Canadian Psychology
2007, Vol. 48, No. 2, 67-76
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DOI: 10.1037/cp2007008

Memory and Aging: Selected Research Directions and Application Issues

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Abstract
Everyday memory failures and long-term memory changes are among the most empirically established, socially expected, personally disconcerting, and widely misinterpreted aspects of human aging. A large, sophisticated, and still growing theoretical research base on memory aging has accumulated over the last several decades. Following a brief summary of a broad swath of selected basic memory aging phenomena, we identify a small subset of relatively recent but well-researched topics that may hold promise for optimizing memory adaptation in late life. Linking research with potential application, we sketch key objectives for three potential directions of intervention in memory and aging.

Research on memory and aging is focused on processes through which individuals may recall previously experienced events or information, the extent to which these processes change with advancing age, and the conditions, correlates, or predictors of such changes. Reflecting the sheer volume of research in this field, numerous reviews of memory and aging have been published in recent decades (e.g., Craik & Salthouse, 2000; Hultsch, Hertzog, Dixon, & Small, 1998; Prull, Gabrieli, & Bunge, 2000; Zacks, Hasher, & Li, 2000). Of all aspects of the many cognitive changes that occur with aging, memory may be the one that has most captivated the interest of both aging individuals and our society in general (Bialystok & Craik, 2006; Dixon, Bäckman, & Nilsson, 2004; Naveh-Benjamin, Moscovitch, & Roediger, 2001; Park & Schwarz, in press; Zacks & Hasher, 2006). Reviewers often include several important facts about memory and aging:

- Memory is viewed as a functional, if not essential, tool of successful lifespan development;
- Memory failures and loss are among the most frequently mentioned complaints of older adults;
- Memory loss is one of the most feared signs and implications of normal aging;
- Late-life memory changes, both subtle and dramatic, can be the early indicators of cognitive impairment, including that associated with neurodegenerative diseases;
- Widespread stereotypes in the Western world hold that, whereas memory abilities improve through childhood, they decline with aging.

For these and other reasons, many researchers, practitioners, and aging adults are profoundly interested in understanding changes in memory abilities throughout adulthood, including answers to simple questions such as how, when, why, and to what extent memory may decline in late life.

Over the last several decades, research on memory and aging has revealed provocative patterns of results. Whereas some memory tasks are associated with robust findings of aging-related deficits, other tasks are associated with less pronounced losses or even equivalent performance by younger and older adults. To understand why such divergent patterns might occur, it is useful to consider briefly both memory tasks and general memory theory. Memory tasks typically associated with aging-related decline include remembering lists of information, expository texts, faces and names, picture characteristics, spatial locations, and those that tap the limits of online memory processing. Tasks often associated with relatively unimpaired performance include memory for facts, words, and knowledge, and those that reflect familiar situations that include substantial environmental or human support. One well-developed theoretical treatment of memory per se has proven helpful in organizing this multidimensional pattern of results. Specifically, the *memory systems perspective* has been especially influential in research on memory and aging (Craik & Salthouse, 2000; Nyberg et al., 2003; Tulving, 1995).

Positing that there are multiple systems of memory, a central goal of this perspective is to explicate the organization of, and relationships among, the systems.

A memory system is defined as a set of related processes, linked by common brain mechanisms, information processes, and operational principles (Schacter & Tulving, 1994). For the present article, we focus on two of the most commonly encountered forms of memory (i.e., episodic and semantic memory), those to which most people refer when they express their beliefs and fears about the effects of aging on memory functioning.

Do All Memory Systems "Age" Alike?

The two exemplar memory systems we have selected reveal that, for typically aging adults, all forms of memory do not necessarily "age" alike. At the individual level, within-person change patterns can be quite variable over both short- and long-term periods. At the group level, the following two systems show rather different patterns of change.

