



Psychological and Behavioural Science

**Tackling Loneliness in an Ageing UK Population
through Intergenerational Connectivity**

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**London School of Economics and Political Science
PB403 Psychology of Economic Life
Summative coursework
December 2018**

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‘By 2030, it is estimated that there will be nearly 16 million people in the UK aged 65 and over. Brave thinking is required from all sides of the political divide to meet the needs of our ageing population. We need to see recommendations that make a difference to the millions of people who rely on health and care services now and in the future’.

Janet Morrison, Chief Executive of Independent Age
(Independent Age, 2017)

Abstract

The shifting population demographic in the UK poses a range of socioeconomic problems, in part due to increased risk factors for loneliness associated with age. While the UK government and many charities are investing significant resources into tackling age-related loneliness, logistical challenges remain. Furthermore, the intransigence of systemic ageism can limit the success and sustainability of current interventions. To address these deficiencies, we apply self-determination theory to analyse the root causes of age-related loneliness and propose an exchange platform which will connect younger and older generations. We provide an example of how this platform might be used as part of ‘relationships education’ in schools to address ageism and disconnect at a societal level, thereby reducing loneliness in the long-term.

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1. Background

In the last decade, the UK has witnessed a large proportion of post-World War II ‘baby-boomers’¹ pass the age of 65. In 2016, the number of UK residents aged 65+ reached 11.8 million, or 18% of the total UK population (ONS, 2017a). As the baby-boomer generation moves into their late 70s and 80s and birth rates continue to dwindle², the 2020 decade will be characterised by an evermore ageing population (ONS, 2017b). Latest projections suggest that in 50 years the total number of residents aged 65+ will equal 20.4 million, accounting for 26% of the total population in the country (ONS, 2018b).³

This trend poses many challenges for government policies. One social and psychological challenge that is gaining relevancy as the UK population continues to age is loneliness (Dury, 2014). According to Age UK, 1.4 million people aged 50+ living in England are often lonely. Based on current population projections, it is expected that by 2025, more than 2 million people aged 50+ will often feel lonely if no actions are taken to address this matter (Age UK, 2018a).

The increased need for initiating successful intervention strategies targeting loneliness becomes clear when considering the negative physical, mental, psychological and economic consequences. From a physical health perspective, loneliness can increase mortality likelihood by 25% (Holt-Lunstad et al., 2015) and is as dangerous as cigarette smoking or obesity (Holt-Lunstad, Smith, & Layton, 2010). Furthermore, deficiencies in social relationships are associated with an increased risk of hypertension (Hawkey, Thisted, Masi, & Cacioppo, 2010)⁴ and developing coronary heart disease and stroke (Valtorta et al., 2016). From a mental health perspective, loneliness increases the risk of cognitive decline (James, Wilson, Barnes, & Bennett, 2011), doubling the risk of Alzheimer’s disease in older people (Wilson et al., 2007)

¹ Typically refers to individuals born between 1946 and 1948 (Age UK, 2018a).

² In 2017, the total fertility rate declined even further, reaching a 10-year low of 1.76 children per woman (ONS, 2018a).

³ See Fig.1 in the Appendix.

⁴ See Fig.2 in the Appendix for an illustration of the direct and indirect effects of loneliness on morbidity and mortality (Holt-Lunstad & Smith, 2016).

and increasing the chance of developing clinical dementia by 64% (Holwerda et al., 2012). In terms of psychological consequences, loneliness makes individuals more prone to developing depression (Cacioppo et al., 2006) and increases risk of suicide in older age (O'Connell, Chin, Cunningham, & Lawlor, 2004). Finally, from an economic standpoint, over a 10-year period the costs of loneliness to health and social care services were estimated to be in excess of £6,000 per person for older people most severely suffering from loneliness (McDaid, Bauer, & Park, 2017).

The growing problem of loneliness in an ageing population has not escaped the attention of the UK Government. In January 2018, Prime Minister Theresa May announced her intention to develop a national programme on loneliness, appointing Tracey Crouch as 'Minister of Loneliness' to carry on the work begun by the late Jo Cox MP (HM Government, 2018). The programme's first publication, *'A connected society: a strategy for tackling loneliness - laying the foundations for change'* was released on October 15, 2018. The report highlights the critical role charities must play in finding a solution.

Organisations such as Age UK, Friends of the Elderly and Triangle Community Services allocate significant resources toward understanding, addressing and alleviating loneliness in older people. Broadly, the range of intervention strategies for combating loneliness offered by these organisations can be categorised in terms of three levels: one-to-one befriending schemes, social group services, and Community Navigators, who identify lonely, hard-to-reach individuals and deliver emotional, practical and social support by referring them to appropriate local services (SCIE, 2012).

