THE MILBANK QUARTERLY
A MULTIDISCIPLINARY JOURNAL OF POPULATION HEALTH AND HEALTH POLICY

Supporting Well-Being in Retirement through Meaningful Social Roles: Systematic Review of Intervention Studies

BEN HEAVEN,[1] LAURA J.E. BROWN,[2] MARTIN WHITE,[1,3] LINDA ERRINGTON,[4] JOHN C. MATHERS,[5] and SUZANNE MOFFATT[1]

[1]*Institute of Health and Society, Newcastle University;* [2]*Research Institute for Health and Social Change, Manchester Metropolitan University;* [3]*Fuse, UKCRC Centre for Translational Research in Public Health;* [4]*Walton Library, Newcastle University;* [5]*Institute for Ageing and Health, Newcastle University*

Context: The marked demographic change toward greater proportions of older people in developed nations poses significant challenges for health and social care. Several studies have demonstrated an association between social roles in later life and positive health and well-being outcomes. After retiring from work, people may lose roles that provide purpose and social contacts. The outcomes of interventions to promote social roles in retirement have not been systematically reviewed.

Methods: We examined three research questions: (1) What kinds of intervention have been developed to promote social roles in retirement? (2) How much have they improved perceived roles? (3) Have these roles improved health or well-being? We included those studies that evaluated the provision of social roles; used a control or comparison group; targeted healthy retirement-transition adults who were living in the community; provided an abstract written in English; took place in a highly developed nation; and reported social role, health, or well-being outcomes. We searched eight electronic databases and combined the results with hand searches.

Findings: Through our searches, we identified 9,062 unique publications and eleven evaluative studies of acceptable quality, which reported seven interventions that met our inclusion criteria. These interventions varied in year of inception and scope, but only two were based outside North America. The

Address correspondence to: Suzanne Moffatt, Institute of Health and Society, Newcastle University, Baddiley Clark Building, Richardson Road, Newcastle upon Tyne NE2 4AX, UK (email: suzanne.moffatt@ncl.ac.uk).

The Milbank Quarterly, Vol. 91, No. 2, 2013 (pp. 222–287)
© 2013 Milbank Memorial Fund. Published by Wiley Periodicals Inc.

studies rarely reported the *quality* or meaning of roles. Only three studies used random allocation, thus limiting inferences of causality from these studies. Interventions providing *explicit* roles and using supportive group structures were somewhat effective in improving one or more of the following: life satisfaction, social support and activity, physical health and activity, functional health, and cognition.

Conclusions: Social role interventions may improve health and well-being for people in retirement transition. Future research should improve the quality of intervention and assessment and look at which interventions are most effective and acceptable in facilitating social roles for diverse older populations.

Keywords: retirement, social role, systematic review, health promotion.

The world's populations are aging. By 2025, the world's average life expectancy will be seventy-three years compared with sixty-eight years in 2009 (WHO 1998, 2011). In industrialized nations, this has led to concerns that the demand for state-supported services, such as health and social care, will outstrip the available funding generated by a proportionally smaller workforce (Thane 2000). Therefore it is important that longer years in retirement are accompanied by good health and well-being (McNamara and Gonzales 2011) and that "healthy aging" becomes a central issue for social policy (Bernard and Phillips 2000).

Since the mid-twentieth century, retirement from full-time employment has been regarded as a defining moment in the progression to later life (Thane 2000). But the once predictable pattern associated with aging and retirement is changing (Biggs 2005). Retirement transitions have become increasingly complex, with many older workers now choosing a "flexible" retirement such as working part time, starting new employment, or doing voluntary work (Quinn and Kozy 1996). In addition, shifts in the global economy and policy have increased the emphasis on extending working lives (Brown and Vickerstaff 2011), reinforced through some industrialized nations' changes in pension age. In addition, because identities and roles are being redefined, the experience of retirement and aging is now more varied than it was for previous generations (Jones and Higgs 2010). Despite the variation in how and when people retire, the transition is typified by multiple lifestyle adjustments, many of which affect health and well-being, including the level and form of physical and social activities.

Social relations in later life have been conceptualized and measured in numerous ways, for example, as social integration (Moen, Dempster-McClain, and Williams 1992), social engagement (Bath and Deeg 2005; Glass et al. 2006; Herzog, Ofstedal, and Wheeler 2002; Mendes de Leon 2005; Thomas 2011), social participation (Sirven and Debrand 2008), social networks (Berkman and Syme 1979), social ties (Kawachi and Berkman 2001), social connections (Kaplan et al. 1988), and social connectedness (Cornwell, Laumann, and Schumm 2008). Maintaining active social relations is closely associated with better health outcomes and reduced mortality in later life (Bath and Deeg 2005; Berkman and Syme 1979; Hold-Lundstad, Smith, and Layton 2010; Kaplan et al. 1988; Sirven and Debrand 2008; Wang et al. 2002). However, it is unclear which aspects of social relations are important and amenable to modification or intervention.

Accordingly, we conducted a concept-mapping process (currently being prepared for publication) and identified three conceptual areas in which social relations were associated with health and well-being outcomes: (1) social networks, (2) social and emotional support, and (3) social roles. The first two areas have been the target of intervention programs (such as those addressing loneliness), and the effectiveness of these interventions has been reported through systematic review and meta-analysis (e.g., Masi et al. 2011). However, the third concept we identified—personally meaningful social roles—has been neglected as an area for intervention development and assessment, despite holding similar promise as a means of improving health and well-being. Social roles are embedded in social relationships (which give meaning to the role) and are thus included in the broader literature concerned with "social relations" in later life.

This article focuses on interventions that create meaningful and socially engaging activities for people during their transition to retirement. Social roles, as we use the term, are participatory activities related to a particular position in a social network, which may provide a sense of purpose, worth, identity, or structure to life. This definition includes, but is not limited to, activities such as volunteering, working for pay, and pursuing personal development through further education or training.

Social roles and related concepts, such as having a sense of purpose, have been described by older people as core components of their health and well-being (Bryant, Corbett, and Kutner 2001; Gabriel and Bowling 2004; Iliffe et al. 2010; Reichstadt et al. 2010). Qualitative

studies involving people in retirement transitions found that some older people report a loss of status upon leaving work, leading to feelings of aimlessness, loss of identity, and attempts to reconfigure a new sense of self (Hobbis et al. 2011; Jones, Leontowitsch, and Higgs 2010). Many older people may prefer to reduce their working hours rather than leave work entirely (Herzog, House, and Morgan 1991), although this is often at the discretion of their employer and may be determined by their financial situation (Moen et al. 2000; Moffatt 2009).

While we know relatively little about the health benefits of working for pay compared with volunteer activity in retirement, both paid and volunteer work are associated with independent and significant effects on beneficial health outcomes, so they may have an "additive" effect for those engaging in both activities (Luoh and Herzog 2002).

The contribution of social roles to health and well-being extends beyond simply "having something to do" and is linked to personal and social interpretations of the roles' value (Lum and Lightfoot 2005; Luoh and Herzog 2002; Moen et al. 2000; Musick and Wilson 2003). Volunteering, therefore, may be particularly beneficial for those whose sense of self is embedded in former work roles and who have either changed roles or are no longer employed (Hobbis et al. 2011; Robinson, Demetre, and Corney 2011).

Volunteering has been associated with a range of positive health and well-being outcomes for older people (Lum and Lightfoot 2005; Musick, Herzog, and House 1999; Musick and Wilson 2003; Van Willigan 2000; Wheeler, Gorey, and Greenblatt 1998). Nonetheless, the attractiveness and effects of volunteering may be shaped by a person's social status, employment, gender, and community involvement (McNamara and Gonzales 2011; Thomas 2011). For example, in relation to full-time employment, working part time encourages women, but not men, to volunteer, and not being employed discourages men, but not women, from volunteering (Taniguchi 2006).

Feeling rewarded for one's volunteer work is associated with improved health and well-being, whereas performing a volunteer role without a sense of reward may have no, or even adverse, health outcomes (Gruenewald et al. 2007; McMunn et al. 2009).

Much of the literature in this field has focused on volunteer work, but other roles, as well, may have beneficial health and well-being outcomes for older people. There is some evidence that interventions promoting learning and engagement opportunities can reduce social isolation (e.g.,

the online learning environment provided by the University of the 3rd Age) (Findlay 2003; Swindell 2001). It is not clear, however, whether the determining factor is access to social networking opportunities or to other factors associated with an "identity" as a student (such as increased self-fulfillment, self-confidence, and esteem).

In contrast, caring for others, like a chronically ill partner or parent, may be associated with detrimental outcomes, including depression and stress (Brody 1990; Strawbridge et al. 1997). We did not investigate those interventions that explicitly concerned coping with the negative consequences of an existing role, for example, that of a caregiver.

The combined evidence regarding social roles and health and well-being outcomes points to the potential value of "social role" interventions aimed at adults retiring from work. This literature, however, is limited by a lack of good-quality studies that assess the effectiveness of interventions. Most of the evidence showing that social roles are associated positively with health and well-being has come from cross-sectional or longitudinal studies, which are limited in their ability to demonstrate the presence and direction of causality. In light of global concerns regarding both the scarcity of resources and an aging population, policy decisions regarding which health and social services to invest in should be based on the best available evidence. The effectiveness of *interventions* designed to promote social roles therefore need to be assessed. This was the aim of our review, which addressed the following questions: (1) What kinds of interventions have been developed to promote social roles in the retirement transition? (2) Have these interventions increased satisfaction with, or quantity of, the participants' roles? and (3) Have these interventions improved the participants' health and well-being?

Methods

Inclusion and Exclusion Criteria

Study Design. To be considered for inclusion in our review, the studies had to describe interventions that could extend or support the participants' social roles. To reduce the chance of overlooking relevant studies because of differences in terminology or reporting style, we included studies when three of us (Laura Brown, Ben Heaven, and Suzanne Moffatt) agreed that the focus of the intervention was consistent with

extending or supporting roles, even if an aim to improve social roles was not explicitly stated.

Population. We included studies involving healthy adults in the retirement transition who were living in the community. Participants were considered to be in the retirement transition if their mean or median age was between fifty-five and seventy years; if they had been selected for the study because they were about to retire or had retired within the past two years; or if they were selected for the study because they had a partner who met one of these criteria. We excluded studies in which the participants had been selected for the intervention because they had a specific medical illness; had received a specific medical procedure or treatment; or had experienced a particular traumatic event (e.g., war, bereavement, or crime) or interventions that dealt explicitly with coping with the negative consequences of an existing role (e.g., that of a caregiver).

We considered only those studies that were conducted in a country defined as having a "very high level of human development" (UN 2009), that is, those nations with the highest life expectancy, literacy rates, education, standards of living, and quality of life. This stipulation was made to ensure that the interventions were developed for people in broadly similar social and economic contexts. We did not restrict the language in which the literature was published, although we did require an abstract or summary of the article in English.

Outcomes. Studies had to include at least one outcome measure related either to the participants' perception of their social roles (e.g., satisfaction with role or a qualitative assessment of its meaningfulness) or to some aspect of their health or well-being. Therefore we excluded studies that examined only the feasibility of an intervention or the well-being of other potential benefactors of the intervention (such as the recipients of the participants' volunteer work). In addition, we included only those studies in which the intervention group was compared with at least one nonintervention control group. We did not stipulate that the studies contain baseline measurements in addition to control or comparison groups. To ensure that we could determine the sustainability of any effects, we insisted on a minimum follow-up period of three months after the intervention's onset.

Search Strategy. Our search strategy was initially developed for Ovid Medline (available on request), which we then adapted as necessary using synonyms appropriate to other databases.

We systematically searched eight electronic databases (Ovid Medline, Embase, PsycInfo, Scopus, Web of Science, CINAHL, ASSIA, and the Cochrane Database of Systematic Reviews) between December 29, 2010, and January 19, 2011, retrieving 9,062 different papers after removing duplicates. Two members of the research team, Laura Brown and Ben Heaven, independently assessed the title and abstract of each reference. Brown identified fifty-five potential abstracts, and Heaven, twenty-five. Of the combined pool of eighty articles, seventeen had been independently identified by both reviewers. After removing duplicates, they were left with sixty-three abstracts. Thirteen were rejected after consultation with a third reviewer (Suzanne Moffatt), based on the following criteria: targets caregivers only ($n = 2$), is set in a nursing home ($n = 1$), does not provide a social role ($n = 7$), targets people with mental illness ($n = 2$), and is not an intervention study ($n = 1$). This process left fifty potentially relevant references, for which the full text of each article was sought.

A comprehensive search of other resources was also conducted (by Laura Brown) to identify additional published and unpublished material of relevance to the review. For this, she sent requests for information to the mailing lists of three learned societies, ten academic email discussion lists, and individual experts. She also hand searched for relevant material from the National Health Service (NHS) and voluntary sector and social policy evidence sources, as well as reference lists of key publications in the field. Twenty-two additional intervention studies identified in this way were taken to the next stage of study selection (see figure 1).

