adaptations to the computer she managed well. She Skyped a lot. She has a son in the North who she now Skypes. She emails friends and family which she could not do before. She is also very active on Facebook and was in touch with a granddaughter who was on a gap year [overseas] and she loved following what she was up to [...].'

In addition to bringing trainees into closer and more regular contact with their families, Care Technologists also observed situations in which the technology helped participants to overcome other barriers to social engagement:



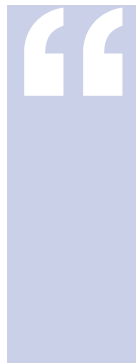
'[He] is quite hard of hearing so he can miss things over the telephone. Because email is not reliant on hearing, [he] was in regular contact with his son, [...] and they were able to discuss more and be in touch more. [He] also received an email for his granddaughter who had not been in touch for several years.'

However, others noted that these social benefits may have been as much to do with the regular visits trainees received rather than something that was specifically enabled through computer and Internet use:



'to be honest the main thing he talked about was the fact that somebody would be visiting him twice a week. He has always been very enthusiastic about interacting with professionals, more so than his own family actually. He likes the attention and I think he was actually more excited about the personal interaction than the learning.'

The computer, Internet access, and training in how to use these also became an opportunity to engage with others socially by showing them things or doing things together on the computer:

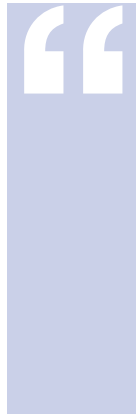


'when I have Skyped [with her] she always had a few friends in her room and they were looking at the Internet together.'

'[She] has been showing her husband whatever she has learnt on her training.'

'She delighted in trying to show staff and family about the computer and her volunteer who visited [regarding] her speech said how much this came on. I also noticed a marked improvement in her speech when she got excited about subjects and things that she was exploring on the Internet. It inspired ideas which she then wanted to share with me which meant her trying to put this into words with the help of a notebook. We eventually understood most of what she wanted to express.'

Trying to disentangle these aspects of social engagement (i.e., engagement produced through the training versus the trainer) is something that future research will need to focus on more closely. Care Technologists also noted that some people were more open to the training and to social engagement than others, and that this might have placed limits on the benefits they showed. For example, as the Care Technologists observed:



'I have noticed no changes in [this person] as she does not seem to socialise with anyone and has very little contact with her family and is house bound. [...] she] needed to be encouraged sometimes to participate in her training as her self esteem and mood was low [for health reasons] but at the end she was glad she had taken part and learnt all I could teach her.'

'by the end of the project [she] did not think the computer was for her. I think if the opportunity had arisen a few years earlier it would have been a different story. [She] is an intelligent woman but if she struggled with the computer she would think herself useless. [...] By the end of it she viewed the computer as a source of stress and didn't want to keep it. She often found it overwhelming. Despite this [she] did learn to use the Internet as a source of information and was able to respond and send emails. Overall though she preferred to continue to use the phone rather than digital technology.'

In addition to personal doubts or vulnerabilities that might have acted as a barrier to engagement, Care Technologists also pointed to the crucial role of family support as a factor in the project's success:



'The grandson who lived locally enjoyed helping his grandfather with the computer and family and friends really encouraged [her] with her participation.'

'One participant had no family or friends apart from the care home where they reside and there is then no real incentive to use email or Skype or Facebook so it then made it rather limiting.'

'Family members were opinionated and there were some who didn't want their parents to take part as they thought that their parent wouldn't be capable of it or able to concentrate.'

5.3.7 Summary of UK findings

The data collected in the UK reveal that the intervention had predictable consequences on trainees' attitudes about computers and associated feelings of competence – both of which were significantly improved as a function of the training received relative to control participants. Importantly, and in line with our intention, the intervention also stimulated increased activity within trainee's social networks. Aside from these predicted effects, the only other detectable direct effects of the intervention were improved cognitive capacity in the training group across time and a maintained sense of self (i.e., personal identity) across time, the latter being especially apparent within participants receiving residential care rather than living in their own home.

Interestingly, indirect effect analyses revealed that the observed improvements in self-competence and social network activity statistically explained the maintenance of personal identity within the training group, and that these processes together contributed to improved cognitive capacity but also better mental health and well-being (even in the absence of direct effects on the latter variables). Thus there is some evidence in the UK data that receiving a computer and Internet connection, and being trained in how to use these for social purposes, can have significant benefits for the overall mental health and well-being of older adults.

Although these results suggest various benefits that may follow from the training provided, there are a number of caveats and qualifications to this. First, although there was some evidence for direct, positive effects of training on cognitive health, the majority of other mental health effects emerged in the context of indirect effect analyses. This suggests that although there are viable pathways between the factors that were affected by the training (namely, competence, social network activity and personal identity maintenance) and mental health outcomes, these links may be more complex and/ or take longer to develop in ways that could be observed more directly. From this perspective, having a longer follow-up on trainees would be a useful addition to any future research. Second, despite the overall positive effects that were observed, the qualitative feedback from Care Technologists suggest a number of potential limiting factors. Identifying these factors – for example features of the individual and their motivation or features of their broader social environment (e.g., the availability of support and encouragement) – that might enhance or attenuate the effects of training, should also be an important focus for future research.

5.4 Italian Method

5.4.1 Participants

127 elderly people (67 females and 60 males) took part in the 'AGES 2.0' project in Italy. All potential participants were vulnerable adults aged between 60 and 95. All were receiving care and support from the 'Labirinto Cooperativa Sociale', one of the main non-profit care organisations in the province of Pesaro and Urbino, Marche Region, in the centre of Italy.

The 'Labirinto Cooperativa Sociale' initially identified potential suitable elderly people using the following criteria: (1) they were willing to be involved in the project for a period of four months; (2) they had the space and infrastructure for Internet access and use, and (3) they had sufficient cognitive ability to engage in the training foreseen by the project. With respect to the latter, the recruiting staff used the 6-item screener to verify basic cognitive abilities (Callahan, et al., 2002). Those who passed this test were given a first interview that included a further assessment of cognitive skills (Mini-Mental State Examination MMSE; Folstein, Folstein, & McHugh, 1975, and Addenbrooke's Cognitive Examination). In order to be retained, candidates required a minimum score of 19/30 points in the MMSE.

The research design specified a sample of 120 elderly people (for Italy), 60 of whom were receiving care in their home while 60 were receiving assistance in care facilities. However, recruit-

ment was difficult, especially in residential care. To compensate for this, the sample included 76 elderly persons receiving domiciliary care and 51 residential participants. After the first interview, 3 people in residential care dropped out. Three other persons, in residential care, did not obtain the 19/30 minimum score in the test. Moreover, 3 additional people belonging to the experimental group decided to give up after a period of time: a person living in care facilities and two persons living in their private homes quit respectively after three, three and one lesson. Reasons given were related to health issues and participants feeling unable to understand and go on with the lessons. Two people belonging to the control group passed away. One had taken part in the cognitive part of the follow-up interview, while the other person died before being able to participate to the second interview.

In the end, a total of 120 people participated in all stages of the research (basic evaluation, random assignment, follow up). This group comprised 62 females and 58 males between 60 and 92 years old (M age 74,48). Among these: 51 members were married, 37 were widowers, 23 single and 9 divorced. Among those who lived in private homes, 28 out of 76 lived alone. Average age at which they left school was 15.21 years. Participation was voluntary and the only rewards were receiving temporary use of a computer and training package for those in the experimental group, or getting a small digital photo camera (outside of the project) for those in the control group.

5.4.2 Design and Procedure

As in the UK study, the intention was to conduct an experimental study following the same design: 2 (treatment: Easy PC, care as usual) x 2 (level of care: domiciliary, residential) x 2 (time: baseline, follow up). However, the implementation of the experiment in the Italian context encountered some obstacles that resulted in deviation from this original plan. The reasons for this are explained below.

Involvement of people receiving care in care facilities is very problematic in Italy. As outlined in the first chapter of the report, residential care, as part of formal public care, plays a marginal role in elderly care in Italy because it is much more expensive than informal care. Informal care by family members and/or by migrant workers is the dominant response to elderly care needs in Italy. With regard to participants recruited from residential care, there was a high level of disability. Briefly, this level of disability reflects the care system in Italy. In Italy, family members typically deal with elderly needs through informal care. Residential care is the last option when family is no longer able to cope with their relative's high level of physical or mental disability. Therefore, elderly people receiving residential care present high levels of assistance needs that can no longer be adequately managed at home. Most of those in residential care are not self-sufficient in any way and need a constant assistance from nurses and social assistance carers for most of the daily activities. Within this context recruitment of elderly participants in residential care was a challenge. Despite every effort being made to contact all care facilities and other third-sector organisations, the total number of elderly in residential care recruited into the research was 51, instead of 60. These participants were very vulnerable.

Moreover, within the residential sample, several issues arose during the implementation of the research that introduced variations from the previously agreed experimental protocol. This was mainly due to the following reasons:

- 1) Dependency on carer. As noted above, most of the people receiving residential care were in a condition of high vulnerability and total dependency on their carers. During the research implementation it emerged that some subjects had agreed to take part in the study just to satisfy the request of their carer, but they were not motivated at all to learn PC.
- 2) Participants' perception of psychological and physical inadequateness for the task. Participants showed an initial interest but when introduced to the PC learning task did not feel adequate to accomplish it. For some of the elderly taking part in the research,

their psychological and physical conditions were aggravated during the experiments and this has compromised their motivation to continue. Moreover, some people who were physically able to follow the lessons were not sufficiently motivated due to issues with depression. These conditions interfered with the ability to persist with the learning task.

- 3) Carers' emotional barrier in randomization. Randomization was compromised by the combination of the level of vulnerability of participants (both above) and the willingness of carers to provide training to certain participants (based on perceptions of need or ability). Based on these factors, there were several instances in which carers switched participants who were originally assigned to receive training into the control group or vice versa. In some of the more isolated residential care in the mountain area of the province it has happened that just two people were available to take part in the study, but one was strongly motivated and with less disability and the other, despite showing interest in the study, was not really interested in training. Again, in these cases, carers did not follow the randomization process to assign the elderly in control or experimental group, but rather allocated training on the basis of known motivations.

Accordingly, although all recruited participants were randomised to condition by the researchers, randomization was not consistently followed by the carers who interacted with participants and delivered the training. This was especially pronounced in residential care, but also affected a number of participants receiving domiciliary care.

The above issues have implications for the interpretation of the Italian data as experimental and for the interpretation of dropout rates. With respect to the first issue, the Italian data cannot be considered a properly controlled experiment. Nonetheless, there were people who received training, people who did not, and assessments were taken of each before and after that experience. Thus there is some capacity to explore the consequences of training. With respect to dropouts, in Italy the number of drop-outs was low, especially when compared to the UK. However, this low number could be considered as result of carers moving participants, who would have otherwise dropped out, into to the control group. Again, this compromises the ability to interpret the Italian data as strictly experimental. In the results section, we discuss the ways we addressed non-randomization in the analyses and the limitations of this for interpretation.

Although the above variations from procedure compromised the experimental aspect of the research, it must be noted that this reflects the vulnerability of the target population and the role of carers in relation to those participants. Carers felt pressured to help their elderly clients and to meet their expectations and needs and tried to make decisions that reflected the ability and motivation of their clients.

5.4.3 Package, training and assessment.

The package. The Italian project also made use of a package similar to Easy PC. This included the installation of a PC with touch screen and keyboard in the house of the participants, as well as providing an Internet key and a photo camera. Participants were able to use the computer for 12 months including the training period of three months, but they had to return the camera after the training.

Although broadly similar to the UK exercise, implementation of PC training faced some critical aspects in Italy. This related to the quality of Internet connections and the broadband provision. In most of the residential care but also in some of the private houses, broadband provision was not available and the Internet connection was therefore not sufficient to reliably use programmes such as Skype. This structural aspect has affected parts of the training. Carers responsible for the training did not highlight any serious limitations of Internet connections for use of Facebook or the web, however for about half of the participants in training, the use of Skype was not possible due to the lack of adequate Internet connections.

The training. Participants assigned to the experimental group were trained by 'Care Technologists', who were care operators of the 'Labirinto Cooperativa Sociale'. Trainers followed the manualised lesson plan previously described under the UK method (Haslam& Morton, 2013a). Again, the intention was to ensure consistency across trainers, but also to personalise training on a case by case basis that was responsive to the needs of the participants.

Although the Italian project followed the same training plan, certain adjustments were necessary. First, the Forget-me-not application was not available in Italian. To supplement this experience, Italian users were asked during and between sessions to write their life history. This included materials and information, such as photographs, music, videos, etc. As in the UK, this resulted in a folder of material about the individual that could be shared online in order to facilitate interpersonal relationships. Homework was assigned between each training session in order to consolidate the learning process.

