





ASA-MetLife Foundation

Attitudes and Awareness of Brain Health Poll

ASA American Society on Aging

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MetLife Foundation

American Society on Aging (ASA), founded in 1954, is an association of diverse individuals bound by a common goal: to support the commitment and enhance the knowledge and skills of those who seek to improve the quality of life of older adults and their families. The membership of ASA is a multidisciplinary array of professionals who are concerned with the physical, emotional, social, economic and spiritual aspects of aging. They range from practitioners, educators, administrators, policymakers, business people, researchers, students, and more. ASA advocates a strengths-based approach to aging and, as an organization, is committed to linking research, practice and policy. *www.asaging.org*

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Foreword

Do Americans think brain health can be improved?
Do we use what we know to stay mentally fit?
Is there more we can do to keep our brains in the best possible condition?

These were the questions that we set out to answer by taking the pulse of the public with regard to brain health.

Our starting point was the knowledge that exciting discoveries in the science of brain health hold great promise for improving the quality of life among older adults, enhancing the prospect that later years can be an era for personal growth, productivity and satisfaction. We also were keenly aware that the good news coming from brain research has to get into the hands—and minds—of the people who should use it.

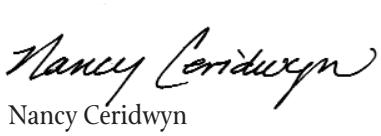
Those who make policy decisions and allocate resources need to know what approach will benefit the most lives. Those who plan new programs and encourage individuals to participate need to understand what works best and why. Dialogue among researchers, policy makers and direct-service professionals is necessary, but not sufficient. All need to understand the perspective of today's adults, younger and older alike, who are the ultimate consumers of cutting-edge information and services.

And so the national poll on American attitudes, awareness and actions for brain health took shape. It adds the voice of the public to the national conversation about brain health. You can read what people had to say about what they know and do in "The Data: Americans Talk about Brain Health" section of this report.

An expert panel framed the issues and formulated questions that formed the nucleus of the poll. Seven leading professionals in the research, policy and practice communities reviewed the data and commented on the findings to outline an agenda for action. We appreciate their participation and are delighted to include their essays in the "Expert Commentaries" section of this report. Harris Interactive pretested the questionnaire, conducted the telephone interviews and provided statistical analysis of the data. We thank the Harris Interactive team of Regina Corso, research director, and Amie Kim, senior research associate, for their expertise. And finally, we thank Terrie G. Raphael from The 2020 Group LLC for her exceptional writing, editing and conceptual skills that brought this report together.

What we learned from the poll was surprising and encouraging. The data challenge us to consider how we as a nation should approach brain fitness going forward and what each of us might do, starting today, to take good care of our own cognitive capacities. It may change how you think about brain health, too.

Gloria Cavanaugh, President and CEO
American Society on Aging



Nancy Ceridwyn
Director of Special Projects

Overview

Headline Facts From the National Brain Health Poll

1. We are optimistic about brain health.

Nearly nine out of ten people think that it is possible to improve brain fitness.

- 53% believe it can improve a lot
- 35% believe it can improve a little

AND: An overwhelming majority says that thinking abilities should be checked routinely, just like a physical checkup.

- 59% say it is very important to get a checkup
- 32% say a checkup is somewhat important

BUT: Brain health is a low priority compared to other health issues.

- Only 3% rate it the most important health subject for people their age
- Another 7% consider it the second most important topic

2. Our memory is good today, but we have doubts about tomorrow.

We give ourselves high scores on our current brain fitness, regardless of age.

- 34% rate their current memory as excellent
- 62% rate their current memory as good

BUT: The younger we are, the sooner we anticipate that most people will begin to worry about their memory.

- People age 42-49 perceive that worries begin at age 52
- People age 50+ identify age 59 as the time when worries typically begin

3. We know about activities that are good for brain health.

Most people recognize that many activities are very useful for improving mental fitness.

- At least 60% say to avoid tobacco, eat fresh fruits and vegetables, do puzzles, reduce stress, limit alcoholic drinks, spend time with family and friends, and see the doctor regularly

AND: Eighty-four percent report that they spend time, usually daily, in activities that are good for brain health.

- 68% choose some kind of art or creative project, including 48% who spend time reading
- 44% keep physically active
- 35% play games and do puzzles
- 25% work
- 22% spend time with others

4. Doctors are our preferred source for information about brain fitness.

More than 70% think that most people their age would go to a medical professional to find out about the brain and how to keep it fit.

- 76% of women and 68% of men identify doctors as the best resource for information
- People in their 40s and 50s are more likely than those 65+ to choose the Internet for brain health news

AND: We encourage others who are concerned about their memory to see a doctor.

- More than 74% would advise close friends or family to talk to a doctor

BUT: We do not do what we think is best.

- Only 58% say they have talked about their memory or brain fitness with anyone
- 47% talk with family and 42% turn to friends
- Just 37% speak with a medical professional: 13% with a nurse and only 24% with a doctor

Changing the Way Americans Tackle Brain Health

Most Americans rely on their cars to take them where they need to go each day. We expect that there will be some wear and tear with steady use—and we also expect to get years of good service from our cars. We know it will not happen unless we take care of them. That's why we schedule regular tune-ups and rotate the tires as needed.

It is the same with our brains. We depend on them, and we have to take care of them.

Today, brain science has moved light years beyond outdated concepts such as mental decline is inevitable once our brains reach maturity or we are just passive containers for a complex organ. Tremendous advances in laboratory research and demonstration studies point the way to a revolution in what we know about staying mentally fit at every age.

Sound data exist about the capacity of the brain to maintain and even improve function across the lifespan. The challenge is to make sure that American consumers have easy access to the good news about the latest discoveries in brain fitness and reasonable opportunities to use the information on their own or in facilitated programs. It all depends on reinforcing the critical link that connects research, public policy, programs and personal practice.

That's why the American Society on Aging brain-health poll is so important. It provides a current window on public perceptions of brain health, identifies the people we trust enough to turn to with our private worries about memory and gives us an action plan for good brain health. It also documents what we are doing today to keep our brains fit.

What the Experts Say

Where do we go from here? That's where the advice of experts comes in. Seven authorities in brain research and senior services take a close look at what Americans think and do about brain health. Here's what they have to say.

It's Time to Make Brain Health a National Priority

- **Brain disease is a major national health issue.** We should make a firm commitment to brain health. It means investing resources and human capital in education, communication and behavior change about mental fitness. It is the responsibility of our society to each citizen and every bit as urgent as taking care of heart health.

- **Future research should examine the relationship between lifestyle and brain fitness.** Longitudinal studies are needed to map what can be done over the course of the lifespan to nurture the brain so that adults can approach their later years with confidence in their mental abilities.

- **Personal brain-health programs should begin early in life and continue across the lifespan.** We have enough information today to prescribe ways of nurturing the brain before birth and through the early years of childhood to maximize mental fitness through adulthood. Lost opportunities are expensive for the individual and society as a whole.

- **A sea change in senior services is fast approaching with the aging of the baby boomer generation.** Our society is about to experience a major spike in the number of people age 65 and older. Improvements in technology and universal design are removing barriers to independence and opening possibilities for productive, active living well into retirement. The demand for more and better services, including those that support mental fitness throughout the lifespan, is likely to increase exponentially.

- **Doctors need continuing-education programs about brain fitness.** Although consumers regularly mine the Internet and other media, they turn to medical professionals when they want to know what to do about their brain health. As the front line for public knowledge about maintaining brain health, doctors should have ongoing access to the latest news about brain capacity and information on how best to prescribe practical approaches that maximize mental fitness.

- **Social policy and social services must keep pace with developments in brain science.** In the same way that consumers should "break a mental sweat" by challenging their brains with new learning, so, too, it is imperative that community programs incorporate the latest findings into innovative activities and resources accessible wherever people live. Program planners have a special responsibility to model positive brain-health behaviors by questioning old paradigms and incorporating current information into the design of services that they offer.

There's Good News from Brain Research

- **With good care, a normal brain can stay healthy and active just as long as the rest of the body.** For some individuals, optimal functioning may be impeded by the presence of organic brain disease or the side effects of clinical interventions prescribed to treat medical conditions. Most people can look forward to enjoying a level of mental fitness that keeps pace with physical fitness if they regularly practice appropriate activities.

- **The discovery of two keys to brain capacity has fundamentally changed our understanding of brain fitness.** Neuroplasticity is the capacity of the brain to change in response to the stimulation of learning and experience. Neurogenesis is the addition of new brain cells, or neurons, that can expand function or restore abilities diminished by disease and disuse. To activate these vital functions, people need to be in enriched environments that include opportunities for socialization, mental stimulation and physical activity.

- **Cross-training for the brain should be routine.** A single activity, no matter how challenging, is not sufficient to sustain the kind of mental acuity that virtually everyone can achieve. For example, reading or doing crossword puzzles, though each is good on its own, offers only partial benefits unless it is part of a comprehensive program for long-term brain health. We now know that brain fitness depends on combining a variety of activities that differ in frequency, intensity and variety.

- **Physical workouts nurture the brain as well as the body.** It is well understood that blood flow stimulated by exercise is good for the heart, lungs and muscles. Now we know that it is beneficial for the brain as well. People reluctant to commit to a regular program of physical activity may be motivated when they understand how it helps them to stay sharp mentally.

- **The results of brain workouts are long-lasting.** Research indicates that gains from memory training interventions among people with normal, age-related cognitive changes can last for up to five years. Although specialized approaches are necessary for people with organic impairments, the potential for maintaining and improving function across the general population is impressive and encouraging.

Brain Fitness Activities Should Be Everywhere

- **Pursuing brain health should take place at home and in the community.** Engaging in solo projects customized to reflect personal interests gives great flexibility to options that can be incorporated into one's home life. Crafts, reading, writing, playing music and doing puzzles appeal to many people. A similarly valuable array of possibilities is available in communal environments such as senior centers and religious and charitable organizations.

- **Brain fitness is an everyday responsibility.** Daily routines should include diversity and ongoing challenge to achieve and sustain the full potential of brain fitness over the lifespan. Some of our mental stretching can be achieved as an adjunct to activities that are part of our work or leisure routines. A thoughtful, proactive approach is essential to assure that we cover our mental-fitness bases every day.

- **Mental fitness activities belong in every type of senior housing.** On-site resources and programs should be titrated to match the range of settings and populations, which may extend from complete independence to maximum support with activities of daily living. Especially when an individual moves into a new residential environment, services that offer appropriate approaches to brain fitness contribute to a smooth transition and promote positive interpersonal engagement.

- **Creative community projects are a rich source of mental challenge.** Senior theater productions, which can be written, performed and directed by older adults, stimulate brain health on multiple levels. Bands and orchestras offer similar opportunities for mental challenge combined with social interaction.

