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Escape loneliness by going digital: A quantitative and qualitative evaluation of a Dutch experiment in using ECT to overcome loneliness among older adults

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Abstract

Background: This study evaluates the outcomes of an Internet-at-home intervention experiment that intended to decrease loneliness among chronically ill and physically handicapped older adults through introducing them to the use of an electronic communication facility. **Method:** To determine the effectiveness of the experiment in terms of reducing loneliness, 15 older adults were interviewed three times: shortly before the start, two years later and immediately after termination of the experiment, while their loneliness scores at zero and post-measurement were compared with those of a control group. **Results:** Both the participants and the control persons experienced a reduction in loneliness over time. However, the reduction was only significant for the intervention participants. Moreover, the changes in loneliness were significantly greater among the participants compared to the control persons. When looking more in detail, the effect of the experiment was only significant regarding emotional loneliness and among the highest educated. Findings of the qualitative research enabled us to understand the mechanisms through which the intervention helped alleviate loneliness. E-mail was found to facilitate social contact. Furthermore, the computer and Internet were often used to pass the time, taking people's minds off their loneliness. Unexpectedly, the intervention also improved people's self-confidence. **Conclusion:** The decline in loneliness is likely to be greater if persons under more favorable circumstances are selected and if more social functions of the Internet are used.

Introduction

In the Netherlands about one-third of the population of 55 years and over feel moderately or severely lonely (de Jong Gierveld, 1999). Many factors have been identified that increase the risk of loneliness among the elderly population, including widowhood, physical or mental decline and low income. Many of these factors are difficult to prevent or to improve. Consequently, it is not easy to develop effective loneliness intervention programmes among the elderly. A wide range of interventions have been tried to alleviate loneliness among the elderly, little is known, however, about the effectiveness of these interventions. Cattan, White, Bond and Learmouth (2005) identified only 76 publications focusing on the effectiveness of loneliness prevention programmes that were based on high quality research. These 76 publications reported about 30 quantitative and 12 qualitative outcome studies. Among the 30 quantitative studies, 17 evaluated group activities, ten concerned one-to-one social support and

three were neighbourhood oriented. Half of the quantitative studies were randomized controlled trials, and one-third were non-randomized controlled studies. Three group interventions used electronic communication tools (ECT) and were conducted in the US. One of these interventions focused on caregivers to people with Alzheimer's disease (Brennan, Moore, & Smyth, 1995). They were linked to a computer network that provided information, decision-making support and interpersonal communication. After one year, however, there was no significant reduction in perceived social isolation among the caregivers. The two other ECT-intervention programmes were five-month Internet training among older residents in community housing (White et al., 1999; 2002). Methodological limitations of the study design restrained Cattan et al. (2005) from judging the effectiveness of these two interventions. In this study we report on a recent Dutch experimental,

one-to-one, Internet-at-home project aimed at decreasing loneliness for chronically ill and physically handicapped older adults.

The percentage of people in the Netherlands who own a PC has increased from 18% in 1985, via 70% in 2000 to 81% at the beginning of 2004. The percentage of people who have an Internet connection at home has climbed from 3% in 1995, via 21% in 1998 to 74% in 2004; the Internet is used primarily to surf the Net and for e-mail. Lower users of ECT include single women, the less educated, people with a low level of income, the unemployed and the elderly (de Haan, 2004; van Dijk, de Haan, & Rijken, 2000).

Paradoxically, seniors have most to gain from fast ECT developments (van der Leeuw, 2004; van Dijk, 2002). Teleshopping and smart houses are modern ECT products that improve the independence and self-care abilities of people in need of care. In addition, the Internet offers easy access to a wealth of information, such as information about their own physical disabilities, from a whole host of sources. The Internet also offers older adults the possibility of strengthening ties with friends and family and forging new contacts, regardless of time or location. In view of these advantages, many efforts have been made in the Netherlands in recent years to encourage older adults to take to the Net. In this context, the Eindhoven branch of SeniorWeb (a low-threshold, non-profit organization in the Netherlands, introducing people who did not grow up with computers to the many possibilities of the Internet, with the purpose of increasing the social participation of this target group), in co-operation with a number of local organizations, decided to set up a small-scale, experimental, Internet-at-home project called 'Esc@pe...als je wereld kleiner wordt' (when your world grows smaller). Because the Esc@pe project was one of 18 experimental loneliness-intervention programmes funded by a

private funding agency, loneliness was from the beginning the key outcome variable.