Befriending schemes provide lonely and isolated individuals with vital company and emotional support. The types of befriending services offered differ across individual programmes, however, these schemes commonly involve volunteers or paid individuals who conduct home visits or provide regular telephone calls. An interview with Age UK Cambridgeshire & Peterborough revealed that since every client needs to be matched to a

suitable volunteer based on proximity and interest, the success of this scheme is somewhat constrained by being highly time consuming, often leaving up to one hundred individuals on a waiting list. With an ageing population, the pressure on these social care services is expected to grow. The interviewed predicted that 'as time goes on, the list is just going to get longer and longer' (C. Cook, personal communication, November 16, 2018). With an ageing population, more and more individuals will suffer from the consequences of loneliness, adding pressure on these social care services.

2. Opportunity for intervention

Clearly, there is an opportunity to design an intervention which can both leverage the valuable work currently being done by charities, along with the increased attention and resources being provided by the UK government, while facilitating the ease and speed with which those at risk for age-related loneliness can benefit from these resources. However, in order to ensure that our intervention is sustainable as well as effective, we need to explore the fundamental causes of the issue in greater depth.

We will adopt a self-determination theory (SDT) framework to address the root of the problem in order to be able to respond with a viable solution. First, SDT will be introduced as a framework for analysing age-related loneliness. Second, the theoretical lens will be applied to understand the causes of loneliness from an individual and societal perspective. Third, we will propose a two-part intervention and describe how it would be implemented and why we believe it provides a sustainable solution. Fourth, the limitations will be assessed before concluding with a potential framework for the future.

3. Self-determination theory as a framework for analysing age-related loneliness

Loneliness can be defined as '*a negative feeling resulting from a perceived deficit in companionship, quantity or quality in one's relationships with either an attachment figure or a community*' (O'Rourke, Collins, & Sidani, 2018, p. 1). Loneliness should not be confused

with social isolation – an objective measure of the frequency of interactions (Gibbens & Singh, 2018) – but rather be understood as a subjective discrepancy between the quantity and quality of social relationships one has as opposed to those one wants (Perlman & Peplau, 1981).

As we will show, this discrepancy can increase due to changing life circumstances which often occur as people age, thus increasing the risk for loneliness. Age is by nature relative and qualifying someone as 'old' and particularly as 'elderly' is subjective. Therefore, we are focusing on *anyone who is experiencing loneliness as a consequence, in whole or in part, of ageing* and the social factors which contribute to the phenomenon of age-related loneliness.

In exploring the literature, we have found self-determination theory (Ryan & Deci, 2017) to be a useful mechanism for understanding the nature of the problem and its mediating processes, as well as for laying out the principles which guide the design and implementation of our proposed intervention.

SDT is a model of motivation and needs satisfaction which builds on the views of Heider (1958) that perceptions of social environments shape behaviour. SDT examines both the motives that underlie and regulate human behaviour relating to intrinsic and extrinsic motivation (Deci & Ryan, 2000), as well as the intrinsic growth tendencies and inherent psychological needs that provide the basis for self-motivation.

Extrinsically motivated behaviours are those where individuals perform an activity by means of obtaining an outcome that is separate from the activity itself (deCharms, 1968). Extrinsic motivation is as such instrumental in nature rather than intrinsically satisfying (Eccles & Wigfield, 2002). In comparison, intrinsically motivated behaviours are defined as those that are performed for an inherent interest and where the reward is the resultant gratification derived from the activity itself (Deci, 1975). Intrinsic motivation is here understood as the motivational instantiation of the intrinsic growth tendencies and inherent psychological needs of humans (Vansteenkiste, Lens, & Deci, 2006).

Three such psychological needs are described in SDT, namely autonomy (Deci, 1975), competence (White, 1963), and relatedness (Reis, 1994). Autonomy refers to volition and the ability to align one's behaviours with one's true desires and motivations (Ryan & Deci, 2017). The need for competence is rooted in human striving for mastery; to feel competent is to feel able to operate effectively (Ryan & Deci, 2017). The concept of relatedness represents the psychological need for social connections which involves a mutual sense of caring and belonging. A primary means of fulfilling this psychological need is to contribute in a way that is meaningful to both the giver and the recipient (Baumeister & Leary, 1995).

4. Problem Analysis

4.1. From the perspective of the older generation

Much psychological and sociological research has examined the apparent dichotomy of human nature wherein people have the capacity to be both active and integrative on the one hand and passive and antisocial on the other (Ryan & Deci, 2017). The SDT model asserts that people will gravitate towards the active and participatory dimension because it helps them thrive; however, they can only do so in the context of a social environment which facilitates the fulfilment of their basic psychological needs (Deci & Ryan, 2000). In other words, which part of human nature prevails is experience-dependent (Ryan & Deci, 2017). As we will show, as people age, they may become lonely due to changes in the social context of their environment which frustrate their basic psychological needs and leave them feeling disconnected. This in turn can result in self-protective or compensatory behaviours such as withdrawal.

