Aging & Mental Health
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713404778

The effects of reminiscence on psychological well-being in older adults: A meta-analysis

Ernst Bohlmeijer[a]; Marte Roemer[b]; Pim Cuijpers Phd[ab]; Filip Smit[ab]
[a] Trimbos-institute, Utrecht, The Netherlands [b] Free-University, Amsterdam, The Netherlands

To cite this Article Bohlmeijer, Ernst , Roemer, Marte , Cuijpers Phd, Pim and Smit, Filip(2007) 'The effects of reminiscence on psychological well-being in older adults: A meta-analysis', Aging & Mental Health, 11: 3, 291 — 300
To link to this Article: DOI: 10.1080/13607860600963547
URL: http://dx.doi.org/10.1080/13607860600963547

Aging & Mental Health, May 2007; 11(3): 291–300

Routledge
Taylor & Francis Group

ORIGINAL ARTICLE

The effects of reminiscence on psychological well-being in older adults: A meta-analysis

ERNST BOHLMEIJER[1], MARTE ROEMER[2], PIM CUIJPERS PHD[1,2], & FILIP SMIT[1,2]

[1]*Trimbos-institute, Utrecht, The Netherlands and* [2]*Free-University, Amsterdam, The Netherlands*

(Received 16 March 2006; accepted 21 July 2006)

Abstract
This paper presents the results of a meta-analysis to assess the effectiveness of reminiscence on psychological well-being across different target groups and treatment modalities. Fifteen controlled outcome studies were included. An overall effect size of 0.54 was found, indicating a moderate influence of reminiscence on life-satisfaction and emotional well-being in older adults. Life-review was found to have significantly greater effect on psychological well-being than simple reminiscence. In addition, reminiscence had significantly greater effect on community-dwelling adults than adults living in nursing homes or residential care. Other characteristics of participants or interventions were not found to moderate effects. It is concluded that reminiscence in general, but especially life review, are potentially effective methods for the enhancement of psychological well-being in older adults. However, a replication of effectiveness studies of the well-defined protocols is now warranted.

Introduction

Aging can be seen as a continuous process of adaptation (Atchley, 1989; Baltes, 1987). Throughout life people are confronted with life-events and challenges they have to cope with. This process of adaptation is a dynamic, life-long process in which people and the environment mutually influence each other (Baltes, 1987). Baltes and Carstensen (1996) defined successful aging as the maximization and attainment of positive outcomes and the minimization or avoidance of negative outcomes. Different processes have been proposed to play a role in successful aging, such as the development and maintenance of primary control (Heckhausen & Schulz, 1995), socio-emotional selectivity (Carstensen, 1995), accommodation and assimilation (Brandstädter, 2002) and selective optimization with compensation (Marsiske, Lang, Baltes, & Baltes, 1995). The importance of reminiscence for successful aging has also been stressed in the last decades (Butler, 1974; Coleman, 1992; Pasupathi & Carstensen, 2003; Wong, 1989; Wong & Watt, 1991). Reminiscence has been defined as 'the vocal or silent recall of events in a person's life, either alone or with another person or group of people' (Woods, Portnoy, Head, & Jones, 1992). To explain the contribution of reminiscence to successful aging, four processes are often mentioned: identity-forming and self-continuity; enhancing meaning in life and coherence; preserving a sense of mastery; and promoting acceptance and reconciliation.

Identity-forming can be seen as an important function of reminiscence (Atchley, 1989; Parker, 1999; Webster, 1994). Personal identity is formed during adolescence (Erikson, 1959; McAdams, 1993). It is based on awareness of how a person has changed over time. Identity can be seen as an authentic biography that gives answers to questions like: where am I coming from? Where am I now? And where am I going? (Bluck, Alea, Habermas, & Rubin, 2005; Giddens, 1991). 'A person's identity is not found in behavior (...) but in the capacity to keep a particular narrative going' (Giddens, 1991). Reminiscence may contribute to a person's self-identity by letting people tell and retell the story of their lives on the basis of questions like, 'What have been important values in your life?' and 'Why did you decide to study biology?'

Meaning in life has been defined as: 'The cognizance of order, coherence, and purpose in one's existence, the pursuit and attainment of worthwhile goals, and an accompanying sense of fulfillment.' (Reker & Wong, 1988) It is generally considered to consist of a cognitive and a motivational component (Dittmann-Kohli & Westerhof, 1997). The cognitive component refers to beliefs

Correspondence: Ernst Bohlmeijer, Department of Prevention, Trimbos Institute, P.O. Box 7253500 AS Utrecht, The Netherlands. Tel: +31 30 2971100. Fax: +31 30 2971111. E-mail: ebohlmeijer@trimbos.nl

ISSN 1360-7863 print/ISSN 1364-6915 online/07/030291–300 © 2007 Taylor & Francis
DOI: 10.1080/13607860600963547

about and evaluations of one's life. The motivational component refers to having a purpose in life. Reminiscence may enhance meaning in life by focusing on past worthwhile experiences, acquired values, past and future plans (Wong, 1995).

Having a sense of mastery, control, competence and self-confidence (whether an illusion or real) plays an important role in successful problem solving, overcoming traumatic experiences and healthy aging (Heckhausen & Schulz, 1995; Pearlin & Schooler, 1978; Wong, 1995). Reminiscence may enhance mastery by focusing on inner resources and on recalling how one coped with past difficulties and how (important) goals were achieved.

According to Erikson's (1959) stage theory, a major challenge of late life is making up the balance of one's life. Part of this process is the recognition of the downsides of life: for example dreams or plans that have not materialized, decisions that have not been made or appeared to be wrong afterwards, conflicts that have not been resolved. Butler (1963) observed an increase of reminiscence at old age and hypothesized that this was due to naturally occurring processes of life-review. Part of this process is the ability to let go and the acceptance of death itself (Garland & Garland, 2001). Several authors have mentioned a parallel process between mourning and life-review (Silver, 1995; Viney, Benjamin, & Preston, 1989). Reminiscence may enhance reconciliation and finding ego-integrity by focusing on the expression of emotions and creating a setting which makes this kind of life-review and mourning possible at all (Coleman, 1999). It can be expected that persons with a positive identity, with higher levels of meaning in life and mastery and who have found reconciliation with their past lives will age more successfully and have higher levels of psychological well-being as a consequence (Westerhof, Dittman-Kohli, & Thissen, 2001).