Study Selection

Two of us (Laura Brown and Ben Heaven) independently evaluated the full texts of the seventy-two articles selected for inclusion against the inclusion criteria, discussing discrepancies between the decisions until we reached a consensus. We rejected fifty-nine papers based on the following criteria: did not describe interventions ($n = 2$); reported ongoing studies not sufficiently developed to be included ($n = 3$); did not directly target social roles ($n = 32$); focused on coping with a negative event ($n = 1$); and was not conducted in a country classified by the United Nations as having "very high human development" ($n = 1$). We also excluded another twenty papers on more than one criterion: not

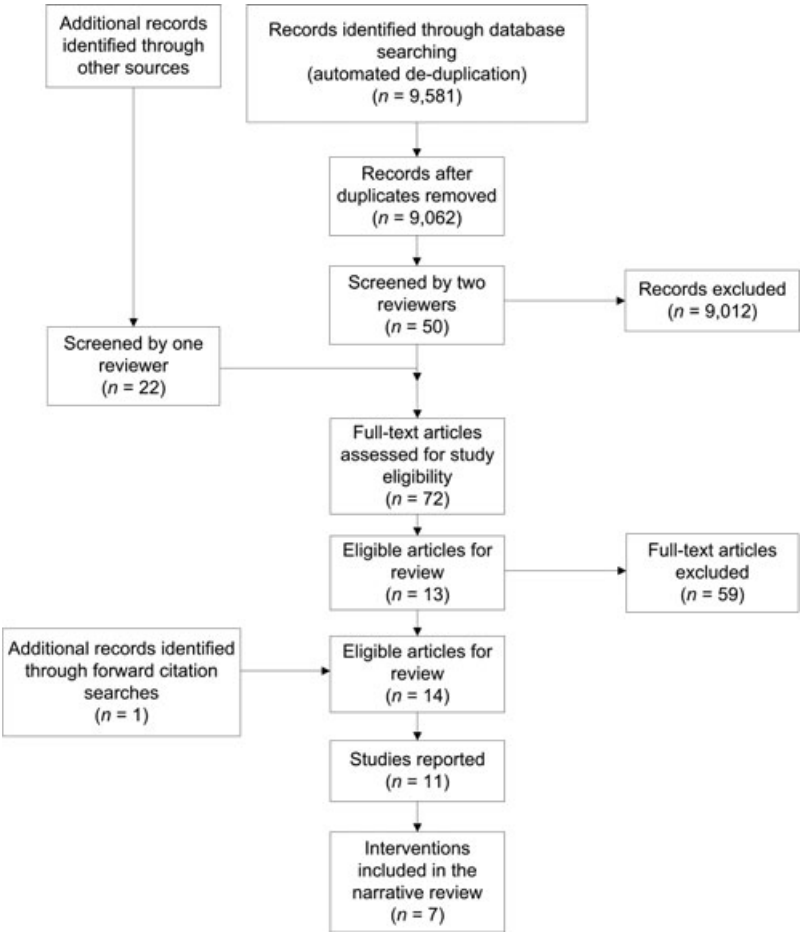

FIGURE 1. Selection of studies for review. (PRISMA 2009 flow diagram adapted from Moher et al. 2009).

conducted in the target population ($n = 9$), and/or did not have a control group ($n = 12$), plus and/or did not include measures of well-being ($n = 7$).

Five of the articles were not written in English (Dube et al. 2000; Fujiwara et al. 2006; Jo and Kim 2008; Lee 2006; Martin and Kiely 1983). We used translations to determine the eligibility of four of them and communicated with Fujiwara and colleagues (2006) to confirm that

the same study was described in an English-language article that we had identified. In all, thirteen articles met our inclusion criteria.

As a final step before extracting the data, we performed forward and backward citation searches on each of these thirteen articles to find any more papers that might report details of the design, methods, or results of the intervention. From this, we found one additional study (Carlson et al. 2009) that met the inclusion criteria for our review, as well as three supplementary papers that did not report evaluation studies but did provide additional information about the interventions reported in papers that did meet the inclusion criteria. We kept these papers to help with the data extraction. One of these fourteen papers described an economic evaluation, so we did not include it in the main analysis. We based our data extraction and analysis on a total of seventeen papers (fourteen eligible and three supplemental).

Data Extraction and Synthesis

Again, Laura Brown and Ben Heaven independently extracted and checked the relevant information using a standard data extraction form and contacted the authors when necessary to provide incomplete, inconsistent, or missing details. They then collated the data from the forms and tabulated them according to intervention and outcome category for the narrative synthesis.

Assessment of Risk of Bias

We assessed the risk of bias in each study in accordance with the Cochrane Collaboration's guidelines (Higgins and Green 2011). This Risk of Bias tool was modified for use with nonrandomized controlled studies to assess the risk of bias in each of the following five domains: selection (from the nonequivalence of participants across study groups), performance (from the absence of blinding of participants and intervention personnel), detection (from the absence of appropriate blinding of the outcome assessors), attrition (according to the amount and handling of incomplete data), and reporting (from the selective reporting of outcomes). The risk of bias for each criterion was scored as high, low, or unclear, according to standardized criteria (available on request).

Results

The fourteen articles we reviewed reported eleven separate studies evaluating seven different interventions: Experience Corps, Foster Grandparent Program, Older Mentors for Newer Workers, Research of Productivity by Intergenerational Sympathy (REPRINTS), Retired Senior Volunteers Program (RSVP), the Successful Aging Program, and the Senior Citizen Park Maintenance Corps.

Intervention Cultural Setting and Scope

Details of the seven interventions are presented in table 1. Five were based in the United States; one was set in Japan (REPRINTS); and one in the Netherlands (the Successful Aging Program). Collectively, the interventions covered a forty-four-year period from the mid-1960s (Foster Grandparent Program) to 2008/2009 (Older Mentors for Newer Workers). The scope of the interventions varied from extensive—occurring in every U.S. state (Retired Senior Volunteer Program)—to a single nonprofit community service organization (Older Mentors) (Crawford 1976; Stevens-Roseman 1966).

Theoretical Basis for Interventions. Four of the interventions were informed explicitly by theoretical concepts or models. Erik Erikson's (1978, 1982) concept of *generativity* was cited in reports of both the Experience Corps and the REPRINTS interventions. In their assessment of the former, Carlson and colleagues (2008, 799–800) quoted Erikson (1959) to explain that generativity is the "expansion of care beyond oneself, toward others, and transferring knowledge and wisdom to younger generations." The Successful Aging Program was informed by Ajzen's (1991) theory of planned behavior and Bandura's (1986) social learning theory (cited by Kocken and Voorham 1998a, 1998b). Specifically, the course used in this program was based on the understanding that social participation is determined by attitudes toward aging, the influence of societal opinion regarding the role of elderly people, and self-efficacy in engaging in new activities. Participants were encouraged to challenge their previously held attitudes through the support and example of a socially active peer role-model and to foster positive social norms of active aging and self-efficacy through group activities. Peer facilitators were therefore central to the intervention.

TABLE 1
Key Features of Interventions Targeting Social Roles for People in the Retirement Period

Intervention (Year of First Implementation)	Funding (F), Setting (S), Scope (SC)	Aims	Theory (T) and Content (C)	Commitment (C), Training and Support (S), Incentives (I)
Foster Grandparent Program, 1965	(F) Federally sponsored (Dept. of Health, Education and Welfare). (S) Home for neglected children, about 150 children, ranging from infants to 12 years, staffed by nuns and laypersons. (SC) 262 projects across USA (1986).	To "alleviate financial & psychological problems faced by impoverished elderly by providing interesting, paid employment"; . . . "provide institutionalized young children with individualized care"; . . . to "investigate older workers' proficiency as workers, & predict individual differences in performance" (Saltz 1971, 314, 318).	(T) None. Saltz (1989, 209) cites a shift away from disengagement theory (Cumming and Henry 1961) in support of gerontologists such as Birren (1964). (C) Ps assigned to 2 or 3 children (aged <6) each. They were encouraged to form personal bonds. Duties included rocking and feeding babies, playing with children, hugging, comforting, taking children to school, and taking part in craft activities. The Gray and Kasteler (1970) study was similar to the preceding except that the children had learning disabilities and one child was assigned per couple.	(C) Four hours per day for five days per week, i.e., 20 hours per week. This was either 8 a.m. to noon or 3:30 to 7:30 p.m. (S) Two-hour sessions per week by nurses or social workers (40 hours total), and Ps received ongoing support. (I) U.S. minimum hourly wage.
Retired Senior Volunteer Program (RSVP), 1971	(F) Federal ACTION Agency and local agencies, such as county governments and senior citizens organizations. (S) Placement in local organizations that require voluntary workers without displacing paid employees. (SC) In every state, 664 programs for 164,000 senior citizens (1975).	"Bringing together . . . retired senior citizens rich in experience with non-profit organizations that desperately need volunteer help . . . while at the same time helping senior citizens to better adjust to their life styles" (Crawford 1976, 2–3).	(T) None. However, this draws on components of the "group work model" (Sainer and Zander 1971, cited by Kornblum 1981), and has clearly defined principles. (C) Ps are placed in a variety of settings ranging from "working with physically or mentally handicapped children to . . . libraries and historical societies" (Crawford 1976, 2).	(C) Typical commitment is 3 hours per week. (S) RSVP staff offer continuing support. (I) Free health insurance and reimbursement for travel expenses and meals.

Continued

TABLE 1—*Continued*

Intervention (Year of First Implementation)	Funding (F), Setting (S), Scope (SC)	Aims	Theory (T) and Content (C)	Commitment (C), Training and Support (S), Incentives (I)
Senior Citizen Park Maintenance Corps, 1981	(F) U.S. Department of the Interior Parks and Recreation Recovery Program. (S) City parks and playgrounds. (SC) One city (Revere, MA).	To measure the effects of paid, part-time employment on perceived health status, morale, and activity levels in retirees.	(T) None. (C) Ps worked in teams of 5 to trim grass and hedges and remove litter in parks and playgrounds in local neighborhoods. Ps are given a large amount of creative control and autonomy and encouraged to think of own ideas for park.	(C) Four hours per morning, 5 days per week for 25 weeks. (S) Training and supervision were provided by the city's landscape gardener. Assistance was occasionally provided for heavy lifting or strenuous work. (I) Hourly fee was $6.
Successful Aging, 1995	(F) Unknown. (S) Unknown. (SC) Community of Ridderkerk, Netherlands.	"Improvement of the social, psychological and physical wellbeing of older adults" (Kocken and Voorham 1998a, 16).	(T) Ajzen's theory of planned behavior and Bandura's social learning theory. (C) A course organized in support of government's policy to give older adults opportunities to participate in society and live a meaningful life. Each meeting began with a senior health educator introducing a topic, followed by a peer-facilitated discussion. There were around 23 people per group.	(C) Four group meetings of 2 hours each. (S) Peer facilitators (aged 55 or older) called "senior health educators," had 1 year of training before leading groups. (I) Unknown.

Continued

TABLE 1—*Continued*

Intervention (Year of First Implementation)	Funding (F), Setting (S), Scope (SC)	Aims	Theory (T) and Content (C)	Commitment (C), Training and Support (S), Incentives (I)
Experience Corps (EC), 1996	(F) Erickson Foundation, Baltimore department of education, and federal support through Americorps funding. (S) Placement in schools. (SC) Nine U.S. cities (1996).	"[EC] was created to help older adults become: (a) motivated to be engaged through the opportunity to 'give back' and make a difference in the success of the next generation; (b) cognitively active through reading with children and library service; (c) physically active through daily transit to and service in schools (d) [be] introduced into new social networks, which include other team members, children, teachers, and staff in the school community" (Carlson et al. 2008, 794).	(T) Erikson's (1982) concept of generativity (as cited by Glass et al. 2004, 94–96) (individuals), a model based on social capital (schools). (C) Ps fulfill needs identified by principals in local schools. Core features of the intervention include having a "critical mass" of volunteers who are trained, and given a placement, in a team of 10 or more. Roles identified by school principals were (1) supporting literacy in class, (2) supporting library functions, (3) teaching children how to solve problems and play, and (4) increasing attendance (Fried et al. 2004, 66).	(C) Fifteen hours per week, over 3 to 4 days [in a school] normally for 1 academic year [4, 6, or 8 months]. (S) Both training and placement were central to the intervention. Training took 32 hours over a 2-week period for each group of volunteers. (I) Stipends to reimburse expenses.
Older Mentors for Newer Workers, 2008/2009	(F) Unknown. (S) Full-time employees at a nonprofit community service organization. (SC) A nonprofit community service organization in one locality.	To improve life satisfaction, with implications for workplace retention and workers' health.	(T) Based on a "Community-based participatory research" (CBPR) principal but also explicitly informed by role theory (Merton 1968). (C) Ps matched with a newer agency worker employed for < 6 months. The role of mentor was to listen and provide support, not to problem-solve.	(C) Intervention lasted 6 months. (S) Feedback sessions were provided halfway through and at the end of the 6-month intervention. A recognition ceremony was also held at the end of the intervention. (I) Unknown.

Continued

TABLE 1—*Continued*

Intervention (Year of First Implementation)	Funding (F), Setting (S), Scope (SC)	Aims	Theory (T) and Content (C)	Commitment (C), Training and Support (S), Incentives (I)
REPRINTS, 2004	(F) Tokyo Metropolitan Institute of Gerontology (TMIG) and, later, also via local municipal bodies. (S) Schools and kindergartens across Tokyo and Nagahama. (SC) Regional (set up by research team).	(1) Intergenerational engagement in which older adults contribute to the children's growth (i.e., sharing knowledge and values and building intergenerational trust); (2) maintain social roles and engage in intellectual activity in order to help improve physical and psychological health; and (3) support lifelong learning.	(T) Erikson's (1982) concept of generativity, as cited by Fujiwara et al. (2009). (C) Ps visited elementary schools, child care centers, and kindergartens in groups of 6 to 10 and served as book-reading volunteers. Ps selected picture books and used them to connect with the children. Ps also went to libraries to select books, and practiced reading them at home or with others. In the kindergartens, Ps read a picture book to approximately 20 children and played with toys for 30 minutes.	(C) Ps took part over an 18-month period (working once a week or fortnight). (S) Three-month period of weekly training with ongoing advice and feedback. Regular meetings held before/after reading sessions for info and mutual learning. Professionals sometimes invited to share their own knowledge. (I) None.