While loneliness can hit people in all stages of life, risk is increased with age largely due to changes in health, social support, and degree of physical isolation (Russell, Peplau, & Cutrona, 1980). The size and diversity of social networks is particularly important (Anderson & Thayer, 2018), yet these tend to diminish as people age. Children grow up, graduate, move away or start families of their own. People may lose touch with co-workers when employment

is terminated, either voluntarily or involuntarily, with poor prospects for re-entering the labour market. Friends and neighbours relocate for financial or personal reasons, and pensioners may be forced to move to lower cost housing. Consequently, older people may find themselves living in neighbourhoods where they feel they do not belong (Davidson & Rossall, 2015).

Declining health, either in ageing individuals or in members of their social network, is also a major contributing factor to loneliness (ONS, 2018c). Spouses, friends and family succumb to disease and death. Many in later life become primary caregivers for a spouse or close family member; without adequate social support, they can become increasingly isolated and suffer negative psychological consequences as a result (Carers UK, 2017).

Loss of function can create barriers to engagement and decrease sociability. An estimated 40% of those over 65 in the UK suffer from a 'limiting longstanding illness' (Age UK, 2018b). Mental health challenges also increase with age, ranging from mild and gradual cognitive decline to debilitating dementia (Prince, Albanese, Guerchet, & Prina, 2014). These age-related diseases and the associated disabilities all negatively impact mobility and access opportunities.

Yet even while they are experiencing this 'slowing down', ageing individuals are situated in a world undergoing rapid transformation and accelerated change in technological and natural phenomena, globalisation and social norms. This paradox can result in a feeling of disconnection in the context of a widening intergenerational gap which is exacerbated by concomitant ageism (North & Fiske, 2012).

Ageism can be defined as stereotyping or discriminating against an individual or group because of age, typically manifested as prejudice against the elderly (North & Fiske, 2012). In England, approximately 37% of those over 65 have experienced ageism (Age UK, 2018b). Over half of UK residents surveyed in 2009 believed elderly people are often treated as children (Griffin, 2010) as opposed to being respected and appreciated.

All these factors combine to leave many feeling left out or left behind as they age and hence, disconnected from society (Singh & Misra, 2009). Once loneliness sets in, it can become

a self-reinforcing phenomenon (Griffin, 2010). The condition of loneliness itself is somewhat stigmatised, with 30% of UK residents surveyed saying they would be embarrassed to admit they were lonely (Griffin, 2010). Underreporting of loneliness can lead to worsening symptoms, development of depression and anxiety, decreased immunity and associated health issues as discussed earlier. Chronically lonely adults are less likely to ask for help and more likely to use isolated activities as coping strategies rather than seeking out companionship or engagement, perpetuating a cycle of withdrawal (Anderson & Thayer, 2018).

Age UK, the largest national charity focusing on the elderly, reports that lack of opportunities to engage in community life in meaningful ways often lies at the core of loneliness (Davidson & Rossall, 2015). In a 2009 poll, 76% of older people surveyed thought the UK fails to make good use of the skills and talents of their generation (Mitchell, 2009). As loneliness relates closely to personal identity and sense of belonging (Victor & Yang, 2012), the perception that society does not see them as having a useful role may put older people at a greater risk for loneliness.

It comes as no surprise that people often feel a sense of diminishing social relevance as they age, given the phenomenon of distancing in ageism. Many younger individuals distance themselves from their elders by emphasising differences between the generations, even to the point of avoiding physical and social contact with the elderly (Chrisler, Barney, & Palatino, 2016). Further, they may see those in older generations as ‘unproductive’ and ‘draining resources’ (Gullette, 2004). Thus, to fully understand the social conditions which contribute to age-related loneliness, we need to explore the underlying causes of ageism in terms of this intergenerational gap.

4.2. From the perspective of the younger generation

Kolarova, Bediove, and Rasticova (2016) examined the factors that influence individuals from different generational demographic cohorts to choose to seek out or not seek out communication with individuals of another generation. The main focus lied on ‘baby boomers’,

Generation X⁵ and Generation Y⁶. Their results suggested that the misunderstanding between Generation Y and ‘baby boomers’ was associated with a lack of empathy on both sides. Interestingly, however, Generation X did not lack empathy towards ‘baby boomers’ and in fact preferred to communicate with them due to the belief that they hold valuable experience to pass on. Conversely, ‘baby boomers’ held no negative feelings towards Generation X either.