Loneliness

Intervention experiments in loneliness have been connected to longstanding loneliness theories (de Jong Gierveld, 1984; Linnemann, 1996; Peplau, Miceli, & Morash, 1982; Weiss, 1973) that are linked to cognitive and learning theories in psychology. Loneliness is defined as the negatively perceived difference between the relationships one has and the relationships one would like to have (i.e. personal standards regarding relationships). It is not so much a matter of the number of relationships, or a lack thereof, but rather a lack of quality in the relationships people have. Feelings of loneliness may, for example, arise if people feel that their existing relationships are not sufficiently meaningful or that there is 'something missing'. We can only speak of loneliness if the discrepancy between actual and desired relationships is perceived to be negative by the person in question. Figure 1 illustrates this definition. Weiss (1973) introduced a distinction between two types of loneliness: 'social' and 'emotional' loneliness. Social loneliness is related to deficient social integration, a lack of contact with people with whom one shares certain common traits, such as friends. Emotional loneliness occurs when someone misses a close, intimate relationship with one other person, usually a partner. The distinction clearly shows which types of relationships are lacking. It also shows that the purpose served by one type of relationship cannot be simply replaced by those of another type of relationship. This assumption is supported by various researchers (Allan, 1979; Dykstra, 1993). The fact that a partner relationship is missing, for example, cannot be made good by increasing one's network of friends and

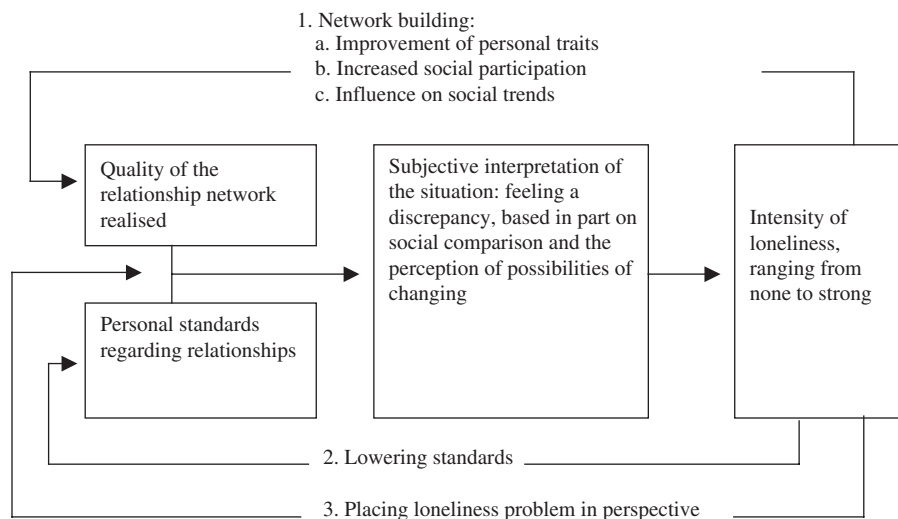


Figure 1. Loneliness as a result of an interpretation of the quality of relationships and personal standards regarding relationships, with possible ways of coping with loneliness.

acquaintances, or vice versa. The distinction also assumes that efforts to reduce social loneliness require a different approach from those aimed at reducing emotional loneliness.