The Older Mentors intervention program was designed in partnership with older workers in a voluntary organization, following the principles of community-based participatory research (Stevens-Roseman 1966). The mentorship role was conceptualized as a means of formally recognizing the experience of older workers. Following the principles of role theory (Merton 1968), the intervention was designed to enhance the status of the work role (through mentoring) with the hypothesis that this would enhance well-being.

Provision of Explicit Social Roles. Six of the seven interventions were designed to provide an explicit functional role. These were acting as "grandparents" to neglected children (Foster Grandparent Program); assisting in local schools and kindergartens (Experience Corps and REPRINTS); undertaking placements in local voluntary organizations (RSVP); acting as mentors for newer workers in the organization in which the participants were employed (Older Mentors for Newer Workers); and conducting gardening and maintenance work in local parks (Park Maintenance Corps). Intergenerational contact was central to three of the interventions. The Successful Aging Program was unusual in that rather than giving the participants a specific role, it targeted health and social behaviors, with the aim of facilitating the active participation of older people in all aspects of society.

Commitment to Roles. The time commitment associated with each intervention varied from two four-hour meetings in the Successful Aging Program to twenty hours per week in the Foster Grandparent Program and the Park Maintenance Corps. In the Older Mentors for Newer Workers intervention, participants were recruited from their place of work and were mentored during normal working hours, thus requiring no additional time commitment.

Roles Performed in Groups. All seven interventions utilized groups in training and support activities, and three interventions also used a group format for recruitment and deployment. Influenced by Sainer and Zander's empirical findings (1971), participants in the Retired Senior Volunteer Program were recruited from preexisting groups of older people to reduce individual anxiety about "signing up" for a volunteer service (Kornblum 1981). In the Successful Aging Program, elements such as peer-educator role models and group-led discussions were used to encourage a new social norm of active engagement (Kocken and Voorham 1998a, 1998b). In the Foster Grandparent and Older Mentors programs, support for volunteers was available via group meetings,

but the roles themselves were based on the relationship between individual volunteers and a beneficiary. In contrast, deployment as part of a mutually supportive team was a feature of both the Experience Corps and REPRINTS. In the Park Maintenance Corps, groups of volunteers carried out tasks that were sometimes physically demanding.

Financial Inequalities. Four of the seven interventions helped with limited financial resources by offering paid employment (Foster Grandparent Program and the Park Maintenance Corps) or compensation for travel and other expenses (Experience Corps and RSVP). Participants in the Foster Grandparent Program (which began in 1965) were paid the U.S. minimum hourly wage, with the explicit aim of supplementing income without affecting entitlement to state benefits. Participants with few financial resources were favored by excluding volunteers with an annual income above $1,800 ($13,500 when adjusted for current standard of living) and $3,000 for couples ($22,500 in 2011 dollars). Likewise, participants in the Park Maintenance Corps were paid $6 per hour ($17.60 in 2011 dollars), up to $3,000 ($22,500 in 2011 dollars) each. Furthermore, these "roles" were advertised as "jobs" rather than leisure or personal growth activities. Two other interventions (Experience Corps and RSVP) provided travel expenses and other incentives to participate. In the Netherlands-based Successful Aging program, adequate finance was discussed as a precursor to well-being. However, unlike four of the five U.S.-based studies, the financial barriers to participating in the program itself were not identified explicitly, and data regarding possible financial reimbursement were unavailable. The REPRINTS program in Japan did not provide participation-related expenses (personal communication, M. Kuraoka, September 15, 2011).

Evaluation Studies: Characteristics and Quality. Four of the seven interventions were assessed by single studies and three by multiple studies (table 2). The duration of the intervention studies ranged from four to twenty-one months. A total of 1,310 participants were assessed at baseline, and 797 of these were followed up at the second assessment point. In all the studies, only 33 percent of the participants were male. The Senior Citizen Park Maintenance Corps was unusual in that it included more male ($n = 46$) than female ($n = 8$) participants. Notably, this intervention involved physical outdoor maintenance work, in contrast with interventions based on activities traditionally associated with productive female roles, such as child care and education (Experience Corps, Foster Grandparent Program), voluntary community work (REPRINTS and

TABLE 2
Design and Outcome of Evaluative Studies

Studies (Presented as Individual Papers) Intervention	Study Design Assessment Points T0: baseline T1: follow-up assessment 1 n = number (Gender) Recruitment (R) Recruitment and assignment (C) Control or comparison group activities Ethnicity African American (AA) White (W) Hispanic or Latino (HL)	Risk of Bias (1) selection (2) performance (3) detection (4) attrition bias (5) reporting bias: H = high, L = low, U: unclear	All Reported Outcomes	Evidence for Effects of the Intervention (SD = standard deviation)
Saltz 1971, 1989, Detroit Foster Grandparent Program (FGP)	Assessment Points T0: just before placement, n = 59, (8M:51F) T1: 12 Ms after T0 Recruitment (R) Community. Groups recruited separately. Approx. 50% of controls	Risk of Bias 1:H 2:H 3:H 4:U 5:H	Life Satisfaction: Life adjustment: responses scored as current satisfactions (Cantril and Free 1962), cited by Saltz (1971, 1989);[1] Life adjustment: content analysis: number	Note: Measurement at first follow-up (10 to 12 months after intervention) is not reported. At second follow-up (24 months after intervention), no comparisons

Continued

TABLE 2—*Continued*

chosen from those turned down from FGP because all slots had been filled or because they were over the minimum income level. Others were selected "from the community." (C) No information given. Ethnicity Exp: 44% AA, 56% W Ctrl: 48% AA, 52% W	of current satisfactions (Cantril and Free 1962), cited by Saltz (1971, 1989);[2] Life adjustment: content analysis: number of hopes for new satisfactions (Cantril and Free 1962), cited by Saltz (1971, 1989);[3] Life adjustment: content analysis: number of current dissatisfactions (Cantril and Free 1962), cited by Saltz (1971, 1989); Life adjustment: content analysis: number of fears or worries (Cantril and Free 1962), cited by Saltz (1971, 1989); Total Adjustment Inventory: adapted from two measures (Havighurst and Albrecht 1953 and Neugarten, Havighurst, and Tobin 1961), as cited by Saltz (1971, 1989). Mental and Psychological Health: Self-concept: Semantic differential (Osgood, Suci, and Tannenbaum 1957), as cited by Saltz (1971, 1989).	are made with the control group. Life Satisfaction (1) Mean number of responses scored as "current satisfactions" increased from 1.5 to 3.6 (SD not reported), within the intervention group ($p < 0.001$). No baseline or follow-up data for the control group are provided. (2) Mean percentage of total responses scored as "current satisfactions" through content analysis increased from 26 to 55 (SD not reported) within the

Continued

TABLE 2—*Continued*

				intervention group ($p <$ 0.01). No score given for controls. (3) Mean percentage of total responses scored as "hopes for new satisfactions" through content analysis decreased from 45 to 14 (SD not reported), within the intervention group ($p <$ 0.01). No score given for controls.
Gray and Kasteler 1970, Utah FGP	Assessment Points T0: on application, $n = 106$ (33M:73F) T1: 12 Ms after intervention, $n = 104$	Risk of Bias 1:H 2:H 3:U 4:L 5:H	Life Satisfaction: Life satisfaction (Neugarten, Havighurst, and Tobin 1961), as cited by Gray and Kasteler (1970);[1] Activities and Attitudes' scale:	Life Satisfaction (1) Responses scored as "high" life satisfaction did not differ between the two groups at baseline (control = 56%,

Continued

TABLE 2—*Continued*

Recruitment (R) Community. A subset of Ps who met inclusion criteria were selected for intervention. Selection based on a range of factors including financial need, so that "the best" of the applicants were selected. The rest became the control group. (C) No information given. Ethnicity No information.	Attitude score (Burgess, Cavari, and Havighurst 1949), as cited by Gray and Kasteler (1970);[2] Total personal and social adjustment (Burgess, Cavari, and Havighurst 1949),[3] as cited by Gray and Kasteler (1970); Social Support and Social Activity: Activities and Attitudes' scale: Activities Score (Burgess, Cavari, and Havighurst 1949), as cited by Gray and Kasteler (1970).[4]	experimental = 50%; chi square = 0.33, n.s.) but were significantly greater in the experimental group (77%) compared with the control group (57%) at follow-up (chi square = 4.43, $p = 0.01$). (2) Responses scored as "good" or "average" attitude increased from 56% at baseline to 100% in the experimental group and 61% to 89% in the control group (chi square = 5.67, $p = 0.01$).

Continued

TABLE 2—*Continued*

	(3) The percentages of responses scored as "good" or "average" on total personal and social adjustment (combination of activities and attitudes scale scores) for each group were not reported at baseline. However, at follow-up, there were significantly more in the experimental group (100%) compared with the control group (61%), (chi square = 23.51, $p = 0.01$). Social Support and Social Activity (4) The percentages of responses scored as "good" or "average" on social and organizational activity for each group were not reported at baseline. However, at follow-up, there were significantly more in the experimental group (100%) compared with the control group (74%) (chi square = 14.42, $p = 0.01$).

Continued

TABLE 2—*Continued*

Crawford 1976, Salt Lake City Retired Senior Volunteer Program (RSVP)	Assessment Points T0: 0 to 3 Ms before intervention, $n = 400$ (no data). T1: 8 to 11 Ms after T0 8 Ms after start of intervention, $n = 381$ Recruitment (R) Two community centers. Two researchers stood at the entrance and distributed numbered yellow cards to the first two RSVP members to enter, skipping the third. The same technique, using green cards, was used to select 100 people who were not RSVP members but who also attended the community centers.	Risk of Bias 1:H 2:U 3:L 4:L 5:L	Productivity and Self-actualization: Self-actualization needs (Reddin and Sullivan's Self-Actualization Inventory), cited by Crawford (1976); Social Support and Social Activity: Relationship needs (item on Reddin and Sullivan's Self-Actualization Inventory);[1] Sociability (Bernreuter's Personality Inventory [1931]),[2] cited by Crawford (1976); Mental and Psychological Health: Adjustment: Social adjustment (retiring versus aggressive types, Bell's Adjustment	Social Support and Social Activity (1) Within group comparison for the intervention group only from baseline to follow-up. The number of respondents that indicated "very high" need decreased, while those indicating low and very low need increased on a 5-point scale (very high, high, medium, low, very low need). Chi square $= 10.52$, df $= 4$, $p < .05$. (2) The intervention and control groups did not differ in mean score at a statistically significant level at baseline: intervention group mean 2.77 (SD 68.81),

Continued

TABLE 2—*Continued*

(C) No training or activities were offered (participants were free to continue using the community centers). Ethnicity No information.		Inventory 1962), cited by Crawford (1976); Emotional adjustment (emotional versus stable, Bell's Adjustment Inventory [1962]), cited by Crawford (1976); Confidence (Bernreuter's Personality Inventory [1931]),[3] cited by Crawford (1976).	control 5.22 (SD 51.09), t-test t = .40, df = 398, $p > .05$. At follow-up the group means differed at a statistically significant level t = 3.45, df = 379, $p < .01$, with the intervention group having a higher (lower score) mean sociability of -7.08 (SD 32.75). The control group mean at follow-up was 5.5 (SD 38.06). Mental and Psychological Health (3) The intervention and control groups did not differ in mean score at

Continued

TABLE 2—*Continued*

				a statistically significant level at baseline: intervention group mean 17.53 (SD 40.72), control 17.59 (SD 40.5), t = 0.01, df = 398, $p > .05$. At follow-up the group means differed at a statistically significant level t = 3.51, df = 379, $p < .01$, with the intervention group having a higher (lower score) mean confidence of 2.11 (SD 45.59). The control group mean at follow-up was 17.97 (SD 42.42).
Kornblum 1981, Philadelphia RSVP	Assessment Points T0: start of intervention, n = 198 (17M:138F) T1: 6 to 7 Ms after T0, n = 149 Recruitment (R) Researcher and RSVP staff approached established groups of older people and invited participation in	Risk of Bias 1:H 2:H 3:H 4:H 5:L	Life Satisfaction: Life Satisfaction Index B (Havighurst 1963), cited by Kornblum (1981). Social Support and Social Activity: Questions; Number of phone calls made and received on an average day; phone calls made	Perception of Age and Aging (1) Age identification: Identify self as young (Y), early middle-aged (EM), late middle-aged (LM), or old (O). At baseline, no statistically significant differences between intervention and control groups on this measure: chi square = 5.541, df = 3, $p > .10$. At follow-up a greater proportion of participants in the

Continued

TABLE 2—*Continued*

the program. Exp group was those who remained in the program for 6 months. Ctrl group was those who initially expressed interest but did not complete first 3 weeks. Self-selecting sample. (C) No further training or activities were offered once participants chose to leave the RSVP. Ethnicity Exp: 6.4% AA, 92.3% W, 1.3% other. Ctrl: 16.9% AA, 83.1% W, 0% other.	and received on the previous day; acquisition of new friends and acquaintances over the previous six months; frequency of loneliness. Perception of Age and Aging: Questions: How do you consider your own age?[1] Do you feel older or younger than peers? Physical Health and Physical Activity: subjective health; Questions: Current evaluation of health; amount of worry about health during past three months; extent of change in health during past three months;[2] number of times in past three months when poor health stopped your going out;[3] number of incidents during the past week with headaches; insomnia; stomach trouble.[4]	intervention group identified as "young" compared with controls. Chi square = 8.985, df = 3, $p < .025$. Physical Health and Physical Activity (2) At baseline, differences between intervention and control groups were borderline significant ($p > 0.05$). At follow-up, group means differed at a significant level; however, before and after group changes were not significant. Kornblum (1981, 96) suggested that a cumulative effect of opposite "drift" in group means was large enough to produce a significant difference and that self-selection rather than program participation was responsible for the significant differences at T1.