As in the UK, in the weeks without a meeting (2nd and 3rd months) Care Technologists contacted the participant by phone or email in order help the participant in case of difficulty. In Italy, the participants who lived in facilities (residential care) had a greater feeling of insecurity and contacted their Care Technologist often to get help. Therefore Italian Care Technologists often had extra brief meeting with these people outside the planned sessions.

Assessments. The assessments of Italian participants before and after the intervention followed the same procedure as in the UK. All questionnaires were translated into Italian (or use was made of official Italian versions; e.g., of the ACE-R). Participants were interviewed by a trained research assistant who delivered the cognitive tests, verbally administered the questionnaire items and recorded participants responses to these. Most of the sessions lasted between one and two hours. The researcher took care to handle trouble and inconvenience by taking small breaks, but the majority of people were happy to participate in the research and have a little opportunity to talk about their lives.

Although the follow-up assessment was to take place shortly after the end of the training, in some cases it was postponed due to health problems or delays and difficulties in training. In some cases, the researcher had to insist with the members of the control group to do the follow-up interview, for they no longer felt the motivation to participate. When the training was over and the second interview (T2) was delivered, all the members of the two groups were thanked and informed that their participation in the project was officially over. Members of the experimental group were given a chance to purchase the computers used during the training for a small fee (calculated from the amount to be paid after the rental rates already paid by the project).

5.5. Results: Italy

5.5.1 Initial checks

As with the UK data, we initially ran checks to establish whether randomisation had been successful. A series of t-tests revealed several significant differences between those assigned to training and control groups on variables assessed at baseline. At baseline the training group showed significantly more positive attitudes towards computers than the control group, $t(119) = 3.04, p < .01$. At baseline, relative to the control group, those in the training group also had fewer group memberships, $t(119) = -2.45, p = .02$, perceived these to be less important, $t(96) = 2.50, p = .02$, showed significantly lower satisfaction with life, $t(119) = -3.52, p = .001$, and expressed significantly higher subjective loneliness, $t(119) = 1.97, p = .05$. There was also a marginally significant difference in cognitive capacity at baseline, as assessed by the ACE-R, with the training group performing slightly better than the control, $t(119) = 1.86, p = .07$. These baseline differences suggest that randomisation was not successful. Instead, those most cognitively able and positively disposed to the intervention (i.e., with more positive attitudes about

computers), and with the potential to benefit from it most (i.e., those most socially isolated), ended up in the training group. Indeed, this is consistent with the recruitment and allocation procedure followed in Italy, as detailed in the method section above (Section 5.4). We address the analytic consequences of this in the section that follows.

None of the other variables differed significantly between the training and control groups at baseline, $t_s < 1.77$, $p_s > .08$. In addition, there was no evidence that the training and control groups differed significantly in terms of their age, $t(119) = -.37$, $p = .71$, or gender, $\chi^2 = .01$, $p = .92$.

As in the UK data, we also explored the presence of any baseline differences between participants recruited via residential versus domiciliary care. Consistent with what might be expected, compared to those living in their own home, participants in residential care were significantly older, $t(119) = 4.76$, $p < .001$, and performed worse on the ACE-R, $t(119) = -6.39$, $p < .001$. Relative to those receiving domiciliary care, residential participants also reported poorer general mental health (GHQ), $t(119) = 2.02$, $p = .05$, higher levels of depression, $t(119) = 3.18$, $p < .01$, more loneliness, $t(119) = 2.28$, $p = .02$, and less satisfaction with life, $t = -2.01$, $p = .05$. They also felt less autonomous, $t(119) = -4.03$, $p < .001$, less competent, $t(119) = -2.50$, $p = .01$, and reported less diverse social networks, $t(119) = -8.62$, $p < .001$, less satisfaction with these, $t(119) = -2.72$, $p < .01$, and that they belonged to a smaller number of social groups, $t(119) = -7.68$, $p < .001$. Finally, residential participants had a weaker subjective sense of self, $t = -2.94$, $p < .01$, and less favorable attitudes towards computers, $t(119) = -2.98$, $p < .01$. Thus, based on these patterns it seems that participants receiving residential care were at greater risk of social isolation on a variety of levels, and were more psychologically vulnerable. Although some of the above differences could simply reflect the additional age of those in residential care, when age differences between groups were controlled most of these baseline differences between care contexts persisted. The only exceptions were GHQ and computer attitudes, which both became non-significant after controlling for age.

As noted in the *Participants* section above, in the Italian sample drop-outs were less of an issue than in the UK, and only 6% of participants who provided Time 1 data were unwilling (e.g., due to lack of interest) or unable (e.g., due to death or ill-health) to provide data again at Time 2. Because of this small number, systematic patterns of drop-out are unlikely. Nonetheless, as a check on this, we conducted a drop-out analysis. This analysis revealed that drop-out was more likely in the training condition ($\chi^2 = 3.86$, $p = .05$), indeed it only took place among participants in the training condition. A series of t-tests indicated that there were no significant differences within the training group between those who did and did not drop-out on any of the key outcome variables ($p_s > .06$). Hence, we can conclude that the impact of drop-outs was minimal (only 4 participants) and not systematic in any way that is likely to have further compromised the equivalence of training and control groups.

5.5.2 Analytic strategy: Italian data

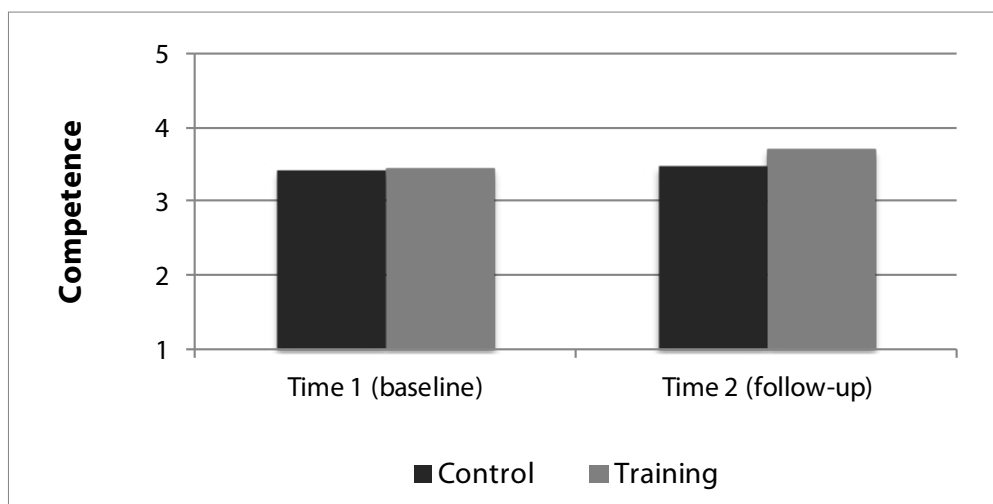
As noted above, there were several baseline differences between conditions. This compromises the interpretation of any condition effects. For example, any significant differences between training and control groups at follow-up could reflect the fact that these groups started from very different places rather than any effect of the training. Conversely, the absence of any condition effects at follow-up could suggest that the training was ineffective, or that it was ineffective for the specific types of people who received it. Since training and control groups were not equivalent at baseline, and the criteria leading to these assignments were not systematic, the various possibilities are difficult to disentangle. In spite of this issue, we first ran the same analyses as reported for the UK data to explore the possible effects of training over time. We then conducted a more focused analysis on only those participants who were identified as being randomly assigned to conditions, and only among those receiving domiciliary care (since after taking out non-randomly assigned participants, there were too few residential participants to provide meaningful comparisons across training and control groups). This more focused analysis is summarised in Section 5.5.6 below.

5.5.3 Effects of intervention on immediate targets

First, using the full data set, we tested any immediate impacts of the training on attitudes to computers using a 2 (condition: training, control) x 2 (population: residential, domiciliary) x 2 (time: 1, 2) mixed analysis of variance. This revealed a significant effect of condition, $F(1, 115) = 33.81, p < .001, h^2_p = .23$. Participants in the training group had more positive attitudes towards computers than those in the control group. The interaction between condition and time was not significant, $F(1, 115) = 2.77, p = .10, h^2_p = .02$, indicating that group differences in computer attitudes were equally present at Time 1 (i.e., before the training) as they were at Time 2 (i.e., after the training). As noted above, there was also a significant effect of population, $F(1, 115) = 23.16, p < .001, h^2_p = .17$, with participants in residential care having less positive attitudes towards computers than those living in their own home. This population difference was further qualified by a significant interaction with condition, $F(1, 115) = 12.98, p < .001, h^2_p = .10$. Follow-up tests revealed a significant difference between training and control participants' attitudes within the residential care group, $F(1, 115) = 35.15, p < .001, h^2_p = .23$, but only a marginal effect in the domiciliary care group, $F(1, 115) = 3.31, p = .07, h^2_p = .03$. Hence, among residential participants in particular, those in the training group were more likely to have positive attitudes about computers relative to those in the control – something that was independent of receiving training itself (i.e., unaffected by time).

The analysis of self-competence did not reveal a significant effect of condition, $F(1, 115) = 1.71, p = .20, h^2_p = .02$. However, there was a significant effect of time, $F(1, 115) = 7.73, p = .01, h^2_p = .06$, and this was qualified by a weak (marginally significant) Condition x Time interaction, $F(1, 115) = 2.82, p = .09, h^2_p = .02$. Further analysis of this interaction indicated that although there were no baseline differences between conditions at Time 1, $F < 1$, by Time 2 the training group was experiencing slightly heightened feelings of competence relative to the control group, $F(1, 115) = 4.29, p = .04, h^2_p = .04$. Moreover, these improved feelings of competence in the training group developed across time, $F(1, 115) = 10.19, p = .002, h^2_p = .08$, whereas the self-competence of those in the control group did not change, $F(1, 115) = .59, p = .44, h^2_p = .01$. Thus, although we are unable to establish that training in the Italian context improved specific attitudes about computers, as might otherwise be expected given the nature of the training, there is some weak evidence that more general feelings of competence increased as a function of receiving training.

Figure 9. Feelings of self-competence in control and training groups across time.



Beyond this, there was a significant effect of population on competence, $F(1, 115) = 11.18, p = .001, h^2_p = .09$, which was again qualified by a significant interaction with condition, $F(1, 115) = 5.08, p = .03, h^2_p = .04$. Follow-up tests revealed that for residential participants, feelings of self-

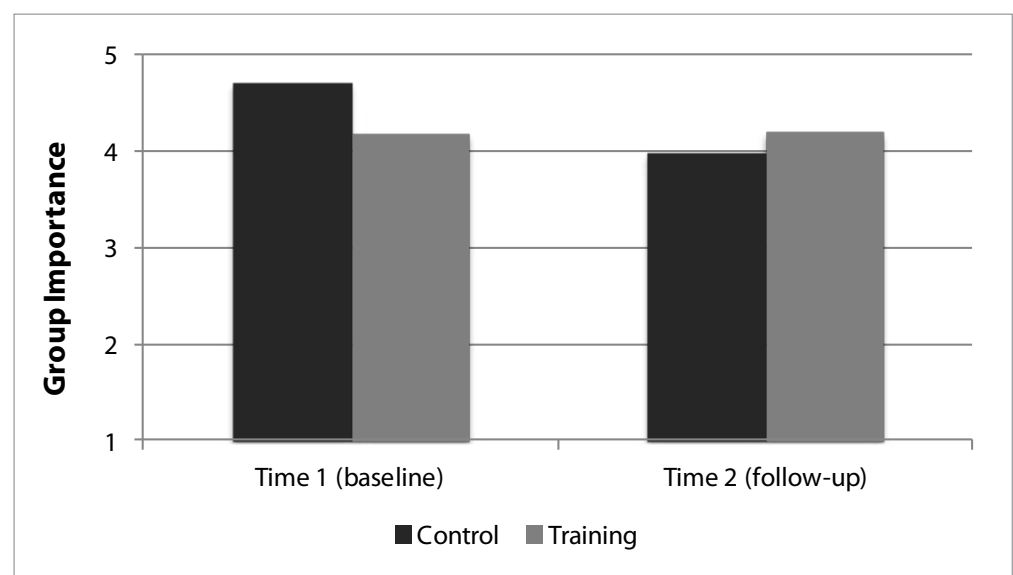
competence were significantly greater in the training condition versus the control, $F(1, 115) = 5.03, p = .03, h_p^2 = .04$, whereas there was no such difference in the domiciliary population, $F(1, 115) = .60, p = .44, h_p^2 = .01$. There was, however, no 3-way interaction, $F < 1$, hence changes across time in the training group were not constrained to a specific population (i.e., residential versus domiciliary).