Episodic memory. This system refers to memory for personally experienced events or information. Everyday examples are bountiful: Trying to remember the names of people one has met at a party, where one parked the car, a conversation or joke one heard, the location of an object in a spatial arrangement, an anecdote one read in a newspaper, or an unwritten list of items to purchase at a store. It is thought to be the latest developing memory system, and some reviewers have suggested it is correspondingly among the first to begin showing signs of aging-related decline. By now it is well established that episodic memory performance generally declines with advancing age, but some cross-sectional (e.g., Nilsson et al., 1997) and longitudinal (e.g., Dixon et al., 2004; Zelinski & Stewart, 1998) research has indicated that the magnitude of aging-related change may be more gradual than precipitous for normally aging adults, at least until the mid-70s (Bäckman, Small, Wahlin, & Larsson, 2000). Among the many provocative findings are those that link episodic memory performance to moderating factors such as health, biological vitality, current and past lifestyle activities, and gender (Herlitz, Nilsson, & Bäckman, 1997; Small, Hughes, Hultsch, & Dixon, 2006; Wahlin, MacDonald, de Frias, Nilsson, & Dixon, 2006). Overall, however, a prodigious amount of research has generally supported the view that episodic memory declines, at least gradually, with aging. In fact, accelerated decline in episodic memory performance may be a significant indicator of impending cognitive impairment.

Semantic memory. This system of memory is expressed through the acquisition and retention of generic facts, knowledge, and beliefs. In research, it is evaluated by administering tests of general world knowledge, facts, words (vocabulary), concepts, and associations. The typical cross-sectional finding for semantic memory is that older adults may remember as much information of this sort as do younger adults. For example, normal older adults, through extended cultural and educational experiences, may possess knowledge bases regarding world facts (sports, celebrities, geographical information, political lore) and vocabulary that are superior to those of younger adults. Nevertheless, some studies have suggested that older adults may access such information more slowly and with more frequent blockages than do younger adults (Bäckman & Nilsson, 1996). Again, longitudinal designs show relatively gradual group-level changes, with some evidence for relatively preserved performance into late life (e.g., Hultsch et al., 1998).

Selected Current Research Directions

Although much memory and aging research is focused on explicating various aspects, functions, and interrelationships in and among the memory systems, we turn now to some selected current directions. In addition to exploring with increasing ingenuity various aspects of memory and aging phenomena, some new research directions include attention to selected covariates, correlates, risk or protection factors, and predictors of both maintenance and memory losses with aging. Five selected directions of memory research are briefly described.

Biological influences. Among the promising new trends in memory and aging research is the ever-increasing attention that biological influences are receiving. This is an entirely logical development, if only because the brain is a crucial site of activation that is representative of memory and other cognitive processing. Clearly, structural and functional changes in the brain are related to, if not predictive of, cognitive performance in adults (e.g., Cabeza, 2004; Cabeza, Nyberg, & Park, 2004; Raz, 2004; Reuter-Lorenz, 2000; Reuter-Lorenz & Lustig, 2005). At a broader biological level, much current research in memory and aging has focused on the extent to which physiological, sensory, and physical health changes may have an effect on cognitive functioning in late life (e.g., Baltes & Lindenberger, 1997; Christensen & Mackinnon, 2004; Wahlin, 2004; Wahlin et al., 2006; Waldstein, 2000). For example, in one longitudinal study, the basic "biological vitality" of older adults was shown to be predictive of 12-year changes in memory and other cognitive functions (MacDonald, Dixon, Cohen, & Hazlitt, 2004). Other research has shown that hormones (Herlitz & Yonker, 2004), genetic factors (Pederson,

2004), and even circadian rhythms (Hasher, Goldstein, & May, 2005) influence memory and cognitive aging. Thanks to many advances in technology and data collection, even relatively peripheral characteristics of biological status – and not just neurological integrity – are now known to affect the patterns and profiles of cognitive and memory changes in aging.