Continued

TABLE 2—*Continued*

			Levels of activity: Questions: Active enough most days of the week? frequency of boredom; number of days you look forward to? Functional Health: Rosow Functional Health Index (Rosow and Breslau 1966), cited by Kornblum (1981).	(3) See above. (4) At baseline, no statistically significant differences between intervention and control groups on this measure were reported $t = .902$, $p > .20$. At follow-up, the group means differed at a statistically significant level $t = 2.806$, $p < .005$. The intervention group reported fewer headaches and less insomnia and/or stomach trouble, 0.254 (SD 0.937) compared with baseline 0.333 (SD 0.863), while the control group reported more, 0.494 (SD 1.304), and follow-up 1.036 (SD 2.072).
Huss 1988, Iowa RSVP	Assessment Points T0: start of intervention, $n = 65$ (11M:47F). T1: 6 months after T0, $n = 58$ Recruitment (R) Exp group recruited from new volunteers as they	Risk of Bias 1: H 2: H 3: L 4: L 5: L	Life Satisfaction: Life Satisfaction Index A (Neugarten, Havighurst, and Tobin 1961), cited by Huss (1988);[1] Purpose in Life (PIL) test (Crumbaugh and Maholick 1963), cited by Huss (1988).[2] Social Support and Social Activity: Social Provisions Scale (SPS) (Russell and	Note: Seventeen (57%) of controls were over 75 years of age. The intervention group had only three (11%) subjects over 75 years. In addition, the medium income for the intervention group was $15,000, compared with only $6,036 in the control group.

Continued

TABLE 2—*Continued*

	entered the RSVP. Ctrl group was recruited through meal clubs at senior citizen centers and groups in elderly housing centers in two cities. Self-selecting convenience sample. (C) No training or activities were offered. Ethnicity No information.	Cutrona 1984), cited by Huss (1988). Physical Health and Physical Activity: Questions: Global judgment of own health; number of days ill in last six months (self-report); number of "significant events" (positive or negative).	Life Satisfaction (1) The mean score of the intervention group increased from baseline (mean 10.75, SD: 4.36) to follow-up (mean 11.89, SD: 4.04). The control group mean score slightly decreased across both time points (mean at baseline 10.23, SD: 4.16, and at follow-up: mean 9.86, SD: 3.92). Regression analysis found a 4% increase in explained variance when group status was combined with pretest scores as predictors of posttest scores in the regression ($p < .01$). (2) The mean score of the intervention group increased from baseline (mean 111.321, SD: 15.04) to follow-up (mean 114.82, SD: 13.62). The control group mean score slightly

Continued

TABLE 2—*Continued*

				decreased across both time points (mean at baseline 111.9, SD: 19.48 and at follow-up: mean 107.76, SD: 16.19). Regression analysis found a 6% increase in explained variance when group status was combined with pretest scores as predictors of posttest scores in the regression ($p <$ .01).
Soumerai and Avorn 1983, Revere, MA Park Maintenance Corps (SCPMC)	Assessment Points T0: 2 to 4 Ms before intervention, $n = 54$ (46M:8F). T1: 7 to 11 months after T0, $n = 47$.	Risk of Bias 1: L 2: L 3: H 4: H 5: U	Life Satisfaction: Life Satisfaction, Cantril Self-Anchoring Scale (Cantril 1965), cited by Soumerai and Avorn (1983);[1] Life Satisfaction Index A (Neugarten, Havighurst, and Tobin 1961), cited by Soumerai and Avorn (1983). Social Support and Social Activity: Social activity level, Cantril Self-	Note: The intervention and control groups were compared at baseline on demographic variables but not on the outcome measures used at follow-up. Life Satisfaction (1) At follow-up, 92% of participants in the intervention group scored "high" in life satisfaction, compared

Continued

TABLE 2—*Continued*

Recruitment (R) Ads placed in local newspapers, senior citizen newsletters, elderly housing complexes, community centers and banks, advertising jobs for retirees to work in the city's parks. Names were publicly drawn from a revolving drum. Twenty-five names were selected for the experimental group. Thirty participants for the control group were selected using a random number table. (C) No training or activities were offered. Ethnicity No information.	Anchoring Scale (Cantril 1965), cited by Soumerai and Avorn (1983). Physical Health and Physical Activity: Physical activity (measured on a Cantril ladder scale from 1 to 9); Perceived health: Questions: Perceived health at end of project;[2] Perceived change in health over 6 months.[3]	with 59% in the comparison group. Mann Whitney U = 343, $p = 0.03$ (one-tailed). Physical Health and Physical Activity (2) Participants in the intervention group rated their health at the end of the project as excellent (35%) and good (56%) compared with ratings of excellent (14%) and good (41%) in the comparison group. Mann Whitney U = 401, $p = 0.002$ (one-tailed). (3) Participants in the intervention group perceived a change in health over the last 6 months as: better (28%), same (68%), and worse (4%) compared with 4%, 82%, and 14% in the comparison group. Mann Whitney U = 356, $p = 0.01$ (one-tailed).

Continued

TABLE 2—*Continued*

Kocken and Voorham 1998a, 1998b, Ridderkerk, Rotterdam, Netherlands Successful Aging	Assessment Points T0: start of intervention, $n = 146$ (55M:91F). T1: 1 M after intervention, $n = 146$. T2: 4 Ms after intervention. Recruitment (R) Invitation letter sent to all eligible members of the community. Participants were assigned to either intervention (first 150) or control group (next 182), according to the order in which the applications were received.	Risk of Bias 1: H 2: H 3: L 4: U 5: U	Life Satisfaction: Well-being (short 8-item version of the Dutch Scale) for Well-being of the Elderly (Linschoten, Gerritsen, and Romijn 1993), cited by Kocken and Voorham (1998a, 1998b). Perception of Age and Aging: Questions: Attitude toward aging (five items); Perception of societal opinion on position of elderly in society (one item: "older adults have too little a say"). Social Support and Social Activity: Social support (a validated scale of perceived everyday support, van Sonderen 1991), cited by Kocken and Voorham (1998a, 1998b); Questions: Number of hours per week spent on hobbies and activities with others outside the home.

Continued

TABLE 2—*Continued*

	(C) Participants were put on a waiting list and given the opportunity to participate in the program at the end of the study. Ethnicity No information.		Physical Health and Physical Activity: Subjective health assessment (measure on a scale 1 to 10). Mental and Psychological Health: Self-efficacy (a Dutch version of the validated general self-efficacy scale, Bosscher, Laurijssen, and de Boer 1992; Sherer et al. 1982), cited by Kocken and Voorham (1998a, 1998b).	
Carlson et al. 2008; Frick et al. 2004; Fried et al. 2004; Glass et al. 2004; Tan et al. 2006; Baltimore	Assessment Points T0: just before training, $n = 128$ (11M:117F). T1: 8, 6, or 4 months after training, $n = 125$.	Risk of Bias 1: L 2: H 3: H 4: H 5: H	Social Support and Social Activity: Questions: Number of adults: You could turn to for help (mean);[1] Who would check	Note: Statistical comparisons were for the amount of change from baseline to follow-up between intervention and control

Continued

TABLE 2—*Continued*

Experience Corp. (EC)	Recruitment (R) Community: social groups and churches near chosen schools, senior events, job fairs, recruitment in the street, and a local AARP mailing list. Random allocation. (C) On a waiting list until the next academic year. Ethnicity Exp: 97.1% AA, W or other, 2.9%. Ctrl: 94.7% AA, W or other, 5.3%.	on you if sick (mean); One could depend on (mean); Seen in a typical week (mean); Could you have used more emotional support (from others past year)? Physical Health and Physical Activity: Questions: Self-perception: More active at follow-up?[2] Number of blocks walked/week (mean); Proportion walking no blocks/week; Flights of stairs climbed/week (number climbed [mean]); Proportion climbing no stairs/week; Activity in kilocalories/week (mean); Number of hours lying down or sitting while awake (mean); Physical activity per week (mins); Leisure-time physical activity: walking for exercise (kCal per week); Leisure-time physical activity: household chores (kCal per week); Leisure-time physical activity: exercise (kCal per week); Leisure-time physical activity: recreational activity (kCal per week); Percentage who are active.	groups (using chi square or t-tests as appropriate). Comparisons between groups at baseline only and at follow-up only were not reported (excluding baseline demographic comparisons). Social Support and Social Activity (1) Mean number of reported adults increased from 5.3 at baseline to 6.2 at follow-up in the experimental group and decreased from 5.8 to 4.3 in the control group. The amount of change differed between the two groups ($p < 0.03$). Physical Health and Physical Activity (2) At follow-up, self-perceptions regarding an increase in

Continued

TABLE 2—*Continued*

	Functional Health: Questions: Strength: Very good/excellent;[3] Feel stronger at follow-up?[4] Fallen in past 12 months? Cane use: less often; Walking speed (m/s).[5] Cognition: Questions: Number of activities engaged in past month: High-intensity cognitive activities; Moderate-intensity activities; Low-intensity activities; Books read/month (mean); Hours of television/day (mean);[6] Cognitive Assessment: Trail-making task: A (seconds); Trail-making task: B (seconds);[7] Rey-Osterrieth complex figures test: copy score; Rey-Osterrieth complex figures test: delayed recall score;[8] Word list memory: immediate recall (score /60); Word list memory: delayed recall (score /20). Mental and Psychological Health: Depression (geriatric depression scale), no data available.	activity from baseline were reported by 62.7% of participants in the intervention group and 42.6% in the control group ($p < 0.04$). Functional Health (3) Strength rated as either "very good" or "excellent" increased from 47.7% of participants at baseline to 64.8% at follow-up in the experimental group and decreased from 52.4% to 35.9% in the control group ($p < 0.03$). (4) Reported increased strength at follow-up was 43.6% of participants in the intervention group and 18.2% in the control group ($p < .02$). (5) Average walking speed (m/s) decreased less from baseline to follow-up in the intervention group compared with controls (0.95m/s to 0.92 for intervention group, 1.06 to 0.86 for controls) ($p < 0.001$).

Continued

TABLE 2—*Continued*

	Cognition (6) Mean hours of television watching from baseline to follow-up decreased for the intervention group (4.6 hrs. to 4.4 hrs.) and increased for controls (4.5 hrs. to 5.3 hrs.) ($p < 0.02$). (7) Mean seconds taken to complete the Trail-making task B (adjusted for age, education, and exposure duration) decreased for the intervention group from baseline to follow-up (174.3 s to 160.7 s) and increased for controls (169.6 s to 191.3 s) ($p < 0.05$ for change score) (interaction effects in ANCOVA not significant: $p < 0.1$). (8) Mean delayed recall score (adjusted for age, education, and exposure duration) increased for the intervention group (intervention group were more accurate) from baseline to follow-up (11 to 12) and decreased for controls (11.4 to 10.3).

Continued

TABLE 2—*Continued*

Carlson et al. 2008, Baltimore EC	Assessment Points T0: after training, $n = 18$ (0M:17F). T1: 6 months after baseline, $n = 17$. Recruitment (R) No information. Potential Ps attended an information event. (C) On a waiting list until the next academic year. Ethnicity Exp: 100% AA Ctrl: 100% AA	Risk of Bias 1: U 2: H 3: U 4: L 5: L	Cognition: Response times [RTs] on Flanker test: Percentage interference;[1] Accuracy on flanker test in congruent trials; Accuracy in incongruent trials;[2] Activation of brain regions of interest (ROI) during Flanker test: ROI ACC;[3] ROI left vLPFC;[4] ROI left dLPFC.[5]	(1) Mean response times (RTs) on the Flanker test expressed as percentage interference. A reduction in interference (i.e., better performance) was reported for the intervention group from baseline to follow-up (9% to 8%) compared with matched controls where interference was stable (9%). Repeated measures ANOVA showed a significant time × group interaction: $F(1,13) = 5.28$; $p < .04$. (2) Mean accuracy on Flanker test improved for the intervention group in comparison with controls from baseline to follow-up, but only when the "cues" used in the trial were incongruent with the correct response—making the task more complex. Repeated measures ANOVA showed a significant time × group × congruency interaction—$F(1,13) = 5.77$; $p < .03$, with post hoc comparisons at $p < 0.5$.

Continued

TABLE 2—*Continued*

				(3) Neuroimaging activity in three regions of interest (ROI) in the brain during Flanker test. Reported intervention-specific increase in brain activity in selected ROI from baseline to follow-up across all levels of complexity compared with controls. No raw data (activation time) provided. Repeated measures ANOVA. Showed significant time × group interaction: F (1,13) = 13.22; $p < .003$. (4) As above, left vLPFC region, F (1,13) = 5.16; $p < .04$. (5) As above, left dLPFC region, F (1,13) = 8.99; $p < .01$.
Stevens-Roseman 2009, Houston Older Mentors for Newer Workers	Assessment Points T0: Before group assignment, n = 22 (1M:21F). T1: 6 Ms after T0, n = 16. Recruitment (R) Recruitment occurred within a workplace, with older employees given the chance to participate. Participants signed up as they arrived at an introductory meeting. Every other name in the list was chosen for the experimental group, and every other name for control.	Risk of Bias 1: U 2: H 3: L 4: H 5: U	Life Satisfaction: Life Satisfaction Index A (Neugarten, Havighurst, and Tobin 1961),[1] cited by Stevens-Roseman (2009).	(1) There was no difference between the life satisfaction scores of the intervention—14.36 (SD 1.91)—and control group—14.00 (SD 2.86)—at baseline (p = 0.73). At follow-up, the intervention group—15.7 (SD 1.34)—scored significantly higher than the control group—11.83 (SD 3.66); $p < 0.01$.