As with the UK data, effects on competence did not extend to feelings of autonomy. On this variable, the only significant effect was of population, $F(1, 115) = 14.94, p < .001, h_p^2 = .12$. As already noted above, participants in the domiciliary group felt more autonomous than those in the residential group. All other effects and interactions were non-significant, $F_s < 1$.

Analysis of the measure of social network diversity revealed a significant effect of population, $F(1, 115) = 81.31, p < .001, h_p^2 = .41$. As noted above, participants receiving domiciliary care had greater network diversity than those receiving residential care. There was also a significant effect of time, $F(1, 115) = 3.93, p = .05, h_p^2 = .03$, such that regardless of condition or population, social network diversity increased slightly across time. There were no other significant effects on this variable, $F_s < 1.20, p_s > .13$. Similarly, satisfaction with the level of contact one had with those in their social network was only influenced by population, $F(1, 115) = 13.78, p < .001, h_p^2 = .11$, such that domiciliary participants overall had greater relationship satisfaction than residential participants. All other effects were non-significant, $F_s < 3.0, p_s > .09$. Thus participants reported social network activity was independent of receiving social media training.

With respect to measures of group-based social connections, although there were some significant effects, these were largely independent of condition (i.e., based on population) or independent of time (i.e., not changing as a function of the intervention). For the sake of brevity, these effects are not described. The only exception was with respect the reported importance of group membership. The analysis of this variable revealed a significant interaction between time and condition, $F(1, 86) = 12.60, p = .001, h_p^2 = .13$. Further tests revealed that at Time 1 control participants valued their group memberships more than training participants, $F(1, 86) = 7.64, p = .01, h_p^2 = .08$, but that this difference had disappeared by Time 2, $F(1, 86) = .96, p = .33, h_p^2 = .01$. This lack of difference at Time 2 was explained by a reduction in group importance across time for control participants only, $F(1, 86) = 21.53, p < .001, h_p^2 = .2$. Group importance remained stable for training participants regardless of time, $F(1, 86) = .01, p = .94, h_p^2 < .001$. A further significant 3-way interaction, $F(1, 86) = 5.97, p = .02, h_p^2 = .07$, revealed that this Time 1 difference was especially apparent among residential participants, $F(1, 86) = 6.52, p = .01, h_p^2 = .07$, rather than domiciliary participants, $F(1, 86) = 1.17, p = .28, h_p^2 = .01$. Neither the pattern of effects for number of group memberships or group importance extended to group fit, all condition $F_s < .21, p_s > .65$. As should also be clear from the degrees of freedom, there was a lot of missing data for this particular variable since some people did not belong to any groups at all.

Figure 10. Subjective group importance in control and training groups across time.

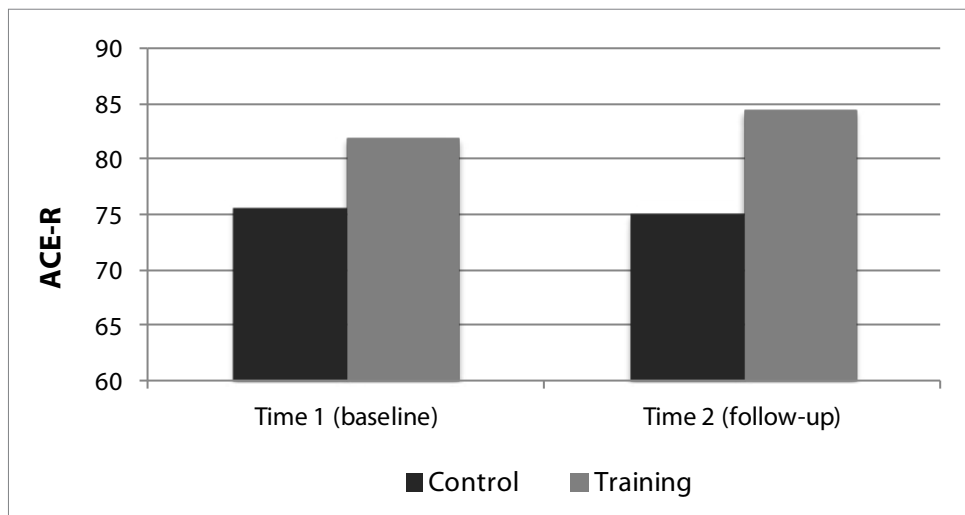


Summary. On the basis of the above analyses, in the full Italian data set there is limited evidence that the training did what it was intended to do. Specifically, computer attitudes were not enhanced as a function of training, and self-reported social engagement – either within one’s interpersonal network on the basis of group memberships – did not increase as a function of training. There was, however, some weak evidence that trainees experienced more competence after receiving the training than before. In spite of the limited evidence for these expected and immediate consequences of the training, we nonetheless considered the possibility of more distal effects on cognitive and mental health.

5.5.4 Direct effects of intervention on cognitive and mental health

Cognitive health. To examine the direct impact of the intervention on cognitive health, using the full Italian data set, we first performed the above analysis on participants’ total ACE-R score. This revealed a significant effect of condition, $F(1, 116) = 17.47, p < .001, \eta^2_p = .13$, such that participants in the training condition had greater cognitive capacity than control participants. Moreover, there is a significant effect of time, significantly dependent on an interaction with condition, $F(1, 116) = 11.59, p = .001, \eta^2_p = .09$. Further tests revealed that although the difference between conditions was already present at baseline, $F(1, 116) = 11.42, p = .001, \eta^2_p = .09$, it was stronger at follow-up, $F(1, 116) = 21.85, p < .001, \eta^2_p = .16$. For training participants, there was also evidence of a significant increase in cognitive capacity across time, $F(1, 116) = 14.82, p < .001, \eta^2_p = .11$, that was not present for control participants, $F(1, 116) = .95, p = .33, \eta^2_p = .01$.¹¹

Figure 11. Cognitive capacity (ACE-R scores) in control and training groups across time.



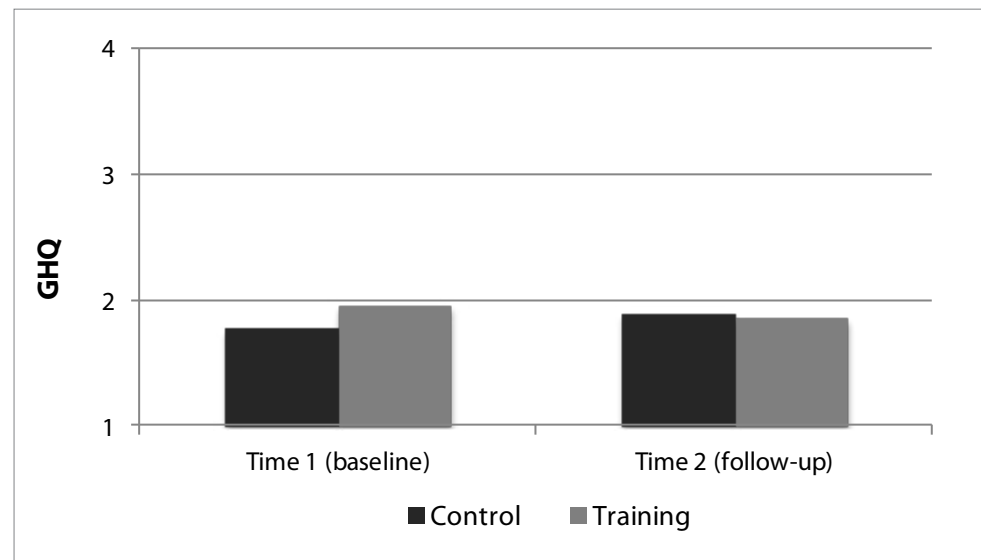
Beyond the above, there was a significant effect of population, $F(1, 116) = 60.77, p < .001, \eta^2_p = .34$, such that domiciliary participants had higher cognitive capacity than residential participants overall. This was qualified by a condition by population interaction, $F(1, 116) = 12.83, p < .001, \eta^2_p = .10$. Cognitive capacity was higher for residential trainee participants relative to residential controls, $F(1, 116) = 24.10, p < .001, \eta^2_p = .17$, whereas in the domiciliary population there was no difference between trainee and control participants in terms of their cognitive capacity, $F(1, 116) = .23, p = .63, \eta^2_p = .002$. All other interactions were non-significant, $F_s < 1.9, p_s > .17$.

Mental health. To explore possible mental health consequences of the intervention, we exam-

¹¹ Supplementary analyses also confirmed the T2 effect on cognitive capacity controlling for existing differences at baseline, $F(1, 115) = 11.75, p = .001$.

ined scores on the UCLA Loneliness, CES-D, GAI, GHQ and satisfaction with life scales. Beyond the various baseline differences between training and control groups (e.g., in loneliness and satisfaction with life) and between populations (i.e., residential versus domiciliary) that have already been reported, there was a significant interaction between time and condition for the GHQ measure, $F(1, 115) = 10.86, p = .001, \eta^2_p = .09$. Further tests revealed that at baseline general mental health was slightly worse in the training group relative to control, $F(1, 115) = 6.60, p = .01, \eta^2_p = .05$, but this difference was not present at follow-up, $F(1, 115) = .17, p = .68, \eta^2_p = .001$. Interestingly, for those in the training group, general mental health improved across time, $F(1, 115) = 4.37, p = .04, \eta^2_p = .04$, whereas for those in the control group it deteriorated across time, $F(1, 115) = 6.56, p = .01, \eta^2_p = .05$.

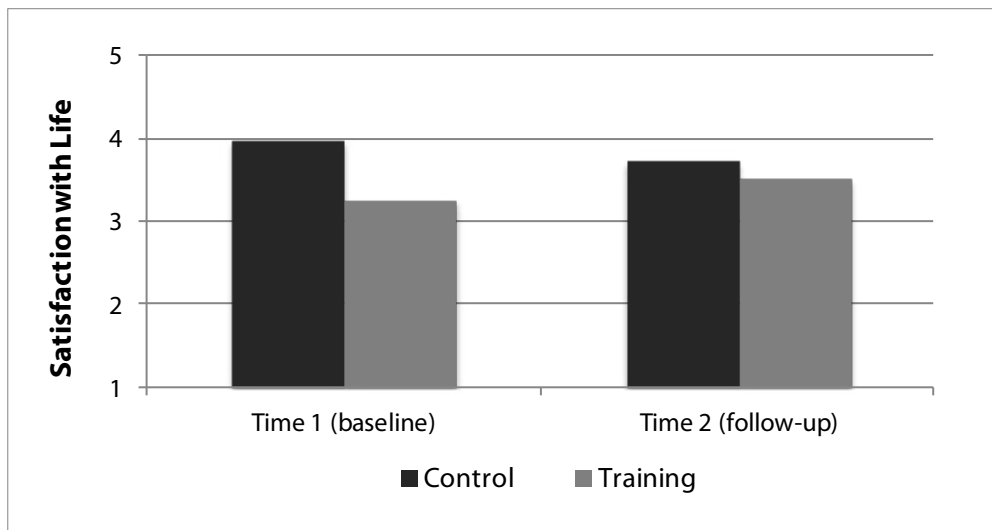
Figure 12. General mental health (GHQ; lower scores represent better general health) in control and training groups across time.



There was also a significant 3-way interaction on this measure, $F(1, 115) = 8.54, p = .004, \eta^2_p = .07$, indicating that this pattern was especially true for residential rather than domiciliary participants. Among residential participants, the difference between training and control groups was significant at baseline, $F(1, 115) = 7.28, p = .01, \eta^2_p = .06$, but not at follow-up, $F < 1$; and this was because of significant across-time improvement in the residential training group, $F(1, 115) = 8.54, p = .004, \eta^2_p = .07$, and significant decline in the residential control group, $F(1, 115) = 6.87, p = .01, \eta^2_p = .06$, all other $F_s < 1$.

The aforementioned effect of condition on satisfaction with life, $F(1, 115) = 7.74, p = .01, \eta^2_p = .06$, was also qualified by a significant condition by time interaction, $F(1, 115) = 16.14, p < .001, \eta^2_p = .12$. The pattern of this interaction mirrored that of the GHQ: at baseline, training participants reported lower satisfaction with life than control participants, $F(1, 115) = 13.64, p < .001, \eta^2_p = .11$, there was, however, no difference between conditions at follow-up, $F(1, 115) = 1.87, p = .17, \eta^2_p = .02$. Again, the lack of difference at follow-up appeared to be a result of improved life satisfaction among trainees across time, $F(1, 115) = 8.16, p = .01, \eta^2_p = .07$, combined with across time deterioration among controls, $F(1, 115) = 7.99, p = .01, \eta^2_p = .07$.