Cognitive influences. Long a focus of experimental and developmental research on cognitive aging, recent efforts to identify cognitive and related factors that influence changes in memory functioning have been aided by advances in theory and method (especially quantitative techniques; Hertzog, 2004). Usually, the influencing factors (or predictors) are considered to be more elemental than memory. For example, working memory, executive functioning, inhibitory mechanisms, and neurocognitive speed have been identified as relevant influences on episodic and semantic memory functioning (e.g., Buckner, 2004, Craik & Salthouse, 2000; Hertzog, Dixon, Hultsch, MacDonald, 2003; Kemper & Mitzner, 2001; Madden, 2001; Park & Minear, 2004; Salthouse, 1996, in press). For example, distractibility and emotional aspects have been linked to older adults' cognitive performance (Blanchard-Fields & Horhota, 2005; Kim, Hasher, & Zacks, in press). This direction will continue to attract research on memory and aging for the foreseeable future.

Social background, lifestyle, and activities. Recent progress has been made in examining the role of background characteristics such as gender, education, and life style activities on memory aging (e.g., Hultsch, Hertzog, Small, & Dixon, 1999; Lövdén, Ghisletta, & Lindenberger, 2005; Pushkar et al., 1995; Small et al., 2006). For example, research has indicated that some healthy older adults' cognitive performance is related to continued engagement in diverse clusters of lifestyle activities. These clusters include not only everyday cognitive activities (e.g., reading newspapers and doing crossword puzzles), but also performing regular physical activities (e.g., exercise) and engaging in social activities (e.g., MacKinnon, Christensen, Hofer, Korten, & Jorm, 2003). However, researchers have not always found evidence that maintaining engagement in such activities over time can protect against all manner of cognitive decline. Although the jury is still "out" on this intriguing question, some studies have begun to support even the more extreme and optimistic notion that active lifestyles (including involvement in lively social networks) may buffer the onset of dementia for some older adults experiencing early signs of neurodegenerative diseases (e.g., Fratiglioni, Paillard-Borg, & Winblad, 2004).

Metamemory, beliefs, and stereotypes. Older adults often wonder about their memory – how it works or does not work, why one remembers some things but not others, and whether memory skills will change over the life course. The term "metamemory" refers to such cognitions about memory – thinking about how, why, and whether memory works. Specific aspects of metamemory include knowledge of memory functioning, insight into memory changes or impairment, awareness of current memory processes, beliefs about and interpretations of memory skills and demands, and even memory-related affect or emotion. The concept of metamemory is useful when considering research questions that are both basic (e.g., how memory and metamemory change and relate to one another in aging) and applied (e.g., the role metamemory may play in compensating for memory impairments and decline).

For older adults, one's beliefs about one's ability to remember may determine: a) the extent to which one places oneself in memory demanding situations, b) the degree of motivation and effort one applies to perform the memory task, c) one's expectation regarding level of memory performance, and d) one's actual memory performance (Hertzog & Hultsch, 2000). Older adults who doubt their own ability to remember names and faces may be especially reluctant to socialize in settings that involve making new acquaintances. In addition, older adults' beliefs about their own memory abilities may be excessively influenced by normal everyday memory failures (e.g., forgetting where one parked the car, forgetting one new name and face) or by stereotypes of memory loss with aging (Chasteen, Bhattacharyya, Horhota, Tam, & Hasher, 2005; Chasteen, Schwarz, & Park, 2002; Hess, Auman, Colcombe, & Rahhal, 2003; Ryan & Kwong See, 1993). Expecting to fail in everyday memory contexts for reasons beyond one's control (i.e., aging) can lead to inadequate efforts to succeed, and to faulty monitoring of performance. On the other hand, an awareness of a deficit may be an important precursor to memory compensation interventions, whether self-initiated or directed by memory rehabilitation clinicians (Dixon, de Frias, & Bäckman, 2001; Prigatano, 1999; Prigatano & Kime, 2002; Schacter, 1996; Wilson & Watson, 1996). Thus, this research direction has immediate links to both theoretical and applied aspects of memory and aging.