Coping styles

Figure 1 shows that there are three ways in which loneliness could be reduced (Fokkema, 2004; Linnemann, 1996). These are also referred to as 'coping styles'. First of all, the perceived discrepancy between actual and desired relationships could be reduced by increasing the number of relationships to the desired level ('network building'; cf. Kam-Shing & Sung-On, 2002). A second solution would be to reduce the severity of the feelings of loneliness by lowering unrealistic desires and overly high expectations regarding relationships ('lowering of standards'; cf. Dykstra, 1990). The third possible way of overcoming loneliness is to learn to cope with feelings of loneliness. In this case, there is still a discrepancy between actual and desired relationships but an attempt is made to reduce the effect of this discrepancy by seeing things in perspective, acceptance, denial or distraction ('reduction of the importance of the loneliness experience'; cf. Linnemann, 1996).

The first solution—to build one's network—can be further specified as there are three possible reasons why the actual relationships do not meet people's expectations. First of all, the reasons could be related to the person him- or herself (intra-individual causes). Examples of such personal traits are a lack of social skills and insufficient self-confidence. A loneliness intervention could be directed to the improvement of these personality traits, with the aim that people will be more successful in forging and maintaining relationships. Secondly, the reasons could be related to a person's contacts with other people (inter-individual causes). This includes such things as a shrinking social network as a result of serious illness or the death of one's partner, loss of family or friends or moving house. In this case, interventions focus on enlarging people's networks by encouraging them to take part in social activities or on offering them the opportunity of coming into contact with other people. Thirdly, the reasons could pertain to the way people socialize with others. Several developments are noticeable in society and community that hinder social contact, for instance: negative stereotypes about the elderly and about growing old; declining solidarity between and within generations; and far-reaching changes in the composition of the population in certain city neighbourhoods. Activity programmes in this respect will try to set up conditions in order to reverse these developments.

In principle, all the three coping styles are distinct and, therefore, related interventions could be instrumental in alleviating loneliness. We may,

however, expect that the coping style and related interventions will be more effective if they are tailored to the cause of loneliness and related type of loneliness. There would, for example, be little use in encouraging an old man to go to a men's club: if he is in search of a new female partner; if he suffers from social anxiety; if he can barely understand people because he is hard of hearing; or if he is very demanding in terms of the friends he makes. And since there are usually several causes to loneliness we may also expect that loneliness interventions will have more effect if they focus simultaneously on various coping styles. Regardless of the style opted for, any intervention aimed at helping people to overcome loneliness will only have a chance of succeeding if the following three conditions are met: 'knowing', 'wanting' and 'being able to'. The person concerned should be aware that he/she has a loneliness problem and know which possibilities the intervention offers to address the problem. 'Wanting' refers to the fact that the person in question should be motivated to make an effort to escape loneliness. If people who in principle would benefit from an intervention are not willing to co-operate, any intervention is doomed to fail. 'Being able to' refers to whether someone is able to take part in an intervention. Physical disabilities such as deafness, having difficulty walking or being visually impaired, may make it difficult to take part. Financial limitations may also prevent people from participating in an intervention.

The aim of this study is to establish whether the Esc@pe experiment was successful. We focus on four research questions. The first question is: Did the Esc@pe project reach the target population, i.e. housebound chronically ill or physically handicapped older people who feel very lonely? Earlier intervention experiences revealed that it is not easy to involve very lonely elderly. People do not like to admit openly to being lonely, which easily creates a barrier to participating in loneliness-intervention programmes.

The second question is: To what extent does modern computer technology (PCs and the Internet) contribute to alleviating feelings of loneliness among this highly specific target group? People who are chronically ill or disabled tend to be socially isolated; the use of e-mail and the Internet would offer them an opportunity to take part in society once again. In addition, past research already found positive effects of Internet use on psychological well-being of older adults in institutional settings (McConatha, McConatha, & Dermigny, 1994, 1995; White et al., 1999; 2002). Therefore, we expect the Esc@pe project to be an effective intervention in combating loneliness in general and social loneliness in particular.