Because of its potential positive effects on psychological well-being, reminiscence has been implemented in health care as a psycho-social intervention for different populations (Garland & Garland, 2000; Gibson, 2004). In order to assess the effectiveness of reminiscence interventions on psychological well-being a meta-analysis was performed. We were especially interested in the question whether the effects of reminiscence are moderated by characteristics of the method being used and characteristics of the target-population.

Moderators

In the past, different typologies of reminiscence have been developed. Wong and Watt (1991) defined six types of reminiscence: integrative, instrumental, transmissive, narrative, escapist and obsessive. Only integrative and instrumental reminiscence were found to correlate with successful aging. Webster (1994, 1999) developed the reminiscence function scale (RFS). This questionnaire measures how often people reminisce with a particular function in mind. Eight functions are discerned: boredom reduction, death preparation, identity-forming, conversation, intimacy maintenance, bitterness revival, teach/inform, problem-solving. In a recent study using the RFS, it was found that higher levels of bitterness revival, boredom reduction, death preparation and total reminiscence correlated with higher levels of anxiety and that depression was correlated with bitterness revival (Cully et al., 2001). Cappeliez, O'Rourke and Chaudhury, (2005) found that boredom reduction and bitterness revival predicted lower life satisfaction, and death preparation predicted higher life satisfaction. These studies show that mere stimulation of reminiscence may not always enhance psychological well-being. It has become customary to discern life review from reminiscence (Haight et al., 1995). Life review is more structured, systematically addresses the whole life-span, focuses on both positive and negative events (conflicts) and is evaluative (Haight & Burnside, 1993). In life review interventions reframing of negative events and the integration of important life-events in a coherent, meaningful life story (synthesis) is actively looked for by both participant and counselor (Webster & Haight, 1995). We therefore expect life review interventions to be more effective than reminiscence interventions. In addition, some authors have stressed that an individual format is a linchpin of life review (Haight et al., 1995). An advantage is that it gives the counselor more time to adapt the intervention to the individual needs of a participant. Others have stressed the usefulness of a group format and the possibilities to exchange life experiences and learn from other group members (Watt & Cappeliez, 2000). We therefore want to explore whether an individual versus group format is a significant moderator of the effects of reminiscence. Another characteristic that might be of importance is the number of sessions. In this respect there is a large diversity among studies. Some interventions consist of only three or four sessions (Davis, 2004; Serrano, Latorre, Gatz, & Montanes, 2004), other interventions consist of up to 28 sessions (McMurdo & Rennie, 1993). It has been suggested that for older adults it takes more time to change and that longer-term interventions are better suited (Knight, 1988). The duration of psychosocial interventions has been found to influence program efficacy (Jané Llopis, 2002), so exploration of duration as an effect-moderator is warranted. In addition to characteristics of interventions we want to test whether the effects of reminiscence are moderated by two characteristics of the participants: living conditions and age. The choice of living conditions is relevant considering the fact that hospitalization, most notably to nursing-homes, poses a potential threat to the psychological well-being of many older adults (Cook, 1998; Haight, Michel, & Hendrix, 1998). The prevalence of depression in

nursing homes is high. The prevalence of major depression is estimated to be 6%–11%, and of minor depression 30% (Ames, 1993). Older adults that have been institutionalized also have lower levels of life satisfaction and well-being than community residents (Loomis and Thomas, 1991). At the same time there is a higher prevalence of chronic diseases and cognitive decline among inhabitants of nursing homes. This may pose restrictions to possible psychological change. Advanced age may be a moderator of the effects of reminiscence as well. A negative correlation between effect sizes on depression as a result of psychological treatment and age was reported by Engels and Vermey (1997). Similarly, Pinquart and Sörensen (2001) found that effects on depression were weaker for older (>77 years) than younger adults.

In the past, one meta-analysis on the effects of reminiscence on psychological well-being was conducted (Pinquart & Sörenson, 2001). They conducted a meta-analysis with 122 psychosocial and psychotherapeutic intervention studies with older adults. They found a mean effect size of 0.45 on psychological well-being across all studies. The mean effect size of reminiscence interventions was also 0.45. In this meta-analysis, control-enhancing interventions were found to have the most effects on psychological well-being (1.03), followed by cognitive behavioural therapy (0.78). In addition, across all studies they found individual interventions to be significantly more effective than group interventions (0.55 versus 0.42) and interventions for nursing home inhabitants more effective than interventions for community-dwelling adults (0.58 versus 0.40). In this meta-analysis the influence of moderators was not specifically tested for reminiscence interventions. In addition, several new studies have been conducted since 2001. For these reasons we decided to conduct a new meta-analysis to examine the effects of reminiscence and life-review on life satisfaction and well-being.

Methods

Selection of studies

Studies were selected through a search of two computerized databases of the literature (Medline, 1966 – June 2005, Psychinfo, 1960 – June 2005), using 'life satisfaction, 'well-being', 'reminiscence' and 'life review' as keywords. The abstracts of potentially eligible studies were read and papers which potentially met inclusion criteria were retrieved and studied. In addition, the primary studies used in earlier meta-analyses (Bohlmeijer, Smit, & Cuijpers, 2003; Cuijpers, 1998; Engels & Vermey, 1997; Pinquart & Sörensen, 2001; Scogin & McElreath, 1994) were collected. Furthermore, the reference lists of retrieved studies were examined and studies that possibly met inclusion criteria were collected.

In order to be included in the meta-analysis, a study had to examine the effects of reminiscence or life review. Furthermore, the study had to report pre-test and post-test data, use a control or comparison group, and had to use a measure of well-being or life satisfaction. Sufficient data had to be reported for the calculation of standardized effect sizes.

Selected studies

Thirty studies were collected. Fifteen studies met the inclusion criteria. Selected characteristics of these studies are presented in Table I. The studies were coded by two researchers on a number of methodological characteristics, including random assignment to conditions, data on drop-out rates, follow-up times, reliability and validity of the measures and intervention type. To be coded as life review the paper had to refer to evaluation and structure as elements of the intervention.