- **Lifelong learning programs are ideal venues for brain fitness activities.** Cognitive fitness is built into the very nature of courses for older learners organized on college campuses. The latest discoveries in brain science should inform how lifelong learning programs are structured in order to maximize benefits to the brain. Established programs can enrich opportunities by adding formal components that translate current research into practical applications and teach memory training techniques.

Looking Ahead

It is easy to marvel at the development of ever-smaller digital devices that hold increasing volumes of data. Yet, far more impressive is the human brain, what Professor Paul Nussbaum in his essay in this report calls the greatest system in the history of the universe. Neuroplasticity and neurogenesis give us potentially unlimited capacity to continuously create and store information as well as to grow new brain cells—**if we regularly challenge our brains.**

The commitment we as a society make to promote and practice brain health now can pay dividends for generations. The immediate beneficiaries are, of course, today's older adults. They can and should participate in a variety of activities at home and in the community that stretch their thinking and stimulate new connections among brain cells. The eventual beneficiaries are the current cohort of aging baby boomers and those even younger who can make brain fitness as much a personal priority as physical fitness.

As a society, we offer narrative maps (Phoenix and Sparkes, 2006) of what it is like to grow older by what we value and where we invest our resources. Continuous engagement in complex challenges will support high cognitive functioning throughout our lives (Andel et al., 2005). It is not too late to begin, and every moment counts.

References

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Phoenix, C., and Sparkes, A.C. 2006. Keeping It in the Family: Narrative Maps of Ageing and Young Athletes' Perceptions of Their Futures. *Ageing and Society*. In press.

For More Information

The full report, *Attitudes and Awareness of Brain Health*, includes a summary of the poll results, expert commentaries with resources for further reading, a description of the methodology and final top-line data. A complete copy of the report is available in PDF format from the American Society on Aging at *www.asaging.org.*

The Data: Americans Talk About Brain Health

Think of the national poll on brain health as a conversation with 1,000 people about a subject that matters to everyone. What we know and do about brain health varies widely. Most of us have ongoing brain fitness routines. Many seek out the newest information about staying mentally fit. Some of us talk with those we trust about our concerns, and a few worry in private. All of us, however, hope our brains will last as long as our bodies.

The national conversation covered three broad themes — what we think about brain health, where we go for information and which activities that we can do alone or in groups are good for our brain fitness. Here's what we said.

What Americans Think About Brain Fitness

Defining Brain Fitness

As a starting point, it helps to know what we mean when we talk about brain fitness. For the majority, it is defined in terms of functional abilities — what we can do with our brains. For nearly two-thirds of respondents, good brain fitness is defined by abilities such as:

What does "brain fitness" mean?

18%	Being alert/sharp
18%	Keeping your brain active/ Exercising the brain
16%	Good mental health/Not senile
14%	Good memory/Ability to remember
14%	Ability to function normally
11%	Ability to think/think clearly
9%	Not suffering from Alzheimer's Disease

Just over one-third (34%) of people interviewed think in terms of the presence or absence of disease as the defining characteristic of brain health. For example, the most frequently mentioned health aspect was not suffering from Alzheimer's disease (9%).

Assessing Personal Brain Fitness

Most of the people who participated in the poll rate their current brain fitness as good (62%), and 3% consider it poor. There was little difference among younger and older age cohorts.

Excellent ability to remember things from last week

Age	%
42-49	49
50-64	44
65+	34

Remembering recent information seems more difficult than recalling the past. Respondents gave themselves lower scores on their ability to remember things from the prior week (91%) than from ten years ago (94%). Younger respondents had a slightly higher level of confidence in their recent recall capacity than those who are older. Among people ages 42 – 49, 49% think that they have an excellent ability to remember relatively new information, while only 44% of those ages 50 - 64 held a similar view. Among respondents age 65 and older, just 34% have a similar level of confidence.

Brain Health Is Not a Priority

Although Americans have strong opinions about brain health, very few people consider it the single health subject about which it is most important for people their age to have current information. It is striking that just 3% of respondents identified brain health as the leading health topic. Health issues rated higher include:

- Heart disease (31%)
- Cancer (26%)
- Diabetes (15%)
- Managing medications (7%)
- Depression (4%)

Serious vision and hearing loss scored at the same low level as brain health. Only kidney disease, liver disease and asthma were identified as important by fewer people (1%).

When Memory Declines

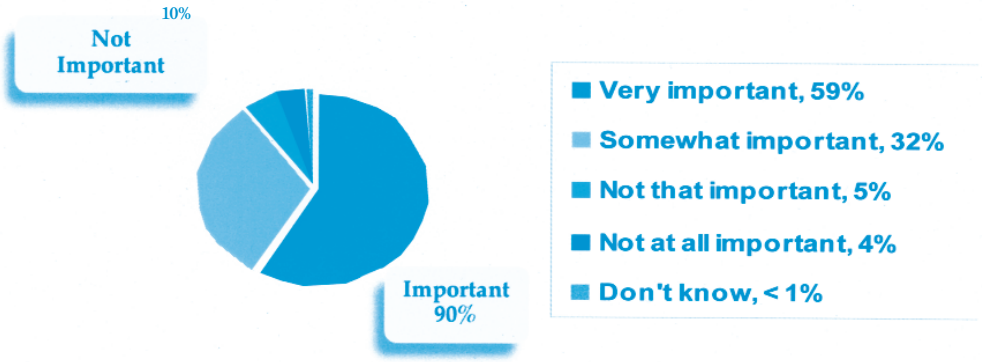
Although few people rate brain health as a relative priority, most of us anticipate that worries about memory are just a few years into the future. The younger we are, the earlier we think that other people begin to be concerned about the state of their memory. For example, people in the 42 – 49 year old range identified the mean age of 52 as the point when most people start to worry about their memory. Those who are age 50 and older believe that memory concerns do not develop until the mean age of 59. Across all age groups, the projected point at which memory worries begin is almost evenly divided by decade. Thirty per cent (30%) pinpointed both the 40s and 50s, while 27% think that worries only begin when people are in their 60s and older.

Getting a Brain Check-Up

We enthusiastically support the idea of brain check-ups. Fully nine out of every ten people interviewed say that it is very important (59%) or somewhat important (32%) for people to have their thinking abilities checked just like they have physical health check-ups. This points to an underlying conundrum between how low we rank brain health and how vigorous we think people should be in the pursuit of good brain health.

There are some gender and age differentials, as well, that reflect variations in the intensity of concern about overall brain health. More women (66%) than men (50%) think that brain check-ups are important. Similarly, more people age 65+ (63%) than those age 50 – 64 (53%) rate brain fitness assessments as important.

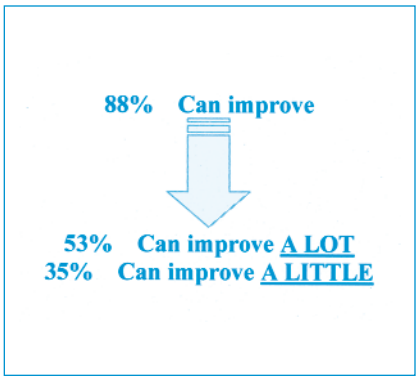
Check-ups for Brain Fitness Are Perceived to Be Critical



Brain Fitness Can Be Improved

Americans are very optimistic about the potential for improving brain fitness. A strong majority (88%) believes that we can do something to keep our brains fit. Of these, 53% see the possibility for a lot of improvement, while the others anticipate at least a little improvement (35%). Just 4% believe that no improvement is possible, and 8% are unsure.

In general, younger respondents have confidence in the potential for improvement. Specifically, 60% of people ages 42 – 49 anticipate a lot of improvement compared to 53% among those who are between 50 – 64 and just 4% of those age 65+.



Getting and Giving Information

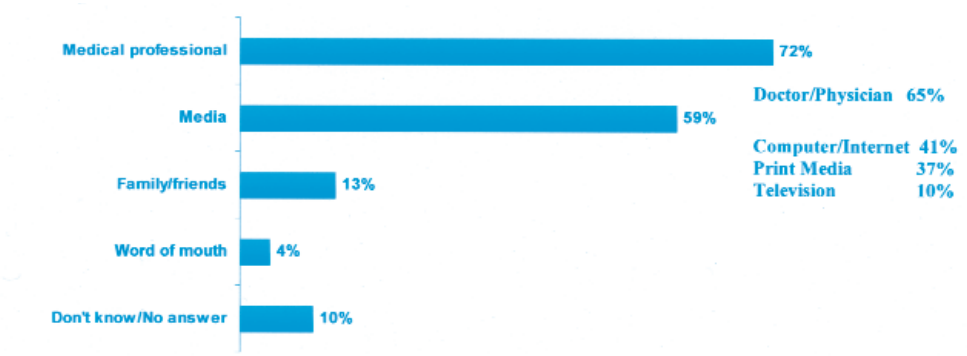
Where We Look for Brain Health Information

Ask your doctor or another medical professional. That is the opinion of 72% of respondents when asked to identify three places where, in their opinion, most people of the same age would go for information about the brain and how to keep it fit. Women are somewhat more likely than men (76% vs. 68%) to cite medical professionals as their resource of choice.

The multi-faceted domain of media was second (59%), including computers and the Internet (41%), print (37%), and television (10%). Of these, the Internet is mentioned proportionately most often by the youngest respondents (ages 42 – 49), those with the highest incomes ($75,000+) and the most education (56% are college graduates).

The category of family and friends was a distant third choice (13%) overall for where respondents think most people are likely to seek brain health information. We learn from this how to target educational resources to reach both the most people and specific sub-groups based on gender and age.

Information About Brain Fitness Mostly Found Through Medical Professionals and the Media



Our Advice to Others

Almost everyone has an opinion about what other people should do if they are concerned about their memory. More than 74% would advise close friends or family to confer with a health professional. And, 69% of these respondents identified that a general physician (rather than a specialist such as a neurologist or psychiatrist) should be the starting point for assistance. Other suggestions were: finding services to help including those that are essentially medical in nature (9%), starting new activities (6%), changing eating habits (5%) and taking medications or diet supplements (4%).

Who We Talk To

It seems that many of us are a bit reluctant to talk with other people about our memory or staying mentally fit. Just 58% of participants indicate that they have talked about the subject with anyone. Although the poll could not explore the matter in depth, it may be helpful to consider if many of us consider the subject embarrassing or that voicing a worry makes a potential problem seem more serious. Perhaps we unsure about the right place to take our concerns.

It is clear that those who do talk about the subject are most likely to speak with family (47%) and friends (42%). Women are much more likely to talk with family (53%) than men (40%).

In one important respect, we do not appear to take our own advice. Just over one-third (37%) turn to doctors (24%) or nurses (13%) about brain fitness. This finding contrasts sharply with our expectation that most people our age would look to the health profession for brain health information and the recommendation that we would make for others to talk to a doctor about memory concerns. However, people age 65+ turn to doctors more often (31%) than do individuals in their 40s (20%) or those between 50 – 64 (22%).