Figure 13. Satisfaction with life in control and training groups across time.



Summary. The above analyses indicated that cognitive capacity was greater for training participants relative to control at both time points. However, this difference was larger at Time 2 than Time 1, and represented a significant improvement among training participants versus stability among controls. Although the ability to infer causality is compromised by the baseline difference between training and control groups, this pattern is at least similar to what was observed in the UK sample. Hence, training appears to have positively impacted upon cognitive functioning. There was also some evidence of mental health improvements among the training group versus declines in the control group, especially on indicators of general mental health and life satisfaction, and especially among residential participants. However, while these patterns are encouraging, they need to again be considered in the context of the differences between groups at baseline: Although mental health seemed to improve for training participants across time, these also started from a worse position and never exceeded the levels reported in the control group, despite the latter experiencing significant decline. We return to these issues in the more focused analysis below (Section 5.5.6).

Additional outcomes. As with the UK sample, we also assessed additional measures related to a healthy self-concept, specifically strength of personal identity. Using the full data set, the analysis of personal identity only revealed a significant effect of population, $F(1, 115) = 16.73, p < .001, \eta_p^2 = .13$, indicating that participants in the domiciliary population had a stronger sense of self than residential participants. No other effects reached significance for this variable, $F_s < 2.06, p_s > .15$.

5.5.5 Indirect effects of intervention on cognitive and mental health

The above analyses suggest limited effects in the Italian sample, the interpretation of which is complicated by the existence of significant baseline differences between training and control groups. These issues aside, there is evidence that feelings of self-competence improved (weakly) in the training group, and that this group also displayed significantly improved cognition. There was some ambiguous evidence of mental health improvements among training participants, at least in terms of the GHQ and satisfaction with life measures. Unlike the UK sample, there was no evidence that social network activity increased as a function of the training, or that this was associated with maintenance of personal identity. Because of this, it was not possible to test all of the mediational chains that were apparent in the UK data. It was, however, possible that the effect of training on cognitive and mental health improvements might be due to

the increased feelings of competence among these participants – partly mirroring the patterns in the UK data. These models were tested in a similar way to the UK sample (i.e., using PROCESS, Model 4; Hayes, 2013; controlling for Time 1 indicators to assess change in Time 2 indicators)

Analysis of the indirect path between training and cognitive improvement (ACE-R) via feelings of self-competence was not significant, as indicated by the 95% confidence intervals for the mediational path including zero [95%CIs = -.89 & .03]. Similarly, the model testing the indirect pathway between training, subjective competence, and improving GHQ (general mental health) was non-significant [95%CIs = -.01 & .07], as was the model in which GHQ was replaced with satisfaction with life as the outcome variable [95%CIs = -.07 & .05]. Hence, while it appears that training did have cognitive health benefits and, perhaps, mental benefits, these cannot be explained by any predictable process related to the training received (e.g., improved attitudes about computers, feelings of competence or social network activity).

5.5.6 Focused analysis: Randomly assigned domiciliary participants

As noted above, the non-random assignment of many participants in the Italian sample complicates the interpretation of any condition effects reported above, since these could be as much a product of pre-existing differences between training and control groups (i.e., at baseline), rather than processes triggered through the training itself. To address this concern, we conducted a more focused analysis of the data. To do this, we re-ran all of the above analyses on the subset of participants who were randomly allocated to receive either training or to serve as a control group. Given random assignment, this sub-set of participants should differ less substantially at baseline, minimising the interference of this issue on the interpretation of the data. This focused analysis was also conducted only among participants recruited through domiciliary care. The reason for this was that after non-randomly assigned participants were excluded, the remaining residential population was too small, and too unevenly distributed across training and control groups, to serve as a basis for meaningful comparisons (16 trainees versus 9 control participants). The domiciliary group, in comparison, was less affected by non-random assignment and substantial numbers remained after these were excluded. The number of participants in this more focused analysis was 60 (training = 29; control = 31).

When the baseline checks were run on this reduced sample, there were fewer significant differences. However, participants who were to receive training still belonged to significantly fewer groups than control participants, $t(58) = -2.89, p = .005$, and were also marginally less satisfied with their life, $t(58) = -1.91, p = .06$, and marginally less satisfied with their relationships as well, $t(58) = -1.834, p = .07$. Thus, although certain baseline differences persisted, these were fewer and less marked than in the full sample, reflecting the consequences of non-random assignment in the latter.

When the main analyses were re-run in the restricted sample, the expected, but previously non-significant, Time x Condition interaction on computer attitudes became significant, $F(1, 58) = 4.47, p = .04, \eta^2 = .07$. The previously observed Condition effect also became more significant, $F(1, 58) = 8.42, p < .01, \eta^2 = .13$. Consistent with expectations, the pattern was such that at Time 2 training participants expressed significantly more positive attitudes about computers than control participants, $p = .001$, a difference that was not significant at Time 1, $p = .27$. This Time 2 difference reflected a significant pattern of improving attitudes in the training participants, $p = .02$, accompanied by no change in the control participants, $p = .53$.

The previously reported weak pattern on self-competence also became stronger in the more focused analysis. Here, the Time x Condition interaction was significant, $F(1, 58) = 4.14, p = .05, \eta^2 = .07$. This interaction reflected the fact that training and control groups did not differ in self-competence at Time 1, feelings of competence grew significantly across time in the training group, $p = .015$, but not in the control group, $p = .75$. However, this growth was not sufficient to produce a significant difference between training and control groups at Time 2, $p = .11$.

Finally, the previously reported effects on ACE-R (cognition) scores held in the more focused

analysis. Again, there was a significant effect of Time, $F(1, 58) = 9.02, p = .004, \eta^2 = .14$, which was qualified by a Time x Condition interaction, $F(1, 58) = 3.84, p = .055, \eta^2 = .06$. This interaction reflects the fact that although training and control groups did not differ at Time 1, $p = .77$, the cognitive capacity of those in the training group grew significantly across time, $p = .001$, whereas those in the control condition did not change, $p = .46$. Although this growth in the training group was significant, it was not sufficient to produce a difference between training and control groups by Time 2, $p = .38$.

The only other significant effect of note to emerge in the focused analysis was the Condition x Time interaction that persisted on satisfaction with life, $F(1, 58) = 8.12, p = .006, \eta^2 = .12$. As in the full analysis, this interaction reflected a marginally significant difference between training and control groups at Time 1, $p = .06$, that had disappeared by Time 2, $p = .96$, as a result of a significant reduction in life satisfaction in the control group, $p = .04$, coupled with a slight increase in the training group, $p = .06$. As in the full analysis, since this particular effect is partly the product of baseline differences between groups, rather than specific growth in the training group, it is difficult to interpret as a product of the training itself.

Summary: The above, more focused, analyses of the Italian data attempted to minimise the impact of non-random assignment by including only those randomly assigned to condition and only those participants receiving domiciliary care. Although this substantially reduced the power of the statistical tests, it did create more matched control and training groups at baseline. Moreover, the key significant effects on self-competence and ACE-R scores that emerged from the main analysis persisted in this more focused analysis. This suggests that these patterns may not have been an artefact of non-random assignment, but instead represented growth within the training group that could be attributed to the training itself. In addition, the expected effect of training on improved computer attitudes was significant in the more focused analysis. This suggests that when training and control groups are matched at baseline, training did impart positive experiences with computers that shifted attitudes in a more positive direction. Although these patterns are encouraging, it is still noteworthy that the effects are fewer than in the UK data and do not involve social processes. Further indirect effect analyses in the reduced sample also failed to reveal any pathways between training condition and improved cognition via increasing self-competence, and also did not show any evidence of indirect pathways to improved mental health.

5.5.7 Computer use and experiences within the training group

As with the UK sample, in the Time 2 follow-up interviews, we asked trainees a number of questions relating to the amount that they used their computer, and the specific programs and applications they used and found useful. When analyzing these data, we retained the full sample of trainees to get a better picture of what computers were used for, irrespective of their effects.

A large proportion of the overall trainee sample reported using their computer every day (56.7%), with over three quarters of the sample using the computer at least every couple of days (78%). In addition, 60% of the sample stated that they tended to use their computer for a period of more than one hour during each session, with the remaining participants reporting using their computer for shorter periods of time at each sitting.

Participants were asked if they used their computer *never, rarely, sometimes, often, or always* in relation to each of the specific programs and applications they were trained in. Inspection of responses to these questions revealed that e-mail use was varied, being used often or always by 38% of participants, but used rarely or never by 42%. Regarding Skype, 80% of the sample reported using this rarely or not at all (only 3% used Skype often or always). In comparison, Facebook appeared to be more popular, with 60% of trainees claiming to use it often or always, and only 23% using it rarely or never. Conversely, 65% reported rare or no use of the life history folder (only 8% used it often or always), and finally 55% reported using Internet forums often or always.

Regarding the perceived utility of each of these applications (responding on a scale ranging from *not useful at all*, *a little*, *somewhat useful*, *quite a lot*, or *a lot*), 38% of participants indicated 'a lot' to the utility of email (with a cumulative 78% finding it at least somewhat useful). Skype was deemed to be less useful, with 43% finding it 'not at all' or only 'a little' useful (25% occupied the middle ground and found it 'somewhat useful'). Many participants found Facebook to be 'very' useful (38%), with 78% finding it at least 'somewhat useful'. Most people (53%) found the life history folder to be 'not at all' or only 'a little' useful (32% responded 'quite a lot' or 'a lot'). Finally, Internet forums were found to be generally useful, with almost half the sample (48%) responding 'a lot', and a cumulative 70% finding them at least 'somewhat useful'. To summarise, it appears that Facebook and Internet forums were the most popular uses of those taught in the Easy PC package – being used regularly by trainees. On the other hand, Skype and the life history folder were in general used very rarely. E-mail use was split more evenly; either being used heavily or very little. Facebook, e-mail and Internet forums were also generally found to be useful, whilst Skype and the life history folder were deemed not to be useful.

Next, trainee participants were asked how much they used their computer independently for a range of general purposes, responding on a scale from 1 (never) to 5 (always). From this information it appears that trainees were most likely to use their computer for the purposes of: *finding information and advice* (48% responding 'always'; a cumulative 82% using the computer for this purpose at least 'sometimes'); *looking at photographs* (85% used the computer at least 'sometimes' for this purpose); and; *communicating with friends or family* (83% doing this at least 'sometimes'). At the other end of the spectrum using the computer for *shopping*, or *meeting new people*, was very unpopular, with 95% and 73% reporting they never used it for these purposes respectively. Using the computer to *write or read documents* was also relatively unpopular, with 81% of respondents indicating only using it for this purpose 'sometimes' or less. Finally, regarding using the computer for *entertainment* (e.g., watching films, playing games, listening to music), whilst a cumulative 62% were engaging in this at least 'sometimes', a relatively large number (30%) never used it for this purpose.

We also collected information from the training participants regarding their feelings about the training itself, their relationship with the trainer, and their sense of connection with other people in the project who were undergoing the training. In terms of the usefulness of the training, 75% of trainees found the training to be 'very useful' with no participants reporting finding it 'not useful at all'. Moreover, 88% of trainees found the clarity of the training to be 'clear' or 'very clear'. Finally, 85% of the trainees found the pacing of the training to be 'just right' (neither too slow nor too fast). With respect to their relationship with the Care Technologist, 92% expressed feeling a positive attitude towards their relationship with the trainer, of whom 68% expressed a very positive attitude. Finally, 83% of trainees did not report feeling any sense of connection to other people within the project. To summarise, based on their own self-reports, the participant experience of the training itself was overwhelmingly positive, with very little negativity or ambivalence expressed. Similarly, relationships with the Care Technologists were overwhelmingly positive.

5.5.8 Qualitative feedback

In this part of the report, to better present the positive effects of training on the experimental group, we briefly discuss some of the qualitative data from the training logs, from the interviews run within the evaluation process with all participants in the experimental group, some of their relatives, all carers and other professionals working in the residential care facilities involved in the projects, and also from some Facebook posts on the Facebook page of the project¹².

The presentation of qualitative results is articulated in three main parts: in the first we summarise the data from the training logs, in the second we focus on the impact of PC training, in particular with regards to self-esteem and web and social media use; in the last part we discuss

12 <https://www.facebook.com/pages/AGES-20/353641898080654?sk=info>.

the challenges of PC training.