With regards to SDT, the willingness of Generation X and ‘baby boomers’ to communicate and establish a mutual understanding supports the psychological needs for competence and relatedness. In terms of competence, ‘baby boomers’ experience a sense of mastery and effectance when younger people seek their advice. Their need for relatedness is also met because the two generations enjoy mutual respect and appreciation, mediated by the process of sharing valuable expertise. However, due to the absence of empathy, neither of these needs is satisfied in relationships between Generation Y and ‘baby boomers’.

At what point does this lack of empathy begin? Multiple studies (See; Koh, 2012; Scott, Minichiello, & Browning, 1998) have tried to address this question. Randler et al. (2014) examined the attitudes of German adolescents towards the elderly. On average they found that pupils did in fact value the older generation, but the effect was significantly influenced by the age of the pupil and the distance to their grandparents. Most intriguingly, the results suggested that there was a positive correlation between increasing age and prejudice towards elders, and a negative correlation between increasing age and appreciation. The results revealed that ageism can begin to take root in children as early as fifth or sixth grade.

To tackle this intergenerational gap, we must first focus on fixing the negative stereotypes towards elders. As previously mentioned, this prejudice may begin as early as ten years of age

⁵ Generation X refers to the generational demographic cohort which followed the ‘baby boomers’ and preceded the Millennials; birth years usually range from the early-to-mid 1960s to the early 1980s.

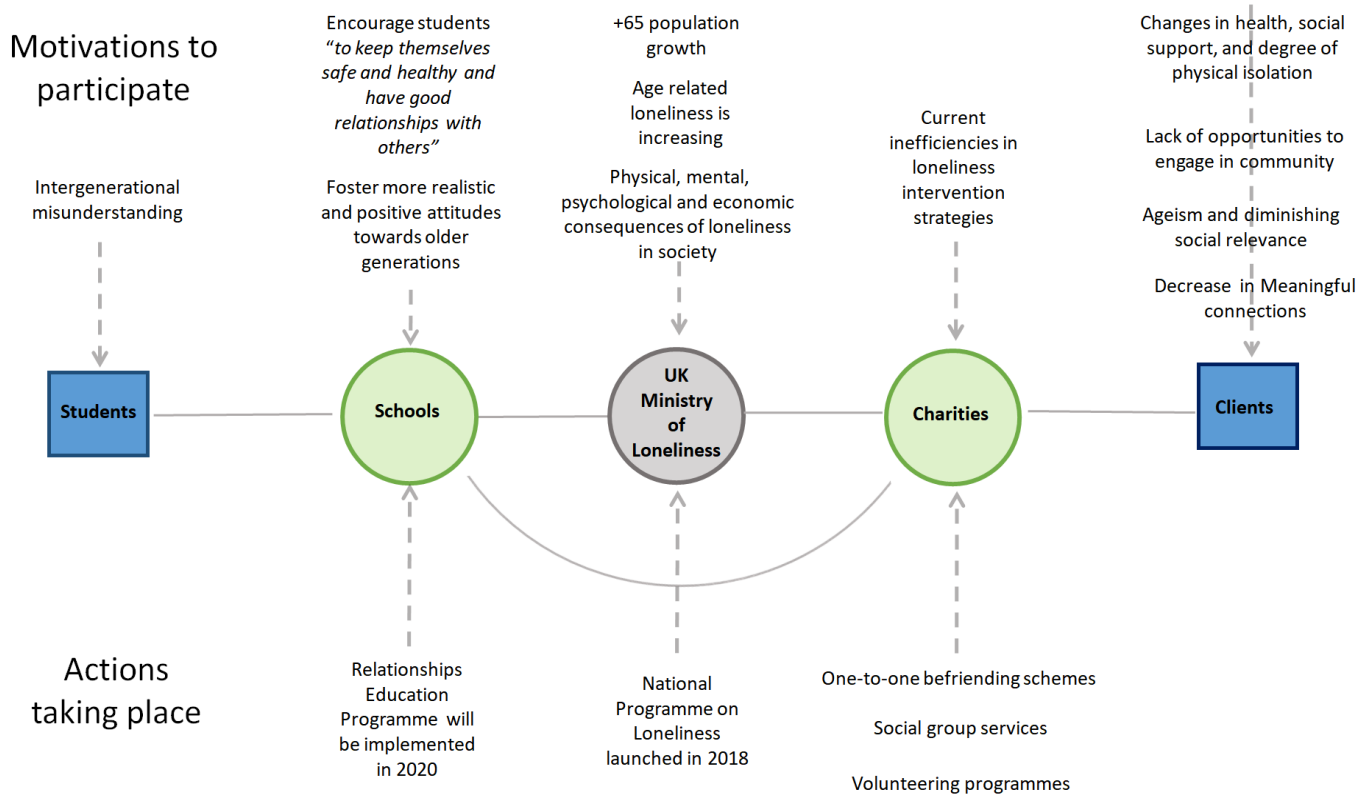
⁶ Generation Y, or the Millennials, refers to generational demographic cohort following Generation X and preceding Generation Z; birth years usually include the 1980s and 1990s.