Taking Care of Our Brains

What We Think Is Useful

Our ideas about the kinds of activities that improve mental fitness correspond to recommendations from the research community, and that is very good news. The seven activities rated as very useful by at least 60% of the respondents are:

- Avoiding tobacco (70%)
- Eating fresh fruits and vegetables (67%)
- Doing crossword puzzles (67%)
- Reducing stress (64%)
- Limiting alcoholic drinks to one per day or fewer (63%)
- Spending time with family and friends (62%)
- Seeing the doctor regularly (61%)
- Working with numbers (60%)

It is not surprising that there is some variation by age and education. For example, people age 65+ and those with less formal education strongly identify diet, spending time with family and seeing the doctor regularly as very useful activities for brain health. Women are more likely than men to report that doing crossword puzzles and reducing stress is very useful. Leading the list of activities perceived to be not at all useful are taking supplements like hormones (42%) and taking herbs like Ginkgo Biloba (33%).

Supplements that Improve Brain Fitness: Vitamins or Minerals

	Very useful	Somewhat useful	Not at all useful	Not sure
Taking vitamins or minerals	31	54	13	2
Taking herbs like ginkgo biloba	10	48	33	9
Taking supplements like hormones	8	41	42	8

The Best Group and Solo Activities

Many of the activities that are recognized as very useful for brain health involve interacting with other people. More than half of respondents identify participating in discussion groups (58%) and taking a class or leading a group (58%) as very useful. Almost as highly regarded are working or volunteering (51%) and learning a new language (49%). Over one-third considers playing board games (39%) and singing or acting in a play (39%) to be very useful as well.

Group Activities Useful for Improving Brain Fitness

	Very useful	Somewhat useful	Not at all useful	Not sure
Being in a group that talks about the current news or books	58	36	3	1
Taking a class or leading a group	58	35	5	2
Working or volunteering	51	42	6	1
Learning a new language	49	34	15	1
Playing board games	40	51	7	1
Singing or acting in a play	39	47	13	1

Time alone gives us many opportunities for engaging in activities that promote brain fitness. Most frequently identified as very useful is doing crossword puzzles (67%). Other activities named by more than half of respondents are working with numbers (60%), writing of various types (54%) and engaging in creative projects (52%).

Solo Activities Useful for Improving Brain Fitness

	Very useful	Somewhat useful	Not at all useful	Not sure
Doing crossword puzzles	67	27	5	1
Working with numbers	60	36	3	1
Writing letter, memoirs, stories, articles	54	41	4	1
Creative projects	52	42	5	2
Playing a musical instrument	44	54	10	1
Watching educational TV or listening to the radio	35	54	10	1

Top choices among physical activities for brain health are walking (57%), exercising at home or in a gym (55%) and swimming, aerobics or playing a sport (51%).

Physical Activities Useful for Improving Brain Fitness

	Very useful	Somewhat useful	Not at all useful	Not sure
Walking	57	35	8	<1
Exercising at home or at a gym	55	39	6	<1
Swimming, aerobic or playing a sport	51	42	6	1
Working in the yard or garden	41	48	10	1
Dancing	39	48	12	1

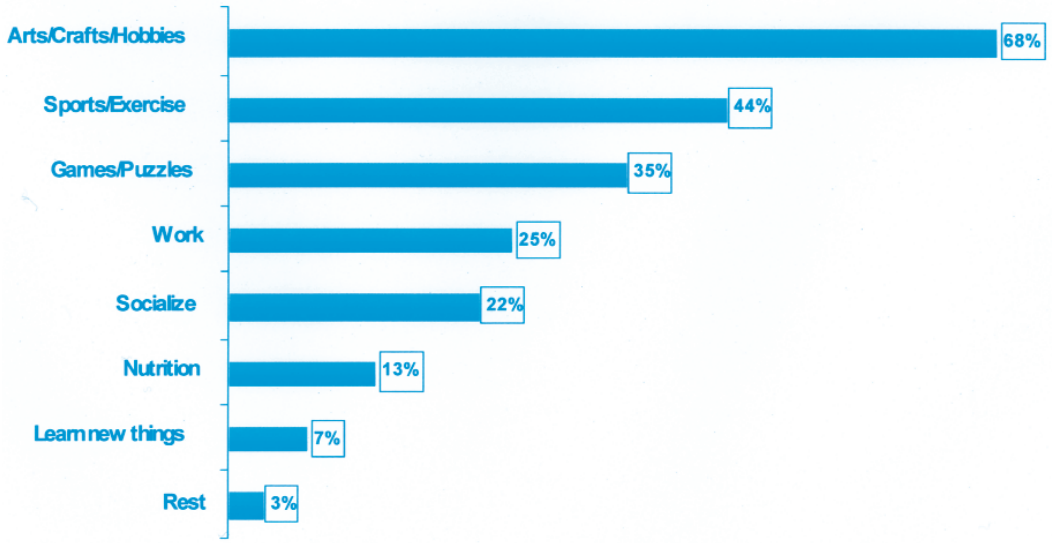
What We Do

Most Americans (84%) report spending time in activities that we know are good for our brains. The majority of us (68%) find an activity we like within the broad category of arts and creative projects, and 84% state that we are involved daily. More of us say we read (48%) than watch television (10%) for our brain's sake.

Keeping physically active involves 44% of respondents, with 26% doing some kind of exercise and 13% walking or jogging. For slightly less than half (48%) of these individuals, exercise is a daily commitment.

Just over one-third play games and puzzles (35%), with crossword puzzles leading the list (15%). As a daily activity, 59% identify this as a way that they spend some of their time. Working (25%), socializing (22%), good nutrition (13%), learning new things (7%) and resting (3%) round out how we take of our brains.

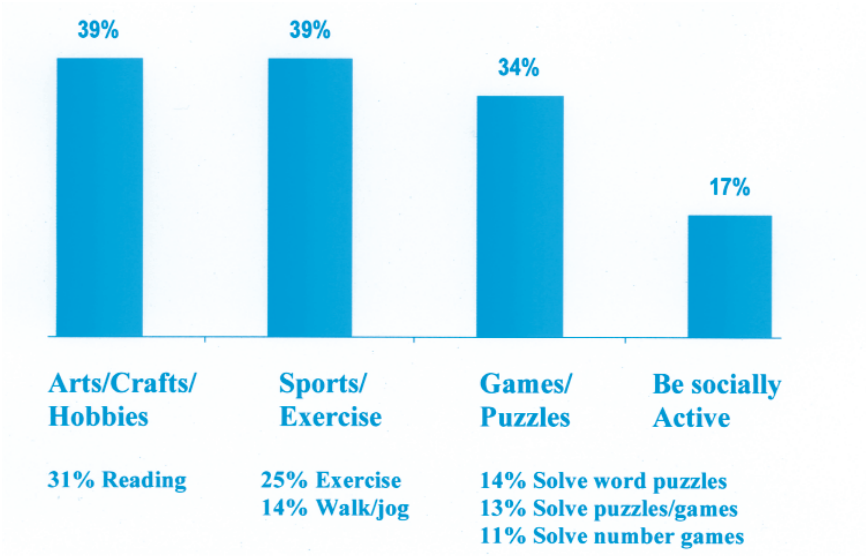
Activities We Do For Brain Fitness



What We Recommend to Others

When the advice we would give to others closely parallels our own behavior, it is likely that we understand what is important for our brain health and why. If we were to suggest that a relative or friend should start a new activity to improve brain fitness, our recommendations would closely parallel how we take care of our own brains. More than three-quarters of respondents recommend making a choice in the general category of arts, crafts and hobbies (39%) or sports and exercise (39%). Games and puzzles were close (34%).

Top Mentions Among Those Who Would Recommend Starting a New Activity



For More Information

In the following section, seven experts offer their reflections on the national opinion poll, identify issues for national attention and provide resources for further exploration. Appendix A describes the methodology of the poll, and final topline data is included in Appendix B.

Expert Commentaries

Brain Health: A Twenty-First Century Priority for Research and Practice

Gene D. Cohen

Longevity and Brain Fitness

During the twentieth century, we witnessed an extraordinary rise in life expectancy. In the United States, there was a greater than 50 percent increase on longevity—from less than 50 years in 1900 to more than 75 years by 2000. Since the human genome has remained constant, we know that the change came from a broad spectrum of improvements in environmental, medical and public health practices combined with individual initiative to maintain physical fitness through the extended lifetime.

Today we are on the cusp of achieving similar advances in brain fitness. We now know that brain health can be extended to match the duration of physical health. To achieve our full human potential, we need continuing research to fully map the generative capacity of the brain at all ages and social policy committed to bringing the newest information about good brain health practice to professionals and the general public alike.

The Good News from Current Research

The growing body of neuroscience research demonstrates that the life experiences and activities that challenge our minds result in continuing positive changes in the human brain in two important ways (Cohen, 2006; Kempermann et al, 2004; Kramer et al., 2004; Verghese et al., 2003; Cohen, 2000; Kolb and Whishaw, 1998). First, new synapses or contact points between brain cells are created by activities that are mentally stimulating. Second, and most significant, we also know that new brain cells form in response to behavioral challenge and new life experiences throughout the entire life cycle—a process once thought to stop at age three. This capacity is called brain plasticity, the ability of the brain to be modified when challenged. Especially important is the growing recognition that as individuals we can help this process along in a positive way. Indeed, we can influence the destiny of the health of our own brain—our own mental fitness—by challenging our minds.

Just as we have come to understand that physical exercise can enhance physical health, now we are learning that brain exercise can enhance the health of the human mind—how well we think, reason and remember. Similarly, as we know there are no shortcuts for physical health, so we now recognize there are no magic bullets or miracle drugs for brain health. State-of-the-art research suggests that to improve brain fitness, we need to challenge our brains in ways that make us feel as if we are mentally sweating. Frequency, intensity and variety of activities are important. A wide variety of activities can contribute to an overall strategy that improves brain health. Reading, word games, writing, playing music, singing, dancing—all are good sources for new learning.

Lessons from the ASA National Brain-Fitness Poll

Scientific discoveries in brain health are most meaningful to society when new information moves into public awareness and leads to behavior change at the individual level. The American Society on Aging national poll on attitudes and awareness to brain health shows us that a wide range of adults are familiar with some of the most important advances in knowledge and use the information in their daily lives.

Several findings are particularly encouraging. For example, the poll found that more than 90 percent of adults age 42 and older view checkups for brain fitness as important and more than half of all adults discuss the state of their memory with others. Nearly 90 percent of the people surveyed believe their brain fitness can be improved, and more than half say it can be improved a lot. Activities that require mental exercise—like doing crossword puzzles—are viewed as more valuable for improving brain health than taking supplements like hormones or herbs like ginko biloba. The majority of people who intentionally seek to keep their brains fit engage in a mix of mentally stimulating activities. It is encouraging that the list of activities viewed by respondents as worthwhile in improving brain fitness is extensive and diverse—including book and news discussion groups, lifelong learning through taking classes, working or volunteering, learning a new language, playing board games, doing crossword puzzles, singing or acting in a play, playing a musical instrument, engaging in creative projects, working with numbers, writing, sports and physical exercise.