- **Data from training logs**

Evidence from the training logs shows that the elderly generally undergo the training with good motivation and were excited about the possibilities unleashed by using a PC, especially with regards to the Internet. The following is a short description of the qualitative findings from the training logs divided by training area:

Internet and social forums

Surfing on the Web seemed to be the most appreciated use participants made of the PC. Mostly, trainees used Google to look up things relating to their interests or pertaining to their past, such as World Wars or historical events, biographies, schools they attended and especially to read online versions of newspapers. The Internet was used to listen to music but rarely to use social forums. Some users made good use of the 'Favorites' toolbar as a simple tool to surf on the Web.

Facebook

The majority of participants enjoyed Facebook although it was used very rarely to expand social relations networks and mainly to keep in touch with relatives, friends, or personnel from the care facilities. Other participants expressed little interest in Facebook, with no relatives or friends being available on the social network or preferring not to share their feelings on the Web. Very rarely, elders found the Facebook interface unfriendly or confusing.

E-mail

E-mails were used to keep in touch with relatives and friends or to send communications to the staff of the care facilities. Generally, participants who liked Facebook also enjoyed communicating via e-mail. Some users chose this channel to share photos with relatives.

Skype

The functionality of this application was hampered by problems with the connection. Moreover, participants in Italy had difficulties in finding contacts of relatives or friends due to the scarce diffusion of the application among people in their age group.

Photos and Games

Many participants shared photos with family on Facebook. Those with an interest in photography particularly enjoyed this activity. Games did not get much attention from the participants, except those who enjoyed playing cards. In general, games were most often used in the first weeks of training, when participants not yet confident using the PC could play card games as a valid aid in learning to use the mouse without getting overly stressed.

Life history folder

Writing a personal diary was closely related to the personal memories and attitude towards the past that the participants had. Only a few users were very keen to write their life-story, seeking for photos or details from relatives. In other cases, participants had a negative relationship with their past and were unwilling to remember or simply preferred not to share their memories.

- **PC impact**

PC training generally had a very positive impact on both residential and domiciliary care participants. As stated by the carers' coordinator, and as reported in the literature as well, most of the people in residential care are completely unmotivated: *'a few weeks after they get in the residential care program they lose their interests and it seems like they are simply there awaiting death. For us, we saw it: PC training for most of them was a great opportunity to get revived, they get a new approach to life'*. As emphasised by a Facebook post of one participant: *'Closed between four walls a new horizon opens up which lets my mind breathe and I feel more engaged and thus more joyful'*.

The Internet was usually used to deepen hobbies or stay in touch with relatives and friends, but

for some of the participants the training was of pivotal support to overcome sorrows. According to the carers and relatives' points of view, PC training had a double effect: on one hand it increased participants' self-esteem, on the other it gave them the opportunity to get acquainted with the Web and with some social media tools.

Concerning the **impact on self-esteem**, carers stressed that:

Having learned how to use PCs improved the self-esteem and personal satisfaction of the elderly. As claimed by a carer *'to approach an instrument that older people perceived to be far from their generation and see the results has certainly improved their self-esteem and confidence in their own abilities, others took control of the new social media and communicated daily with family, distant friends and the staff from the facilities in which they resided'*. Moreover, self-perception also improved in the group, as those who attended the course were seen as 'modern elders' and open to changes.

As stressed by another carer: *'It should be noted that the project has instilled great self-esteem in the users; many had started on the path hesitant and in disbelief of their potential because of their age. Instead, at the end of the path they were very pleased with the outcome which was, moreover, completely unexpected to them'*.

The training helped participants build self-confidence. As described by a carer: *'The participant tended to deprecate and devalue her capabilities even though she has actually been able to achieve a good level of competence in the use of computers'*. The daughter of one of the participants in domiciliary care reported that *'She also discovered personal skills she didn't think she had'*.

Referring to another participant, the carer stated that *'he became passionate about using PCs and through the computer he was able to meet satisfy many of his interests and curiosities. This has significantly improved his self-esteem'*.

Facebook posts by experimental group participants outline thoughts and considerations, showing their enthusiasm and wishes:

'I am very happy to have participated in this initiative; I discovered that at my age you can still learn. I didn't think it would have been so easy and interesting'.

'I am very happy that there are these courses. They make us feel less old than we are, and learn communication techniques that we never thought we had given our huge age. And if the teacher is like [name] everything becomes almost fun. Many heartfelt thanks to all!!!!!!'

'To say I'm an enthusiast about the computer is an understatement of the truth; much of the credit must go to [name], who has been able to unravel usually inaccessible technical mysteries even to a partially senile old man - whom I have the undeniable impression of being. As irrefutable proof I must explain that I'm ninety-two years old'.

'I started this program with some scepticism; today I completed it and feel extremely satisfied because it gave me confidence in myself. Having a certain age, I thought I couldn't do it and instead I re-discovered in myself a lot of capabilities – Thank you'.

Throughout the training process, and in order to increase self-esteem, the role of the carers, their empathy and professional skills in motivating and supporting the participants, were crucial.

Concerning **social media impact**, it emerged from the analysis of quantitative data that the increase in group participation and therefore in opportunity to socialise through social media was quite limited in Italy compared to the UK. Regarding social media, participants had different attitudes. As reported by a carer about a participant in domiciliary care: *'At the beginning of the training, she initially showed much reluctance to use social media. Then, thanks to her friendship with another participant in the project, she began using Facebook and e-mails'*. However, in another training log, a carer wrote: *'He did not like social networks such as Facebook and Skype as unrelated to his way of thinking about communication and interpersonal relationship, while he appreciated the Life history folder where he rebuilt his life by adding pictures and commenting on his passions'*.

In a training log concerning one of the participants in domiciliary care we can also read about the difficulties in maintaining an interest in the training: *'The user showed total disregard for both the use of e-mails and Facebook, considering both as useless. In addition, the user said he was hesi-*

tant in pursuing the course. After an initial lack of interest in the use of computers and upon expressing his indecision about continuing with the class, the user started to get really passionate about using the Internet (although using only a few of the programs covered by the project). Although not using the social networks expected by the course, the user registered on several forums and groups to comment on current events and political news'.

As posted on Facebook: *'The computer class of the AGES 2.0 project is going well. I like using Google Maps to search for places (I looked for a place in [name] where I worked and other things). I like reading the newspaper online, especially the news. I did some research on Google, looking for astronomy websites. I listened to music on YouTube'*. From another post on a participant's AGES 2.0 Facebook page: *'I am super happy I learned how to use the computer. It keeps me a lot of company: I read newspapers, play solitaire, etc.'* As noted in another training log: *'She became especially passionate about card games, often used in moments of insomnia'*.

Internet training also had a practical positive impact on participants in managing their daily life and independent living, as claimed during the interviews with two elderly people in domiciliary care:

'I don't use Facebook very much, I use the Internet more; I learned how to notify the gas reading through the Web'. 'I keep informed with [a local newspaper] online; I still can't do certain things like for instance use the INPS [social security institute] portal'.

The most important result from PC training was to grant access to the Web and its entertainment potential, as well as taking part in Web communities and interacting in social media groups. The potential of the Web to improve social relationships was explicitly considered as wish by a participant: *'I'm happy about the lessons and I hope to have fun especially to the point of finding a friend who fills the otherwise dull day'*. Moreover, as noted in a training log for a participant in domiciliary care: *'The Internet was immediately perceived as a means to reduce one's loneliness, and especially Facebook. It was perceived as a resource for meeting new people, including one of the users who had completed the AGES 2.0 course before'*.

Getting in contact via Facebook with other participants in the experimental group was positively considered by some participants, especially those in residential care. For them, PC training was the opportunity to increase relationships with people who were living in the same residential care facility and taking part in the training as well. A participant, via Facebook, has significantly increased social relationships, exchanging daily messages and photos with about 20 friends. In addition, via the Internet, he was able to read the newspaper every day and, thanks to the PC, see pictures and videos of the parties and trips he took part in with the other guests of the residential facility. Facebook also fostered face-to-face interactions with other people in the residential facility taking part in the experimental group. As emerged in an interview with a carer: *'I then noticed that he talked about himself showing a few guests some pictures from his country of origin'*.

Moreover, PC training has increased and improved communications between elderly people and carers. For most of them, the relationship with the carers was crucial and Facebook was used to keep in touch with the carers even when they were not working, as well as to share with them web links, photos, experiences and feelings.

Facebook was also used to contact relatives, especially nephews, nieces and grandchildren. As one of the participants in the residential care experimental group claimed, *'eventually I was able to see my grandson playing with his band thanks to YouTube, and it was great'*.

Participants in the domiciliary care experimental group tended to avoid contact with others undergoing training in residential care, as argued by a participant: *'I don't want any contacts with other elderly people to listen to them complaining about their health, we are all seniors but I am not looking for a network of old people'*. For those in domiciliary care, social media was a tool to foster contact with relatives or to cultivate their interests.

For those who used the PC for social relationships with relatives and old friends, a carer highlighted that *'I saw them more serene and calm and they were glad to share with me their emotions and experiences with the contacts they had'*.

As claimed by a relative of one of the domiciliary care participants: *'In winter, she can't get out much and therefore the possibility of using the Internet is helping her because she can contact her brothers who live in [city] and [city]'*. The project was positively considered by the relatives who were interviewed and one of them reported: *'I believe that the project is positive because it lets people with physical difficulties maintain social relationships'*.

Despite the limited use of social media such as Facebook and Skype in Italy compared to the UK, in one of the training logs concerning a participant in domiciliary care we can read: *'Facebook is used constantly to keep in touch especially with the family members the lady kept in contact with very often using Skype as well. Both the lady and some of her family members noticed an improvement in her memory and ability to concentrate'*. (Moreover, as highlighted by the psychologist working as coordinator of one of the care facilities involved in the project, *'the project has given them the opportunity to use a new tool. A lady, for instance, has used the Internet to find tutorials to learn how to sew, something that interested her. The program has had an impact on their feeling of loneliness. As a nursing home we'd be happy to participate in such a project in order to extend the experience to all participants'*).

• Challenges in PC training and experimental results

In most cases, the first challenge the carers had to manage was the **initial scepticism** towards PCs. Carers highlighted that at the beginning of the training *'participants were sceptical about their ability to learn and were hesitant towards PCs, but once they started most of them got involved with PCs and started to use computers with interest and curiosity'*. Nevertheless, it was not easy for all the participants to become familiar with all the necessary information on how to use a PC, and one of the most challenging features was the use of the keyboard. In general, learning new ICT skills represented a source of **worries and anxiety** for some participants and the role of the carers was crucial in order to manage these conditions. As claimed by a carer in an interview: *'Faced with new things she is taken over by anxiety and loses confidence in her actions. Despite these initial fears, during the course she has strengthened her self-esteem and personal satisfaction and opened up to social relations using FB and learning from the use her friends make of social networks'*.

Moreover, for some of the participants in the project, **physical and mental disabilities** represented additional complications for the training. Mainly, these were: sight problems, hearing difficulties, difficulties with calibrating hand movement, limited memory. Carers were able to partly overcome some of these barriers with specific devices and applications. Although Easy PC provides a friendly interface, elders still needed to use keyboards and many of them were not able to control hand movements properly. Such problems were partially overcome by placing larger letters on the keyboards or using touch screens instead of the mouse.

As noted in a training log: *'The lady doesn't see well and it was necessary to apply stickers with larger fonts on the keyboard keys. It wasn't always possible to meet the lesson's deadline, especially at first. She has very much enjoyed the course and the computer overall'*.

Nevertheless, due to severe difficulties in using the keyboard, the first lessons for some of the participants were used to simply get familiar with it. As noted in the training log for a domiciliary care participant: *'The lady has difficulties writing with a keyboard. Therefore, we spend time doing writing exercises'*.

Many elders asked to have prolonged or follow-up training as they would easily forget the instructions. This problem was partially tackled with the use of notes or posters.

As we can read in a training log about a domiciliary care participant: *'The lady has never used a computer in her life. So I had to teach her to write with the keyboard and to know the use of the keys in it. The lady had been very committed during the computer course. Her initial difficulties related to never having used a computer and not being able to write with the keyboard - physical or touch screen- were overcome. The lady was always very motivated in using the computer and achieved good progress. It wasn't always possible to meet the lessons' deadlines, because some topics required a longer time to understand and test than those indicated by the technician's manual'*.