(Randler et al., 2014). Thus, preventing or reducing ageism at an early age may, over time, decrease the intergenerational gap and diminish some of the causes of loneliness.

5. Proposed Intervention

5.1. Stakeholder analysis

Fig.3: Motivations, actions and interconnectivity between the stakeholders involved.



Based on our analysis of the causes of age-related loneliness, we have identified five stakeholders of society for whom the potential of implementing a solution is most impactful: older generations, non-profits addressing the needs of older generations, the UK government, the education system and younger generations. The diagram above illustrates the key representatives of such institutions; each of them play a key role in the implementation of the proposed intervention. Further, the figure illustrates the motivations for each stakeholder to engage in behaviours that reduce age-related loneliness and the actions already implemented or soon to be executed. As it will be further explained, our proposed intervention leverages these initiatives.

5.2. Age-related education as part of the ‘relationships education’ in schools

From the year 2020, the UK government will make it compulsory for all schools across the country to include ‘relationships education’ as part of their curriculum in both primary and secondary school. In the words of the Education Secretary Damian Hinds (Department for Education & The Rt Hon Damian Hinds MP, 2018, July 19), the aim of this class is ‘making sure they [students] are informed about how to keep themselves safe and healthy and have good relationships with others.’ As part of this new class curriculum, we propose that schools should also include *ageing education*, a class that teaches children what happens as we get older, taught by members of the older generation who are familiar and experienced with the concept. This is founded on Knapp and Stubblefield’s (2000) study which taught students the process of ageing as part of their classes. The results suggested that the course not only helped create more realistic views of ageing but also fostered more positive attitudes towards the elderly. While this study did find a positive change in students’ perceptions of ageing, our solution takes it a step further. As Newman and Smith (1997) suggested, to decrease the intergenerational gap, we must have ongoing, mutually worthwhile interactions between the young and the elder. At this stage, we propose including our new intergenerational exchange platform as part of the ‘relationships education’ curriculum.

5.3. Intergenerational exchange platform

Based on the sense of disconnect which can accompany the ageing process, our solution focuses on creating connections through an intergenerational platform, specifically between younger and older generations. This platform addresses age-related loneliness at both the individual and societal level. Connecting older people with children allows our solution to target the essence of individual loneliness by creating a context which satisfies the three basic psychological needs proposed by SDT. At the same time, including children as part of our intervention can help inhibit stereotyping from an early age, addressing the societal root of the

problem. In order to reach both segments of society, two stakeholders are included as part of the platform: schools and charities focused on addressing the needs of older people.

The proposed platform will centralise individual's information based on interests, desired interaction formats and more general data. The interest matching will be powered by a data-based algorithm accessible through a web page and app, which can only be accessed and regulated by school and charity coordinators.

To encourage student participation, we suggest that schools have all children participate in the platform as a default, following guardian or parental consent, as part of their 'relationships education'. Due to the default effect or the status quo bias (Baron & Ritov, 1994), people tend to stick to pre-selected (default) options due to a preference for the current state of affairs. Thus, if parents have to 'opt-out', they are more likely to allow their children to take part because they prefer to 'go with the flow'. As Secretary Hinds (Department for Education & The Rt Hon Damian Hinds MP, 2018, July 19) states, part of the 'relationships education' is that '[s]chools must communicate regularly with parents to help them feel comfortable about what their children are being taught.' Thus, obtaining parental consent should not require extra work, as schools are regularly communicating with the parents.

5.4. Connecting through the Pen-Pal example

We will use Pen-Pal as an example to further clarify the use of the platform. Pen-Pal will be a means of connecting young and elder in the form of letter-writing.⁷ The first step of the solution is capturing the individuals' interests and general information in order to populate the platform's database. The interest of acquiring a Pen-Pal will be one of the variables that the platform will include in its database. Other possible shared interests could be seeking advice on specific topics, including but not limited to the storytelling of historic events, pet-sitting, or

⁷ See Fig.4 in the Appendix for a graphical illustration of the Pen-Pal example.

sharing a specific hobby (e.g. knitting). The mode of interaction⁸ and additional variables pertaining to geographical location, age, or disabilities, can also be incorporated in the platform database.