In thirteen studies, subjects were randomly assigned to conditions. Most studies used a no-treatment control group. In eight studies the control group was offered a placebo intervention (i.e. discussion about current topics or a friendly visit); in one study the control group consisted of people given care as usual. In three studies the drop-out rates were higher than 25 percent. In nine studies, a group format was used for the delivery of the intervention while the other six studies used an individual format. Life review was used as the intervention in seven studies; the other eight studies used reminiscence as the intervention. In 80% of the studies the majority of the participants were women and the average age was 75 to 85 years. In nine studies the participants were living in nursing or residential homes. The instruments used most for measuring psychological well-being in the studies, included in this meta-analysis, are the Life Satisfaction Index-A or LSI-A (Neugarten, Havighurst, & Tobin, 1961) and the Affect Balance Scale or ABS (Bradburn, 1969). The ABS was developed in the 1960s in accordance with the theory that emotional well-being consists of both a positive and a negative effect and that these effects are not correlated with each other. On the positive side the ABS asks for an example of a situation in which a respondent has felt proud in the last weeks after being complimented; on the negative side if the respondent has felt depressed or upset as a consequence of being criticized (Bradburn, 1969; Diener, 1984). Well-being depends on the relative presence of both effects. The LSI-A was developed on the basis of the theory that psychological well-being can be operationalized as a global cognitive appraisal of the quality of one's life (Neugarten et al., 1961). The LSI-A consists of five themes: regarding life as meaningful, taking pleasure in daily life, feeling

Table I. Selected characteristics of studies examining the effects of reminiscence on life satisfaction and well-being.

Study	Target population	Conditions	*N*	%DO	RA	GRP/IND	SS	Meas.	%W	Age (M)	Outcome measures
Life review											
Arkof, 2004	Community-dwelling older women	1. LR	18	–	–	GRP	14 ss of 2 hrs	Pre	100	70	SPWB
		2. No treatment	18	–				Post			
Davis, 2004	Patients with right hemisphere cerebral vascular accidents	1. LR	7	–	+	IND	3 ss of 1 hr	Pre	43	68	LSI-Z
		2. Current events	7	–				Post			
Fielden, 1990	Sheltered housing residents	1. LR	15	–	+	GRP	9 ss of 1.5 hrs	Pre	–	74.7	PGCM
		2. Current events	16	–				Post			
Haight, 1988, 1992	Homebound, disabled elderly (Meals-on-Wheels)	1. LR	16	19	+	IND	6 ss of 1 hr	Pre	78	76	LSIA
		2. Friendly visit	16	19				Post			ABS
		3. No treatment	19	16				1 yr			
Haight, 1998	Residents of nursing homes	1. LR	104	27	+	IND	6 ss of 1 hr	Pre	69	79.6	LSIA
		2. Friendly visit	97	27				Post			ABS
								1yr			
Serrano, 2004	Clients of social services	1. LR	20	14	+	IND	4 ss of 1.5 hrs	Pre	84	77	LSIA
		2. Care as usual	23	14				Post			
Weiss, 1994	Residents of long-term care setting	1. LR	20	30	+	GRP	8 ss of 1.5 hrs	Pre	–	–	LSES
		2. No treatment	8	–				Post			
								6 mn			
Reminiscence											
Cook, 1991	Nursing home residents	1. REM	14	29	+	GRP	16 ss of 1 hr	Pre	90	81.3	LSIA
		2. Current events	13	38				Post			
		3. No treatment	14	29							
Cook, 1997	Female residents of nursing homes	1. REM	12	–	+	GRP	16 ss of 1 hr	Pre	100	82.4	LSIA
		2. Current events	12	–				Post			
		3. No treatment	12	–							
Hanaoka, 2004	Residents of institutions and nursing homes	1. REM	42	5	+	GRP	8 ss of 1 hr	Pre	86	81,8	LSIA
		2. Current events	38	5				Post			
								3 mn			
Harp Scates, 1986	Volunteers from a rural retired senior program	1. REM	17	16	+	GRP	6 ss of 1 hr	Pre	–	75.1	LSIA
		2. Activity-group	17	16				Post			
Lai, 2004	Nursing home residents with dementia	1. REM	36	17	+	IND	6 ss of 30 min.	Pre	86	68	WIB
		2. Current events	35	17				Post			
		3. No treatment	30	13				6 wks			
McMurdo, 1993	Inhabitants of residential homes	1. REM	29	10	–	GRP	28 ss of 45 min.	Pre	80	81	LSIA
		2. Exercise	20	25				Post			
Rattenbury, 1989	Residents of nursing homes	1. REM	8	–	+	GRP	8 ss of 30 min.	Pre	–	85	MUNSH
		2. Current events	8	–				Post			
		3. No treatment	8	–							
Serrano, 2004	Clients of social services	1. LR	20	14	+	IND	4 ss of 1.5 hrs	Pre	84	77	LSIA
		2. Care as usual	23	14				Post			
Wang, 2004	Elderly residing in community care facilities and at home	1. REM	48	12	+	IND	16 ss of 0.5–2 hrs	Pre	55.3	76	HPS
		2. No treatment	46	17				Post			

Abbreviations: Ss: Number of sessions: DO: Percentage of drop-out; RA: Random assignment; GRP: Group; IND: Individual; Meas: Measurements; REM: Reminiscence; LR: Life review (structured reminiscence); %W = percentage of women; Age(M) = medium age; ABS = Affect Balance Scale; HPS = Health Perception Scale; LSIA = Life Satisfaction Index A; LSI-*Z* = Life Satisfaction Index *Z*; LSES = Life Satisfaction in the Elderly Scale; MUNSH = Memorial University of Newfoundland Scale of Happiness; PGCM = Philadelphia Geriatric Center Morale Scale; SPWB = Scales of Psychological Well-Being, WIB = Well-being/Ill-being Scale.

success in achieving major life goals, having a positive self image and having an optimistic attitude (Neugarten et. al., 1961).

Methodology and calculation of effect sizes, d, from primary studies

In a meta-analysis the effects that are found in the primary studies are converted into a standardized metric effect size which is no longer placed on the original measurement scale and can therefore be compared with measures from other scales (Glass, McGaw, & Smith, 1981; Wolf, 1986). Standardized effect sizes, *d*, are commonly calculated as: $d = (M_1 - M_0)/Sd_0$; where, M_1 and M_0 are the means at post and pre-test and Sd_0 is the pre-test standard deviation of measures of psychological well-being. The standardized effect sizes, *d*, show by how many standard units (*z*-scores) a group has progressed after treatment at t_1 as compared with their mean baseline score at t_0.