In another training log we can read: *'There are still difficulties writing with the keyboard. The gentleman worked hard to complete the training. His initial difficulties related to never having used a computer and not knowing how to write with a keyboard, whether physical or touch screen, were overcome as well. It was almost never possible to keep the pace of the lessons, since all the topics covered required a longer time to comprehend and test than those indicated by the technician's manual.'*

The need to consolidate the concepts learned and overcome memory limits are stressed in this training log about a domiciliary care participant: *'She asked several times to look back to previous lessons, fearing she would not remember all the steps involved in the applications. So we often 'summarised' the content and took notes to integrate into the manual'. As noted in a training log for a domiciliary care participant: 'It has often been necessary to repeat some of the topics the lady had the most difficulty learning, especially Facebook and Skype'.*

To support participants in the use of PCs, a participant in the domiciliary care group suggested that: *'It would be useful to have a second course, also because our memory is not the same as it used to be, and to learn new things we need a lot of time and repetition'.*

Family attitude towards PC use played a crucial role for residential and domiciliary care participants. As we can read in a training log: *'After a very difficult beginning, the participant is passionate about the use of the Internet and especially Facebook. He used Facebook to send photos of his grandchildren to some of his relatives, but unfortunately this activity was stopped by his family for privacy reasons (several times I was asked to delete my contacts on Facebook)'. The participant was interested in the Internet and Facebook, but his activity did not gain his family's consent.*

In most of the cases the family had an important role in supporting PC use, as claimed by a domiciliary care participant in an interview:

'Since I have been using the PC I can do things I didn't before, and my grandchildren have helped me very much. Now instead of the encyclopaedia I use Google a lot. I go on the Internet to see the weather, geography, and get informed about certain painters (like De Chirico). I'm a painter and now I have also learned to use Paint with the help of my sister as well'.

Therefore, PC training has been the opportunity to increase family relations and intergenerational relationships, knowledge, and self-esteem in general.

Nevertheless, some risks in Internet use have been highlighted by the training participants themselves as well as by their family members. A participant claimed that: *'On Facebook there are risks such as bullying for the kids'.* In order to restrict potential risks related to Internet use, carer introduced monitoring and protecting filters to the Web, informing participants of these tools but not using them as censorship.

Many other features affected the impact of training on the participants. The project lasted several months and has involved several care facilities. The researcher responsible for delivering the standardised assessment questionnaires before and after the training highlighted that the **general context of the residential care** played an important role in the outcome. Some of them were considered stimulating and supportive of PC use, depending on where the PCs were located and the time and place the training was held; others were less supportive to the innovation introduced by the use of PCs. Moreover, **seasons** seemed to have an impact on the general psychological condition of the participants: *'During the summer, participants showed a more positive attitude towards life, as is argued in many international studies on this topic as well',* the researcher stressed. Despite external features, the differences in seasons equally affected the two experimental groups as well as the control group, nevertheless it would be important to take into account this aspect in planning further developments of the project.

In general, the **specific health and psychological condition of the participant** affected the training and especially the results of the standardised tests administered to collect the quantitative data. As we read in a training log about a residential care participant: *'The course was also influenced by the participant's negative mood, due to conflicts with the family and the nursing home where he resides'.*

The general **national and regional context** also played a crucial role in the use of the programs. For instance, the limited use of Skype is to be considered a result of technical problems but also of the lack of other Skype contacts for most of the participants. As noted in a training log: *'Skype has been displayed but not used due to lack of contacts and preference for Facebook, where, in particular, he shared photos.'*

The possibility of training at home has been positively highlighted by a participant's relative, as *'The fact that you did the course at home allowed him to participate. In fact, he is very shy and would not go into a facility to carry out the training.'*

The experimental study was intended to test how new technologies, particularly the Internet and social networks, help foster communication and social inclusion of the elderly, and to evaluate the effects on their health and well-being. In a broader definition of communication and social inclusion, going beyond the quantitative findings from the standardised tools used in measuring the impact of the training on the experimental group versus the control group and including the qualitative findings based on data from training logs, interviews with participants, carers, and relatives, as well as Facebook posts by the participants, we can argue that the training had a very positive impact on participants, both in residential and in domiciliary care.

This Facebook post by a participant in the training sums up most of the qualitative feedbacks collected during the course and serves as an overall observation on the AGES project:

'I must thank the AGES project team and everyone who collaborated. I participated in this computer study 'not without concern', because the not-tender age of 80 certainly does not help, with the memory being depleted and the ailments of time. I wanted to try it out and I must say I am satisfied because now I feel less lonely. When I think of a poem, a piece of history and I do not remember who wrote it, I can just write a sentence and the die is cast. Likewise, I can also communicate with family and friends, read the news in the papers, see city maps, etc. On [date] the course I undertook has come to an end and I can say straightaway that I'll miss it because I did learn something but so much is still left and unfortunately time is running out. Let's make do! A heartfelt thank you to all of you and especially to my precious teacher. Sincerely [name].'

5.5.9 Summary of Italian findings

The data collected in Italy reveal that the intervention had some impact on important individual outcomes. Specifically, receiving the training seemed to improve cognitive capacities as well as contributing to feelings of self-competence. However, for practical and organisational reasons outlined in the method, strict randomization was not followed in the Italian study, potentially compromising the interpretation of the aforementioned effects. However, a more focused analysis on a subset of data that was identified as being relatively unaffected by these threats to experimental control, confirmed the key findings and further revealed that training was associated with improving attitudes towards computers across time.

Unlike the UK data, there was no evidence that the benefits of training extended to social outcomes (e.g., indicators of social network activity or group participation) or other indicators of positive self-concept function. There was also no evidence for direct or indirect effects on mental health outcomes. Thus, while the effects of training in the Italian sample seem to converge with those observed in the UK, they were more limited in their scope and extent.

One possible reason for this is revealed in the inspection of computer use among the trainees, and the qualitative feedback from carers' logs. These pointed to less engagement with key, interactive, social applications (i.e., Skype) relative to other packages and relative to what was observed in the UK. Similarly, the broader qualitative feedback suggests that training was a positive experience for those who received it, and that they and their carers felt that the training contributed positively to their lives and well-being. However, the feedback again pointed more to the impacts of training on competencies and self-esteem resulting from that, rather than active social engagement via the Internet. The feedback suggests that the relative lack of social engagement in the Italian trainees was a function of both technical issues (i.e., connectivity not

supporting Skype) as well as motivational issues (i.e., lack of interest and engagement in these specific uses). We return to these issues in the final discussion (Section 6).

6. Comparative Research findings and implications

There were a number of significant findings to emerge from the studies conducted as part of this project. Across both Italian and UK sites, there was evidence that those engaged in the training intervention became more positive about computers across time, developed a stronger sense of self-competency and showed improved cognitive capacity. Generally, these findings were stronger in the UK, but similar patterns were evident in the Italian sample, especially in more focused analyses that tried to address the specific issues of recruitment and allocation that occurred within Italy.

In the UK, there was also evidence of broader effects: training activated participant's social networks and helped them to maintain a sense of their own identity (which declined in the control group). Moreover, the combined processes of increasing self-competence, increased social network activity, and maintained sense of identity, together explained the improvements in cognitive health that were observed, and were also indirectly associated with improved mental health and well-being.

Thus, the combined results show that giving vulnerable older adults a computer, broadband connection, and training in how to use these can be beneficial for their well-being. These benefits seem especially evident with respect to cognitive health, but there is the potential for impacts on mental health also.

Although there was some broad consistency in findings across sites, there were also important differences. It is interesting to consider the reasons for the differences, the implications of these results for future research in these areas, and for policies intended to increase the use of technology among vulnerable older adults and to increase their social engagement.

With respect to the differences between Italian and UK findings, a number of factors seem relevant. As noted in the context information at the beginning of this report (Chapter 3), the social integration of older adults and the nature of care are quite different within the UK and Italy. For example, the place of older people in society, and in the family more specifically, differs in important ways by country. The care system also differs significantly, especially with respect to residential care, which in Italy includes the most vulnerable and least able to live independently or with informal care provided by family. There also seem to be cultural differences in social engagement outside the home and in the penetration of Internet technology and social media use within the wider population (both higher in the UK than in Italy). All of these things are important backdrops to the effects that have been observed here.

For example, it seems likely that capacity to use the Internet, and capacity to use this specifically for social engagement, was more possible for UK participants. The status of broadband, especially in the Italian region that was engaged in this research, meant that connections were less reliable and certain applications less functional. In addition, given the wider use of the Internet and social media within the UK, once participants were online they had many more opportunities to connect to friends and family than was the case in Italy. Indeed, this was revealed in the exploration of computer use among the trainees (Sections 5.3.5; 5.5.7). In the UK it is clear that Skype, in particular, was valued by participants as a means to connect to family and friends, especially those living far away (see also qualitative feedback, Section 5.3.6), whereas Skype was less used and perceived less positively among Italian trainees. These factors help to explain the significant effect of the

training on social engagement in the UK, and the absence of this effect in Italy.

The above issues point to an important implication of the findings. Although we have shown that even very vulnerable older adults (e.g., those receiving residential care) can be responsive to supportive training in how to use computers – and how to use these for social purposes – their capacity to act on this training and fully benefit from it is limited by technological and social constraints. To engage socially online, one needs a reliable connection and the capacity to reach social contacts via that medium. This implies that investment in broadband technology is an essential element in any intervention to increase social engagement and reduce exclusion by improving computer skills among older people. Although we were able to observe beneficial effects even when these factors were not optimal (i.e., in the Italian study), we observed wider benefits when the technology was more reliable and the capacity to socially connect more possible (i.e., in the UK study).

In addition to the accessibility of the Internet, and social contacts through this, the capacity to access the computer technology itself is an important issue and one that was a constant focus of consideration in the present research. Computers and their interface are not always physically accessible to vulnerable older adults, for whom mobility/ dexterity might compromise the ability to use keyboards or a mouse; impaired vision and hearing might make it difficult to read the screen or hear a caller on Skype; and even issues to do with circulation and skin dryness can make touch screens less responsive. In addition to adapting the training to be responsive to the needs and interests of our participants (section 5.2.2), in many cases we have had to adapt the hardware to enable users to engage fully and effectively with it given their physical constraints. This is not a trivial issue for policy initiatives that might seek to increase digital engagement among older populations: just knowing how to do it and being willing to engage is not enough; people must be physically enabled also. The Easy PC represents one attempt to increase accessibility, but there are other platforms that might be more effective for certain users (e.g., tablets) or the need to further augment or adapt the system to address the needs of the individual.

In addition to learning about the impact of social media training on the health and well-being of older adults – and the physical, social and technological factors that affect this – we have also learned about the process of social experimentation in the service of policy advice. Social experimentation is clearly vital to produce informed policy decisions that are best placed to improve the lives of those targeted through them. But in order to conduct social experimentation effectively, it is important not just to have available participants and researchers who are able to test them. It is also important to have wider institutional support for the experimentation process and willingness to learn through that.

As noted in the methods, while it was possible to follow the original experimental plan very closely in the UK, practical issues related to the context of care in Italy meant that the strict experimental protocols were relaxed in the Italian study. While this is unfortunate, we were still able to implement the project and produce relevant findings from it. In part, the ability for the UK study to avoid these issues is related to the history of working relationships between the research team and the care provider — the latter, as an institution, has been involved in social experimentation, has seen the benefits of this, and has developed a good working relationship with the research partners. In Italy, the partnership between the researchers and care organisation was new, and these relationships less well developed. For future examples of social experimentation to be effective, and to be maximally beneficial to both research and organisational partners, it is important to ensure that solid relationships are at its basis. Cultivating effective and on-going links between researchers and interested governmental and organisational partners would seem an important priority for policies that also seek to fund and benefit from social experimentation.

Finally, it is useful to speculate about the implications of the findings for wider technological developments in the care sector. In particular, the local authorities with which we have been engaged in this project are interested in the possibilities of tele-health (see next Section on stakeholder feedback). This project did not test the effectiveness of tele-health and therefore it would be inappropriate to make statements about its likely effects on the population of older adults in these regions. However, if the main message of the research is that technology can be an effective tool for health and well-being when older adults are fully supported to use it, and when that technology allows them to build up a sense of competency and engage socially

with others, those issues would seem relevant to the implementation of tele-health. If tele-health interventions are such that they leave vulnerable older adults feeling less enabled and more isolated, they are likely to be seen less positively and might be less well-placed to improve the health and well-being of those they intend to help. Of course, this is merely a suggestion based on the current project and future research would have to explore these issues more fully and specifically in the context of tele-health initiatives.

7. Policy recommendations coming from evaluation and up-scaling activities

This section summarises lessons learnt during the implementation of other project activities parallel to the training and to the research analysis, namely as arising from carers' logs, observations from participants, personnel involved in the implementation of the training, relatives and psychologists or residential care home directors in interviews aimed at evaluating the project, and stakeholders' meetings with policy-makers and NGOs' representatives.

As for the stakeholders' meetings, they have been crucial in discussing the possibility of continuing or up-scaling the project as well as considering further possible policy developments. The discussion that emerged provides room to suggest policy paths aimed at improving the efficiency of the initiative and possibility for its up-scaling.

In addition, during the Italian stakeholders' meetings, the efficiency of the Easy PC option has been discussed with reference to the cost-benefit model tailored on the project's costs and results.