Continued

TABLE 2—*Continued*

	(C) Continued to work as usual. Ethnicity Exp: 36% AA, 5% W, 36% HL, 23% missing. Ctrl: No data			
Fujiwara et al. 2006; 2009, Chūō ward (central Tokyo); Tama ward, Kawasaki (Tokyo suburb); Nagahama, Shiga Prefecture (western Japan) REPRINTS	Assessment Points T0: Start of training, $n = 141$ (38M: 103F). T1: 9 Ms after training, 5 Ms after job placement, $n = 122$ T2: 21 Ms after training, 17 Ms after placement. Recruitment (R) Community: Advertisements and events targeting social activity and hobby clubs, adult volunteering, and community-based health promotion programs. Groups recruited separately. (C) No specific training or program was used. Participants were asked not to engage in intergenerational activities. Ethnicity No information.	Risk of Bias 1: H 2: H 3: L 4: H 5: H	Productivity and Self-actualization: personal activity, Social Activity Checklist (Takahashi et al. 2000), cited by Fujiwara et al. (2009); lifelong study, Social Activity Checklist (Takahashi et al. 2000), cited by Fujiwara et al. (2009); Occupation, Social Activity Checklist (Takahashi et al. 2000), cited by Fujiwara et al. (2009).[1] Social Support and Social Activity: Social or volunteer activity, Social Activity Checklist (Takahashi et al. 2000), cited by Fujiwara et al. (2009); Providing social support, scale developed by Noguchi (1991), cited by Fujiwara et al. (2009) (3 categories of 4 items each, data presented only for each category): To family members living together; To family members living apart; To	Note: Analysis was based on mixed model ANOVA. Statistical comparisons were not made between the groups at follow-up. Factors assessed were time and group assignment, with age and gender controlled. Productivity and Self-actualization (1) Decrease in mean scores from baseline 0.3 (SD 0.4) to follow-up 0.2 (SD 0.4) for the intervention group, control means 0.3 (SD 0.5) to 0.3 (SD 0.4). Significant group × time interaction ($p < 0.001$). Social Support and Social Activity (2) Increase in mean scores from baseline 11.2 (SD 5.9) to follow-up 13.1 (SD 4.5) for the intervention group, control means 12.7 (SD 5.0) to 12.7 (SD 4.4). Significant group × time interaction ($p = 0.046$).

Continued

TABLE 2—*Continued*

	friends or neighbors;[2] Receiving social support: As above (family together, apart, friends and neighbors);[3] Social network score (frequency of communication): Friends/neighbors; Grandchildren;[4] Neighborhood children; Distant children (via volunteer work, etc.);[5] Number of friends or neighbors contacted; Number of distant friends contacted.[6] Physical Health and Physical Activity: Questions: Number of chronic conditions; Systolic blood pressure; Diastolic blood pressure; Self-rated health score.[7] Functional Health: Questions: Use of eye glasses; Functional capacity: Percentage full scorers (Tokyo Metropolitan Institute of Gerontology Index of Competence); Functional capacity: Self-maintenance (Index of	(3) Decrease in mean scores from baseline 9.9 (SD 4.8) to follow-up 8.8 (SD 4.6) for the intervention group, slight increase in means for the control group 10.5 (SD 4.8) to 11.0 (SD 4.1). Significant group × time interaction ($p = 0.038$). (4) Increase in mean scores from baseline 2.1 (SD 2.1) to follow-up 2.4 (SD 2.1) for the intervention group, decrease in means for control group 2.7 (SD 2.0) to 2.4 (SD 2.0). Significant group × time interaction ($p = 0.07$). (5) As expected, the intervention group increased their frequency of contact with children outside their own neighborhoods (through volunteer activity) with means of 1.6 (SD 1.7) at baseline and 3.3 (SD 1.1) at follow-up and 1.6 (SD 1.8) to 1.4 (1.5) for controls. Significant group × time interaction ($p < 0.001$).

Continued

TABLE 2—*Continued*

	Competence); Usual walking speed (m/minute); Maximum walking speed; Hand grip strength (KG);[8] One leg standing duration test; "Elaboration of fingers" / peg test (gross movements of hands, fingers, and dexterity as necessary in assembly tasks); Functional capacity: Social role. Cognition: Functional capacity: intellectual activity (Tokyo Metropolitan Institute of Gerontology Index of Competence); Cognitive function: immediate recall (Japanese version of Rivermead Behavioural Memory Test); Delayed recall; Verbal fluency: Phonological; Verbal fluency categories; Information (WAIS-R: Information subtest); Picture completion (from WAIS-R); Digit symbol (from WAIS-R). Mental and Psychological Health: Depression (Geriatric depression scale); Self-esteem (Rosenberg's 10-item scale [1979]), cited by Fujiwara et al. (2009); Self-rated health score (includes depression); Locus of control (Kambara and colleagues' 18-item version of Locus of Control, LOC [1982]), cited by Fujiwara et al. (2009).	(6) Increase in mean scores from baseline 3.1 (SD 1.3) to follow-up 3.5 (SD 1.1) for the intervention group, decrease in means for control group 3.3 (SD 1.2) to 3.2 (SD 1.1). Significant group × time interaction ($p = 0.044$). Physical Health and Physical Activity (7) Increase in mean scores from baseline 1.9 (SD 0.6) to follow-up 2.1 (SD 0.7) for the intervention group, decrease in means for control group 2.1 (SD 0.5) to 2.0 (SD 0.6). Significant group × time interaction ($p = 0.012$). Functional Health (8) Participants got weaker over time, with greater loss of strength in the comparison group. Intervention group means 25.7 (SD 6.8) at baseline to 25.4 (SD 6.4) at follow-up; control group means 26.6 (SD 5.9) to 25.1 (SD 6.7). Significant group × time interaction ($p = 0.005$).

Continued

TABLE 2—*Continued*

Total: Studies: $n = 11$ USA: 9 Japan: 1 Netherlands: 1 Interventions: $n = 7$	Total: T0 $n = 1310$ (220M:666F) T1 $n = 797$	Total: Life Satisfaction: $n = 16$ Cognition: $n = 25$ Social Support and Social Activity: $n = 29$ Functional Health: $n = 15$ Physical Health and Physical Activity: $n = 33$ Productivity and Self-Actualization: $n = 4$ Perception of Age and Aging: $n = 4$ Mental and Psychological Health: $n = 9$[a]	Total: Life Satisfaction: $n = 10$ Cognition: $n = 8$ Social Support and Social Activity: $n = 9$ Functional Health: $n = 4$ Physical Health and Physical Activity: $n = 5$[b] Productivity and Self-Actualization: $n = 1$ Perception of Age and Aging: $n = 1$ Mental and Psychological Health: $n = 1$

Notes: Superscript numbers are evidence of a significant effect of the intervention.
[a]Excludes mental and psychological health measure from EC when no information on outcome was available.
[b]Excluding two results likely due to selecting bias.

Older Mentors), and group support (Successful Aging Program). Five of the eleven studies did not report the participants' ethnicity, and none indicated the representativeness of ethnicity data.

All the studies in our review had a high or unclear risk of bias in at least two of the five categories assessed. The highest levels of risk were associated with selection and performance bias, generally arising from the nonrandom allocation of participants to groups (selection bias) and a lack of participant blinding to group allocation (performance bias). Only three studies randomly assigned participants to groups. Instead, groups often were assigned according to factors like convenience or perceived need, resulting in high risks of systematic biases between groups. Such biases make it almost impossible to evaluate, with confidence, the success of an intervention.

Eight of the eleven studies showed a low or unclear risk of attrition bias. Attrition rates were clearly linked to recruitment strategies. For example, in studies in which the participants applied for an engaging and demanding paid role (Foster Grandparents Program, Park Maintenance Corps); for a role that placed them on a waiting list for "a place in the program" (Successful Aging Program); or where participants were recruited based on whether they had already been exposed to the intervention (Crawford 1976; Huss 1988), the attrition was low. High attrition was found only in the one study in which participants were recruited from existing social groups (Retired Senior Volunteer Program, Kornblum 1981). However, the high rate of attrition may be partly attributed to participants being able to maintain their social networks outside the intervention program.

Outcomes: Social Roles

The evaluative studies had either no or limited measures of perceived roles, and only two reported that the meaningfulness of the roles had been recorded, though neither study reported the results (Huss 1988; Saltz 1971, 1989). Roles were also assessed by measures of performance (Fried et al. 2004; Saltz 1971, 1989). Huss (1988) reported the time spent in the role, the perception of performing volunteer work, and the effect of different roles (clerical, personal interaction, and a combination of both) but found that the type of volunteer work did not have a significant relationship to life satisfaction scores. In a post-hoc analysis, Kornblum

(1981, 99) investigated the effect of providing novel versus familiar social roles and concluded "that participation in a new role [compared with a familiar one] . . . had no measurable impact upon participants." Fried and colleagues (2004) reported the participants' number and duration of activities within the Experience Corps. None of the other evaluation studies reported outcomes relating to roles.

Outcomes: Health and Well-Being

Health and well-being outcomes from the eleven evaluative studies are shown in table 2. In almost all cases, when evidence for an intervention effect was reported, the outcome was favorable to those who received the intervention.

The Foster Grandparent Program was evaluated by two studies. Both Saltz (1971, 1989) and Gray and Kasteler (1970) reported increased life satisfaction for those receiving the intervention. Saltz reported a decrease in the intervention group's "Hopes for New Satisfactions" (1971, 325), although this finding may indicate greater contentment after receiving the intervention. Gray and Kasteler (1970) also reported favorable outcomes in measures of attitude toward life and in total and personal adjustment. Approximately one year after the start of the intervention, participants in the Foster Grandparent Program scored higher on measures of social activity and participation in organizations than did those in the comparison group.

Three studies assessed the RSVP program. Crawford (1976) reported that those participants who received the intervention scored higher on measures of sociability at follow-up than did people in a comparison group; their relationship needs decreased; and they had more confidence than controls. In a second study by Kornblum (1981), the intervention group reported fewer headaches at follow-up, and a greater proportion reported feeling "young" after taking part in the program. A third study, reported by Huss (1988), found that those participants who received the intervention had higher measures of both life satisfaction and purpose in life from baseline to follow-up, while the scores for those in a comparison group fell slightly over the same period in both areas. These findings, however, should be interpreted with caution because the adults receiving the intervention were, on average, eight years younger and twice as wealthy as those in the comparison group.

Citizens who took part in the Park Maintenance Corps had greater life satisfaction and better self-reported health, and a greater proportion perceived an improvement in their health when looking back over the preceding six months, compared with those placed on a waiting list (Soumerai and Avorn 1983).

In contrast with the other interventions, Kocken and Voorham (1998a) found no evidence, across a wide range of outcome measures, that the Successful Aging Program had a statistically significant intervention effect.

Two studies evaluated the Experience Corps. The first found that the program improved perceived social support and perceived physical activity and strength and that it lessened perceptions of decline in strength over time (Carlson et al. 2008; Frick et al. 2004; Fried et al. 2004; Glass et al. 2004; Tan et al. 2006). Participation in the program also diminished declines in average walking speed. Participants receiving the intervention performed better at a range of cognitive tasks over time, becoming faster and more accurate, and they watched less television from baseline to follow-up, whereas adults in a comparison group performed worse over the same period and watched more television. In a second study, participants receiving the intervention carried out cognitive tasks both more quickly and more accurately, and neuroimaging demonstrated increased activity in the relevant brain areas (Carlson et al. 2009).

Stevens-Roseman (1966) reported that the participants in the Older Mentors for Newer Workers program who were given an active role had greater life satisfaction from baseline to follow-up, whereas those in a comparison group had less satisfaction over the same period.

Active volunteering in the REPRINTS program led to a range of desirable outcomes in measures of social support and physical and functional health (Fujiwara et al. 2009). But the intervention and comparison groups differed significantly on a number of variables: years in education, number of grandchildren, and experience of volunteer activities.

Participants who received the intervention reported offering more assistance to others and having more contact with grandchildren and distant friends at follow-up, whereas adults in a comparison group reported receiving more support from others and having less contact with friends and relatives. Active REPRINTS volunteers' subjective assessments of their health grew more positive over time, while those of people in the comparison group became less positive, and those who received the intervention lost less grip strength over time. Those who received

the intervention participated slightly less in paid occupational roles than at baseline, and they reported receiving less social support at follow-up. However, the behavior of those receiving the intervention may reflect a greater investment of time in volunteer (rather than paid) activities and those receiving less support also reported increases in offering assistance to others, suggesting less perceived need for assistance.

Evidence Synthesis. A comparison of the interventions to ascertain which were the most effective in promoting health and well-being was limited by both a lack of random allocation in all but three of the studies and a dearth of comparable measurement instruments. The three randomized studies were those that assessed the Park Maintenance Corps (Soumerai and Avorn 1983), the Experience Corps (EC) (Carlson et al. 2008; Frick et al. 2004; Fried et al. 2004; Glass et al. 2004; Tan et al. 2006), and the Older Mentors for Newer Workers program (Stevens-Roseman 1966). Collectively they demonstrated effectiveness in life satisfaction, social support and social activity, physical health and physical activity, functional health, and cognition. In two of these three studies, we found only one directly comparable outcome measure: the Life Satisfaction Index A (Neugarten, Havighurst, and Tobin 1961) reported by both Soumerai and Avorn (1983), and Stevens-Roseman (1966). Two studies measured "social support and social activity," but each measured a different subconcept and used different instruments (see table 2). Likewise, Soumerai and Avorn (1983) measured self-reported overall physical activity and perceived health, and the study of the Experience Corps measured self-reported behavior in twelve activities.