The third research question is: Does the loneliness reduction differentiate between higher and lower educated elderly? Low income would not be a problem because a PC was offered for three years

for free. People with higher education develop their digital sensitivity faster than the lower educated and more often explore the potential functions of the Internet. In addition, at least among the Dutch elderly, higher educated elderly are more familiar with the English language than the lower educated (Wasser & Richmond-Abbott, 2005). So, we hypothesize that the reduction in loneliness will be greater among higher educated participants.

Finally, through open interviews we aimed to gain insight into the fourth research question: What are the main loneliness-reducing mechanisms of the Esc@pe project and its necessary preconditions? According to the coping styles discussed above, we expect a reduction in loneliness in two ways. The Internet gives the opportunity, especially for chronically ill and physically handicapped elderly, to develop new contacts and to maintain contact within existing relationships (coping style 1b: network building—increased social participation). In addition, the use of the PC and Internet could distract the participants from their loneliness experience by involving them in a new world of electronics (coping style 3: reduction of the importance of their loneliness).

Methods

Intervention

In the Esc@pe project fifteen seniors were given on loan, free of charge, a PC and peripheral equipment (including Internet access through a cable connection, a monitor, speakers and a printer) for a period of three years (September 2001–September 2004). Participants were recruited by volunteer home visitors of the Red Cross and De Zonnebloem (a charity for people with a physical disability) who were able to propose seniors who met the following selection criteria: (1) living alone; (2) few possibilities to leave the home, which would bring them into contact with others; (3) participant in a home visiting scheme of one of the organizations involved in the project; (4) not yet a PC and Internet user, but with no negative attitudes towards computers; (5) ability to work with a standard PC; (6) sufficient sight and hearing abilities; and (7) willingness to take part in the study. The project team selected the first 15 participants from the 22 candidates proposed on the basis of the forms completed by the volunteer visitors. The candidates who were not selected were placed on a back-up list. The project team decided which people on this list would be the first to replace any drop-outs based on the zero measurements. The project team members involved were informed about the project during a special meeting in June 2001. The candidate participants were able to personally apply for the project after the possibilities of the project had been demonstrated in their homes.

At the start of the project, the participants were given five two-hour lessons at home by experienced teachers, all volunteers of SeniorWeb Eindhoven. During these lessons the participants learned how to e-mail and how to use the Internet. During the rest of the project, the participants were supported and coached by visiting volunteers from the Red Cross or De Zonnebloem who had also paid home visits to the participants once every two or three weeks prior to the start of the pilot project. The visiting volunteers were not allowed to increase the frequency of their visits in order to influence the loneliness effect of the intervention as little as possible. If participants had been visited more frequently for instruction and support, they could have started feeling less lonely simply because they were visited more often in real life rather than by their contacts in cyberspace (the so-called Hawthorne effect).

SeniorWeb Eindhoven organized special training programmes for the volunteer home visitors who had little or no computer experience themselves. The volunteer visitors could fall back on SeniorWeb's volunteers at all times in the event of problems and the participants, who were also given free membership to SeniorWeb, were allowed to use its PC Help Desk and PC Help at Home facility free of charge. At a later stage, a local maintenance and trouble shooting team (POTS) was set up specifically for this project. For research reasons, participants were asked to get in touch with this team through the volunteer visitors.

Research population

Only eight of the fifteen participants who embarked on the project remained until the end. Seven of the initial participants did not complete the project due to: death ($n=3$); rheumatism ($n=1$); too much difficulty learning to work with a computer ($n=1$); moving house ($n=1$); and 'a better alternative' ($n=1$). Six new participants were taken from the backup list; two of them died before the end of the project. A total of nine people dropped out and the project was closed with twelve people. We have restricted our findings to these twelve participants, who we will refer to as the intervention group in the following. The average age of the intervention group at the start of the project was 66 years; seven people were older than 65. Eleven participants were women. Despite the selection criteria to live alone, one of the participants was married and lived with her partner and one lived with other family members. Six of the participants had completed primary school. One participant had graduated from a lower vocational school. The remaining five had completed secondary education or higher (vocational) education.

As it was impossible for practical reasons to put together a control group, we used a so-called virtual control group made up of respondents of the Digistein surveys held in 2002 and 2004.