We were interested in obtaining the effect size of the experimental effect minus the effect (of spontaneous recovery) in the control group. Therefore, we calculated the standardized pre – post change score of the experimental group (d_E) and did the same for the control group (d_C). Then we calculated their difference, i.e. $\Delta(d) = d_E - d_C$. These incremental standardized effect sizes show by how many standard units the experimental group has been removed from the control group. An effect size of 0.5 thus indicates that the mean of the experimental group is half a standard deviation larger than the mean of the control group. Lipsey and Wilson (1993) have shown that from a clinical perspective an effect size of 0.56 to 1.2 can be interpreted as a large effect, while effect sizes of 0.33 to 0.55 are moderate, and effect sizes of 0 to 0.32 are small.

Among the primary studies two types of control conditions were mostly used: no specific intervention but unrestricted access to care-as-usual (CAU) and placebo interventions, e.g. friendly visits and current events groups (placebo). In the placebo interventions conversations take place but only on topics concerning the here and now. These interventions are used as a control for attention. When both types of control groups were used in one study, weighted mean effect sizes were calculated for both control groups separately and then pooled in the overall meta-analysis. In addition, meta-analyses were conducted for reminiscence versus CAU and of reminiscence versus placebo control separately.

In most studies means and standard deviations were reported allowing the calculation of *d*. For the other studies test statistics (χ^2, *T*, *F*) or correlation coefficients, *r*, were converted into the *d* statistic using the equations reported by Wolf (1986).

Analysis

Basically, meta-analysis amounts to pooling individual *d*s and obtaining a best overall estimate of the treatment effect, within its 95% confidence interval (95% CI). The analysis was conducted with the computer program Meta-Analysis, version 5.3 (Schwarzer, 1989). This program is based on the statistical techniques outlined by Hedges and Olkin (1985). We made use of the random effects model. In this model it is not assumed that each primary study is a replication of the other primary studies, and the outcomes of the random effects model are conservative in that their 95% CI are often broad, thus reducing the likelihood of type-II error.

For the meta-analysis the random effects model was used, because under this model it is realistically assumed that the variance in the outcomes of the primary studies mirrors both true variance and random error. The model breaks down the observed variance into both parts. The results that are presented in Tables II and III are not corrected for the reliability (Cronbachs α, or test-retest reliability *r* of the outcome measures as used in the primary studies), because this type of correction is rarely applied, and we wanted to obtain outcomes that are comparable with other studies.

All analyses included a homogeneity test to test the idea that individual effect sizes systematically co-vary with the characteristics of the studies. For the same reason, the amount of unexplained variance that was not attributable to sample error was assessed. In addition, a new, more precise measure of the consistency between trials (I^2) was measured (Higgins, Thompson, Deeks, & Altman, 2003). A measure of the consistency of results of different studies included in a meta-analysis helps to determine the generalizability of the findings. I^2 is calculated as $100\% \times (Q\text{-df})Q$ where *Q* is Cochran's heterogeneity statistic and df the degrees of freedom (Higgins et al., 2003). A score between 0 and 25 can be considered as an indication of high consistency, a score between 25 and 50 as moderate and a score higher than 50 as low (Higgins et al., 2003).

A population effect size can only be interpreted reliably if the underlying data set is sufficiently homogeneous (Schwarzer, 1989). At least 75% of the observed variance should be explained by sampling error (Hunter, Schmidt, & Jackson, 1982) and the chi-square test for homogeneity should not become significant (Schwarzer, 1989). If the variance that is caused by random sample error is below 75%, an outlier analysis is performed with the same computer program Meta-Analysis, version 5.3 (Schwarzer, 1989). If no outliers are found a systematic approach is used. To identify outliers, meta-analyses are conducted, each time leaving out one study, and then observing the percentage of variance which is accounted for by sample error alone. The study that yields the largest increase of

Table II. Results of meta-analyses examining the effects of reminiscence on life satisfaction and well-being.

	N_{ES}	N	D	95% CI	Q	%SE	I^2
All studies	17	775	0.54	0.33–0.75	32.20**	65.0	50
Reminiscence versus No-treatment	10	367	0.57	0.35–0.78	10.51	100	14
Reminiscence versus Placebo-interventions	13	574	0.60	0.24–0.97	31.99**	36.4	63
All studies, Outliers excluded	14	487	0.68	0.46–0.87	19.24	90.1	32

**$P<0.01$.
Abbreviations: N_{ES}: Number of effect sizes; N: number of subjects in the studies; D = overall effect size; 95% CI = 95% Confidence Intervals; Q = Homogeneity Q; %SE: Percentage of the variance accounted for by random sample error; I = measure of consistency between studies.

Table III. Results of meta-analyses of reminiscence across modalities.

	N_{ES}	N	D	95% CI	Q	I^2
Intervention characteristics						
Reminiscence	7	291	0.40	0.17–0.64	4.21	0
Life review	7	196	1.04	0.74–1.34	4.78	0
Group	8	232	0.67	0.40–0.94	3.63	0
Individual	6	261	0.60	0.35–0.86	16.09**	69
<9 sessions	9	286	0.70	0.46–0.95	13.43	41
≥9 sessions	5	201	0.55	0.27–0.84	5.71	30
Characteristics of participants						
Nursing home residents or Residential care	8	322	0.44	0.22–0.67	6.90	0
Others	6	171	1.04	0.72–1.37	3.75	0
80 years or older	4	103	0.56	0.15–0.96	1.73	0
Younger than 80 years	10	390	0.63	0.43–0.84	17.29*	48

**$P<0.01$; *$P<0.05$.
Abbreviations: N_{ES}: Number of effect sizes; N: number of subjects in the studies; D = overall effect size; 95% CI = 95% Confidence Intervals; Q = Homogeneity Q; I = measure of consistency between studies.

amount of variance is excluded. This procedure is repeated until the minimum level of 75% is reached and the chi-square test for homogeneity is not significant.