Conducting a meta-analysis of the three randomized studies would have been inappropriate because the interventions were substantially heterogeneous, differing in the type of social role provided, sub-population targeted, and the outcome measures used to assess their efficacy.

Of all the studies we reviewed, we found only two instruments that had been used in more than one study: Cantril's Ladder of Aspiration (Saltz 1971, 1989; Soumerai and Avorn 1983) and the Neugarten Life Satisfaction Index A (LSIA) (Gray and Kasteler 1970; Huss 1988; Sourmerai and Avorn 1983; Stevens-Roseman 1966). Additional items on self-report questionnaires or physical activity measures were analogous across studies (e.g., walking speed) but too few in number to form the basis of meaningful comparisons.

Only one study reported the cost-effectiveness of a social role intervention. Frick and colleagues (2004) found that the Experience Corps

in Baltimore cost, on average, $205,000 for each quality adjusted life year (QALY) gained by the older participants. Accordingly, the authors concluded that the program was cost-effective or cost saving only when also considering the benefits to children who received support from the volunteers.

To facilitate comparison, we grouped the interventions according to their prominence in one of the following intervention domains: having an explicit theoretical basis; providing participants with an explicit role; requiring high levels of commitment from participants (at least four hours per day, five days a week); using groups in at least three of four areas of recruitment, training, deployment, or support; and specifically targeting adults with low financial resources (see table 3). We then grouped the outcome measures into eight descriptive conceptual categories: (1) life satisfaction, (2) perception of age and aging, (3) productivity and self-actualization, (4) social support and social activity, (5) physical health and physical activity, (6) functional health, (7) cognition, and (8) mental and psychological health. The intervention groups and their respective pooled outcomes were then compared. Note that only three intervention groups contained outcome categories applicable to every intervention in the group.

The Park Maintenance Corp and the Foster Grandparent Program were mainly for people with few financial resources. We rated both as requiring a "heavy commitment" from participants in comparison with the other interventions. There was some evidence that both interventions were associated with greater life satisfaction.

Two interventions (Retired Senior Volunteer Program, Experience Corps) used a group format for recruiting, training, deploying, and supporting the programs' participants. Of the eight conceptual outcome categories, only two were applicable to both interventions, which together showed some evidence for improving social support and social activity. Out of a combined pool of twenty-five measures for physical health and physical activity, only two (self-perception of being more physically active over time, and reported headaches, insomnia and/or stomach trouble) showed evidence of an intervention effect.

The Successful Aging Program did not offer an explicit role to those receiving the intervention, and it also was the only intervention that did not produce evidence of an intervention effect. No individual outcome categories could be applied to all the remaining six interventions.

TABLE 3
Interventions Grouped by Characteristic Features with Pooled Outcomes

Intervention Feature	Most Intensive	Medium Intensity or Unrelated Category	Least Intensive	Outcome Categories for "Most Intensive" Interventions	Evidence for Statistically Significant Intervention Effects across Pooled Interventions
Theoretical Basis	Explicit theoretical basis	Explicit evidence base	Atheoretical or no explicit evidential basis		
	REPRINTS EC Successful Aging Older Mentors	RSVP	FG Park Maintenance	REPRINTS Productivity and Self-Actualization: 3(1) Social Support and Social Activity: 13(5) Physical Health and Physical Activity: 4(1) Functional Health: 9(1) Cognition: 8(0) Mental and Psychological Health: 4(0) Experience Corps. Social Support and Social Activity: 5(1)	Life Satisfaction: 2(1), 50% Cognition:[a] 25(8), 32% Social Support and Social Activity: 20 (6), 30% Functional Health: 14(4), 29% Physical Health and Physical Activity: 18(2), 11% Perception of Age and Aging:[b] 2(0) Mental and Psychological Health: 5(0)

Continued

TABLE 3—*Continued*

Intervention Feature	Most Intensive	Medium Intensity or Unrelated Category	Least Intensive	Outcome Categories for "Most Intensive" Interventions	Evidence for Statistically Significant Intervention Effects across Pooled Interventions
				Physical Health and Physical Activity: 13(1) Functional Health: 5(3) Cognition: 17(8) Mental and Psychological Health: (No information) Successful Aging Life Satisfaction: 1(0) Perception of Age and Aging: 2(0) Social Support and Social Activity: 2(0) Physical Health and Physical Activity: 1(0) Mental and Psychological Health: 1(0) Older Mentors Life Satisfaction: 1(1)	
Provision of Explicit Roles	Provides explicit role	No explicit role			
	Park Maintenance FGP	Successful Aging		Park Maintenance Corps: Life Satisfaction: 2(1)	Life Satisfaction: 15(11), 73% Perception of Age and Aging:[a] 2(1), 50%

Continued

TABLE 3—*Continued*

Intervention Feature	Most Intensive	Medium Intensity or Unrelated Category	Least Intensive	Outcome Categories for "Most Intensive" Interventions	Evidence for Statistically Significant Intervention Effects across Pooled Interventions
	REPRINTS EC RSVP Older Mentors			Social Support and Social Activity: 1(0) Physical Health and Physical Activity: 3(2) FGP Life Satisfaction: 9(6) Mental and Psychological Health: 1(0) Social Support and Social Activity: 1(1)	Social Support and Social Activity: 27(9), 33% Cognition:[a] 25(8), 32% Functional Health: 15(4), 27% Productivity and Self-actualization: 4(1), 25% Physical Health and Physical Activity: 32(5), 16% Mental and Psychological Health:[a] 8(1),[b] 13%

Continued

TABLE 3—*Continued*

Intervention Feature	Most Intensive	Medium Intensity or Unrelated Category	Least Intensive	Outcome Categories for "Most Intensive" Interventions	Evidence for Statistically Significant Intervention Effects across Pooled Interventions
				REPRINTS (see previous) Experience Corps. (see previous) RSVP Productivity and Self-Actualization: 1(0) Social Support and Social Activity: 7(2) Mental and Psychological Health: 3(1) Life Satisfaction: 3(3) Perception of Age and Aging: 2(1)	

Continued

TABLE 3—*Continued*

Intervention Feature	Most Intensive	Medium Intensity or Unrelated Category	Least Intensive	Outcome Categories for "Most Intensive" Interventions	Evidence for Statistically Significant Intervention Effects across Pooled Interventions
				Physical Health and Physical Activity: 12(1) Functional Health: 1(0) Older Mentors (see previous)	
Commitment to Role	Heavy	Medium or sustained	Minimal		
	Park Maintenance FGP	RSVP EC REPRINTS	Successful Aging Older Mentors	Park Maintenance Corps (see above) FGP (see above)	Physical Health and Physical Activity:[a] 3(2), 67% Life Satisfaction:[c] 11(7), 64% Social Support and Social Activity:[a, c] 2(1), 50% Mental and Psychological Health: 1(0), 0%

Continued

TABLE 3—*Continued*

Intervention Feature	Most Intensive	Medium Intensity or Unrelated Category	Least Intensive	Outcome Categories for "Most Intensive" Interventions	Evidence for Statistically Significant Intervention Effects across Pooled Interventions
Group Design	4 factors	3 factors	2 factors		
1. Recruitment					
2. Training					
3. Deployment					
4. Support					
	RSVP EC	REPRINTS FGP Older Mentors Park Maintenance	Successful Aging	RSVP (see previous) Experience Corps. (see previous)	Productivity and Self-Actualization:[a] 1(1), 100% Life Satisfaction: 3(3), 100% Functional Health: 6(3), 50% Perception of Age and Aging:[a] 2(1), 50% Cognition:[a] 17(8), 47% Mental and Psychological Health:[a, b] 3(1), 33%

Continued

TABLE 3—*Continued*

Intervention Feature	Most Intensive	Medium Intensity or Unrelated Category	Least Intensive	Outcome Categories for "Most Intensive" Interventions	Evidence for Statistically Significant Intervention Effects across Pooled Interventions
					Social Support and Social Activity:[c] 12(3), 25% Physical Health and Physical Activity:[c] 25(2), 8%
Financial Inequalities	Target low SES adults	Remove financial barriers to participation (all SES)	Do not address financial inequalities directly		
	Park Maintenance FGP	RSVP EC	Successful Aging REPRINTS Older Mentors	Park Maintenance Corps (see previous) FGP (see previous)	Physical Health and Physical Activity:[a] 3(2), 67% Life Satisfaction:[c] 11(7), 64% Social Support and Social Activity:[a, c] 2(1), 50% Mental and Psychological Health: 1(0), 0%

Notes: n = total measures across all studies of the intervention (number of measures indicating a statistically significant effect of the intervention).
[a]Significant effect applicable to only one intervention in the group.
[b]Excludes mental and psychological health measure from EC where no information on outcome was available.
[c]Outcome category applied to all pooled interventions.

However, the pooled outcomes demonstrated that as a whole, interventions providing an explicit role were associated with an increase in life satisfaction and moderate success in improving perceived social support and social activity.

Discussion

Our review shows that for people of retirement transition age, interventions offering an explicit social role with group support can improve health and well-being for those who carry out the role. However, major sources of bias affecting the studies in this review limit how confidently we can claim that the interventions were effective. Conclusions regarding causality can be made confidently from only the three studies making random assignments to groups. All three studies demonstrated a beneficial intervention effect, although factors such as the heterogeneity of intervention design, small number and quality of studies, and noncomparable outcome measures prevent a meta-synthesis of these outcomes.

According to both the empirical and theoretical literature, social roles are linked to well-being outcomes through the way in which they are interpreted (such as providing feelings of worth, purpose, or perceptions of usefulness and status) (Hobbis et al. 2011; Jones, Leontowitsch, and Higgs 2010; Lum and Lightfoot 2005; McMunn et al. 2009; Reichstadt et al. 2010). The lack of a "social role" measurement is therefore problematic when trying to establish the mechanisms underlying any changes in health or well-being. For instance, taking on "tasks" can increase social contact, physical activity, and financial remuneration, all of which may independently influence health and well-being, regardless of the role's perceived value. Measurements of social roles would help determine whether social role interventions are worth the investment. This is pertinent as social role interventions compete for resources with other interventions targeting physical health and "lifestyle" factors, which, while important, are not the sole components of well-being in retirement (Bryant, Corbett, and Kutner 2001; Gabriel and Bowling 2004; Iliffe et al. 2010).

Demographic factors (e.g., gender and socioeconomic status) shape the attractiveness of particular types of role (McNamara and Gonzales 2011; Thomas 2011). If social role interventions are

effective in promoting health and well-being, it will be important to maximize an intervention's applicability to different sections of society or to offer roles that are attractive to those most needing intervention. This will require assessment of the value and meaning of different roles.

Only one of the interventions (Retired Senior Volunteers) was designed to offer a flexible assignment by matching volunteers to available roles in the community. All other interventions made just one specific role available to participants or offered no explicit role, which likely limited their perceived relevance and attraction to particular groups of people. For instance, the Park Maintenance Corp attracted primarily those men who had previously worked in manual, semiskilled occupations. According to studies of interventions that provided stereotypically female roles (e.g., child care, teaching, volunteer activities), most of the participants were women.

The generalizability of the interventions beyond their original setting may be limited. Programs set in the United States placed greater emphasis on financial well-being than did the Successful Aging Program or REPRINTS, possibly reflecting the sociopolitical context of retirement in North America, which provides less support than European countries (Alesina and Angeletos 2003) and Japan (Campbell 1992) do. Moreover, the Japanese cultural norms regarding the role of older people in the family and expectations of familial support may explain REPRINTS's absence of financial provision (Okamoto and Tanaka 2004). This highlights the interventions' limited cultural and varied temporal context. For example, most of the interventions (i.e., those set in the United States) generated a "worklike" role by supporting participants delivering services to others in a formal or structured setting, possibly reflecting U.S. cultural ideals of productivity (Alesina, Glaeser, and Sacerdote 2006).

It is important not to assume that worklike social roles are necessary for well-being in retirement (Atchley 1971). In the Netherlands, where both "early retirement" and full state pensions are available (Kapteyn and de Vos 1999), the "successful aging" intervention focused on self-development outside a work setting. Nevertheless, financial resources have long been a key concern in retirement and older age and will continue to be so in most societies (Moffatt 2009). Thus roles that lead to some financial remuneration may be attractive to those people with the least resources.

Strengths and Limitations of the Methods

Developing sensitive, unbiased search strategies that lead to the retrieval of a manageable number of search records is problematic for many systematic reviews, and particularly so when searching for concepts, such as "social roles," whose definitions have changed and now overlap with those of other concepts. Therefore, although we cannot be confident that our review uncovered all the relevant literature, our overall search strategy offered a credible solution that achieved a good balance between sensitivity and specificity.

Over most of the time period of the cited interventions (1965 to 2004), the average age of retirement fell in many industrialized nations (Banks and Smith 2006). If the mean age of retirement in some nations was below our inclusion criteria (fifty-five to seventy years), this could have limited the number of relevant studies included in the review. But Gendell (1998) reported that the mean retirement ages from 1965 to 1995 across four industrialized nations (including two in this review: Japan and the United States) for both men and women did not fall below 59.9 years. Moreover, since the early 2000s, the retirement age rose in Britain (Office for National Statistics 2012) and other developed nations (Banks and Smith 2006). Even though these figures support the use of our inclusion criteria, they also demonstrate the changing social and political context of retirement across the time frame of the interventions.