Memory in interactive situations. In recent decades, some researchers have begun to examine memory

phenomena that occur in (and are influenced by) contexts other than the traditional research lab (Hess, 2005). Accordingly, many observers have noted that much everyday cognitive activity occurs in interactive group or social contexts (e.g., Clancey, 1997; Greeno, 1998). An interactive (and even collaborative) context frequently envelops cognitive performance in everyday life. Examples of such everyday collaborative cognition include: a) family groups or lineages reconstructing stories from their shared past, b) spouses enlisted to help remember important appointments, duties, or dates, and c) strangers in unknown cities consulted in order to solve way-finding or map-reading problems (Dixon, 1999). Lurking behind this observation is the contention that collaboration may affect functional performance outcomes, perhaps enhancing practical solutions, as well as quantity and quality of memory. Of particular importance in memory aging research is the possibility that the strategic deployment or use of human cognitive aids (i.e., other individuals) may be a means of compensating for individual-level aging-related losses or deficits (Dixon & Gould, 1998; Strough & Margrett, 2002).

This is a growing and promising area of research in memory and aging. It reveals that, although individual-level performance on memory tests may be the "nuts and bolts" of cognitive psychology, much everyday memory performance is interpersonal or even social in nature. For older adults, such collaborative memory activities may serve both a social integration and a cognitive preservation purpose. For some older adults, having a well-known collaborative partner may be one way to help them overcome or avoid everyday memory failures. It may also provide older adults with the confidence that they can perform memory tasks or at least "manage" them successfully.

Ideas for Applications of Research on Memory and Aging

Having briefly reviewed selected research themes and results in the field of memory and aging, we turn now to an equally condensed list of potential applications for the growing population of older adults in North America. This section begins with an effort to transition from the research base to the practical goals available for memory enhancement. Following this, three specific categories of research with applied implications are discussed. The discussions include both individual-level clinical interventions and group-level social policy considerations.

A general goal: Communicate the fact and context of memory decline. At the most general level, an overarching goal would be to devise and implement educational and public information initiatives that reflect the most sensitive and realistic understanding of the research base on memory and aging. As noted clearly in our review, this would include the basic fact of gradual decline in episodic memory performance, coupled with both an optimistic qualification (that there are individual differences in rate attributable to a variety of conditions) and a realistic perspective (that incidence of accelerated memory decline and impairment typically increases with advancing age). Applications are likely to be most effective when stakeholders are on the same page regarding the prevailing research background: Such stakeholders would include clinical and policy researchers, health care professionals, care takers of older adults, older adults themselves, and the general public. Directing public attention to the issue of memory and aging is not an insurmountable problem, as the vast majority of older adults and their families are clearly curious, if not concerned, about this issue. The challenge is to translate research findings into the public discourse in a manner that a) retains the empirical balance of the actual research base, while b) using innovative and testable interventions to explore the extent to which promising research may be translated into effective applications. In sum, the general goal of both large- and small-scale initiatives would be to convey effectively the coordinated facts that: a) average cognitive and memory decline are typical and inevitable aspects of human aging, but b) individual differences are pronounced, and c) many older adults may retain the capacity of cognitive improvement and adaptation.

What the application objective is (and is not). The objective of large- and small-scale applications targeting memory and aging is clear: to promote successful or healthy cognitive and memory aging. The first step is to adopt an operational definition of memory health that is lenient and qualified (e.g., corrective, resilient, adaptive, relatively high), rather than strict and inflexible (e.g., unimpaired, disease-free, flourishing, absolutely high). The former is more representative of the extent of memory health that could reasonably be expected for older adults. From this perspective, memory health in aging would be indicated when memory performance is relatively high (cf. their own cohort), relatively maintained (over the recent past), and relatively consistent (rather than variable and unpredictable). On the other hand, unhealthy memory status would be associated with: a) the presence of neurodegenerative disease, b) abrupt and accelerated performance decline, c) notable reductions and disruptions in everyday and domain-specific memory skills, d) absence of signs of resilience and adaptation, and e) increased inconsistency. The objective for