In this view, before addressing each policy recommendations, it has to be remarked that the project does not entail a mere digital literacy training. Rather it aims at developing specific skills that could ease the social relations of participants and their cognitive and social activation.

7.1 Support improvements in digital literacy among older people

The proportion of the population that is digitally literate is rising rapidly, due to improvements in connectivity, technologies, uptake of training and as young technology-savvy generations replace older people.

Digital exclusion is largely a short-to-medium-term problem. The UK Government goal of enabling everyone who has the capacity, to become digitally literate by 2020 recognises this. It is also an age-related problem. 83% of people who are not currently digitally literate but who are 'willing and able' to become so are aged 45 and over. Within this broad cohort, the majority who would benefit from training and support to become digitally literate are the older age groups.

In demonstrating that training older people in the use of social media is associated with social and cognitive benefits, the AGES 2.0 project makes a case for supporting policies focused on enhancing the digital literacy of older people, including older people in care settings. It argues for adopting a broad definition of those 'willing and able' to become digitally literate, including not only those who 'have a positive perception of being online' (the current definition), but those who may be ambivalent, due to a lack of appreciation of the potential benefits of being online.

7.2 Encourage care homes to provide access to digital technologies and support

The population of older people entering care will be increasingly digitally literate. Over time more and more people will arrive in care settings with their own PCs, tablets and smart phones. In response to this nascent demand, enlightened care providers have started to provide free wifi or access to PCs in communal areas (as might be found in hotel lobbys). It is likely that as this trend continues and care home residents without digital skills witness those with digital skills benefitting from online social interactions, this will arouse curiosity, a desire to learn and, potentially, scope to transfer skills between care home residents, with appropriate support from staff.

Statistics from carehome.co.uk suggest that in 2013 only 3,400 out of 20,000 care homes in the UK were providing residents access to the Internet¹³.

In the UK, the Care Quality Commission is responsible for inspection of care provision and for ensuring that people in care get safe and appropriate care that meets their needs and supports their rights. This includes access to activities and mental stimulation.

The findings of AGES 2.0 support the case for suggesting that inspection and quality control bodies (such as the Care Quality Commission) across Europe should include access to the Internet and support in using the Internet as an inspection criterion, to be addressed during visits.

7.3 Support care staff in acquiring the skills required to enable older people to become digitally literate

The role of the Care Technologist is new to most care settings. We would suggest that this as a new professional profile that will merge the skills of a carer with those of a PC trainer. This new profile needs to be adequately recognised by sector skills councils, training and qualification awarding bodies. European and national policy makers should support initiatives (e.g. further development of competency frameworks, qualifications and training programmes) that encourage the acquisition of these skills.

Besides the typical competences needed for the care of the elderly, a competent Care Technologist also requires a range of skills, including: the ability to train older people to use ICTs; ICT and trouble-shooting skills; an understanding of online security; and an appreciation of the ways in which older people tend to like to use PCs and sites that they may find rewarding, and so on.

7.4 Tailor the PC to the participants' needs

The PC and the most common interface are not always thought to be accessible for people with slight impairments. Problems with visual problems or shaky hands may hamper the usage of PCs by older people, who have the cognitive ability to learn how to use a PC. This has been highlighted in the carers' logs, as well as by participants and their relatives in the evaluation interviews. The project managed many such situations successfully by:

- providing an easy to use interface, Easy PC, with few functions and direct links to the installed programs;
- allowing the elderly to test different accessories and choose the most comfortable ones (e.g. some elders found difficult to use the mouse and preferred a touch screen, while

¹³ <http://www.carehome.co.uk/news/article.cfm/id/1560123/care-homes-urged-to-get-residents-online-and-stop-the-digital-divide-becoming-a-digital-gulf>

others found the mouse most simple to use);

- finding practical solutions to tackle further difficulties, such as the use of a digital magnifying glass to focus on icons and items, sticking bold characters onto the keyboard, allowing the participants to play games they know, such as card games, on the PC, in order to get familiar with the mouse.

The adoption of a flexible approach about contents and timing in the implementation of the training has been effective in tailoring the project to individuals' needs.

Particular attention has been devoted by the carer technologist in managing stressful situation to avoid the risk of frustration that can spur from the first difficulties.

The ability of the Carer Technologist to 'tailor' the PC to the participants' needs, to go through stressful situation and to establish a frank relation with the participant is of momentous importance for the achievement of the training aims and to avoid the risk of frustration that can arise from initial difficulties.

7.5 Provide prolonged assistance

One of the main concerns of the elderly is the possibility of having a prolonged training course and to have technical support to solve problems that may arise while using the PC.

Follow-up should ensure, via sporadic meetings and remote assistance, both that participants do not forget specific tasks or competences they have learnt and that technical problems are solved.

During the project, elderly people should obtain prolonged support from carer technologists or, where possible, from younger relatives or friends.

The proposal of creating a new professional profile of the Care Technologist goes in this direction.

To provide people in charge of assisting elderly people, such as carers, with competences of PC trainers can allow beneficiaries to have ongoing assistance in order not to forget the acquired knowledge and to broaden it, as remarked by participants, their relatives and carers themselves in the evaluation interviews.

Such an approach would answers the objective need that older people have to keep active in order not to lose recently acquired knowledge.

7.6 Involve local actors

The involvement of NGOs and, more specifically, of centres organising recreational activities for elderly people, like the Italian social centres, can also represent a valid resource for the recruitment of elderly people at risk of social exclusion, together with public structures in charge of providing health and social assistance. The project established a local network of actors that has successfully reached potential beneficiaries.

Furthermore, as highlighted by NGOs and policy makers during the stakeholders' meetings, in cases where the beneficiaries do not need constant assistance, NGOs can be a relevant ally in ensuring follow-up assistance. Many organizations are already involved in projects or activities involving elderly people at risk of social exclusion and, needless to say, are formed by young people able to solve most of the practical problems that the participants faced after the training (like forgetting a password and how to request a new one).

7.7 Find adequate funding in the existing toolbox of social and health policies

According to the discussion with policy-makers during the stakeholders' meetings, the European Social Fund appears to be the natural source of funding to build on the initiative at local and regional level and to support the emergence of the new professional profile of the carer-technologist by ad-hoc training courses for carers. Then, Easy PC may be supported via the existing health and social policies. In many Italian regions, families may ask for the activation of free specific services for people with disabilities. The Easy PC option might also be included among the services eligible as a tool to help the beneficiaries to keep connected with their family, to make use of web based services (like requesting or receiving documents on line from public administration and receiving results of blood analysis or prescriptions) and to support elders' private and social life. In specific contexts, the usage of a PC may represent a tool against social exclusion, thus also reducing the risks for the insurgence of further mental pathologies. As highlighted by policy-makers, PC training for elderly people may be associated with the deployment of web-based programs for telemedicine for this group of healthcare beneficiaries or may facilitate the health assistance of elderly people living in remote areas. Beneficiaries will be able to connect with doctors on Skype or to communicate health data via the web so that a continuous monitoring of their health conditions occurs. It may even be possible to activate home visits when necessary.

8. References

- Active Ageing Index, United Nations Commission for Europe / European Commission. <http://www1.unece.org/stat/platform/display/AAI/Active+Ageing+Index+Home>, Data downloaded October 2014.
- Active Ageing Index (AAI) (2013). Active Ageing Index 2012, Concept, Methodology and Final Results, UNECE Grant No: ECE/GC/2012/003. <http://www.euro.centre.org/aai>.
- Ayers, S., (2013), *The Click Guide to Digital Technology for Adult Care*, Wordpress.
- Baray, G., Postmes, T., & Jetten, J. (2009). When I equals we: Exploring the relation between social and personal identity of extreme right-wing political party members. *British Journal of Social Psychology*, 48(4), 625-647.
- Baumeister, R. F., & Leary, M. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497-529.
- Bennett, D. A., Schneider, J. A., Tang, Y., Arnold, S. E., & Wilson, R. S. (2006). The effect of social networks on the relation between Alzheimer's disease pathology and level of cognitive function in old people: a longitudinal cohort study. *The Lancet Neurology*, 5(5), 406-412.
- Berkman, L.F., & Syme, S.L. (1979). Social networks, host resistance and mortality: A nine-year follow-up study of Alameda County residents. *American Journal of Epidemiology*, 109, 186-204.
- Boden-Albala, B., Litwak, E., Elkind, M.S.V., Rundek, T., & Sacco, R.L. (2005). Social isolation and outcomes post stroke. *Neurology*, 64, 1888-1892.
- Byrne, G.J., & Pachana, N.A. (2011). Development and validation of a short form of the geriatric Anxiety Inventory-the GAI-SF. *International Psychogeriatrics*, 23, 125-31
- Cabinet Office (2014). *The UK Government's Digital Inclusion Strategy*, HM Gov website, updated 31 July 2014. <https://www.gov.uk/government/publications/government-digital-inclusion-strategy>.
- Cacioppo, J.T., & Hawkley, L.C. (2003). Social isolation and health with an emphasis on underlying mechanism. *Perspectives in Biology and Medicine*, 46, S39-S52.
- Cacioppo, J. T., Hughes, M. E., Waite, L. J., Hawkley, L. C., & Thisted, R. A. (2006). Loneliness as a specific risk factor for depressive symptoms: cross-sectional and longitudinal analyses. *Psychology and aging*, 21(1), 140.
- Cacioppo, J. T., & Patrick, B. (2009). *Loneliness: human nature and the need for social connection*. New York: W. W. Norton & Company.
- Callahan, C. M., Unverzagt, F. W., Hui, S. L., Perkins, A. J., & Hendrie, H. C. (2002). Six-item screener to identify cognitive impairment among potential subjects for clinical research. *Medical care*, 40(9), 771-781.
- Callegaro, L., & Pasini, G. (2008). Informal care and labour force participation: The economics of family networks, in A. Börsch-Supan (coord.), *First Results From the Survey of Health, Ageing and Retirement in Europe (2004-2007): Starting the Longitudinal Dimension*, Mannheim: Mannheim Research Institute for the Economics of Ageing, 187-203.
- Calzada, I., & Brooks, C. (2013). The Myth of Mediterranean Familism, *European Societies*, 15(4), 514-534.
- Campbell, J.D., Trapnell, P.D., Heine, S.J., Katz, I.M., Lavalley, L.F., & Lehman, D.R. (1996). Self-concept clarity: Measurement, personality correlates, and cultural boundaries. *Journal of Personality and Social Psychology*, 70, 141-156.
- Cohen, S., Doyle, W.J., Skoner, D.P., Rabin, B.S., & Gwaltney, J.M. Jr. (1997). Social ties and susceptibility to the common cold. *Journal of the American Medical Association*, 277 (24), 1940-1944.

Coward, R. (2014). Loneliness is not a bug with a technological solution. *The Guardian*, May 28. Retrieved from <http://www.theguardian.com/uk>.

Daatland, S. O., & Lowenstein, A. (2005). Intergenerational solidarity and the family welfare state balance. *European Journal of Ageing* 2(3), 174-182.

Deters, F., & Mehl, M. R. (2012). Does posting Facebook status updates increase or decrease loneliness? An online social networking experiment. *Social psychological and personality science*, 4, 579-586.

Diener, E., Larsen, R.J., Levine, S., & Emmons, R.A. (1985). Intensity and frequency: Dimensions underlying positive and negative affect. *Journal of Personality and Social psychology*, 68, 653-663.

Dodge, H. H., Ybarra, O., & Kaye, J. A. (2014). Tools for advancing research into social networks and cognitive function in older adults. *International Psychogeriatrics*, 26(04), 533-539.

Dorling, D., Vickers, D., Pritchard, J., Thomas, B. & Ballas, D., (2008). *Changing UK: the way we live now*, report commissioned for the BBC.

Ell, K., Nishimoto, R., Mediansky, L., Mantell, J., & Hamovitch, M. (1992). Social relations, social support and survival among patients with cancer. *Journal of Psychosomatic Research*, 36(6), 531-541.

Esping-Andersen G., (1990). *The Three Worlds of Welfare Capitalism*, Princeton University Press.

Eurobarometer (2007). Health and long-term care in the European Union. *Special Eurobarometer*, 283, 1–247. Brussels: European Commission.

Eurostat Digital Inclusion

http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_bdek_di&lang=en, Data downloaded October 2014

Eurostat/Labour Force Survey (LFS) Household Composition

http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfst_hhaceday&lang=en, Data downloaded October 2014

Eurostat Population Projections

http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Population_projections, Data downloaded October 2014

Everson-Rose, S. A., & Lewis, T. T. (2005). Psychosocial factors and cardiovascular diseases. *Annual Review of Public Health*, 26, 469-500.