The challenge that faces us as a nation is to assure that critical knowledge is available in culturally appropriate ways so that adults in every community understand what they can do to extend brain health and have ready access to resources so that they can achieve their full potential at every age.

Boomers and the Brain

The baby boom generation—those born between 1946 and 1964—is the first group in history to enter middle age with parents in their 70s, 80s, and older who are generally independent, productive and creative. Within their extended families, the boomers see that later life can be enjoyable and meaningful. As a result, they have greater expectations for a positive experience throughout their mature years than any previous cohort. High on their list of requirements are programs and services for maximizing their brain health as they age. The generation has a track record of social change that bodes well for investing the necessary resources to make brain fitness a national priority and accomplishment.

Where We Go From Here

Brain fitness programs maintain brain vitality and a sharp mind with advancing years. A variety of resources for building on current knowledge can be tapped by communities around the country to make progress in this important area. (See the list of selected resources on the next page.)

As a society we need to enhance public education that informs aging baby boomers and older adults alike about what each person can do starting today to have a positive influence on the destiny on their own brain health. Similarly, we need creative community program planning to provide a variety of ways for those in the second half of life to maximize their full potential of brain fitness. Finally, we need thoughtful public policies that promote research and services so that decades from now the twenty-first century will be known as the era that advanced brain fitness with aging.

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For More Information

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Selected Resources

AARP
601 E Street, N.W.
Washington, DC 20049
800-424-3410
www.aarp.org

AARP, through its National Retired Teachers Association (NRTA) arm, in conjunction with the Dana Alliance for Brain Initiatives, has developed a Staying Sharp Program focused on brain fitness with aging.

American Society on Aging (ASA)
833 Market Street, Suite 511
San Francisco, CA 94103
415-974-9600
www.asaging.org

ASA is national not-for-profit membership organization that informs the public and health professional about issues affecting the quality of life for older people and promotes innovative approaches to meet these needs, including a focus on brain fitness.

Civic Ventures
139 Townsend Street, Suite 505
San Francisco, CA 94107
415-430-0141
www.civicventures.org

Civic Ventures is a think tank and incubator that aims to create ideas and invent programs that help society achieve the greatest return on experience. Their particular focus is on involving Americans in their middle and late years who are redefining the second half of life.

National Center for Creative Aging (NCCA)
138 S. Oxford St.
Brooklyn, NY 11217
718-398-3870
www.creativeaging.org

NCCA is dedicated to fostering an understanding of the vital relationship between creative expression and the quality of life of older people, providing technical assistance for program development and serving as a clearinghouse for information.

North Carolina Center for Creative Retirement (NCCCR)
Reuter Center, CPO # 5000
The University of North Carolina at Asheville
One University Heights
Asheville, NC 28804-8516
828-251-6140
www.unca.edu/ncccr

NCCCR has the threefold purpose of promoting lifelong learning, leadership and community service opportunities for retirement-aged individuals.

National Institute on Aging (NIA)
Building 31, Room 5C27
31 Center Drive, MSC 2292
Bethesda, MD 20892
800-222-2225
www.nih.gov/nia

NIA is the federal research program most involved in supporting studies of aging. In addition to providing information on research findings, much practical information is offered through the Institute's diverse publications-especially their "Age Pages".

National Institute of Mental Health (NIMH)
Public Information and Communications Branch
6001 Executive Boulevard, Room 8184, MSC 9663
Bethesda, MD 20892-9663
866-615-6464
www.nimh.nih.gov/healthinformation/index.cfm

NIMH programs and publications focus on reducing the burden of mental illness and behavioral disorders as well as promoting mental health in all age groups through research on mind, brain and behavior.

Advancing the Science of Brain Fitness: What We Know, What We Don't Know, and What We Need to Learn

Henry W. Mahncke

The Challenge for Brain Fitness Research

The American Society on Aging national poll on attitudes and awareness to brain health provides a fascinating insight into how people view brain function and how to keep their brains sharp as they age. At the same time, the results of the poll pose a challenge to researchers in the field of cognitive aging. While nearly 90% of respondents believe that brain fitness can be improved, the approaches that people report they use or believe would be helpful rarely have been clinically validated. The mismatch between popular belief and scientific reality highlights an opportunity for well-designed studies showing efficacy of cognitive, exercise or dietary approaches that will find an eager audience of individuals motivated to improve their brain fitness. Yet the mismatch also creates risk: the emerging field of brain fitness could become dominated by unvalidated treatments and poor science.

Changing Views

Not long ago, many experts would have disagreed with the current popular view that it is possible to improve brain fitness at every age. For many years, the prevailing concept was that the brain was like a machine, and, like all machines, it wore out over time. Every year, a few more neurons died, a little more disorganization set in and the brain shrank a bit more. This wear-and-tear perspective led to a general opinion that cognitive decline was inevitable and inexorable.

Over the past decade, researchers in cognitive aging, neurology, neuroscience and related fields have demonstrated that virtually all those beliefs about cognitive decline are false. We now know that new neurons are born in the adult brain, that brain plasticity can drive positive reorganization in older brains and that engaging in specific activities can thicken—indeed, actually enlarge—specific brain regions as the complexity and number of connections between neurons increase. Concurrently, retrospective studies of leisure time and work-related activities have demonstrated that people who engage in mentally stimulating activities reduce their risk of dementia.

In the aggregate, these data have changed the minds of scientists about how the aging brain functions. Researchers now are virtually unanimous in their agreement that the brain is capable of positive change throughout life. The dominant perspective is that some specific set of activities is most likely to drive positive change.

The Missing Link in Research

The broader public now recognizes the revolution in scientific understanding and thinks in terms of "use it or lose it." We need, however, to better understand what "use it" actually means. Respondents to the ASA poll recommend changes in diet, exercise and mental activities as most likely to help with memory. These approaches generally are supported by good retrospective and cross-sectional data suggesting that the same dietary and exercise habits which promote heart health may promote brain health and that mentally stimulating activities are associated with slower or reduced onset of dementia.

Studies to date are, however, generally limited by the fact that they are primarily retrospective and cross-sectional. This makes it difficult to be certain that differences in memory actually are caused by the interventions. Therefore, large randomized controlled studies of specific testable interventions are required to firmly establish how—or even if—these approaches work to improve memory or slow the onset of dementia. Although these studies will take time and may be expensive, they are absolutely necessary for progress that will enable physicians to make scientifically based and clinically validated recommendations to their patients.

Without these types of studies, the field of brain fitness runs a real risk of evolving into an industry dominated by unvalidated therapeutics and poor science. For example, a quick Internet search for "memory enhancement" yields more than 25 text ads for products that enhance memory, very few of which have been subjects of a meaningful clinical trial. With so many people believing that something can be done to improve memory, untested programs or products may fill any vacuum left by real science.

Investing in Brain Health

Building the future of a science-driven field of brain health and memory function will require significant investments to fund large-scale trials and substantial efforts in patient and physician education. The National Institutes of Health as well as private companies likely will be involved in organizing and funding clinical trials. As results from these trials are published, professional societies will have the important role of developing evidence-based practice guidelines for the treatment of memory complaints in generally healthy individuals. Medicare and private health insurers will need to evaluate changes in reimbursement policies if studies conclusively demonstrate real benefits to older individuals and reduced costs to health care systems. Given the tremendous interest and belief in brain fitness that the ASA poll demonstrates, the scientific community has an obligation to develop and test approaches that can offer scientifically based and clinically validated ways to help all individuals maintain their brain fitness through life.

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For More Information

About the science behind diet, exercise and mental activity recommendations:

The Alzheimer's Association (2006) "The Science Behind the Recommendations" *Maintain Your Brain.* Available from the Alzheimer's Association on the World Wide Web: www.alz.org/maintainyourbrain/science/overview.asp

About recent randomized controlled studies of cognitive training interventions:

Ball, K., et al. (2002) "Advanced Cognitive Training for Independent and Vital Elderly Study Group. Effects of cognitive training interventions with older adults: a randomized controlled trial." *Journal of the American Medical Association* 288(18):2271-81.

Mahncke, H.W., et al. "Memory enhancement in healthy older adults using a brain-plasticity-based training program: a randomized controlled study." *Proceedings of the National Academy of Sciences,* in press.

About recent randomized controlled studies of herbs and vitamins:

Solomon, P.R., et al. (2002) "Ginkgo for memory enhancement: a randomized controlled trial." *Journal of the American Medical Association* 288(7):835-40.

Barnes, D.E. and Yaffe, K. (2005) "Vitamin E and donepezil for the treatment of mild cognitive impairment." *New England Journal of Medicine* 352(23):2379-88.

Does Public Opinion Reflect Research Findings on the Effectiveness of Mental Activity for Improving Memory Functioning and Reducing Dementia Risk?

Linda Ercoli

Commentary

Public opinion generally is in concert with research data that support the effectiveness of memory enhancement strategies in older adults and suggest that engaging in mental and leisure activities may reduce the risk of developing cognitive impairment and dementias such as Alzheimer's disease. Results of the attitudes and awareness poll conducted by Harris Interactive for the American Society on Aging illustrate that 90% of respondents believed that brain fitness can be improved from "a little" to "a lot" and that a variety of activities may be helpful in improving brain fitness. Research support that brain fitness can be improved comes from clinical trials on the effectiveness of specific memory enhancement strategies in older adults and from prospective studies that investigate the association between lifestyle activities and future cognitive functioning.

Research Evidence

In clinical trials, older adults are administered cognitive tests and then randomly assigned to either a memory (or other cognitive ability) intervention or a control condition. The memory enhancement interventions often involve teaching mnemonic strategies, which are techniques that make use of association, imagery and organizing information in meaningful ways. These experiments frequently show that mnemonic strategies improve performances on laboratory-based or everyday memory and cognitive tests compared to control conditions (Verhaeghen 1992). Specific or formal mnemonic techniques are effective, and general strategies or persons' self-generated memory techniques also can be beneficial (Derwinger et al., 2005; Cavallini et al., 2003). The effect of memory training is moderate in magnitude and gains can last up to five years (Verhaeghen, 1992; O'Hara et al., 2006).

One important point that the public may not be aware of is that memory training interventions involving mnemonic strategies are most appropriate for adults with normal, age-related cognitive difficulties. In contrast, persons with more severe memory loss - such as those in the early stages of dementia or in some persons with preclinical dementia syndromes such as Mild Cognitive Impairment - may not be able to learn, employ or benefit from such strategies. In fact, trying to learn these techniques can be very frustrating for memory-impaired persons. Different interventions are required for persons with significant memory impairment.