These surveys formed part of a population survey of the City of Eindhoven, in which 1461 inhabitants of Eindhoven aged 15–84 took part in 2002. From this research group only fourteen people could be selected who also completed the questionnaire in 2004, who were 50 years or older in 2002, who had never used a PC and the Internet until the end of the Esc@pe project, and who were lonely or very lonely at the time of the first interview. The control group did not differ substantially from the intervention group in terms of age and level of education. At zero measurement, the average age of the control group was 68 years; nine of the fourteen people were over 65. Six people of the control group had completed secondary or higher (vocational) education. The control group *did* differ in terms of sex and living arrangement. Half the people in the control group were men and no less than one third lived with their partners.

In order to quantitatively determine the loneliness-reducing effect of Esc@pe, the severity and type of loneliness were measured among the intervention group and the control group two and three times respectively. In both these groups, the zero measurement was carried out using a structured questionnaire during face-to-face interviews held in September 2001 and September 2002, respectively. Subsequent measurements among the intervention group were made in November 2003 and September 2004. Four participants in the intervention group joined the group at a later stage to replace participants who had dropped out before the interim measurement. The zero measurement of these participants was carried out in August 2002, October 2002, February 2003 and October 2003. Subsequent measurements among the intervention group were made with the aid of a questionnaire on the Internet. Among the control group, the zero measurement was followed only by a post-measurement, in September 2004.

Measures

Degree of loneliness was measured with the aid of the loneliness scale developed by de Jong Gierveld and Kamphuis (1985). This scale contains eleven items about aspects of loneliness, without actually using the words 'lonely' or 'loneliness'. The five positively formulated items express feelings of social embeddedness, a sense of belonging. For example: 'There are plenty of people I can turn to in times of need'. The six negatively formulated items express feelings of desolation and of missing an attachment relationship. An example of such an item is: 'I miss having a really close friend'. The answer categories are: 'yes!' = totally agree; 'yes'; 'more-or-less'; 'no'; and 'no!' = totally disagree.

The first step was to dichotomize the answers using the following procedure. Disagreeing (the answers 'no!', 'no' and 'more-or-less') with the five items that

were positively formulated and agreeing (the answers 'yes!', 'yes' and 'more-or-less') with the six negatively formulated items is indicative of feelings of loneliness and was assigned the code 1. Summing the dichotomized answers to the eleven items gives a scale score ranging from 0–11. The higher the score, the lonelier the person is. A score of three or more is indicative of loneliness (de Jong Gierveld, 1999). When constructing their loneliness scale, de Jong Gierveld and Kamphuis did not make a distinction between social and emotional loneliness since it was their intention to develop a unidimensional measure of the severity of feelings of loneliness. The items were, however, developed with Weiss's distinction in mind. In addition, recent work demonstrates thoroughly that a distinction of two subscales is legitimated despite the fact that the social loneliness subscale coincides with the positively formulated and the emotional subscale with the negatively formulated items (Dykstra & Fokkema, 2007; van Baarsen, 2001; van Tilburg, Havens, & de Jong Gierveld, 2004). That is why we will not only present the total score on the loneliness scale, but also make a distinction between social loneliness (maximum score = 5) and emotional loneliness (maximum score = 6).

Were possible reduced feelings of loneliness purely the expected result of improved social relationships or distraction from loneliness, or did the intervention also have other loneliness-reducing elements? And what were the circumstances under which the intervention was effective or ineffective? Qualitative research was carried out to find the answers to these questions. Those participants who crossed the finishing line ($n = 12$) and their volunteer visitors were asked to complete an evaluation form. In addition, in-depth interviews were held with four participants, two project team members and the project leader. All interviews had a 'personal' style. This means that they tried to keep them as close to a 'casual' conversation as possible to build trust and, where possible, to avoid socially desirable answers. The interviews lasted an average of two hours.