One of the primary aspects of the platform is the role of the schools' and charities' coordinators. Coordinators will act as direct users of the platform, be responsible for data collection, and serve as mediators of the matches and interactions. The algorithm, populated by the abovementioned variables, will yield best possible matches. In the Pen-Pal example, the student and the elder will be matched based on common interest as this method of facilitating interaction has proven to be most successful in previous matchings (C. Cook, personal communication, November 16, 2018). The coordinators will communicate the match with the individuals and oversee the interaction between them. Given that connections based on some interests and interaction formats can be more difficult to supervise than others, the solution is flexible enough to adapt to each stakeholder's specific needs by allowing the choices on each of the variables to be restrained.⁹

5.5. The sustainability of the proposed platform

Key to the success of our intervention is ensuring participants are sufficiently motivated to use the platform. SDT examines the intrinsic and extrinsic motivations which drive human behaviour (Deci & Ryan, 2000), as well as the intrinsic growth tendencies and inherent psychological needs which provide the basis for self-motivation. Participants from schools and charities will be motivated, either extrinsically or intrinsically, to join the platform based on matching personal interests. While intrinsic and extrinsic motivations may seem antagonistic, research has shown that the latter may actually enhance the former (Ryan, Mims, & Koestner,

⁸ The Pen-Pal interaction format is clearly through physical mail. Connections will also be enabled through other traditional formats, e.g. telephone or email, or more technologically advanced means, e.g. sharing videos or skypeing.

⁹ The Pen-Pal connection is a low resource-consuming interaction format. Once the match is obtained, coordinators only need to oversee the physical letter exchange. However, more technological interaction formats will involve more time and monetary resources to implement. If the stakeholder does not hold the necessary means to support such interaction, the variables to generate such contact can be excluded.

1983). Individuals might be motivated to join the platform for external rewards (e.g. gaining advice on a specific topic or building an academic curriculum) and/or out of intrinsic motivations (e.g. sharing, helping, or connecting with others). Once the match is established, intrinsic motivation will be based on the fulfilment of psychological needs in both younger and older generations to create deeper engagement, maintain meaningful connections, and lead to internalisation of such behaviour (Vanteenkiste, Lens, & Deci, 2006).

Our solution creates a context which supports the fulfilment of psychological needs in older individuals by addressing the lack of perceived autonomy, competence, and relatedness via enabling and encouraging giving behaviours. Becoming part of the platform and acquiring a match or a connection will involve operating in a giving-receiving context, e.g. providing time and companionship. Research has shown that giving behaviour in particular is associated with the fulfilment of psychological needs. In a series of studies performed by Weinstein and Ryan (2010), volunteering increased feelings of competence, autonomy and relatedness. Another study focusing on the motivations which encourage donations in the US concluded that consumers were more satisfied with a form of donation which enhanced their feelings of autonomy, competence, and relationship with respect to the charity and its projects (Mulder & Joireman, 2016).

Providing a platform which enables and encourages giving can also improve self-efficacy and feelings of competence and usefulness, especially for those experiencing age-related loneliness. The above analysis (Section 4.1.) suggests that the role of those individuals deemed ‘elderly’ in society has been perceivably diminished and that rapid cultural and technological changes tend to alienate older generations, accentuating their feelings of reduced competence in society. Studies on elderly volunteering have reported an association between this kind of giving behaviour and self-esteem and mastery over time (Caprara & Steca, 2005; Musick & Wilson, 2003).

The need for relatedness has been defined as feeling significant to others to whom we feel (or would like to feel) connected (Ryan & Deci, 2000). According to Crocker, Canevello, and Brown (2017), one of the most important benefits of giving is the sense that one is valued by and valuable to others. Furthermore, giving can be particularly helpful to individuals who are already experiencing loneliness. For example, a longitudinal study in Wisconsin suggested that the psychological well-being of individuals with few social ties may be enhanced by volunteering (Piliavin & Siegl, 2007).

Lastly, creating a platform which supports the psychological need for autonomy in relation to giving behaviours has the potential to motivate older generations to engage in social interactions with younger generations. According to Weinstein and Ryan (2010, p. 224), 'prosocial actions that are freely done and are expressions of well-internalized values also provide opportunities to experience autonomy need satisfaction and the well-being that follows from it.' Due to the natural physical constraints which can emerge as age increases, dealing with autonomy is challenging since a physiological dependence on others tends to grow as we get older. However, having the choice to engage in giving behaviour and help others can be a powerful tool to support autonomy.

The platform can also help meet the psychological needs of children who participate. A sense of relatedness may be enhanced by children feeling that they matter to someone from a different generation who is willing to spend time and energy to help them out with their own personal interests. The need for competence may be met when children master a skill or a new subject in which they are interested, guided by an older person with experience and knowledge in the area. Finally, if children have a positive experience connected with older people through the platform, they may become intrinsically motivated to continue. Thus, self-endorsed engagement in the behaviour may help meet their need for autonomy.