Activities that Improve Brain Fitness

Participants in the brain-health poll indicated their understanding that a variety of activities can improve brain fitness. In parallel, prospective research studies suggest that a higher frequency of engaging in a variety of common cognitive or leisure activities may be beneficial for brain health. In these studies, older participants are asked about their mental, physical or leisure activities, and then they are followed over time (from a few to approximately 20 years). The relationship between their reported level or type of activity is used to calculate the risk for developing cognitive impairment or dementia. These studies suggest that engaging in a variety of activities - common activities such as reading or watching the news and leisure activities like dancing, playing board games, solving puzzles or playing musical instruments - is significantly associated with reduced risk for developing dementia or memory impairment (Verghese et al., 2003; Wilson et al., 2002, 2003). Depending on the level of activity and on the specific study, reductions in risk for Alzheimer's disease range from 33% to over 60%. The higher the frequency of activity, the lower the risk for dementia. In most of these studies, mental activities are more strongly associated with lower dementia risk than are physical activities.

Reducing the Risk of Dementia

Why do a variety of activities correlate with reduced dementia risk? There is not a definite answer to this question currently, but one explanation is that engaging in novel tasks and, to a lesser extent, the exchange of ideas are the key components of activities associated with lower dementia risk (Fritsch et al., 2005). More research is needed on the benefits of specific activities. How activity level is associated with dementia is not clear. It is possible that reduced cognitive activity is an early sign of dementia or that persons with high mental abilities remain active until age related declines curb activities (Hultsch et al., 1999). Alternatively, high cognitive activity may be protective (Mortimer, 1997) or may strengthen processing skills that enable compensation for cognitive difficulties (Wilson et al., 2000).

Overall, clinical trials and prospective studies suggest that environmental factors play a role in maintaining brain fitness. Also, they indicate that mental activities and lifestyle changes in general are ways by which individuals can exert control over their own brain health. These findings parallel the survey participants' beliefs that they can improve their own mental fitness through a variety of activities.

Recommendations

Research

More studies are needed to establish a cause-and-effect relationship between brain fitness and activity level and reduced risk of dementia. Longitudinal studies of diverse groups of adults over long time periods are needed to increase understanding of the complex relationship between lifestyle and brain fitness. Measures of brain function, such as FDG-Positron Emission Tomography, functional Magnetic Resonance Imaging (MRI), and measures of brain structure (MRI) also should be included. In vivo methods of measuring brain accumulations of amyloid or tau pathology may be particularly helpful in understanding whether or to what extent low levels of mental activity may be associated with pathological evidence of preclinical Alzheimer's disease.

Community

Opportunities for adults to engage in cognitively stimulating activities in community settings should be increased. Venues for promoting brain health and fitness include senior centers, community colleges and not-for-profit organizations such as the Alzheimer's Association. These types of organizations can offer programs and activities for educating adults about memory and brain fitness as well as provide opportunities for new learning.

Specific community education programs to target improving memory and other cognitive functions can be designed and implemented. The UCLA Center on Aging, a campus based organization, is one example of a not-for-profit organization that developed and hosted a standardized educational program for memory enhancement and memory education. The program was developed by experts and is implemented by trained lay volunteers at various venues (e.g., senior, and community centers, church and temple groups, social clubs). Such programs can reach diverse populations and provide opportunities for new learning, mental activity and exchange of ideas for both volunteers and recipients.

Clinical

The brain health poll indicated that most persons turn to medical professionals for memory concerns. Therefore, professionals can be a source for disseminating knowledge about brain fitness. Continuing education on brain fitness can be developed to enhance medical professionals' knowledge. Moreover, although cardiac disease and diabetes were of greater concern to survey participants than memory or brain fitness, such disorders are risk factors for cognitive impairment and dementia (Roman et al., 2004). Physicians then also may help "fill in the gaps" by educating patients on the link between cardiac health, diabetes, cerebrovascular risk factors and brain fitness.

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Websites

Alzheimer's Association
www.alz.org

UCLA Center on Aging
www.aging.ucla.edu

Mindtools
www.mindtools.com

A Community-Based Approach for Promoting Brain Health

Sandi Johnson

The Brain Health Puzzle

The national poll on attitudes and awareness of brain health conducted for the American Society on Aging by Harris Interactive reveals a critical conundrum in how Americans view brain health. While many people believe that brainpower can be strengthened, for most people brain fitness is a low priority compared to other health subjects such as heart disease, cancer and managing medications. Many are reluctant to discuss their concerns with doctors or other health professionals even though they would encourage others to seek help before problems become severe.

Brain health is a serious matter, yet many adults - of every age - are quick to say dismissively "Oh, I'm having a senior moment" when they forget a name, what they were about to say or where they put their keys. Cognitive decline is not an inevitable consequence of aging, and there are many ways to strengthen - and even improve - brain functioning at every age. In fact, people do not need to go far to improve their brain function. It can happen at home or in the community. It can be intentional or a positive by-product of time spent in a variety of ways. All that matters is the right attitude and the right activities. Being open-minded, engaging in new pursuits and stretching mentally is all it takes to benefit brain health.

Social Interaction is Good for the Brain

Maintaining and improving mental acuity should be a routine part of life at home. People can do crossword puzzles, follow instructions for installing a VCR, try new recipes and read the daily newspaper. Simple lifestyle changes like eating a healthy diet, avoiding tobacco and reducing stress can have positive effects on preserving cognitive function.

From my perspective as Director of the North Shore Senior Center in Northfield, Illinois, I see daily evidence of the power of social interaction for maintaining and improving brain health. Being an active participant in the community offers both formal and informal venues for stimulating activities that promote brain fitness.

There are about 15,000 senior centers in the United States, which collectively serve close to 10 million adults age 50 and older annually. The programs and services of each center reflect the diverse interests and intellectual, emotional, social and spiritual needs of local community residents. The benefits of socialization at senior centers, as at other community organizations, are enormous. Over and over it is reported that interactions among people are stimulating to the brain. People come to senior centers regularly to read, take classes, relax alone or in fellowship and to play games. For example, bridge and other games that require concentration and memorization are challenging and stimulating (Preidt 2006; Valadez 2006).

Volunteer activities offer an excellent framework for socialization. Volunteers may be motivated by the opportunity to help others without realizing that simultaneously they are improving their own cognitive function. The time spent helping others strengthens self-esteem, while the mental challenge of adapting to the needs of the organization for which one is working can be stimulating. Service clubs, religious organizations, local government and schools are among the many venues for volunteering. At the North Shore Senior Center, for example, volunteers do peer counseling, make friendly visits, assist with countless administrative functions, govern the organization and much more.

As the following examples make clear, volunteering benefits both the organization and the contributor.

> A 69-year-old widow, Mrs. S, had moved to an apartment in the suburbs to be near her son and his family. At one time she had been very busy working in the family grocery store. Now, she was depressed and lonely. Recognizing this, her son called the volunteer center and, in turn, was referred to the Senior Center. Based on her background, a staff person had the wonderful idea of asking Mrs. S to work in the Senior Center's small gift shop. At first, the woman was reluctant but eventually agreed. Before long, she was in charge of the shop's greeting card section. Today Mrs. S enjoys arranging the card display—perhaps similar to the way she had arranged fruit in her grocery store—and places orders for new cards. As a result, card sales are reaping good income for the Center, and Mrs. S is thriving.
>
> Mr. G, a retired attorney was serving on a board of a non-profit agency when the decision was made to seek bond financing for a major capital project. He was asked to oversee the mechanics of the financing process. As the project moved forward, Mr.G commented with a big grin, "I feel like a horse that has just been let out of the barn."
>
> The suggestion was made to Mr. B, a 75-year old retired bus driver that he volunteer in the Senior Center's escorted transportation program that provides frail seniors with rides to their medical appointments. Although he was a bit uneasy about the idea, Mr. B accepted his first assignment to drive a 91-year-old retired social studies teacher to her doctor. The teacher had traveled extensively throughout the United States country and, during the drive to and from the appointment, the volunteer and former teacher shared stories about traveling across the country. They talked about their love of back roads and Midwest cornfields. By the end of the outing, Mr. B found that his anxiety was gone and realized he had thoroughly enjoyed his volunteer experience.

Learning Engages the Brain

Classes provide new information and new opportunities for interaction. Taking courses at Lifelong Learning Centers, OASIS Centers, Emeritus programs and community colleges stimulates the brain and promotes mental fitness. The subject may be ancient history, investing or learning a foreign language. In peer-led settings, students become teachers who draw on life experiences as well as formal training. Group discussions are particularly effective for stimulating thinking as one is challenged to evaluate different points of view.

The creative arts are another form of good exercise for the brain. For example, drawing, painting, sculpting, printmaking, woodworking, knitting, sewing, and ceramics require planning, concentration and problem solving. In creative or memoir writing, for example, one may work diligently to choose the most descriptive words and use intellectual discipline to develop good sentence structure. Similarly, writing poetry encourages the imagination and unleashes creativity.

Playing a musical instrument also stimulates the brain. Many communities have bands, community orchestras or chamber music groups, all of which offer opportunities for socialization and personal growth. As an example, there are more than 100 New Horizons bands around the country for the 50+ crowd. New Horizons Music programs provide entry points to music making for adults, including those with no musical experience as well as people who long ago were part of school music programs but have been inactive for long periods.

Physical Exercise for the Brain

Most people know that physical exercise is good for the body. It prevents falls, staves off diseases such as diabetes and hypertension, enables the body to rebound more quickly from sickness or injury and contributes to emotional well being.

Less widely appreciated is the power of exercise to nurture the brain. Regular exercise is associated with a delay in the onset of dementia (Larson 2006). In one study, senior citizens who walked regularly showed significant improvement in memory skills compared to sedentary older persons. Walking as little as 20 minutes a day improved their concentration and abstract reasoning (Franklin Institute 2004). Walking is readily accessible, whether along a neighborhood sidewalk, in an indoor mall or on a treadmill. For people who prefer more vigorous activities, hiking, biking and canoeing are excellent options as well as aerobic exercise, weight lifting, yoga, dancing, swimming, golf, volleyball, tennis, tai chi and Pilates.

Although many older persons are well aware of the importance of physical fitness, 85% of seniors do not exercise on a regular basis. They do not exercise for the same reason that people of all ages resist physical activity—they think of it as too hard, too boring or they are disappointed by the lack of immediate results. Yet the long-term benefits to body and mind are enormous (Kemp 2004).

Take Action Today

We need to sound a national call that emphasizes the value of brain health for individuals and our communities alike. Seniors who are mentally at their best will contribute to their families and to society the experience and wisdom that they have accumulated over their life span. Therefore, as a society we should provide incentives that motivate organizations to provide programs supporting brain health and for people to participate in them.

Keeping mentally fit can be done wherever we live. It is a matter of putting our brains to work in activities that we like on our own and with other people. The time to begin is today.

Sandi Johnson, LCSW, is the executive director of the North Shore Senior Center (NSSC) in Northfield, Illinois. NSSC is a multi purpose senior center that serves residents living in 23 of Chicago's northern suburbs. In 2005, NSSC provided services and programs to more than 37,500 older adults and their family members. NSSC was one of the first eight senior centers in the United States to be accredited by NCOA/NISC.