intervention would be to restore or maintain healthy memory aging. Therefore, intervention goals would include managing, correcting, adapting, and compensating for selected losses that have occurred, relative to the older adults themselves and to their cohort. The objective would not be to restore memory functioning to the high and robust levels of neurologically intact younger adults. With typical aging, some memory "gains" may actually be losses of a magnitude lower than expected by the harsh realities of neurodegenerative diseases and the unfortunate implications of some stereotypes of cognitive aging.

Application: Plasticity in memory aging? Can aging-related losses in specific domains of memory performance be overcome by systematic training in the associated memory skills? Much research has shown that programmatic training in specific mnemonic techniques can lead to improved memory performance in older adults (Ball et al., 2002; Einstein & McDaniel, 2004; Kramer & Willis, 2002; Verhaeghen, Marcoen, & Goosens, 1992). Both in terms of recovering long-term (semantic-like) memories from the distant past and in the all-important learning of new information (episodic memory), a variety of techniques have been shown to be successful. In fact, in one especially powerful program, researchers (e.g., Kliegl, Smith, & Baltes 1990) demonstrated dramatic improvements for older adults in learning serial lists of words and digits through a classic and easily learnable mnemonic technique. However, in virtually all cases – including the large-scale randomized trial of Ball et al. (2002) – two notable limitations of memory training research have appeared. First, older adults' episodic memory performance can be boosted by specific training regimens, but the improvements are limited to the specific memory tasks and techniques required and trained. Second, the favourable domain-specific training effects can be detected up to two years later, but evidence for generalizability to broader aspects of everyday functioning is not confirmed.

Accordingly, policy practices and interventions should be focused on categorical memory problems, such as those encountered by specific older adults with particular memory failures in distinct circumstances. Because memory training can show powerful changes in specific memory domains, interventions can be designed to facilitate individual older adults' adaptation to changing demands or critical memory losses, or as treatment in cognitive rehabilitation settings for emerging but specific memory impairments. To the extent that these problems occur across an older adult cohort, some memory strategies may be trained more generally either prior to the typical advent of the problem (prevention) or after (rehabilitation). The fact of memory plasticity may encourage funding and support of memory clinics well staffed by specialists in cognitive neurorehabilitation or neuropsychology (e.g., Stuss, Winocur, & Robertson, 1999), and eventually well supplied with modules for training strategies for addressing memory challenges common to older adults.

Application: Everyday memory compensation. Some formulations for overcoming or avoiding everyday memory failures require less investment (of time, money, and effort) than memory training regimens. Some may even be produced spontaneously by older adults experiencing thematic or predictable everyday memory challenges. Research examining what older adults do to counter-balance or overcome everyday memory problems, or perceived accumulated memory deficits, has shown that their metamemory beliefs and actions directed to everyday memory compensation can be defined, delineated, and measured easily and effectively (de Frias & Dixon, 2005). Early research has also shown that, without the benefit of specific memory interventions, older adults use several memory techniques, sometimes informally, to compensate in daily cognitive challenges (Dixon et al., 2001). The techniques used by older adults in everyday life can be clustered into five categories: 1) using simple external memory aids (e.g., lists, calendars), 2) implementing their own tailored internal mnemonic techniques (e.g., repetition, rehearsal), 3) investment of more effort in encoding or retrieval of new information, 4) spending or requesting more time to process new information (e.g., asking speakers to slow their pace), and e) consulting or recruiting other individuals as potential memory aids (e.g., spouses or caregivers).