In addition, contrasts of subgroups of studies were formed on the basis of characteristics of the intervention and participants. When the 95% confidence intervals are not overlapping, the contrast is considered as significant. Furthermore, Orwin's Fail/Safe N was calculated. This number indicates how many (hypothetical) studies with an effect size of zero should be found and included in the meta-analysis in order to reduce the observed effect size to a smaller value of, say, 0.20. A large Fail/Safe N indicates that the results are robust and can be safely generalized.

Results

The overall mean effect size for all studies (17 contrast groups) was 0.54, with a 95% confidence interval of 0.33–0.75 (see Table 2). This effect is significant from zero ($Z = 4.98$, $p < 0.001$) and represents a medium effect. The Q-test for the 0-hypothesis of homogeneity across effect sizes had to be rejected, indicating the presence of as yet unexplained variance that might be attributable to the systematic effects of covariates. In total, 65% of the variance is caused by random sample error, which leaves room for a remaining 35% which may systematically co-vary with (unknown) covariates. The number of studies with a zero-effect that should be found in order to reduce the effect size to 0.20 is 29 ('Orwin's fail safe N').

The overall mean effect size for reminiscence versus no treatment control groups was 0.57 (95% CI 0.35–0.78). The overall mean effect size for reminiscence versus placebo interventions was 0.60 (95% CI 0.24–0.97). In order to find a more homogeneous group of studies we used a systematic approach. Seventeen meta-analyses were conducted, each time leaving out one study, and each time we observed the percentage of variance which was accounted for by sample error alone. Leaving out Haight's 1998 and Hanaoka's 2004 studies yielded the largest increase of amount of variance accounted for by sample error alone (from 65% to 90%). In addition, the Q-test for the 0-hypothesis of homogeneity across effect sizes could not be

rejected, suggesting a homogenous sample of studies. The removal of the two studies resulted in a meta-analysis of 13 studies and 14 contrast groups. An overall mean effect size of 0.68 was found (95% CI: 0.46–0.87; $Z = 6.39$, $p < 0.001$). Still, 33 studies with a zero-effect would be needed to reduce the effect size to 0.20 ('Orwin's fail safe *N*').

We conducted several more series of meta-analyses, for selections of studies, including characteristics of interventions and characteristics of participants. The results are summarized in Table 3. Life review was found to have significant larger effects on psychological well-being than reminiscence ($d = 1.04$; 95% CI 0.74–1.34 versus $d = 0.40$; 95% CI 0.17–0.64). Other intervention characteristics were not found to moderate effects of reminiscence. As to characteristics of participants, community-dwelling adults were found to profit more from reminiscence ($d = 1.04$; 95% CI 0.72–1.37) than adults living in nursing homes or residential care institutes ($d = 0.44$; 95% CI 0.22–0.67). Reminiscence is equally effective for adults above 80 years and younger adults.

Insufficient data were available to calculate long-term effects of the interventions.

Discussion

Psychological well-being of older adults may be challenged by age-graded losses (e.g. approaching death, death of spouses and friends, chronic diseases, autonomy) and by disappointment with and bitterness about the past. Reminiscence has been claimed to help older adults to adapt to and cope with difficult life circumstances and developmental tasks in late life. (Butler, 1974; Coleman, 1992; Wong, 1989; Wong & Watt, 1991). Reminiscence may help older adults by focusing on former successful coping experiences (Wong, 1995), by reinforcing a sense of continuity (Parker, 1999), by finding meaning and coherence in one's life (Birren, 1987, Watt & Cappeliez, 2000) and by promoting reconciliation (Coleman, 1999) and by resolving hitherto unresolved conflicts (Butler, 1974; Haight, 1988). Many studies have tested the effects of reminiscence interventions on psychological well-being in older adults. This meta-analysis was conducted to assess the effectiveness of reminiscence on psychological well-being across different target groups and treatment modalities. The results of this meta-analysis suggest that, on average, reminiscence interventions have moderate effects on life-satisfaction and emotional well-being of older adults. The mean effect size that was found (0.54) can be considered as moderate from a clinical perspective, based on the categories suggested by Lipsey and Wilson (1993). The effect size was somewhat larger (0.68) after excluding two studies in order to create a homogenous cluster of studies. The effect-size of 0.54 that was found in this meta-analysis is comparable to the effect size of 0.45 that was found in a meta-analysis by Pinquart and Sörenson (2001). The small difference may be explained by the fact that we were able to include the results of some recent studies.

We further studied the influence of moderator variables and found that life review yielded significantly greater effects (1.04) than simple reminiscence (0.40). This is an important finding that lends weight to the necessity of making a distinction between the two types of reminiscence (Haight et al., 1995; Watt & Cappeliez, 2000; Webster & Haight, 1995; Webster & Young, 1988). In simple reminiscence people are given general cues about their past to stimulate associations with pleasant memories and to exchange these memories (Haight & Dias, 1992). Life review is a more structured variant. It focuses systematically on all the major life events, decisions and turning points in one's life, both positive and negative. Participants are actively encouraged to evaluate the significance and impact of these events and to resolve conflicts from their past. After reviewing the different life events separately the focus is on synthesizing the positive and negative experiences into a coherent life story with themes. So life review is more intense and actively tries to influence the above-mentioned working ingredients of reminiscence. Because conflicts and negative life events are actively discussed, it may first enhance feelings of sadness and regret before reconciliation and self-acceptance are possible which in the end may have a greater effect on psychological well-being. That life review has greater effects on psychological well-being than plain reminiscence can also be explained on the basis of recent correlation/population studies. It was found that bitterness revival and boredom reduction correlate with higher levels of psychological distress and lower levels of life-satisfaction (Cappeliez et al., 2005; Cully et al., 2001). Integrative reminiscence (focusing on evaluation and synthesis) and instrumental reminiscence (focusing on former problem solving) were found to correlate with successful aging (Wong & Watt, 1991). These findings corroborate a comprehensive model of the functions of reminiscence that was developed by Cappeliez et al. (2005). On the basis of research on autobiographical memories and reminiscence the model stipulates that reminiscence serves three main functions: self-continuity, guidance and emotional regulation. Within these domains both positive and negative types of reminiscence can be placed. In theory reminiscence may promote some positive functions of reminiscence but lifereview will focus on negative functions of reminiscence as well and try to transform them to more positive ones. If for example a participant in a life review intervention tells autobiographical stories that express feelings of bitterness, a counselor may be able to focus on

underlying assumptions and challenge them or focus on memories that contradict these stories (Payne, 2000; Watt & Cappeliez, 2000). Then the participant will be encouraged to reframe his or her experiences and develop an alternative, more positive life story accordingly. Especially for people with high levels of psychological distress, life review, caused by negative reminiscence functions, is more effective than plain reminiscence. For these participants it may be useful to integrate life review with other therapeutic approaches like cognitive therapy (Watt & Cappeliez, 2000) or narrative therapy (Bohlmeijer et al., submitted).