For More Information

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Additional Resources

Gulf Coast Community College: Lifelong Learning
www.gulfcoast.edu/lifelong_learning.htm

OASIS
www.oasisnet.org

New Horizons International Music Association
www.newhorizonsmusic.org

Osher Lifelong Learning Institute at the University of Southern Main
www.usm.maine.edu/olli

Promoting Brain Health in Senior Housing

Kirsten Tierney

Residential Communities and Brain Health

Senior housing programs are natural settings for maximizing access to information, activities and opportunities for brain health as part of an overall emphasis on senior wellness. These communal environments specialize in providing quality of life resources for people above a specific age. On-site activities can be organized centrally for small groups of people living in close proximity. Services that promote brain fitness are among the features with maximum potential for making a positive difference in the lives of site residents.

When people initially move into senior residential communities, among the activities with the highest rates of participation are book clubs, exercise classes and word games (including cross-word puzzles, word scrambles, Scrabble and generating new words from a larger word). This is congruent with findings from the poll on attitudes and awareness to brain health conducted by Harris Interactive for the American Society on Aging that reading (39%), exercise (39%) and games (34%) are activities of choice for staying mentally fit. Among group activities considered very useful or somewhat useful for improving brain fitness are engaging in book or current news discussion groups (94%), taking a class or leading a group (93%), working or volunteering (93%) and singing or acting in a play (86%). These preferences are closely aligned with the interests observed among people in senior living communities across the country.

Spectrum of Senior Housing Environments

The potential for maintaining - and improving - brain health should be a priority across the spectrum of senior living settings since the industry as a whole reaches a large and diverse population of older adults in many parts of the country. National associations identify six major categories of senior housing settings, and appropriate activities should be readily available in each type of residential environment. Programming must be designed to match cognitive needs in each community.

Active adult communities are structured for fully independent living in privately owned residences. Senior rental apartments offer community activities and other amenities in addition to rental units. In both, mental fitness programs tend to involve computer classes, college-level courses or self-directed brain challengers such as word games or sudoku logic puzzles.

Independent living communities provide central dining facilities and other services such as housekeeping, linen service and transportation as well as social and recreational activities. While residents are likely to have access to community-based programs, onsite facilitated programs for mental fitness generally are present as well. Examples include group word games or structured classes such as the Brain Fitness Program developed by Posit Science that focuses on improving mental speed and the accuracy and strength of memory and cognition.

Assisted living residences offer supportive care for help with activities of daily living as well as a range of services similar to those in independent living communities. Cognitively stimulating programs are one component of on-site activity resources. In general, they organize less complex games such as word searches or picture matching and instructional craft projects.

Individuals requiring 24-hour nursing and/or medical care may reside in nursing homes (technically, skilled nursing facilities) generally licensed for Medicare and/or Medicaid reimbursement. Continuing care retirement communities combine features of independent living, assisted living and skilled nursing services within a single campus, with a range of individualized programs to maximize mental fitness included as an integral component of on-site activities.

The Kisco Senior Living Approach

Like many developers of retirement communities and apartments for active adults, Kisco Senior Living is attuned to brain health because it complements our holistic approach to wellness. Our philosophy is that wellness is more than the opposite of illness. Rather, it is a combination of many factors that serve to strengthen and enhance mind, body and spirit. In our residential communities, we promote successful aging strategies across the spiritual, physical, social, intellectual, emotional and vocational dimensions of wellness. We offer exercise classes, lifelong learning, innovative therapies, spirituality and meditation and intergenerational activities. Brain fitness is a key to success in each of these areas. Therefore, mental aerobics classes and programs are part of all of our 24 communities.

We know that older adults in our residential communities who have good memories are more likely to engage actively in new programs, learn new skills, meet new people and have an overall successful experience in the senior housing setting. As a result, in the last two years Kisco Senior Living has made a commitment to introduce innovative brain health programs for the long-term benefit of our residents. We have worked with experts at Posit Science in California, Eldercare University in North Carolina and The Senior Theatre Resource Center in Missouri to bring exciting resources into our on-site programs. For example, in 10 of the Kisco communities we have active theatre groups in which the seniors themselves write a play, rehearse and then perform it. Participants develop a new sense of confidence and acquire new skills and information. Many chose to participate in additional senior theatre productions, while others are buoyed to try new activities. At new residential sites, we are preparing for the Baby Boomers and are planning innovative ways to meet their brain health expectations in particular.

Senior Housing Programs as a Resource for Increasing Brain Fitness

The senior housing industry must recognize and respond to heightened awareness and requests from residents in order to retain its competitive advantage and succeed in enhancing the quality of life for the residents. State of the art knowledge about brain health should be shared across the spectrum of senior housing settings and translated into testing and implementing services that address healthy eating, regular exercise and active engagement with friends, learning and fun in support of brain health. For example, site owners can commit to making healthier food options available, organize activities that stimulate cognitive fitness and provide appropriate technology—such as computers, magnification readers and other assistive devices that are useful—as part of

their core operations.

Encouraging all adults—whether they reside in senior living residences, naturally occurring retirement communities or in multi-generational settings—to fully engage in life is key to the long-term well being of our society in general. A great brain health workout will involve interpersonal interaction, engagement with stimulating topics for new learning and participation in diverse activities. We must continue to raise awareness that our brains need to work out as much as our hearts, lungs and muscles. Increased understanding should lead to support for continuing research and expanded programs that will keep brains fit and maximize the quality of life across the years and in all living environments.

Kirsten L. Tierney, PT, MBA, director of Healthy Strides, based in Carlsbad, CA, oversees wellness programming for residents and associates in Kisco Senior Living congregate housing communities and senior apartments. Nearly a decade of experience providing and managing physical rehabilitation services in both in-patient and assisted living settings is the basis for her focus on whole person wellness as a means of maintaining quality of life throughout the aging process.

For More Information

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Wheatley, M. (2002) *Turning to One Another: Simple Conversations to Restore Hope to the Future.* San Francisco: Berrett-Koehler Publishers, Inc.

Eldercare University
www.eldercareuniversity.com

Posit Science
www.positscience.com

Art Age Publications: The Senior Theater Resource Center
www.seniortheatre.com

Senior Housing Associations

American Association of Homes & Services for the Aging (AAHSA)
www.aahsa.org

American Health Care Association (AHCA)
www.ahca.org

American Seniors Housing Association (ASHA)
www.seniorshousing.org

Assisted Living Federation of America (ALFA)
www.alfa.org

National Center for Assisted Living (NCAL)
www.ncal.org

National Investment Center for the Seniors Housing & Care Industries, Inc. (NIC)
www.nic.org

Lessons from the Brain Health Poll for Lifelong Learning Programs: A Practitioner's Perspective

James E. Frasier

Lifelong Learning for Brain Fitness

Active learning that challenges our minds to work in new ways is the central process in keeping cognitively fit over the lifespan. There is, however, a troubling gap between what people do that they believe is good for their brain health and what research tells us are beneficial strategies for continuing cognitive growth and development. As a nation, we are faced with an opportunity—and an obligation—to make cognitive fitness as much a part of our everyday routines as physical fitness. To do so, we must convincingly communicate the importance of engaging in new and stimulating activities that keep our brains in tiptop shape and improve our mental performance. We need to assure that appropriate resources are available to older adults in every community. And, finally, we should establish targets for increasing participation rates across the full array of activities that keep us on our mental toes. Lifelong learning programs offer a valuable venue for a cultural shift to keeping mentally fit.

The Disconnect between Science and Public Behavior

From current neuroscience research, we know that participating in challenging activities leads to the formation of new brain cells and new connections among these cells, a process called neurogenesis. Practical application suggested by experts is to engage in new activities or do routine things in different ways. For example, a person who enjoys crossword puzzles should take on the challenge of sudoku—logic-based puzzles—in order to "break a mental sweat." Simply continuing to do crossword puzzles, while interesting, will become routine and no longer provide a mental challenge. The benefits for brain fitness come from creating new pathways in the brain. (For more detail about how the brain changes and how new brain cells are generated see Cohen 2005 and Staying Sharp 2005).

Data from the Harris Interactive poll on brain health attitudes and awareness commissioned by the American Society on Aging offers two provocative findings that should guide future developments in community-based learning programs for older adults. First, the poll makes it clear that although respondents do not identify brain fitness as a priority health topic, they have a good grasp of what brain fitness is, where to get information, and the value of a brain fitness checkup. Second, knowing that brain health can be improved does not translate into behavior that maximizes the capacity of the brain to grow at any age. Together, these findings suggest that American adults lack general knowledge about how to stay cognitively fit and do not practice that which they know.

For example, the most common choice of activity for brain health was reading, and exercise was second. Older respondents more frequently mentioned the former, and younger people indicated the latter at a higher rate. While the generational difference is not surprising, it is noteworthy that there was minimal evidence of participation in a more diverse and balanced approach to activities that promote brain health. The poll presented a broad array of activities selected by an expert panel in the fields of neuroscience and gerontology. These included taking a class, being in a group that discusses books or current events, volunteering, learning a new language, singing, playing a musical instrument, taking up a hobby for the first time, swimming, spending time with family, writing, limiting alcohol intake and reducing stress. While reading and exercise are valuable and enjoyable, they are not sufficient for Americans to achieve and sustain the full potential of brain fitness over the lifespan.

The Lifelong Learning Approach

Lifelong learning programs can play a major role in the lives of individuals who are actively seeking to improve their brain fitness. In general, lifelong learning programs focus on the 50+ population. Classes and activities are usually non-credit, with no grades or tests, and many classes are peer led.

Many programs are located on college campuses, and all are designed to be intellectually stimulating. The setting gives participants the opportunity to be around younger people and possibly interact directly. As well, adult learners may have access to other campus facilities including libraries, athletic centers, special lectures and even discounts at college bookstores and dining facilities. Faculty members may be available as resource persons. Since lifelong learning programs are generally expected to be self-sustaining, participants typically pay membership and/or class fees. Most programs depend heavily on volunteers from their membership ranks to coordinate program components such as registration, course development, selecting staff (e.g., group leaders, class assistants and trip leaders) and other key operational and logistics functions.

A variety of lifelong learning programs are available in the United States and internationally. Institutes for Learning in Retirement (ILRs), Osher Lifelong Learning Institutes, Next Chapter programs, Universities of the Third Age (found in Europe, Australia, China and other countries), OASIS and Elderhostel are examples of successful lifelong learning programs. Each of these organizations provides a natural setting for enriched brain fitness activities. They can be prime supporters for national initiatives to enhance the brain fitness of their constituencies in positive and proactive ways.

Cognitive fitness may be approached subliminally or it may take a direct and 'in your face' approach, whichever works best in a particular context. The term "cognitive fitness" may be too cerebral for some groups. It may suffice to provide the programs and activities that support brain fitness without any specific reference to the concept. In other cases, participants may want to know more about the science behind brain fitness so they can understand and experience the strategies and be part of the process. It will probably require some experimentation to find a formula that works for each organization. Both strategies should be available in some combination with every lifelong learning program.