By creating a context which both facilitates intrinsic motivation and supports the psychological needs of the participants, the platform provides a sustainable strategy for

bridging the intergenerational gap which contributes to the sense of disconnectedness and alienation in older people. At the same time, educating children and increasing empathy through the ‘relationships education’ can help prevent ageism in both current and future generations, reducing the incidence of age-related loneliness in the long-term.

6. Current Limitations

While our solution attempts to tackle the problem of age-related loneliness, there are aspects which cannot be addressed. Firstly, there are other causes of loneliness aside from ageism and the widening intergenerational gap. For example, we cannot solve the problems associated with age-related mental decline. However, with that in mind, a study conducted by Santini et al. (2016) investigated the role of loneliness and social relationships on mental health in older men and women. The results found that poor social relationships had a negative effect on mental health, with loneliness being a mediator. They conclude that in order to improve mental health outcomes amongst the ageing population, public health policies should include interventions which focus on relationship quality and social integration, an aspect which we have addressed with our solution.

A second limitation to discuss is the use of coordinators. While the solution attempts to elicit the feeling of giving, the use of coordinators may cause it to backfire. Firstly, as Crocker, Canevello, and Brown (2016) have suggested, when demands are large or individuals feel required to participate, giving can feel more like a cost than a benefit. Choosing to take part freely in the platform has a more positive effect on the giver as opposed to feeling forced by the school or charity, who – by default – may have extrinsically-motivated the individual to participate in absence of any inherent intrinsic value. Such extrinsically-motivated default behaviour can have negative psychological effects and cause intrinsic motivations to be crowded out by extrinsic motivations (Vanteenkiste, Lens, & Deci, 2006). For this intervention to successfully elicit giving behaviour, steps should be put in place to ensure that the use of the platform is framed in an effective manner. For example, Deci, Eghrari, Patrick, and Leone

(1994) have shown that autonomy-supportive environments enhance intrinsically motivated behaviours while controlling contexts diminish such behaviours. Creating autonomy-supportive environments in schools allows for self-initiation and choice, while preventing behaviours from feeling prescribed or guarded (Deci, Eghrari, Patrick, & Leone, 1994). However, the solution as currently proposed does not accommodate this feature. At the current stage, each of the stakeholders will have to decide how to present the platform to their members, which can cause significantly different responses depending on cognitive biases such as priming (Bargh & Chartrand, 1999) or the messenger effect (Chaiken, 1980). As the creation of a standard for autonomy-supportive environments across school curriculums requires stronger governmental regulation and time, this proposition currently lies outside the scope of our analysis.

Another drawback of using coordinators is the inability for individuals to access the platform themselves. However, due to the diversity of the interactions, it is important to put safety measures in place. We predict that, as the platform's database gets more populated, with security and safety checks becoming more advanced, the platform can become accessible through personal devices with time. Personal access to the database in the long-run should remove the 'authority figure' association and hence, facilitate the sense of giving and free choice.

Finally, the use of the platform is currently limited to the individuals who are registered with participating charities. However, the flexibility of the platform allows the intervention to be applied in multiple settings, such as through health care professionals or the private sector. Furthermore, a larger proportion of individuals affected by age-related loneliness would be reached if the platform became accessible through personal devices.

This limitation also holds for students. While all children by law must attend schools, many may have social constraints which prevent them from accessing and being on the platform. However, while the platform is a highly recommended and essential step for students

to get involved, implementing the process of ageing classes and having an elder teach them is still an effective strategy for removing ageism and prejudice towards the older generation (Knapp & Stubblefield, 2000).

7. Conclusions

Our proposed intervention provides solutions to the problem of intergenerational connectivity introduced at the beginning of our essay. In light of our analysis, SDT provides a powerful framework for understanding the essence of the problem and for designing a sustainable intervention. As previously discussed, one of the main challenges posed by the current strategies taken by charities working on age-related loneliness is the lack of efficiency in the matching process. The proposed platform will employ an efficient algorithm which will dramatically decrease the amount of time and resources required to match individuals successfully. By building on the existing infrastructure of the stakeholders involved and easing as well as fostering connections in a more resource efficient manner, our proposed solution aims to facilitate meaningful relations by creating a context that supports autonomy, competence and relatedness across generations. Crucially, both the young and elder can benefit from giving behaviours as an essential means of need satisfaction.

Through our intervention, we can make a direct and immediate impact on those who are currently lonely and seeking help. Furthermore, because loneliness can be more difficult to tackle once it has manifested, our intervention also seeks to address societal factors which contribute to the disconnect between younger and older generations. For this reason, we recommend that schools implement *ageing education* as part of the new 'relationships education' in order to prevent ageism and reduce age-related loneliness in the long-term. However, in the future, this intervention should not be reduced to the five stakeholders identified, but rather incorporate a multitude of stakeholders to provide a diverse pool of individuals and hence, to target disconnect and ageism on a more widespread societal dimension.