Other intervention characteristics were not found to moderate effects on psychological well-being. Apparently, if a process of life-review is brought about, reminiscence can have substantial effects on life satisfaction and emotional well-being in the short term. Individual and group formats seem to be equally effective. It was found that reminiscence is more effective for community-dwelling participants than for those from nursing or residential homes. This was in contrast with the meta-analysis by Pinquart and Sörenson (2001) who found that psychosocial interventions were more effective for nursing home residents. But this effect was mainly caused by control-enhancing interventions. The differential effects that were found in our study may be explained by the fact that the studies with participants from nursing homes made more use of simple reminiscence interventions which are seemingly less effective. In addition, in one study (Lai, Chi, & Kayser-Jones, 2004) participants suffered from dementia. For older adults with dementia reminiscence may be very worthwhile but restricted effects on psychological well-being can be expected (Woods, Spector, Jones, Orrell, & Davies, 2005). Therefore we caution the reader not to draw too firm conclusions from this study. Finally, we found that 'younger old adults' did not profit more from reminiscence than adults at a very advanced age. This finding is in contrast to former findings by Engels and Vermey (1997) and Pinquart and Sörenson (2001). An explanation could be that in these former meta-analyses all kinds of interventions were included. It may be that reminiscence is more suitable for adults at a very advanced age, as a common, recognizable activity, than other therapeutic approaches, e.g. cognitive therapy (Schuurmans, 2006).

The present meta-analysis has several important limitations. First, the total number of effect sizes was relatively small and the homogeneous clusters are even smaller. Second, the overall quality of the included studies, some studies excepted, is not very high. Many studies used rather small groups, the intervention is not always clearly defined, some studies had to deal with a high drop-out rate, the validity of data analysis methods is not always clear (Lin et al., 2005; Thornton & Brotchie, 1987). A meta-analysis cannot rise above the quality levels of the individual studies. Third, most studies did not measure long-term effects, so this meta-analysis gives no insight into the long-term effects of reminiscence and life review. Fourth, although the distinction between reminiscence and life review is crucial, even the label of life review covers a large variety of interventions and these interventions can have very different theoretical underpinnings. For example, the intervention used by Haight et al. (1988) is based on the work of Butler (1963). Serrano et al. (2004) developed their intervention on the basis of recent research into autobiographical memories of depressed people. Watt and Cappeliez (2000) developed their protocol on the basis of cognitive theories of depression. And Arkoff, Meredith and Dubanoski (2004) developed a protocol in which seven sessions focused on the past and the present and seven sessions focused on the present and the future. This protocol was inspired by Carlsen (1988) and her therapy with older adults. In addition, reminiscence and life review were applied in very different settings.

Despite these limitations, this meta-analysis suggests that reminiscence, and more so life review, is a worthwhile intervention for enhancing psychological well-being in older adults. The effect sizes of life review are comparable to those of control-enhancing interventions and cognitive-behavioural therapy (Pinquart & Sörenson, 2001). At the same time, due to the before-mentioned limitations, further research is necessary. We want to end this paper by suggesting some directions. A first important step is that protocols for life-review interventions have to be well worked out. They have to be based on recent empirical research into the different functions of reminiscence and autobiographical memory. Protocols need to specify how positive mediating processes (e.g. meaning in life, mastery, coherence and integration) and negative mediating processes (e.g. bitterness, powerlessness) are influenced and what skills are needed by counsellors. Promising are life-review interventions that combine life-review with other therapeutic approaches (Bohlmeijer, Valenkamp, Westerhof, Smit, & Cuijpers, 2005; Watt & Cappeliez, 2000). Secondly it may be useful to focus on one or two settings and target-groups as a first step to further establish the evidence base of life-review and to replicate studies in different countries. Until this date no replication of studies on the effects of reminiscence and life review have taken place. Stronger international collaboration could be helpful in this respect. And it might be useful to have a framework of reminiscence to guide this international research collaboration as has been suggested recently by Hwang et al. (2003).

Many older adults suffer from reduced psychological well-being and reminiscence and life review have potentially a lot to offer to them. But a greater

research effort is needed to provide a sound scientific underpinning of these promising approaches.

References

Ames, D. (1993). Depressive disorders among elderly people in long-term institutional care. *The Australian and New Zealand Journal of Psychiatry*, *27*, 379–391.

Arkoff, A., Meredith, G. M., & Dubanoski, J. P. (2004). Gains in well-being achieved through retrospective proactive life review by independent older women. *Journal of Humanistic Psychology*, *44*, 204–214.

Atchley, R. C. (1989). A continuity theory of normal aging. *Gerontologist*, *29*, 183–190.

Baltes, P. B. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental Psychology*, *23*, 611–626.

Baltes, M. M., & Carstensen, L. L. (1996). The process of successful aging. *Ageing and Society*, *15*, 397–422.

Birren, J. E. (1987). The best of all stories. *Psychology Today*, *21*, 91–92.

Bluck, S., Alea, N., Habermas, T., & Rubin, D. C. (2005). A tale of three functions: The self-reported uses of autobiographical memory. *Social Cognition*, *23*, 91–117.

Bohlmeijer, E., Valenkamp, M., Westerhof, G., Smit, F., & Cuijpers, P. (2005). Creative reminiscence as an early intervention for depression: Results of a pilot project. *Aging & Mental Health*, *9*, 302–304.

Bohlmeijer, E., Smit, F., & Cuijpers, P. (2003). Effects of reminiscence and life review on late-life depression: A meta-analysis. *International Journal of Geriatric Psychiatry*, *18*, 1088–1094.