A Real World Example

Lifelong learning centers are stimulating environments for participants and staff. I am the Director of The Osher Lifelong Learning Institute (OLLI) at Eckerd College and the Academy of Senior Professionals at Eckerd College (ASPEC). Both are examples of the kinds of programs that operate in many communities across the country. One of our basic criteria when creating a class, a travel experience, a special event or interest group is that the subject must be about something an individual would not, or perhaps could not, do alone. Thus, our programming fills a niche by bringing together people with disparate backgrounds and common interests to engage in a new endeavor. Together, individuals can share experiences, learn together and improve their cognitive fitness.

Brain fitness is interwoven throughout our special events, programs and workshops. We educate our OLLI and ASPEC participants, some 1,000 strong, plus our 2,800 Elderhostel guests who enroll in over 70 programs each year on the benefits of lifelong learning and brain fitness. Examples include peer led interest groups and a wide variety of intellectually stimulating classes in diverse subjects. Adult learners can choose Homer's Odyssey, tai chi and yoga, a New Visions workshop, social programs, activities supporting college faculty and students, volunteer opportunities and more. All of the experiences are designed to be both fun and educationally challenging. Participants expand their friendship networks and find new meaning and purpose relevant to the current era of their lives.

We always are on the lookout for new and stimulating endeavors to add that support our "brain fitness center" concept that draws an important parallel with gyms where people go for physical fitness activities. We recently piloted a Senior Leadership program and have plans to introduce a New Horizons Band. Partnerships are being formed with community organizations such as Stetson University Law School, the *St. Petersburg Times* newspaper, a local environmental preserve, and various media and cultural arts centers.

The Challenge to Lifelong Learning Professionals

My goal for the lifelong learning community is to raise cognitive fitness to the same level of understanding and practice as that of physical fitness. The challenge for all of us involved in leading lifelong learning programs is to recognize the long-term benefits of offering stimulating intellectual and interpersonal brain fitness activities. We can—indeed, must—create environments that will engage our participants in becoming more cognitively fit. To do so, we must stay informed about leading edge discoveries in neuroscience research and translate action-oriented information into the design of new programs. In essence, professionals must practice what we preach. Only by challenging our professional paradigms with new information and strategies can we create new connections that will keep our services as fit as our participants want to be.

James Frasier, EdD, is director of continuing education and The Osher Lifelong Learning Institute at Eckerd College in St. Petersburg, Florida.

[1]We are indebted to the scholarship of Gene Cohen, Paul Nussbaum, Phyllis Moen, the American Society on Aging, Mark Freedman and Judy Goggin from Civic Ventures, the AARP/NRTA Dana Alliance Staying Sharp series, John Rowe and Robert Kahn and many others for creating the framework and conducting the basic research on which our programs at Eckerd College are founded. Special recognition is due to the Bernard Osher Foundation for providing us with essential resources needed to help others in our community discover the opportunities for lifelong learning on our campus.

For More Information

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NRTA - AARP's Educator Community and the Dana Alliance for Brain Initiatives (2005) *Staying Sharp: Current Advances in Brain Research: Learning Throughout Life*. Washington, DC.

Additional Resources for Lifelong Learning Programs

Osher Lifelong Learning Instistute at Eckerd College
www.eckerd.edu/olli

The Academy of Senior Professionals at Eckerd College
www.eckerd.edu/aspec

Elderhostel: Adventures in Lifelong Learning
www.elderhostel.org/ein/intro.asp

University of the Third Age: The Third Age Trust
www.u3a.org.uk

Civic Ventures
www.civicventures.org

Osher Lifelong Learning Institute at the University of Southern Maine
www.usm.maine.edu/olli/national

The Bernard Osher Foundation
www.osherfoundation.org

Brain Health in America

Paul D. Nussbaum

Making Brain Health a National Priority

Our nation needs to define and implement a comprehensive health policy that promotes brain health through education, health practice and social application. The human brain is the most complicated and important system in our body and the maestro of our every thought, emotion and behavior. That just 3% of Americans sampled on attitudes and awareness to brain health by Harris Interactive for the American Society on Aging view brain fitness as their most important health subject and only 7% as the second most important underscores the lack of general awareness and understanding of the human brain and brain health.

The poll indicates that the vast majority of Americans (88%) believe their brain fitness can be improved. Respondents to the survey also provided responses suggesting a basic understanding of the types of activities or behaviors that can improve brain health. While these responses may not relate perfectly with what is being learned from scientific research, it does suggest our citizens have some knowledge on brain health that can be nurtured. Indeed, the majority of people interviewed indicate they are engaged in activities related to brain health.

The poll results also reveal that 90% of those 42 years of age and older believe check-ups for brain fitness are important. This is despite the fact that the respondents rate brain health low on a list of overall personal health topics. Medical professionals are considered by respondents as the best source of information and advice for memory-related concerns. Further, over half of those surveyed report they have discussed their memory with friends and family. Together, these findings make clear that it is essential for the United States to make brain health a national priority immediately.

Taking a Proactive Approach

It is time the United States identifies brain health as a major national health issue and ongoing concern. The human brain should be approached and treated the same way our nation has dealt with cardiac health. From the clinical perspective, diseases of the brain - stroke, Alzheimer's disease, Parkinson's disease, vascular dementia and others - cause premature death of millions of our family members. These numbers will increase with the demographic shift that our aging population brings in the next 30 to 50 years. From a proactive health perspective, our nation has no policy or practice in place that underscores the importance of understanding the basics of our brain, how we can maintain or improve our brain health and why a lifelong practice of brain health is important.

The Enriched Environment Model

Research on animals raised in enriched environments compared to controls has demonstrated positive effects on brain structure and function. Autopsied analysis of the brains of these animals demonstrated a larger cortex, increased number of synaptic connections and new brain cell development (neurogenesis) in the hippocampus, a region critical to new learning and memory.

An enriched environment contains the following three factors: (1) socialization, (2) mental stimulation and (3) physical activity. Recent research on the human brain suggests similar neuroplasticity and neurogenesis in the hippocampus as demonstrated in animal studies (Eriksson et al., 1998). Indeed, the human brain is now considered by some to be a highly dynamic and constantly reorganizing system capable of being shaped positively across the entire lifespan (Nussbaum, 2003 and 2006). Human brain plasticity contrasts with traditional ideas of the human brain being a fixed and essentially limited system that only degrades with advanced age.

A human brain capable of being shaped is one that can be improved from a health perspective. The enriched environment model for human brain health deserves consideration as one approach to development and implementation of policy that supports and encourages proactive brain health practice for all Americans. The same critical factors important for positive brain changes in animals may also apply for humans. Two additional factors identified as important to brain health in humans are spirituality and diet (Nussbaum 2003, Nussbaum 2006).

Brain health is a lifelong pursuit that begins in the womb and does not end at any artificial age threshold. There likely is a cumulative positive or negative effect on brain health in late life that is contingent upon our brain health practice as children and young adults. Indeed, research has shown that poverty in childhood and lower IQ in young adulthood, head injury and substance abuse correlate with increased risk of dementia. Of equal importance to brain health is the identification of those behaviors in youth that foster lifelong brain integrity. Enlightened policy and practice will work to define and implement behaviors critical to brain health at specific ages across the lifespan. In a nation committed to brain health, the consumer must be educated on the behaviors and activities they can pursue to maximize their own brain health regardless of age. Enlightened policy and practice on brain health also will define the proper types of brain health assessments and the proper time for such assessments to occur across the lifespan.

Research to Practice: A Reasonable First Step

Research on brain health provides us with specific types of behaviors in five domains that correlate with reduced risk of dementia. These behaviors or activities can be organized into domains of socialization, physical activity, mental stimulation, diet and spirituality. Together, they constitute a personal brain health program that should begin early in life and be encouraged by our society throughout life.

Socialization

Research indicates that individuals who isolate and segregate have a higher risk of developing dementia than those who remain integrated in society. A nation invested in brain health will reinforce lifelong community involvement with particular focus on sustained activities characterized as complex and novel. Research indicates a passive lifestyle in middle age relates to increased risk of dementia, further arguing for humans to remain engaged in complex pursuits. Of interest is a recent study published in *USA Today* (June 23-25, 2006) that found 25% of Americans have no one to confide in and only a third fewer have close friends and confidants. Such indications of increased isolation and reduced social network are precisely the wrong direction if brain health is a priority.

From a policy perspective, brain health cannot be achieved in a society that encourages retirement and removal of oneself from the greater community of social interaction and work environment. With retirement, there is a greater likelihood of isolation, passivity, loss of role and reduced critical thinking. From a brain health perspective, retirement makes little sense and is particularly troubling when one considers our nation's reliance on an artificial and poorly understood cutoff for retirement at age 65. A nation concerned with brain health will undertake a critical review of existing policy on retirement, encourage all citizens—particularly those in young adulthood—to develop hobbies, promote lifelong pursuits of complex and novel activity and explain the importance of growing a social network of interpersonal relationships.

Physical Activity

Regular physical exercise, including walking and aerobics, reduces risk of dementia. Other activities that correlate with reduced risk of dementia include gardening, knitting and dancing. It is important to understand that with every heartbeat, 25% of the blood goes directly to the brain. Another factor worth consideration is that each of these activities involves utilization of both sides of the body and, therefore, both sides of the brain. Every person should purchase a pedometer to monitor their walking behavior and achieve 10,000 steps daily.

A national campaign to encourage daily exercise and physical activity is needed to educate consumers about how an active lifestyle can improve brain health. Current initiatives focused on heart health also should highlight benefits of regular exercise for the brain. Businesses should include brain fitness and physical activity as part of their employee wellness programs. (Emeritus is one example.) Existing exercise clubs and aerobic centers can consider including brain health as part of their overall value to the consumer.

Mental Stimulation

From development in the womb to late life, our brain requires mental stimulation. A complex and novel environment is best for brain health promotion. Research suggests that talking, reading and singing to a developing baby in the womb has positive neurological effects. A mother who exercises and eats well also has a positive impact on her developing baby and may help to reduce neurodevelopmental disorders. The identification of those factors that create an enriched environment in the womb is critical. Consumers will need to be educated about these factors, particularly as part of birthing classes and primary care.

Language development is critical early in life and may help to offset vulnerability to neurodegenerative disease late in life. This includes a language—such as sign language—that can be learned prior to the development of oral language. Infants trained in sign language demonstrate enhanced articulatory skills by the second grade relative to controls and have higher IQs. Further, higher IQ in childhood or young adulthood relates to reduced risk of dementia in late life. Sign language might be an important component in every Head Start or baby wellness program in existence.

Travel is a behavior that correlates with reduced risk of dementia. By definition, travel involves being in a recurring novel and complex environment that in turn places demands on the cortex. Highly familiar surroundings utilize more primitive brain structures typical of rote and passive behavior. Reading, writing and playing board games have also been shown to be health promoting for the brain regardless of age. Music and development of musical talent also relates to brain health. Research suggests music may assist in learning for children.