Our review deliberately concentrated on retirement transitions in countries categorized as having a "very high level of human development" (UN 2009). Those countries ranked 1 to 4 on the Human Development Index (HDI) are Norway, Australia, Iceland, and Canada, with the Netherlands, Japan, United States, and United Kingdom ranked 6, 10, 13, and 21, respectively (UN 2009). We chose this inclusion criterion to ensure that our review centered on interventions that were applicable to populations with a broadly similar infrastructure, culture, and standards of living. Our search revealed that only one study (from Brazil: de Souza and Grundy 2007) was excluded because it was not conducted in a country of "very high human development," confirming that there is little relevant work in countries not ranked as such.

Our analysis was restricted to articles with an abstract or summary in English. None of the 9,062 papers identified in the initial search (after

de-duplication) were excluded because they did not have an English-language abstract. Indeed, the Centre for Reviews and Dissemination (citing Egger et al. 1997) states that studies from non-English-speaking countries are less likely to be published in English if they report non-significant results, thus producing a bias in reviews that exclude papers not written in English (CRD 2009). The implications of our strategy (including non-English-language papers but insisting on an English-language abstract) are less clear, although this may have limited our selection strategy.

Generating Robust Evidence about Social Interventions for Policymakers

Evaluating complex behavioral interventions remains a challenge (Craig et al. 2008; Michie et al. 2009), although the application of standard clinical trial techniques could have improved the quality of the studies we reviewed.

In the future, similar studies should ensure that some or all of the following techniques are used (as appropriate): randomization at the individual level or by existing social groups through cluster randomization techniques; inclusion of control groups participating in activities that differ only in the absence of the intervention component under investigation (e.g., attending a general social group versus one whose members were also given a specific role); and use of "intention to treat" (ITT) analyses to minimize the risk of attrition bias. Notably, ITT analysis was not used in any of the three studies in our review that used random assignment to groups, despite evidence of unequal dropout rates. Publishing study protocols before beginning the data collection and analysis can reduce reporting bias, and blinding the outcome assessors to the participants' group assignment can reduce detection bias.

Using a panel of standardized, appropriate measurement tools to assess the health and well-being of older people would be a significant aid in comparing intervention modalities. A current example is the NIH Toolbox, which assesses cognition, motor, sensation, and emotional health (Gershon et al. 2010). The appropriate application of these techniques and outcome measures to the evaluation of social interventions would improve the basis on which policy decisions are made.

Conclusions and Implications for Policy and Practice

Social roles are important for people making the transition into retirement. From a policy perspective, the potential value of social role interventions is the theoretical and empirical link between meaningful roles and beneficial health and well-being outcomes. Although a systematic review of the evidence in this field has been lacking, our review addresses this gap. We identified a range of different social role interventions and found that most of the available evidence shows that social role interventions can produce health and well-being benefits for older people. However, the evidence is currently not robust enough to recommend social role interventions as an effective health promotion tool in practice.

Future research should ensure that the development and assessment of social role interventions are methodologically sound and permit the causal attribution of effects. Measures of participants' perceptions of the quality of their social roles should also be included and reported. All this will improve our understanding of meaningful and appropriate roles for different groups of older adults and contribute to the development and implementation of interventions that improve the health and well-being of aging populations.

References

Ajzen, I. 1991. The Theory of Planned Behaviour. *Organizational Behavior and Human Decision Processes* 50(2):179–211.

Alesina, A.F., and G-M. Angeletos. 2003. Fairness and Redistribution: US versus Europe. SSRN eLibrary. Available at http://ssrn.com/paper=346545 (accessed April 18, 2012).

Alesina, A.F., E.L. Glaeser, and B. Sacerdote. 2006. Work and Leisure in the U.S. and Europe: Why So Different? In *NBER Macroeconomics Annual 2005*, Volume 20, ed. M. Gertler and K. Rogoff, 1–100. Cambridge, MA: MIT Press. Available at http://www.nber.org/chapters/c0073 (accessed November 16, 2012).

Atchley, R.C. 1971. Retirement and Leisure Participation: Continuity or Crisis? *The Gerontologist* 11(1):13–17.

Bandura, A. 1986. *Social Foundations of Thought and Action; A Social Cognitive Theory*. Engelwood Cliffs, NJ: Prentice Hall.

Banks, J., and S. Smith. 2006. Retirement in the UK. *Oxford Review of Economic Policy* 22(1):40–56.

Bath, P.A., and D. Deeg. 2005. Social Engagement and Health Outcomes among Older People: Introduction to a Special Section. *European Journal of Ageing* 2(1):24–30.

Bell, H.M. 1962. *Bell Adjustment Inventory*. Palo Alto, CA: Consulting Psychologists Press, Inc.

Berkman, L.F., and S.L. Syme. 1979. Social Networks, Host Resistance, and Mortality: A 9-Year Follow-Up Study of Alameda County Residents. *American Journal of Epidemiology* 109:186–204.

Bernard, M., and J. Phillips. 2000. The Challenge of Ageing in Tomorrow's Britain. *Ageing & Society* 20:33–54.

Bernreuter, R.G. 1931. *The Personality Inventory*. Stanford, CA: Stanford University Press.

Biggs, S. 2005. Beyond Appearances: Perspectives on Identity in Later Life and Some Implications for Method. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 60(3):S118–28.

Birren, J.E. 1964. *The Psychology of Aging*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Bosscher R., L. Laurijssen, and E. de Boer. 1992. Competentie op later leeftijd; een exploratieve studie [Competence in later life; an explorative study]. *Bewegen & Hulpverlening* 9:255–65.

Brody, E.M. 1990. *Women in the Middle: Their Parent-Care Years*. New York: Springer.

Brown, P., and S. Vickerstaff. 2011. Health Subjectivities and Labor Market Participation: Pessimism and Older Workers' Attitudes and Narratives around Retirement in the United Kingdom. *Research on Aging* 33(5):529–50.

Bryant, L.L., K.K. Corbett, and J.S. Kutner. 2001. In Their Own Words: A Model of Healthy Aging. *Social Science & Medicine* 53(7):927–41.

Burgess, E.W., R.S. Cavari, and R.J. Havighurst. 1949. *Your Activities and Attitudes*. Chicago: Science Research Associates.

Campbell, J.C. 1992. *How Policies Change: The Japanese Government and the Aging Society*. Princeton, NJ: Princeton University Press.

Cantril, H. 1965. *The Pattern of Human Concerns.* New Brunswick, NJ: Rutgers University Press.

Cantril, H., and L.A. Free. 1962. Hopes and Fears for Self and Country: The Self-Anchoring Striving Scale in Cross-Cultural Research. *American Behavioral Scientist* 6(1).

Carlson, M.C., K.I. Erickson, A.F. Kramer, M.W. Voss, N. Bolea, M. Mielke, S. McGill, G.W. Rebok, T. Seeman, and L.P. Fried. 2009. Evidence for Neurocognitive Plasticity in At-Risk Older Adults: The Experience Corps Program. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences* 64(12):1275–82.

Carlson, M.C., J.S. Saczynski, G.W. Rebok, T. Seeman, T.A. Glass, S. McGill, J. Tielsch, K.D. Frick, J. Hill, and L.P. Fried. 2008. Exploring the Effects of an "Everyday" Activity Program on Executive Function and Memory in Older Adults: Experience Corps. *The Gerontologist* 48(6):793–801.

Cornwell, B., E.O. Laumann, and L.P. Schumm. 2008. The Social Connectedness of Older Adults: A National Profile. *American Sociological Review* 73(2):185–203.

Craig, P., P. Dieppe, S. Macintyre, S. Michie, I. Nazareth, and M. Petticrew. 2008. Developing and Evaluating Complex Interventions: The New Medical Research Council Guidance. *BMJ* 337:a1655.

Crawford, R.D. 1976. *A Study of the Psychological and Sociological Effects That Being a Member of the Retired Senior Volunteer Program Has upon Persons Aged Sixty and Over in Salt Lake County, Utah*. Salt Lake City: Brigham Young University Press.

CRD (Centre for Reviews and Dissemination). 2009. Chapter 1: Core Principles and Methods. In *Systematic Reviews: CRD's Guidance for Undertaking Reviews in Health Care*. York: CRD, University of York. Available at http://www.york.ac.uk/inst/crd/SysRev/!SSL!/WebHelp/SysRev3.htm#TITLEPAGE.htm (accessed March 8, 2013).

Crumbaugh, J.C., and L.T. Maholick. 1963. *Manual of Instructions for the Purpose-in-Life Test*. Munster: Psychometric Affiliates.

Cumming, E., and W.E. Henry. 1961. *Growing Old, the Process of Disengagement*. New York: Basic Books.

de Souza, E.M., and E. Grundy. 2007. Intergenerational Interaction, Social Capital and Health: Results from a Randomized Controlled Trial in Brazil. *Social Science & Medicine* 65(7):1397–1409.

Dube, M., S. Lapierre, L. Bouffard, and R. Labelle. 2000. Psychological Well-Being through the Management of Personal Goals: A Group Intervention for Retirees. *Revue québécoise de psychologie* 21(2):255–80.

Egger, M., T. Zellweger-Zähner, M. Schneider, C. Junker, C. Lengeler, and G. Antes. 1997. Language Bias in Randomised Controlled Trials Published in English and German. *The Lancet* 350(9074):326–29.

Erikson, E.H. 1959. Identity and the Life Cycle. In *Psychological Issues*, 1st ed., 161–171. New York: International Universities Press.

Erikson, E.H., ed. 1978. *Adulthood*. New York: W.W. Norton.

Erikson, E.H. 1982. *The Life Cycle Completed: A Review*. New York: W.W. Norton.

Findlay, R.A. 2003. Interventions to Reduce Social Isolation amongst Older People: Where Is the Evidence? *Ageing & Society* 23:647–58.

Frick, K., M. Carlson, T. Glass, S. McGill, G. Rebok, C. Simpson, and L. Fried. 2004. Modeled Cost-Effectiveness of the Experience Corps Baltimore Based on a Pilot Randomized Trial. *Journal of Urban Health* 81(1):106–17.

Fried, L.P., M.C. Carlson, M. Freedman, K.D. Frick, T.A. Glass, J. Hill, S. McGill, G.W. Rebok, T. Seeman, J. Tielsch, B.A. Wasik, and S. Zeger. 2004. A Social Model for Health Promotion for an Aging Population: Initial Evidence on the Experience Corps Model. *Journal of Urban Health* 81(1):64–78.

Fujiwara, Y., M. Nishi, N. Watanabe, S. Lee, K. Inoue, H. Yoshida, N. Sakuma, Y. Kureta, K. Ishii, H. Uchida, F. Kakuno, and S. Shinkai. 2006. An Intergenerational Health Promotion Program Involving Older Adults in Urban Areas. Research of Productivity by Intergenerational Sympathy (REPRINTS): First-Year Experience and Short-Term Effects. *Nippon kōshū eisei zasshi* [*Japanese Journal of Public Health*] 53(9):702–14.

Fujiwara, Y., N. Sakuma, H. Ohba, M. Nishi, S. Lee, N. Watanabe, Y. Kousa, H. Yoshida, T. Fukaya, S. Yajima, H. Amano, Y. Kureta, K. Ishii, and H. Uchida. 2009. REPRINTS: Effects of an Intergenerational Health Promotion Program for Older Adults in Japan. *Journal of Intergenerational Relationships* 7:17–39.

Gabriel, Z., and A. Bowling. 2004. Quality of Life from the Perspectives of Older People. *Ageing & Society* 24:675–91.

Gendell, M. 1998. Trends in Retirement Age in Four Countries, 1965–95. *Monthly Labor Review* 121(8):20–30.

Gershon, R.C., D. Cella, N.A. Fox, R.J. Havlik, H.C. Hendrie, and M.V. Wagster. 2010. Assessment of Neurological and Behavioural Function: The NIH Toolbox. *The Lancet Neurology* 9(2):138–39.

Glass, T.A., C.F.M. De Leon, S.S. Bassuk, and L.F. Berkman. 2006. Social Engagement and Depressive Symptoms in Late Life. *Journal of Aging and Health* 18(4):604–28.

Glass, T.A., M. Freedman, M.C. Carlson, J. Hill, K.D. Frick, N. Ialongo, S. McGill, G.W. Rebok, T. Seeman, J.M. Tielsch, B.A. Wasik, S. Zeger, and L.P. Fried. 2004. Experience Corps: Design of an Intergenerational Program to Boost Social Capital and Promote the Health of an Aging Society. *Journal of Urban Health* 81(1):94–105.

Gray, R.M., and J.M. Kasteler. 1970. An Evaluation of the Effectiveness of a Foster Grandparent Project. *Sociology & Social Research* 54:181–89.

Gruenewald, T.L., A.S. Karlamangla, G.A. Greendale, B.H. Singer, and T.E. Seeman. 2007. Feelings of Usefulness to Others, Disability, and Mortality in Older Adults: The MacArthur Study of Successful Aging. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 62(1):P28–37.

Havighurst, R.J. 1963. Successful Aging. In *Processes of Aging*, Vol. 1, ed. R.H. Williams, C. Tibbits, and W. Donahue. New York: Atherton Press.

Havighurst, R.J., and R. Albrecht. 1953. *Older People.* New York: Longmans, Green.

Herzog, A.R., J.S. House, and J.N. Morgan. 1991. Relation of Work and Retirement to Health and Well-Being in Older Age. *Psychology and Aging* 6(2):202–11.

Herzog, A.R., M.B. Ofstedal, and L.M. Wheeler. 2002. Social Engagement and Its Relationship to Health. *Clinical Geriatric Medicine* 18(3):593–609.

Higgins, J.P.T., and S. Green, eds. 2011. *Cochrane Handbook for Systematic Reviews of Interventions*. Chichester: Wiley.