Ferragina, E. and Seeleib-Kaiser, M. (2011). Welfare Regime Debate: Past, Present, Futures?. *Policy and Politics*, 39(4), 583-611.

Folstein, M. F., Folstein, S. E., & McHugh, S. H. (1975). "Mini-mental state." A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, 12, 189-98.

Gagne, M. (2008). The role of autonomy support and autonomy orientation in prosocial behavior engagement. *Motivation and Emotion*, 27, 199-223.

Gal, J. (2010). Is There an Extended Family of Mediterranean Welfare States?. *Journal of European Social Policy*, 20(4), 283-300.

Gleibs, I., Haslam, C., Jones, J., Haslam, S.A., McNeil, J., & Connolly, H. (2011a). No country for old men? The role of a Gentlemen's Club in promoting social engagement and psychological well-being in residential care. *Ageing and Mental Health*, 15, 456-466.

Gleibs, I., Haslam, C., Haslam, S.A. & Jones, J. (2011b). Water clubs in residential care: Is it the water or the club that enhances health and well-being? *Psychology and Health*, 26, 1361-1378.

Gioncada, M., Trebeschi, F. & Mirri, P. (2011). *Le rette nei servizi per persone con disabilità ed anziane. La compartecipazione al costo dei servizi residenziali, diurni e domiciliari*. Santarcangelo di

Romagna: Maggioli.

Goldberg, D. P., & Williams, P. (1978). *Manual of the General Health Questionnaire*. Windsor: NFER Publishing.

Griffin, J. (2010). *The Lonely Society*. The Mental Health Foundation. Retrieved from <http://www.mentalhealth.org.uk>.

Haslam, C., Haslam, S.A., Knight, C., Gleibs, I., Ysseldyk, R., & McCloskey, L.G. (2014). We can work it out: Group decision-making builds social identity and enhances cognitive performance in elderly care residents. *British Journal of Psychology*, *105*, 17-34.

Haslam, C., Holme, A., Haslam, S.A., Iyer, A., Jetten, J., & Williams, W.H. (2008). Maintaining group membership: Identity continuity and well-being after stroke. *Neuropsychological Rehabilitation*, *18*, 671-691.

Haslam, C. & Morton, T. (2013a). *AGES Project: Activating and guiding the engagement of seniors - Train the users manual*. University of Exeter.

Haslam, C. & Morton, T. (2013b). *AGES Project: Activating and guiding the engagement of seniors - Assessment manual*. University of Exeter.

Hawkley, L. C., & Cacioppo, J. T. (2007). Aging and loneliness: Downhill quickly. *Current Directions in Psychological Science*, *16* (4), 187-191.

Hawkley, L. C., Masi, C. M., Berry, J. D., & Cacioppo, J. T. (2006). Loneliness is a unique predictor of age-related differences in systolic blood pressure. *Psychology and Aging*, *21*(1), 152.

Hawkley, L. C., Thisted, R. A., Masi, C. M., & Cacioppo, J. T. (2010). Loneliness predicts increased blood pressure: 5-year cross-lagged analyses in middle-aged and older adults. *Psychology and Aging*, *25*(1), 132.

Hayes, A. F. (2013). *An introduction to mediation, moderation, and conditional process analysis*. New York: Guilford Press.

Helliwell, J.F., & Huang, H. (2013). Comparing the happiness effects of real and on-line friends. *PLoS ONE*, *8*(9).

Holt-Lunstad, J., Smith, T.B., & Layton, J.B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLOS Medicine*, *7*(7).

House, J.S., Umberson, D., & Landis, K.R. (1988). Structures and processes of social support. *Annual Review of Sociology*, *14*, 293-318.

Howerlida, T. J., Deeg, D. J. H., Beekman, A. T. F., Tilburg, T. G. V., Stek, M. L., Jonker, C., & Schoevers, R. A. (2012). Feelings of loneliness, but not social isolation, predict dementia onset: Results from the Amsterdam Study of the Elderly (AMSTEL). *Journal of Neurology, Neurosurgery and Psychiatry*. Retrieved from <http://jnnp.bmj.com>

Humphreys R, (2013). *Paying for social care - Beyond Dilnot*, The Kings Fund.

ISTAT (2013). I presidi residenziali socio-assistenziali e socio-sanitari. Al 31 dicembre 2013. *Statistiche report*.

Jay, G.M., & Willis, S.L. (1992). Influence of direct computer experience on older adults' attitudes toward computers. *Journal of Gerontology*, *47*, 250-257.

Jetten, J., Haslam, C., Pugliese, C., Tonks, J., & Haslam, S.A. (2010). Declining autobiographical memory and the loss of identity: Effects on well-being. *Journal of Clinical and Experimental Neuropsychology*, *32*, 408-416.

Jones, J. M., Haslam, S. A., Jetten, J., Williams, W. H., Morris, R., & Saroyan, S. (2011). That which doesn't kill us can make us stronger (and more satisfied with life): The contribution of personal and social changes to well-being after acquired brain injury. *Psychology and Health*, *26*(3), 353-369.

Knight, C., Haslam, S.A. & Haslam, C. (2010). In home or at home? Evidence that collective decision making enhances older adults' social identification, well-being and use of communal

space when moving to a new care facility. *Ageing and Society*, 30, 1393-1418.

Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., et al. (2013). Facebook use predicts declines in subjective well-being in young adults. *PloS one*, 8(8).

Laing & Buisson (2013). *Market Survey of Older People*. London: Laing & Buisson.

Local Government Association (2013). *Towards Excellence in Adult Social Care: Progress with adult social care priorities, England 2011–12*. London.

Mason, M., Sinclair, D., & Berry, C. (2012). *Nudge or compel: Can behavioural economics tackle the digital exclusion of older people?* The International Longevity Centre UK. Retrieved from <http://www.ilkuk.org.uk>.

McConatha, D., McConatha, J. T., & Dermigny, R. (1994). The use of interactive computer service to enhance the quality of life for long-term care residents. *The Gerontologist*, 34(4), 553-556.

McConatha, J. T., McConatha, D., Deaner, S., & Dermigny, R. (1995). A computer based intervention for the education and therapy of institutionalized older adults. *Educational Gerontology: An International Bimonthly*, 21, 129-138.

Minas, C., Jacobson, D., Antoniou, E. and McMullan, C. (2014) Welfare regime, welfare pillar and southern Europe. *Journal of European Social Policy*, 24(2), 135-149.

Mioshi, E., Dawson, K., Mitchell, J., Arnold, R., & Hodges, J. R. (2006). The Addenbrooke's Cognitive Examination Revised (ACE-R): A brief cognitive test battery for dementia screening. *International Journal of Geriatric Psychiatry*, 21, 1078–1085.

Moreno L., Klose, P.M. (2013). Youth, family change and welfare arrangements, *European Societies*, 15(4), 493-513.

Network non autosufficienza NAA (ed.) (2013). *L'assistenza agli anziani non autosufficienti in Italia - Quarto rapporto*, Santarcangelo di Romagna: Maggioli.

Ong, A. D., Rothstein, J. D., & Uchino, B. N. (2012). Loneliness accentuates age differences in cardiovascular responses to social evaluative threat. *Psychology and Aging*, 27 (1), 190 – 198.

ONS (2013). *Social Networking: The UK as a Leader in Europe*, UK Office for National Statistics, June 2013.

ONS (2014). *Changes in the Older Resident Care Home Population between 2001 and 2011*, UK Office for National Statistics, August 2014. http://www.ons.gov.uk/ons/dcp171776_373040.pdf.

Orr, G. (2014). Britain has been voted the loneliness capital of Europe - so how did we become so isolated? *The Independent*, June 26. Retrieved from <http://www.independent.co.uk>.

Pesaresi, F. (2013). *Residenze sanitarie assistenziali. Costi, tariffe e compartecipazione dell'utenza*. Santarcangelo di Romagna: Maggioli.

Powell, M. & Barrientos, A. (2004). Welfare Regimes and the Welfare Mix. *European Journal of Political Research*, 43(1), 83-105.

Radloff, L.S. (1977). The CES-D scale: A self report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.

Ranci, C. & Pavolini, E. (eds.) (2013). *Reforms in Long-Term Care Policies in Europe*, New York: Springer.

Randall, C. & Corp, A. (2014). *Measuring National Well-being: European Comparisons*. Office of National Statistics, UK.

Russell, D. (1996). The UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, 66, 20-40.

Slegers, K., van Boxtel, M., & Jolles, J. (2008). Effects of computer training and internet usage on the well-being and quality of life of older adults: A randomized, controlled study. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 63, 176-184.

Slegers, K., van Boxtel, M., & Jolles, J. (2009). Effects of computer training and Internet usage on cognitive abilities in older adults: A randomized controlled study. *Aging: Clinical and Experimental Research*, 21, 43-54.

South Devon Healthcare NHS Foundation Trust website.
<http://www.sdhct.nhs.uk/hospitalandcommunitycare/>, Accessed October 2014

White, H., McConnell, E., Clipp, E., Branch, L.G., Sloane, R., Pieper, C., Box, T.L. (2002). A randomized controlled trial of the psychosocial impact of providing internet training and access to older adults. *Aging and Mental Health*, 6, 213-221.

Wilson, R. S., Krueger, K. R., Arnold, S. E., Schneider, J. A., Kelly, J. F., Barnes, L. L., & Bennett, D. A. (2007). Loneliness and risk of Alzheimer disease. *Archives of general psychiatry*, 64(2), 234-240.

Wittenberg, R., Hancock, R., Morciano, M., Comas-Herrera, A., Malley, J., King, D. (2011). Projections of Demand for and Costs of Social Care for Older People in England, 2010 to 2030, under Current and Alternative Funding Systems. Report of research for the Commission on Funding of Care and Support. Canterbury and London: PSSRU, University of Kent and London School of Economics.

World Health Organisation, Health for All Data Base. <http://data.euro.who.int/hfad/>, Data downloaded October 2014

Woodward, A. T., Freddolino, P. P., Blaschke-Thompson, C. M., Wishart, D. J., Bakk, L., Kobayashi, R., & Tupper, C. (2011). Technology and aging project: Training outcomes and efficacy from a randomized field trial. *Ageing International*, 36, 46 – 65.

The coordinator of the project

Regional Agency for Health of Marche (Italy). The Agency is the operative arm of the Health Service (Servizio Sanità), which is the organisational structure of the Regional Council responsible for Health in the Marche Region. The Health Service, besides its roles of economic and financial planning and strategic control, performance monitoring, and issues relating to human resources and accreditations, manages the development of the Health and Social- Health Regional Plan, with the view of promoting socio-health integration.

Partners

Fondazione Giacomo Brodolini (Italy) is an Italian research centre working in the field of labour and social policies. Having forty years of experience, FGB has developed broad capacities in pursuing researches and offering services at EU level in its fields of expertise. FGB has taken part in several EU funded projects in the field of social inclusion analyzing the role of vulnerable groups (young workers, elderly, women, migrants, etc), with a focus on social exclusion, employment and gender.

The **University of Exeter (UK)** will lead the research in the United Kingdom. It is a top UK university that combines world-leading research with high levels of student satisfaction. With 16,000 students and 3,000 staff, it is ranked 7th out of more than 100 UK universities in the Times league table. The university's *School of Psychology* has 60 academic staff, 96 postgraduate research students and its work with Somerset Care was recently honoured for "Outstanding Dementia Research" at the National Dementia Care Awards.

Torbay and Southern Devon Health and Care NHS Trust (UK) is an integrated health and adult social care organisation, responsible for providing community health services in Torbay and Southern Devon and in Torbay for providing and commissioning adult social care services. It employs approximately 2000 staff including frontline health and social care staff, such as district nurses, occupational therapists and social workers, and operate from a range of different premises across Torbay and South Devon such as community hospitals and clinics.

Cooperativa Labirinto (Italy) is a social cooperative which has been working in the District of Pesaro and Urbino since 1991. It works in the field of welfare services, carrying out activities in specific sectors: healthcare (children, youth, disability, mental health, elderly people); training; physical rehabilitation activities. It focuses its working activities on welfare policies, through the active participation of local communities' life, the permanent reading of the needs of individuals and communities, the design and management of services of social solidarity.

Somerset Care Group (UK) is one of the largest not-for-profit providers of care services in Southern England. It provides: residential care for over 1,500 older people in 32 Care residential and nursing homes; personal care and assistance for over 4,000 people living in their own home. Somerset Care is committed to making care accessible to all regardless of financial circumstances. *Through its training arm, Acacia Training & Development*, Somerset Care provides professional training to company staff, external companies and individual learners across South West England.

For further information on the project, please visit:

www.ages2.eu