Bohlmeijer, E., Webster, J., Cuijpers, P., Westerhof, G., Beekman A. (2006). Reminiscence: Recent progress and emerging trends in conceptual and applied understanding. *Review in Clinical Psychology. Submitted*.

Bradburn, N. M. (1969). *The structure of psychological well-being*. Chicago: Aldine.

Brandstädter, J. (2002). Protective processes in later life: Maintaining and revising personal goals. In C. Hofsten, L. Backman & K. Y. Florence (Eds.), *Psychology at the turn of the millennium, vol 2: Social, developmental and clinical perspectives* (pp. 117–150). Florence, KY: Taylor & Frances/ Routledge.

Butler, R. N. (1963). The life-review: An interpretation of reminiscence in the aged. *Psychiatry*, *26*, 65–76.

Butler, R. N. (1974). Successful aging and the role of the life review. *Journal of the American Geriatrics Society*, *22*, 529–535.

Cappeliez, P., O'Rourke, N., & Chaudhury, H. (2005). Functions of reminiscence and mental health in later life. *Aging & Mental Health*, *9*, 295–301.

Carlsen, M. B. (1988). *Meaning-making: Therapeutic processes in adult development*. New York: W.W. Norton.

Carstensen, L. L. (1995). Evidence for a life-span theory of socio-emotional selectivity. *Current Directions in Psychological Science*, *4*, 151–156.

Coleman, P. G. (1992). Personal adjustment in late life: Successful aging. *Reviews in Clinical Gerontology*, *2*, 67–78.

Cook, E. A. (1991). The effects of reminiscence on psychological measures of ego integrity in elderly nursing home residents. *Archives of Psychiatric Nursing*, *5*, 292–298.

Cook, E. A. (1998). Effects of reminiscence on life satisfaction of elderly female nursing home residents. *Health Care for Women International*, *19*, 109–118.

Cully, J. A., LaVoie, D., & Gfeller, J. D. (2001). Reminiscence, personality, and psychological functioning in older adults. *Gerontologist*, *41*, 89–95.

Cuijpers, P. (1998). Psychological outreach programmes for the depressed elderly: A meta-analysis of effects and dropout. *International Journal of Geriatric Psychiatry*, *13*, 41–48.

Davis, M. C. (2004). Life review therapy as an intervention to manage depression and enhance life satisfaction in individuals with right hemisphere cerebral vascular accidents. *Issues in Mental Health Nursing*, *25*, 503–515.

Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, *95*, 542–575.

Dittmann-Kohli, F., & Westerhof, G. J. (1997). The SELE-Sentence Completion Questionnaire: A new instrument for the assessment of personal meanings in aging research. *Anuario de Psicologija*, *73*, 7–18.

Engels, G. I., & Vermey, M. (1997). Efficacy of nonmedical treatments of depression in elders. *Journal of Clinical Geropsychology*, *3*, 17–35.

Erikson, E. H. (1959). *Identity and the life cycly*. New York: International University Press.

Fielden, M. A. (1992). Depression in older adults: Psychological and psychosocial approaches. *British Journal of Social Work*, *22*, 291–307.

Garland, J., & Garland, C. (2001). *Life review in health and social care: A practitioner's guide*. Philadelphia: Brunner-Routledge.

Gibson, F. M. A. (2004). *The past in the present: Using reminiscence in health and social care*. London: Health Professions Press.

Giddens, A. (1991). *Modernity and self-identity*. Cambridge: Polity Press.

Glass, G. V., McGaw, B., & Smith, M. L. (1981). *Meta-analysis in social research*. Beverly Hills: Sage.

Haight, B. K. (1988). The therapeutic role of a structured life review process in homebound elderly subjects. *Journal of Gerontology*, *43*, 40–44.

Haight, B. K., & Dias, J. K. (1992). Examining key variables in selected reminiscing modalities. *International psychogeriatrics*, *4*, 279–90.

Haight, B. K., & Burnside, I. (1993). Reminiscence and life review: Explaining the differences. *Archives of Psychiatric Nursing*, *7*, 91–98.

Haight, B. K. (1992). Long-term effects of a structured life review process. *Journal of Gerontology*, *47*, 312–315.

Haight, B. K., Coleman, P., & Lord, K. (1995). The linchpins of a successful life review: Structure, evaluation and individuality. In B. K. Haight & J. D. Webster (Eds), *The art and science of reminiscing: Theory, research, methods and applications* (pp. 179–192). Washington: Taylor & Francis.

Haight, B. K., Michel, Y., & Hendrix, S. (1998). Life review: Preventing despair in newly relocated nursing home residents: Short-and long-term effects. *International Journal of Aging & Human Development*, *47*, 119–142.

Hanaoka, H., & Okamura, H. (2004). Study on effects of life review activities on the quality of life of the elderly: A randomized controlled trial. *Psychotherapy and Psychosomatics*, *73*, 302–311.

Harp Scates, S. K., Randolph, D. L., Gutsch, K. U., & Knight, H. V. (1985). Effects of cognitive-behavioral, reminiscence, and activity treatments on life satisfaction and anxiety in the elderly. *International Journal of Aging & Human Development*, *22*, 141–146.

Heckhausen, J., & Schulz, R. (1995). A life-span theory of control. *Psychological Review*, *102*, 284–304.

Hedges, L., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Orlando: Academic press.

Higgins, J. P. T., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ: British Medical Journal*, *327*, 557–560.

Hunter, J. E., Schmidt, F. L., & Jackson, G. B. (1982). *Meta-analysis. Cumulating research findings across studies*. Beverly Hills, CA: Sage.

Jané-Llopis, E. (2002). What makes the ounce of prevention effective? A meta-analysis of mental health promotion and mental disorder prevention programmes. Dissertation. Katholieke Universiteit Nijmegen.

Knight, B. G. (1988). Factors influencing therapist-rated change in older adults. *Journal of Gerontology*, *43*, 111–112.

Lai, C. K., Chi, I., & Kayser-Jones, J. (2004). A randomized controlled trial of a specific reminiscence approach to promote the well-being of nursing home residents with dementia. *International Psychogeriatrics*, 16, 33–44.

Lappe, J. M. (1987). Reminiscing: The life review therapy. *Journal of Gerontological Nursing*, *13*, 12–6.