Analysis

The following procedure was chosen to assess the intervention effect on loneliness. Firstly, we tested whether the loneliness score had dropped significantly within both the experimental group and the control group between zero measurement and post-measurement. For this we used paired *t*-tests. The analysis was carried out both in terms of the total loneliness score and for the social and emotional subscales, and also for lesser educated (up to lower secondary) and better educated (upper secondary or higher) separately. Secondly, in order to determine whether the reduction in feelings of loneliness among participants could

indeed be attributed to the intervention, we investigated whether there were differences in loneliness between the two groups at T0 and whether any changes in loneliness were greater in the experimental group than in the control group. For this, a multivariate multilevel regression was specified, where observations were 'nested' within the group of respondents. The regression analysis also controlled for the time interval between baseline and the post-observations.

Results

Table I shows the average scores of the intervention and control groups on the (social and emotional) loneliness scale for all three (intervention group), or both (control group) time points.

Prior to commencement of the project, the average loneliness score for the intervention group was 8.1 (SD=2.4). This is very high: a score of three or higher is indicative of loneliness (de Jong Gierveld, 1999). In the large-scale national survey 'Living Arrangements and Social Networks of Older Adults' (Knipscheer, de Jong Gierveld, van Tilburg, & Dykstra, 1995) the average loneliness scores for single older men and women were much lower: 2.2 for single men and 2.4 for single women. Therefore, in answer to the first research question, Esc@pe had succeeded in selecting very lonely seniors.

In terms of the second research question, feelings of loneliness among participants in Esc@pe clearly decreased during the project. After two years (T0-T1) the total score on the loneliness scale had dropped significantly ($t=2.20$; $p=0.050$): from 8.1 (SD=2.4) to 6.7 (SD=3.6). This reduction in the loneliness score was still significant ($t=2.79$; $p=0.018$) after three years (T0-T2) and the average loneliness score dropped to 5.8 (SD=3.9). We did see, however, that the greatest reduction in loneliness took place between zero measurement and the interim measurement. Feelings of loneliness also decreased among the control group (from a mean of

8.2; SD=1.9 to 7.5; SD=2.6) between the two measurements—this reduction was not significant. The outcomes of the regression analysis further show that the difference in reduction in loneliness between the intervention and control groups was significant ($p=0.050$).

The participants in Esc@pe especially experienced a reduction in feelings of emotional loneliness. The average score on the emotional loneliness subscale dropped between all measurements and was significant between T0 and T1 ($t=2.35$; $p=0.039$) and T0 and T2 ($t=3.20$; $p=0.008$), but not between T1 and T2 ($t=1.20$; $p=0.256$). On the social loneliness subscale we saw a reduction between all measurements, but the reduction was not significant in any of these instances.

Table II confirms our expectation that the reduction in loneliness especially applies for those participants with a high level of education (third research question). The difference between T0 and T2 among the lesser educated in the group of participants was -1.14 ($t=1.019$; $p=0.348$); among the better educated the equivalent figure was -4.00 ($t=4.472$; $p=0.011$). Loneliness decreased among both the lesser and the better educated in the group of participants, but the decline was clearly significant only in the case of the better educated. Within the control group, loneliness was only reduced slightly (not significant) among the lesser educated (-1.25 ; $t=1.616$; $p=0.150$) and did not change among the better educated in the control group.

Qualitative findings

As expected, the intervention was found to alleviate feelings of loneliness by offering people a network of contacts (see Figure 1, coping style 1b). The participants were less able than most people to keep in touch with their real life social contacts because of chronic illness or handicap, which increased the risk that they would become socially isolated. The Internet proved to be an ideal medium

Table I. Average scores of the participants in Esc@pe ($n=12$) and the control group ($n=14$) on the loneliness scale and the subscales social and emotional loneliness at different points in time.