Hobbis, S., K. Thirlaway, L. Sander, and L. Hendry. 2011. Retirement and Lifestyle Behaviours: A Thematic Analysis of a Pilot Study. *Health Psychology Update* 20(2):2–8.

Holt-Lunstad, J., T.B. Smith, and J.B. Layton. 2010. Social Relationships and Mortality Risk: A Meta-analytic Review. *PLoS Medicine* 7(7):1–20.

Huss, M.J. 1988. *A Descriptive Study of Older Persons Performing Volunteer Work and the Relationship to Life Satisfaction, Purpose in Life, and Social Support*. Iowa City: University of Iowa Press.

Iliffe, S., K. Kharicha, D. Harari, C. Swift, C. Goodman, and J. Manthorpe. 2010. User Involvement in the Development of a Health Promotion Technology for Older People: Findings from the SWISH Project. *Health & Social Care in the Community* 18(2):147–59.

Jo, K.H., and Y.K. Kim. 2008. Development and Application of a Multidimensional Suicide Prevention Program for Korean Elders by Utilizing a Community Network. *Taehan kanho hakhoe chi* 38(3):372–82.

Jones, I.R., and P.F. Higgs. 2010. The Natural, the Normal and the Normative: Contested Terrains in Aging and Old Age. *Social Science & Medicine* 71(8):1513–19.

Jones, I.R., M. Leontowitsch, and P. Higgs. 2010. The Experience of Retirement in Second Modernity. *Sociology* 44(1):103–20.

Kambara, M., K. Higuchi, and N. Shimizu. 1982. Development of Locus of Control Scale: Reliability and Validation [in Japanese]. *Japanese Journal of Educational Psychology* 30:302–7.

Kaplan, G.A., J.T. Salonen, R.D. Cohen, R.J. Brand, S. Leonard Syme, and P. Puska. 1988. Social Connections and Mortality from All Causes and from Cardiovascular Disease: Prospective Evidence from Eastern Finland. *American Journal of Epidemiology* 128(2):370–80.

Kapteyn, A., and K. de Vos. 1999. Social Security and Retirement in the Netherlands. In *Social Security and Retirement around the World*, ed. J. Gruber and D.A. Wise, 269–304. Chicago: National Bureau of Economic Research and University of Chicago Press.

Kawachi, I., and L. Berkman. 2001. Social Ties and Mental Health. *Journal of Urban Health* 78(3):458–67.

Kocken, P.L., and A.J.J. Voorham. 1998a. Effects of a Peer-Led Senior Health Education Program. *Patient Education and Counseling* 34:15–23.

Kocken, P.L., and A.J.J. Voorham. 1998b. Interest in Participation in a Peer-Led Senior Health Education Program. *Patient Education and Counseling* 34:5–14.

Kornblum, S.F. 1981. Impact of a Volunteer Service Role upon Aged People. PhD diss., Bryn Mawr College.

Lee, C.H. 2006. Effects of Logotherapy with Exercise on Meaning of Life, Ego Integrity and IADL in the Elderly. *Taehan kanho hakhoe chi* 36(5):701–9.

Linschoten C.P., J.C. Gerritsen, C.L. Romijn. 1993. De Schaal Subjectief Welzijn Ouderen nader onderzocht [A closer look at the Scale for Subjective Wellbeing of the Elderly]. *Tijdschrift voor Gerontologie en Geriatrie* 24:57–65.

Lum, T.Y., and E. Lightfoot. 2005. The Effects of Volunteering on the Physical and Mental Health of Older People. *Research on Aging* 27(1):31–55.

Luoh, M.-C., and A.R. Herzog. 2002. Individual Consequences of Volunteer and Paid Work in Old Age: Health and Mortality. *Journal of Health and Social Behavior* 43:490–509.

Martin, L., and M.C. Kiely. 1983. The Kindly: A Bond between the Aged and the Community. *Canadian Journal of Community Mental Health* 2(1):59–70.

Masi, C.M., H.-Y. Chen, L.C. Hawkley, and J.T. Cacioppo. 2011. A Meta-Analysis of Interventions to Reduce Loneliness. *Personality and Social Psychology Review* 15(3):219–66.

McMunn, A., J. Nazroo, M. Wahrendorf, E. Breeze, and P. Zaninotto. 2009. Participation in Socially-Productive Activities, Reciprocity and Wellbeing in Later Life: Baseline Results in England. *Ageing & Society* 29(5):765–82.

McNamara, T.K., and E. Gonzales. 2011. Volunteer Transitions among Older Adults: The Role of Human, Social, and Cultural Capital in

Later Life. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 66B(4):490–501.

Mendes de Leon, C.F. 2005. Social Engagement and Successful Ageing. *European Journal of Ageing* 2(1):64–66.

Merton, R.K. 1968. *Social Theory and Social Structure*. New York: Free Press.

Michie, S., D. Fixsen, J.M. Grimshaw, and M.P. Eccles. 2009. Specifying and Reporting Complex Behaviour Change Interventions: The Need for a Scientific Method. *Implementation Science* 4(40). Available at http://www.implementationscience.com/content/4/1/40 (accessed March 5, 2013).

Moen, P., D. Dempster-McClain, and R.M. Williams Jr. 1992. Successful Aging: A Life-Course Perspective on Women's Multiple Roles and Health. *American Journal of Sociology* 97(6):1612–38.

Moen, P., W.A. Erickson, M. Agarwal, V. Fields, and L. Todd. 2000. *The Cornell Retirement and Well-Being Study: Final Report*. Ithaca, NY: Bronfenbrenner Life Course Center, Cornell University.

Moffatt, S. 2009. Work, Retirement and Money. In *Mental Health and Well-Being in Later Life*, ed. M. Catten, 64–83. New York: Open University Press.

Moher, D., A. Liberati, J. Tetzlaff, and D.G. Altman. 2009. Preferred Reporting Items for Systematic Reviews and Meta-analyses: The PRISMA Statement. *Annals of Internal Medicine* 151(4):264–69.

Musick, M.A., A.R. Herzog, and J.S. House. 1999. Volunteering and Mortality among Older Adults: Findings from a National Sample. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 54B(3):S173–80.

Musick, M.A., and J. Wilson. 2003. Volunteering and Depression: The Role of Psychological and Social Resources in Different Age Groups. *Social Science & Medicine* 56(2):259–69.

Neugarten, B.L., R.J. Havighurst, and S.S. Tobin. 1961. The Measurement of Life Satisfaction. *Journal of Gerontology* 16(2):134–43.

Noguchi, Y. 1991. Social Support for the Elderly: The Concept and Its Measurement [in Japanese]. *Social Gerontology* 34:37–48.

Office for National Statistics. 2012. Pension Trends—Chapter 4: The Labour Market and Retirement. Available at http://www.ons.gov.uk/ons/rel/pensions/pension-trends/chapter-4—the-labour-market-and-retirement—2012-edition-/sum-pensiontrends.html (accessed June 11, 2012).

Okamoto, K., and Y. Tanaka. 2004. Subjective Usefulness and 6-Year Mortality Risks among Elderly Persons in Japan. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 59(5):P246–49.

Osgood, C.E., G.J. Suci, and P.H. Tannenbaum. 1957. *The Measurement of Meaning*. Urbana: University of Illinois Press.

Quinn, J.F., and M. Kozy. 1996. The Role of Bridge Jobs in the Retirement Transition: Gender, Race, and Ethnicity. *The Gerontologist* 36(3):363–72.

Reichstadt, J., G. Sengupta, C.A. Depp, L.A. Palinkas, and D.V. Jeste. 2010. Older Adults' Perspectives on Successful Aging: Qualitative Interviews. *American Journal of Geriatric Psychiatry* 18(7):567–75 (10.1097/JGP.0b013e3181e040bb).

Robinson, O.C., J.D. Demetre, and R.H. Corney. 2011. The Variable Experiences of Becoming Retired and Seeking Retirement Guidance: A Qualitative Thematic Analysis. *British Journal of Guidance & Counselling* 39(3):239–58.

Rosenberg, M. 1979. *Conceiving the Self*. New York: Basic Books.

Rosow, I., and N.A. Breslau. 1966. Guttman Health Scale for the Aged. *Journal of Gerontology* 21:556–59.

Russell, D., and C. Cutrona. 1984. The Provisions of Social Relationships and Adaptation to Stress. Paper presented at the American Psychological Convention: Toronto, Ontario.

Sainer, J., and M. Zander. 1971. *SERVE: Older Adult Volunteers in Community Service*. New York: Community Service Society of New York.

Saltz, R. 1971. Aging Persons as Child-Care Workers in a Foster Grandparent Program: Psychosocial Effects and Work Performance. *Aging and Human Development* 2:314–40.

Saltz, R. 1989. Research Evaluation of a Foster-Grandparent Program. *Journal of Children in Contemporary Society* 20:205–16.

Sherer, M., J.E. Maddux, B. Mercandante, S. Prentice-Dunn, B. Jacobs, and R.W. Rogers. 1982. The Self-Efficacy Scale: Construction and Validation. *Psychological Reports* 51:663–71.

Sirven, N., and T. Debrand. 2008. Social Participation and Healthy Aging: An International Comparison Using SHARE Data. *Social Science & Medicine* 67(12):2017–26.

Soumerai, S.B., and J. Avorn. 1983. Perceived Health, Life Satisfaction, and Activity in Urban Elderly: A Controlled Study of the Impact of Part-Time Work. *Journal of Gerontology* 38(3):356–62.

Stevens-Roseman, E.S. 1966. Older Mentors for Newer Workers: Impact of a Worker-Driven Intervention on Later Life Satisfaction. *Journal of Workplace Behavioral Health* 24(4):419–26.

Strawbridge, W.J., M.I. Wallhagen, S.J. Shema, and G.A. Kaplan. 1997. New Burdens or More of the Same? Comparing Grandparent, Spouse and Adult-Child Caregivers. *The Gerontologist* 37:505–10.

Swindell, R. 2001. Technology and the Over 65s? Get a Life. *Social Alternatives* 20(1):17–23.

Takahashi, M., S. Shibazaki, S. Hashimoto, N. Kawakami, A. Tamakoshi, T. Ojima, and M. Nagai. 2000. Evaluation of Social Activities of the Elderly in 27 Regions with Use of the "Check List for Vivid Social Activities" [in Japanese]. *Nippon Koshu Eisei Zasshi* [*Japanese Journal of Public Health*] 47:936–44.

Tan, E., Q.-L. Xue, T. Li, M.C. Carlson, and L.P. Fried. 2006. Volunteering: A Physical Activity Intervention for Older Adults—The Experience Corps (R) Program in Baltimore. *Journal of Urban Health* 83(5):954–69.

Taniguchi, H. 2006. Men's and Women's Volunteering: Gender Differences in the Effects of Employment and Family Characteristics. *Nonprofit and Voluntary Sector Quarterly* 35(1):83–101.

Thane, P. 2000. *Old Age in English History: Past Experiences, Present Issues*. Oxford: Oxford University Press.

Thomas, P.A. 2011. Gender, Social Engagement, and Limitations in Late Life. *Social Science & Medicine* 73(9):1428–35.

UN (United Nations). 2009. *Human Development Report 2009*. Available at http://hdr.undp.org/en/reports/global/hdr2009/ (accessed December 6, 2012).

van Sonderen, E. 1991. Het meten van sociale steun [Measurement of social support]. Diss., University of Groningen.

Van Willigan, M. 2000. Differential Benefits of Volunteering across the Life Course. *Journal of Gerontology* 55(5):308–18.

Wang, H.-X., A. Karp, B. Winblad, and L. Fratiglioni. 2002. Late-Life Engagement in Social and Leisure Activities Is Associated with a Decreased Risk of Dementia: A Longitudinal Study from the Kungsholmen Project. *American Journal of Epidemiology* 155(12):1081–87.

Wheeler, J.A., K.M. Gorey, and B. Greenblatt. 1998. The Beneficial Effects of Volunteering for Older Volunteers and the People They Serve: A Meta-analysis. *International Journal of Aging and Human Development* 47:69–79.

WHO (World Health Organization). 1998. 50 Facts: Global Health Situation and Trends 1955–2025. In *The World Health Report 1998—Life in the 21st Century: A Vision for All*. Available at http://www.who.int/whr/1998/media_centre/50facts/en/index.html (accessed March 3, 2013).

WHO (World Health Organization). 2011. Life Expectancy and Mortality. In *World Health Statistics 2011*. Available at http://www.who.int/gho/publications/world_health_statistics/2011/en/index.html (accessed March 3, 2013).

Acknowledgments: We thank our colleagues who have contributed to this article in various ways: John Bond, Mima Cattan, Alan Godfrey, Nicola Hobbs,

Jose Lara, Thomas Mayer, Paula Moynihan, Dorothy Newbury-Birch, Lynne Rochester, Falko Sniehotta, and Peter Tennant.

This work was funded by the Lifelong Health and Wellbeing program, which is a Cross-Research Councils' initiative in partnership with the following: Biotechnology and Biological Sciences Research Council, Engineering and Physical Sciences Research Council, Economic and Social Research Council, Medical Research Council, Chief Scientist Office of the Scottish Government Health Directorates, National Institute for Health Research / Department of Health, Health and Social Care Research & Development of the Public Health Agency (Northern Ireland), and Wales Office of Research and Development for Health and Social Care, Welsh Assembly Government.

Martin White was funded in part as the director of Fuse, Centre for Translational Research in Public Health. Fuse is a UK Clinical Research Collaboration (UKCRC) Public Health Research Centre of Excellence. Funding from the British Heart Foundation, Cancer Research UK, Economic and Social Research Council, Medical Research Council, and National Institute for Health Research (NIHR), under the auspices of UKCRC, is gratefully acknowledged.