Lin, Y. C., Dai, Y. T., & Hwang, S. L. (2005). The effect of reminiscence on the elderly population: A systematic review. *Public Health Nursing*, *20*, 297–306.

Lipsey, M. W., & Wilson, D. B. (1993). The efficacy of psychological, educational and behavioural treatment. *American Psychologist*, *48*, 1181–1209.

Loomis, R. A., & Thomas, C. D. (1991). Elderly women in nursing home and independent residence: Health, body attitudes, self-esteem and life-satisfaction. *Canadian Journal on Aging*, *10*, 224–231.

Marsiske, M., Lang, F. B., Baltes, P. B., & Baltes, M. M. (1995). Selective optimization with compensation: Life-span perspectives on successful human development. In R.A. Dixon & L. Bäckman (Eds.), *Compensating for psychological deficits and declines: Managing losses and promoting gains* (pp. 35–79). Hillsdale: Lawrence Erlbaum Associates.

McAdams, D. P. (1993). *The stories we live by: Personal myths and the making of the self*. New York: William Morrow & Co, Inc.

McMurdo, M. E., & Rennie, L. (1993). A controlled trial of exercise by residents of old people's homes. *Age and Ageing*, *22*, 11–15.

Neugarten, B. L., Havighurst, R., & Tobin, S. (1961). The measurement of life satisfaction. *Journal of Gerontology*, *16*, 134–143.

Parker, R. G. (1999). Reminiscence as continuity: Comparison of young and older adults. *Journal of Clinical Geropsychology*, *5*, 147–157.

Pasupathi, M., & Carstensen, L. L. (2003). Age and emotional experience during mutual reminiscing. *Psychology and Aging*, *18*, 430–442.

Payne, M. (2000). Narrative therapy. *An introduction for counsellors*. London: Sage.

Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior*, *19*, 2–21.

Pinquart, M., & Sörensen, S. (2001). How effective are psychotherapeutic and other psychosocial interventions with older adults? A meta-analysis. *Journal of Mental Health & Aging*, *7*, 207–243.

Rattenbury, C., & Stones, M. J. (1989). A controlled evaluation of reminiscence and current topics discussion groups in a nursing home context. *The gerontologist*, *29*, 768–771.

Reker, G. T., & Wong, P. T. P. (1988). Aging as an individual process: Toward a theory of personal meaning. In J. E.Birren & V. L. Bengtson (Eds.), *Emergent theories of aging* (pp. 214–246). New York: Springer Publishing Co.

Schwarzer, R. (1989). *Meta-analysis programs*. Freie Universitat Berlin.

Schuurmans, J. (2005). *Anxiety in late life, moving toward a tailored treatment*. Dissertation. Vrije Universiteit.

Scogin, F., & McElreath, L. (1994). Efficacy of psychosocial treatments for geriatric depression: A quantitative review. *Journal of Consulting Clinical Psychology*, *62*, 69–74.

Serrano, J. P., Latorre, J. M., Gatz, M., & Montanes, J. (2004). Life Review Therapy Using Autobiographical Retrieval Practice for Older Adults with Depressive Symptomatology. *Psychology and Aging*, *19*, 272–277.

Silver, M. H. (1995). Memories and meaning: Life review in old age. *Journal of Geriatric Psychiatry*, *28*, 57–73.

Thornton, S., & Brotchie, J. (1987). Reminiscence: A critical review of the empirical literature. *The British Journal of Clinical Psychology*, *26*, 93–111.

Viney, L. L., Benjamin, Y. N., & Preston, C. (1989). Mourning and reminiscence: Parallel psychotherapeutic processes for elderly people. *International Journal of Aging & Human Development*, *28*, 239–249.

Wang, J. J. (2004). The comparative effectiveness among institutionalized and non-institutionalized elderly people in Taiwan of reminiscence therapy as a psychological measure. *Journal of Nursing Studies*, *12*, 237–245.

Watt, L. M., & Cappeliez, P. (2000). Integrative and instrumental reminiscence therapies for depression in older adults: Intervention strategies and treatment effectiveness. *Aging & Mental Health*, *4*, 166–177.

Webster, J. D. (1994). Predictors of reminiscence: A lifespan perspective. *Canadian Journal on Aging*, *13*, 66–78.

Webster, J. D. (1999). World views and narrative gerontology: Situating reminiscence behavior within a lifespan perspective. *Journal of Aging Studies*, *13*, 29–42.

Webster, J. D., & Haight, B. K. (1995). Memory Lane milestones: Progress in reminiscence definition and classification. In B. K. Haight & J. D. Webster (Eds.), *Art and science of reminiscing: Theory, research, methods, and applications* (pp. 273–286). New York: Springer.

Webster, J. D., & Young, R. A. (1988). Process variables of the life review: Counseling implications. *International Journal of Aging & Human Development*, *26*, 315–323.

Weiss, J. C. (1994). Group therapy with older adults in long-term care settings: Research and clinical cautions and recommendations. *Journal for Specialists in Group Work*, *19*, 22–29.

Westerhof, G. J., Dittman-Kohli, F., & Thissen, T. (2001). Beyond life satisfaction: Lay conceptions of well-being among middle-aged and elderly adults. *Social Indicators Research*, *56*, 179–203.

Woods, B., Spector, A., Jones, C., Orrell, M., & Davies, S. (2005). Reminiscence therapy for dementia. *The Cochrane database of systematic reviews*. Cochrane AN: CD001120 Electronic Publication.

Wolf, F. M. (1986). *Meta-Analysis; quantitative methods for research synthesis*. Beverly Hills: Sage.

Wong, P. T. (1989). Personal meaning and successful aging. *Canadian Psychology*, *30*, 516–525.

Wong, P. T., & Watt, L. M. (1991). What types of reminiscence are associated with successful aging? *Psychology and Aging*, *6*, 272–279.

Wong, P. T. P. (1995). The processes of Adaptive Reminiscences. In B. K. Haight & J. D. Webster (Eds.), *Art and science of reminiscing: Theory, research, methods, and applications* (pp. 23–35). New York: Springer.

Woods, B., Portnoy, S., Head, D., & Jones, G. (1992). Reminiscence and life-review with persons with dementia: Which way forward? In G. M. Jones & B. M. L. Miesen (Eds.), *Care giving in dementia* (pp. 137–161). London: Routledge.