| | T0 | T1 | T2 | Difference T0-T1 ¹ | Difference T0-T2 ¹ |
|------------------------|------|------|------|----------------------------------|----------------------------------|
| Experimental group: | | | | | |
| Total score loneliness | 8.08 | 6.67 | 5.75 | -1.42 [~] | -2.33* |
| Social loneliness | 3.25 | 2.83 | 2.42 | -0.42 | -0.83 |
| Emotional loneliness | 4.83 | 3.83 | 3.33 | -1.00* | -1.50** |
| Control group: | | | | | |
| Total score loneliness | 8.21 | | 7.50 | | -0.71 |
| Social loneliness | 4.00 | | 3.64 | | -0.36 |
| Emotional loneliness | 4.21 | | 3.86 | | -0.36 |

Notes: T0 = zero measurement September 2001 (experimental group including replacements) and September 2002 (control group); T1 = interim measurement November 2003; T2 = post-measurement September 2004.

¹Negative figures imply a reduction in loneliness.

[~] $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

to get in contact and stay in touch with others, despite poor health. Most of this contact was with family and acquaintances ($n=10$) and, to a far lesser extent, contact with other Esc@pe participants ($n=3$). In addition, as expected, the intervention resulted in more regular and improved contact between the participants and their volunteer visitors: they got to know and understand each other better.

The intervention was also found to have a positive effect on personal traits (coping style 1a). Learning to use the computer and finding one's way around in cyberspace were found to increase people's self-confidence. As the participants had no experience whatsoever with computers prior to the project, it is hardly surprising that some of them initially had qualms about it. Would they ever get the hang of it? Once they felt comfortable using the computer, they saw this as a personal triumph and they were proud of themselves. The increased confidence was not restricted to the computer. One volunteer visitor, for example, told us that her participant had not driven a car for a long time after she had had a stroke, but that taking part in Esc@pe had encouraged her to take a few lessons and that she had started driving again. That same participant had also plucked up the courage to go to the Community Centre for dinner again and to enrol for a computer course for over-55s. So, the positive effect on personal traits in turn facilitated social contact.

A second way in which the intervention reduced loneliness was by placing the loneliness problem in perspective (coping style 3). Many of the participants used the computer and Internet as a meaningful way to pass the time (games, decorating e-mails, looking for information, learning to use computers, etc.), distracting their attention from the lonely situation they were in. There was no evidence that the intervention contributed to a reduction in loneliness by lowering people's expectations and wishes in terms of their social relationships (coping style 2).

The loneliness-reducing mechanisms of Esc@pe were not as effective, or had no effect whatsoever,

Table II. Average scores of the participants in Esc@pe ($n=12$) and the control group ($n=14$) on the loneliness scale at two points in time by level of education.

| | T0 | T2 | Difference T0-T2 ¹ |
|-------------------------|------|------|----------------------------------|
| Experimental group: | | | |
| Low level of education | 7.57 | 6.43 | -1.14 |
| High level of education | 8.80 | 4.80 | -4.00* |
| Control group: | | | |
| Low level of education | 8.88 | 7.63 | -1.25 |
| High level of education | 7.33 | 7.33 | 0.00 |

Notes: T0=zero measurement September 2001 (experimental group including replacements) and September 2002 (control group); T2=post-measurement September 2004.

¹Negative figures imply a reduction in loneliness.

* $p<0.05$.

among people who had recently experienced negative life events; who were not motivated; or who did not have the necessary skills (using the Internet requires certain communication and computer skills). The following quote aptly summarizes this:

'I guess I was becoming rather lonely here. It might sound strange, but all I was doing was [caring for my children and grandchildren and looking after] my mother, only things that really had to be done. I didn't really come into contact with people. My family lives [far away] so I don't get to see them that often. I suppose that if you simply stay indoors and are feeling down-and-out, no one will come and drag you out of it. Not even my children, they have a life of their own, their own jobs and little pleasures, so no, that doesn't help either. When your world grows smaller, that's our project. Well, that's what happened to me. Then you just sit here, sit here idly and I don't always enjoy watching television either and then you start reading a book but you can't keep your mind to it... And now this, [Esc@pe], it's really quite something. You're occupied with something, time flies and you improve your language a bit. In the beginning, well, the mouse would go all over the place, except in the right direction. I've had, I guess, about five lessons and for the rest I did it by myself, I've managed. To start with, I knew nothing about computers. I saw that my children had a computer, but it never really occurred to me that I would [ever] use it. I said, 'I don't think I'll ever learn this. This really is a computer age, especially for the children, but not for me'. And then I said 'yes'. I was a little afraid, well afraid, you don't really have to be afraid because if you don't like it you can send it back, of course, you can have them come and fetch it. But for me that wasn't the case. I knew when they asked me that I would stick it out until the end. My grandson said, 'Well, grandma'—he always says granny— 'well, granny, our mum won't ever get the hang of it because she's so untechnical [laughing] but you will, it will be fine'. It's good to get a compliment [like that] [laughing]... Those e-cards you can find and send off are just great. And if they are beautiful and the other person gets it and then gives you a compliment, that's just wonderful. I find this very enriching, I really do. Yes, I really do, I can't imagine my life without it [laughing]... I'm happy I was given this chance... For me, it's really terrific.'

Discussion

The results suggest that the Esc@pe experiment was a success. Firstly, Esc@pe selected very lonely seniors with a chronic disease or handicap.

Secondly, a significant reduction in feelings of loneliness was observed between the start and finish of the project among the group of participants; a non-significant reduction in loneliness was observed in the control group and the difference in reduction between the experimental and control group was significant. When broken down by type of loneliness, the effect of the experiment was only significant with regard to emotional loneliness; contrary to our expectations, no significant decreases in feelings of social loneliness were observed. Furthermore, the effect especially holds for the more highly educated; loneliness did reduce among the lesser educated as well, but the decline was not significant. This supports our assumption that better educated people find it easier to write e-mails, are more proficient in English, find it easier to acquire computer skills and/or had learned more during the computer lessons and were therefore able to do more with the computer. The difference in loneliness reduction by level of education could, however, also be explained by another factor. At the start of the intervention the better educated were lonelier on average than the lesser educated: 8.8 compared with 7.6. In other words, there was more room for improvement among the more highly educated.

The qualitative results showed that the expected loneliness-reducing effects were achieved. Our expectation was that the use of the PC and Internet would reduce feelings of loneliness by improving the participants' social lives and distracting them from their loneliness experience. The intervention resulted in more contact with the outside world and improved the contact between the participants and their personal volunteer visitors. Moreover, the computer and the Internet were used to pass the time, pushing out feelings of loneliness. An increase in self-confidence due to the intervention had not been expected.

Given its modest scope and the fact that the experiment was only carried out once, we cannot generally conclude that the Internet-at-home project is a successful loneliness intervention for elderly people who are housebound due to a chronic disease or disability. Another limitation of the research is the sub-optimal matching of the intervention group and the control group, both in terms of the background characteristics of the respondents and the time of measurement (the difference between the zero measurement and the post-measurement was three years for the intervention group—excluding those who replaced drop-outs—compared with two years for the control group). We therefore cannot conclude that the reduction in loneliness observed among the participants could be attributed to the intervention.

The effects observed are so promising, however, that repetition of the experiment on a larger scale and with a comparable control group would be very useful. The project team should then define the

target group with great care. Esc@pe included only seniors living alone who had never worked with a computer before. Candidates who had negative attitudes towards computers and the Internet were not selected. The degree to which candidates were capable of and motivated to start working with a computer was not addressed during the selection process, however. As a result of these selection criteria, Esc@pe helped people with very strong, almost dire feelings of loneliness at the start of the project. An Internet-at-home project for housebound seniors may well be even more successful if people who still live with their partners, who have basic computer skills, and who are more highly motivated to work with computers are included. We also recommend excluding from participation those people who had recently experienced a negative life event or who were not willing to change. Another possibility would be to make even more use of the facilities offered by computers and the Internet than Esc@pe did. This could include such things as stimulating real-time chat contact, audiovisual communication, participation in message boards and contact with people in similar positions.

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