For applied and policy considerations, the two most promising compensatory mechanisms may be the first (external memory aids) and the last (recruiting intact human memory aids). In contrast to the training of internal mnemonic strategies, educating older adults and their families about the efficiency and generalizability of external memory aids could lead to substantial improvements in adaptation to the memory demands of everyday life. Many memory problems faced by older adults are thematic, in that they occur regularly and predictably. For example, forgetting birthdays and appointments can be remedied by the use of a prominently visible calendar, and forgetting where one parks the car and deposits the keys can be remedied by a simple notation system. Unlike the dramatic demonstrations of the power of internal mnemonics, external memory aids will produce more modest results, but they can be designed to be effec-

tive or easily modifiable for a broader class of memory problems that may occur to older adults. Recruiting or using available human companions as memory aids is a natural and longstanding compensatory mechanism for many older dyads (e.g., couples) and cognitively impaired individuals (with their caregivers or adult children). Even early Alzheimer's disease patients have been found to report that they increase their use of human memory aids in the months following their diagnosis (Dixon, Hopp, Cohen, de Frias, & Bäckman, 2003). Although at present informal and unsystematic, the fact of such spontaneous use by older adults suggests that the compensatory mechanism of recruiting other people to help with everyday memory adaptation may be one worth conveying to health practitioners and family service agencies in the community.

Application: Promoting lifestyle engagement? As noted earlier, the concept of lifestyle engagement refers to the extent to which older adults engage (contemporaneously and biographically) in physical activities (e.g., aerobic exercise), cognitive activities (e.g., card or board games), and social activities (e.g., clubs or family networks). The theory was originally based simply on a quaint "use it or lose it" notion, but is now more likely to originate in the notion of cognitive reserve (e.g., Stern, 2006). Essentially, a personal biography of engaging in everyday activities in these three domains is thought to be associated with greater activation of reserve capacity such that the likelihood of maintaining some aspects of cognitive performance longer than might be expected, and even with postponing the cognitive symptoms associated with neurodegenerative diseases such as Alzheimer's, is enhanced (e.g., Fratiglioni et al., 2004; Small et al., 2006). Although the overall results of the research are somewhat mixed (Colcombe & Kramer, 2003; Salthouse, 2006; Stern, 2006), enough studies have produced promising findings that the effort to examine this relationship has increased dramatically in recent years.

In addition to promising research results, two factors may contribute to the growing popularity of this topic. First, the idea of lifestyle engagement is attractive to theorists and practitioners because of its everyday, functional, and accessible qualities. Any relatively healthy older adult typically engages in some of these lifestyle activities, so the notion that they may promote cognitive maintenance – as well as healthy adjustment to late life – is promising, if not exciting. Second, the activities themselves are ordinary and broadly interesting to older adults. Theorists and practitioners alike wonder if there is any possibility that prescribing some of these activities to older adults could have a beneficial effect not only on physical health and social networks, but also on cognitive adaptation in everyday life. Indeed, casual reading of recent popular press items has revealed the extent to which this hopeful notion has permeated society: Regular commentary about the potential benefits of doing daily crossword puzzles or other cognitively stimulating activities sometimes adopts a prescriptive tone. However, two qualifications should be mentioned: 1) no randomized clinical trials have been conducted, but the available evidence remains promising, and 2) a wide range of cognitive outcomes have been examined, but memory per se has not been explored systematically. Nevertheless, at an individual level, and as a public policy matter, it is risk-free to recommend that all healthy aging adults be encouraged to remain active physically, cognitively, and socially. Such lifestyle engagement might contribute to healthy memory aging, but it is highly likely to contribute to overall adaptation to late life. While researchers await the results of clinical trials, the generally promising nature of the current research base could be conveyed to general health practitioners and to resource managers in adult community centres.