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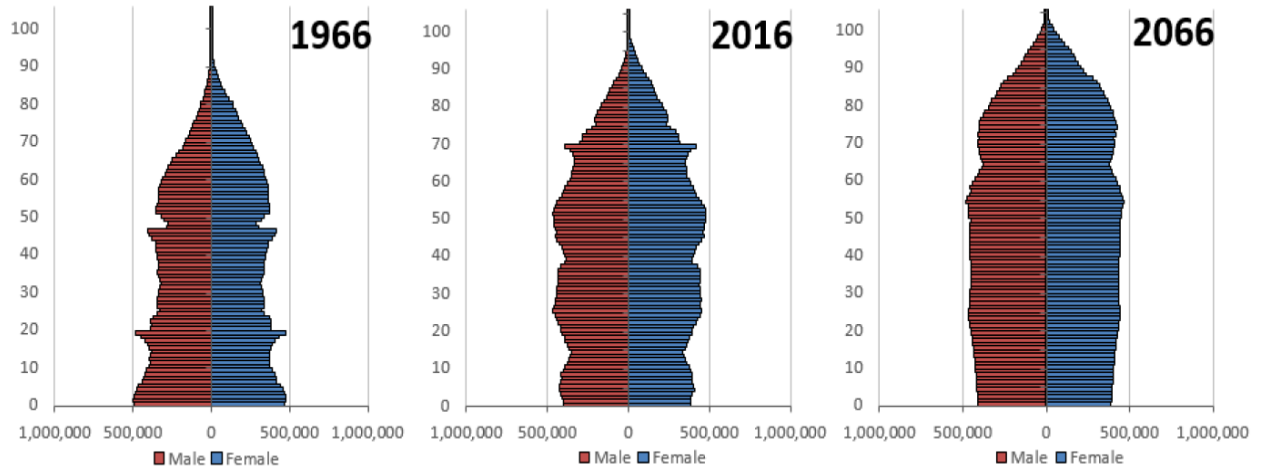
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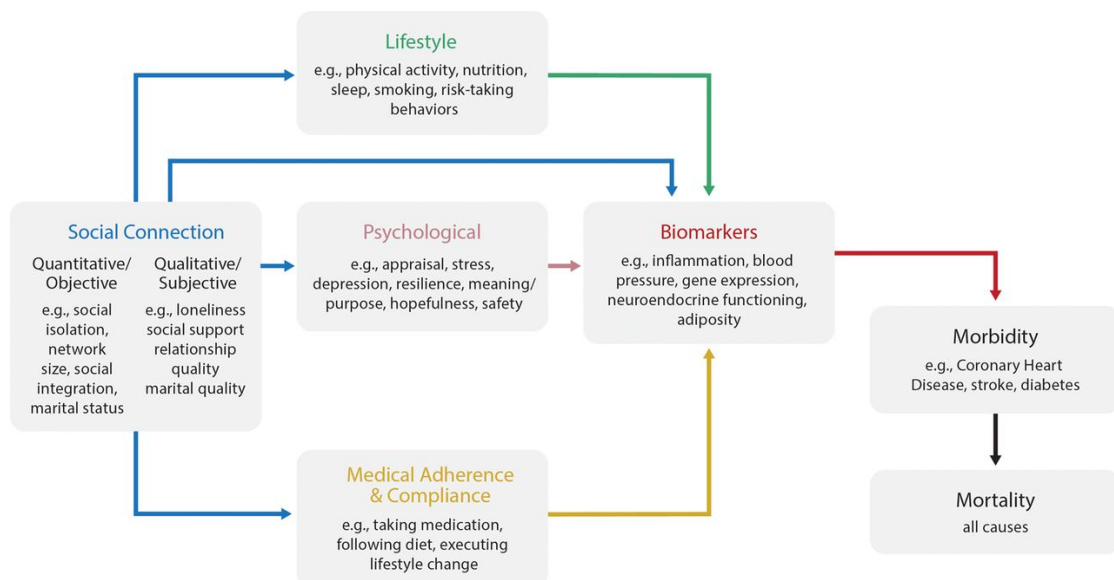
Appendix

Fig.1: Population pyramids, 1966, 2016 and 2066 (principal projection), UK.



Source: Population estimates, Principal population projections, 2016-based, (ONS, 2018b)

Fig.2: Loneliness impact on morbidity and mortality.



Source: Holt-Lunstad & Smith, 2016

Fig.4: Graphical illustration of the proposed Pen-Pal example

The PEN-PAL
example