Conclusion

Memory changes are among the most prominent, frequently noted, and enigmatic aspects of human aging. Accordingly, over several decades researchers have produced prodigious information pertaining to the cognitive foundations of memory and aging. Among the robust findings of this research is that some important systems of memory (i.e., episodic memory) decline gradually with typical aging, while other systems (i.e., semantic memory) may follow a pattern suggestive of moderated maintenance. The field has benefited from a broad range of comprehensive and analytical experiments on components and correlates of adult age differences in memory performance, as well as longitudinal memory changes with aging.

In this brief review, we focused on five clusters of relatively novel research directions in memory and aging. Across the biological to social span of influences, we reported that: a) several biological markers (including vitality, genetics, and neurobiological intactness) are promising covariates of memory and aging phenomena; b) a variety of cognitive influences on memory performance demonstrate how thoroughly integrated memory is in larger and mutually implicative cognitive networks; c) numerous aspects of the social and experiential background (and current condition) of older adults may have an uncanny and buffering relationship to cognitive change with aging;

d) beliefs and stereotypes of memory and aging are widespread, both correct and erroneous, and could be implicated to some extent in older adults' hesitance to engage (or even to reduce effort) in everyday memory-demanding tasks; and e) research on collaboration in cognition suggests that such an interactive setting for memory performance is common and possibly effective for older adults experiencing individual-level memory decline.

Following this brief review, we offered several ideas for applying the research base on memory and aging to addressing the everyday memory challenges faced by older adults. We emphasized the importance of deriving goals, objectives, everyday applications – as well as interventions and rehabilitation procedures – from the robust research base on memory and aging. A first application is that of memory training, typically implemented in terms of relatively internal mnemonic strategies. When engineered in the context of memory research and theory, such procedures have produced powerfully effective techniques for improving episodic memory in older adults. Less dramatic and less formal results have appeared from a second, theory-guided, set of procedures known as memory compensation mechanisms. Nevertheless, some memory compensation techniques have the advantage of being tailored to specific problems – and often spontaneously produced by older adults themselves – and others have the advantage of possessing a much broader range of accessibility and generalizability. The third potential avenue of application stems from the research on lifestyle engagement. If the promising research results in understanding the potential buffering roles of physical activity, cognitive activity, and social activity are even partly right – and they most likely are – then a wide range of potential interventions are opened to clinicians and rehabilitation specialists. These interventions have the advantage of being selected from the active and ongoing lifestyles of older adults; this genuineness may make such interventions among the most user-friendly for many older adults.

In sum, given current demographic developments, the field of memory and aging is one that is likely to be of increasing interest in the next few decades. This interest will derive from theoretical perspectives – which have been driving the field for several burgeoning decades – as well as from increasing attention to matters of individual well-being, social policy, and the latent but nascent ability to deliver on the promise of healthy (memory) aging.

Roger A. Dixon is supported by a grant from the U.S. National Institute on Aging (R37 AG08235) and by the Canada Research Chairs program. Tiana Rust is supported by a Canada Graduate Scholarship from the Social Sciences and Humanities Research Council of Canada. Sarah Feltmate is supported by a Canada Graduate Scholarship from the Canadian Institutes of Health Research.

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Résumé

Les défaillances quotidiennes de la mémoire et les changements de mémoire à long terme font partie des aspects du vieillissement humain les plus étudiés de façon empirique, les plus attendus d'un point de vue social, les plus déconcertants d'un point de vue personnel et, qui plus est, ils sont très souvent mal interprétés. Une vaste base de recherche théorique, complexe et continuellement grandissante sur les effets du vieillissement de la mémoire a été mise en place au cours des dernières années. Suite à la présentation d'un bref résumé d'un éventail choisi de phénomènes de base sur le vieillissement de la mémoire, nous identifions un sous-échantillon de sujets récents mais bien documentés au point de vue recherche, qui pourrait s'avérer prometteur pour l'optimisation de l'adaptation de la mémoire lors des dernières années de la vie. De façon à lier la recherche à des applications potentielles, nous décrivons les objectifs clés de trois orientations possibles d'interventions qui traitent de la mémoire et du vieillissement.

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