Lifelong learning programs are attended by millions of older Americans. At present, there is little recognition of lifelong learning as a health promoting behavior for the brain. Stimulation of the hippocampus through new learning is indeed a positive brain health behavior, and an enlightened society should promote lifelong learning as part of every health care policy. The United States would be wise to incentivize learning across the lifespan as one method to increase brain health and lower the risk of dementia, thereby reducing the cost of care for persons with dementia. Lifelong learning programs such as Elderhostel and Osher Lifelong Learning Institutes should be identified and standardized as centers of brain health for the consumer interested in pursuing novel and complex stimulation.

Diet

While we do not yet have a specific brain health diet, research suggests that foods containing Omega 3 fatty acids—such as salmon, tuna, walnuts—help to maintain the fatty substance of the brain that is important for efficient information processing. Vitamins E and C are known as antioxidants and help delay the aging process. Fruits and vegetables are highly valuable foods, while saturated fats and trans fatty acids should be avoided.

Another critical aspect of diet is to eat less because caloric restriction relates to increased health and longevity in animals. Early research suggests some promise for caloric restriction with brain health as well. Research indicates when we eat with utensils, thereby avoiding fast finger foods, we tend to eat less. Eating one meal a day with family or friends incorporates key brain health factors including socialization, music, communication, eating less, slow tempo and stress reduction (Weiping et al., in press).

A nation that prioritizes brain health will provide the consumer with clear labels that identify products as brain healthy. This can occur on foods sold in the grocery store and on restaurant menus throughout the United States. The same is already done for cardiac health. Women who are pregnant deserve information on what foods are critical for development of their baby's brain in the womb (e.g., those containing folate and iron).

Spirituality

Research suggests that daily prayer and regular attendance at a formalized place of worship correlates with health and longevity. Prayer and meditation offer outlets from our hurried and harried world. Stress, particularly chronic stress, can correlate with structural and functional damage to the brain. Memory is one cognitive function disturbed by chronic stress, and early research suggests the hippocampus may be vulnerable to the effects of ongoing stress.

Learning how to achieve balance in our lives is an important step to stress reduction. This begins with the practice of saying "no" when we are asked to join too many activities. Research on animals indicates too much stimulation slows or stops the development of the brain. Therefore, prayer, meditation and relaxation procedures are recommended as part of a daily brain health program.

Once again, national policy can help to educate Americans on the importance of "down time," relaxation or breathing exercises, prayer and meditation for our overall health. Acquiring enough sleep is another important factor for brain health as memory consolidation may occur during specific periods of sleep. It is important for consumers to understand how and why to slow their pace down on a daily basis.

Urgent Call to Action

Our nation is not educated or even aware of the importance of the human brain to our overall health. We have no systems or programs in place to educate our youth on the basics of the human brain. We are more likely to care for something if we are familiar with it and understand the implications of our care. The poll on brain health underscores the need for a national prioritization of brain health that includes education for all consumers, proactive lifestyle implementation to promote brain health beginning in the womb and health care practices that integrate brain health into annual examinations beginning in adulthood.

Brain health also needs to be integrated into the mainstream of our society. The possibilities are enormous and promising. Examples include:

- Ongoing public messages and information dissemination on the human brain
- Consumer education on brain healthy diets with standardized labels on foods and menus
- Development of curricula for elementary schools that foster an understanding of the basics of the human brain and promote healthy brain development
- Brain health practices in Head Start and baby wellness programs
- Utilization of neuroimaging technology to illustrate healthy brain development in enriched environments
- Critical review of retirement as a national policy
- Development of specific researched-based behaviors that promote brain health across the lifespan
- Establishment of brain health centers that incorporate the five components of brain health discussed above

- Ongoing medical education for health care providers on the importance and value of brain health
- Establishment of standard clinical protocols for annual assessment of brain health
- Inclusion of lifelong learning as part of basic health care plans
- Integration of brain health promotion in existing health payer plans.

These are some ideas to begin the process of moving the United States from a brain ignorant society to an enlightened nation that prioritizes brain health across the lifespan. Research dollars in the area are critical. Resources should be allocated to better understand the complexity of the human brain, including pursuit of how the brain may be able to help cure the body's ills, new forms of mental communication and mind over matter activities. While these may appear like science fiction today, there is good reason to believe that the capacity of the greatest system ever developed in the history of the universe—the human brain—is limited only by our imagination.

The urgency of prioritizing brain health in the United States is supported by the simple yet unfortunate fact that we lose millions of our family members annually to diseases that invade the brain. We spend billions of dollars on the care of those with brain disease and billions more for caregivers who become ill and miss work. The demographic reality of our population indicates that these numbers certainly will increase and more lives will be ruined unless we take action now.

Our nation is passive and ignorant regarding the human brain. We allocate little attention or motivation to understanding this miraculous part of our being. Yet there exists a quiet hope that brain disease will not affect us personally. Research on the human brain indicates it is time to become more proactive with lifelong pursuit of brain health. A national prioritization of brain health with enlightened policy focused on health and understanding of our brain is needed. Such policy should accomplish change in three areas:

(1) Ongoing education about the basics of the human brain for all consumers
(2) Communication of research-based activities that promote brain health
(3) Application of such activities and education into the mainstream of our daily lives through family, business (see MetLife, Emeritus), health care payer systems, retail, media, schools, employer sites, medical practice, professional organizations (see American Society on Aging) and religion.

In our national focus and sense of urgency there should be no difference between cardiac health and brain health. All consumers deserve to have information on the human brain and the opportunity to engage in a lifelong pursuit of their own brain health. The American Society on Aging poll provides additional support to my belief that brain health is a highly important but unexplored and poorly understood frontier for our nation to champion.

Paul D. Nussbaum, PhD, is clinical neuropsychologist and adjunct associate professor of neurological surgery, University of Pittsburgh School of Medicine, Pennsylvania.

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American Society on Aging
www.asaging.org

Emeritus Assisted Living
www.Emeritus.com

Age On: Health Promotion Across the Lifespan
www.Paulnussbaum.com

Appendix A: Methodology

Expert Panel

Experts in brain health research, policy and practice collaborated on the definition of critical topics for the poll and formulated questions to include in the questionnaire. Members of the panel included:

- **Kimberly Acquaviva**, PhD, MSW, Assistant Research Professor, School of Medicine and Health, George Washington University, Washington, DC.
- **Gene Cohen**, MD, Director of the Center on Aging, Health and Humanities at The George Washington University, Washington, DC.
- **Linda Ercoli**, PhD, Assistant Clinical Professor, Department of Psychiatry and Biobehavior, University of California-LA, Los Angeles, CA
- **James Frasier**, EdD, Director, Continuing Education, Eckerd College, St. Petersburg, FL.
- **Sandi Johnson**, LCSW, Executive Director, North Shore Senior Center, Northfield, IL.
- **Linda Noelker**, PhD, Senior Vice President of Planning and Organization Resources at Benjamin Rose Institute, Cleveland, OH, and former Chair of the ASA Research Committee.
- **Henry Mahncke**, PhD, Vice-President, Posit Science, San Francisco, CA.
- **Paul Nussbaum**, PhD, Clinical Neuropsychologist and Adjunct Associate Profession of Neurological Surgery, University of Pittsburgh School of Medicine, PA.
- **Kirsten Tierney**, PT, MBA, Director of Healthy Strides, Kisco Senior Living, Carlsbad, CA.

The project benefited from the participation of these distinguished professionals, and ASA deeply appreciates the generous time and thoughtful expertise each person contributed to the development of the poll design.

National Sample

A total of 1,000 residents of the United States participated in telephone interviews conducted by Harris Interactive between April 10 – 21, 2006. The interviews averaged 15 minutes to complete.

Data were weighted so that findings from the sample are projected for the national population ages 42 and older.

Profile of Respondents

- Nearly three-quarters of the interviews were conducted with people below the age of 65, including approximately 50% with members of the aging baby boom generation.
- Two-thirds of people interviewed report that they work full- or part-time or are active as volunteers, while one-third is retired.
- Almost one-quarter of respondents described themselves as belonging to a racial or ethnic minority group.
- Among those who reported household income information, 20% are below $25,000 annually; 21% are between $25,000 up to $49,000; 28% have from $50,000 to $99,000; and the remaining 18% more than $100,000.
- Levels of education ranged widely. One-quarter of those interviewed had some college or technical/vocational education, and 28% reported earning college degrees, while 40% were high school graduates or completed a GED program. Just 7% did not complete high school.
- The sample was balanced by gender (53% female and 47% male), geographic region (East 26%, South 26%, Midwest 24% and West 24%) and involvement in religious activity (51% yes and
  49% no).

Appendix B: Topline Results

American Society on Aging National Brain Health Poll

Audience: 1,000 U.S. ages 42+

Conducted April 10 - 21, 2006

BASE: QUALIFIED RESPONDENTS

Which one health subject is most important for people your age or older to get current information about? Which one is second important?

TOTAL MENTIONS

52%	Heart disease
41%	Cancer
24%	Diabetes
10%	Managing medications
7%	Serious vision or hearing loss
7%	Brain fitness
5%	Depression
3%	Kidney or liver disease
3%	Asthma
8%	Don't know/Refused

MOST IMPORTANT

31%	Heart disease
26%	Cancer
15%	Diabetes
7%	Managing medications
4%	Depression
3%	Serious vision or hearing loss
3%	Brain fitness
1%	Kidney or liver disease
1%	Asthma
8%	Don't know/Refused

SECOND MOST IMPORTANT

35%	Heart disease
25%	Cancer
15%	Diabetes
7%	Serious vision or hearing loss
7%	Brain fitness
4%	Managing medications
3%	Asthma
3%	Kidney or liver disease
3%	Depression

Brain fitness means different things to
different people. In your opinion, what does "brain fitness" mean?

65%	**ABILITIES (NET)**
18%	Being alert/sharp
18%	Keeping your brain active/ exercising the brain
14%	Good memory/ability to remember
14%	Ability to function normally
11%	Ability to think/think clearly
3%	Good cognitive ability
4%	Ability to read
4%	Ability to understand
3%	Ability to learn new things
3%	Solving puzzles
3%	Ability to communicate/interact
2%	Being smart/intelligent
2%	Staying current
1%	Ability to do calculations/math
1%	Ability to make decisions
1%	Ability to concentrate/focus
1%	Ability to respond quickly

1% Physically active/able to do exercise
1% Going to school and learning
2% Other abilities mentions
34% HEALTH (NET)
16% Good mental health/Not senile
9% Not suffering from Alzheimer's disease
4% Not suffering from dementia
3% Positive emotional state
2% Not suffering from mental illness
2% Eating right/healthy
1% Not suffering from a stroke
1% Not suffering from brain tumors/
cancer
2% Other health mentions
5% Other mentions
8% Don't know
* None/Nothing
* Declined to answer/No answer

How important is it for people to have their thinking abilities checked just like they have physical check-ups?

90% VERY/SOMEWHAT IMPORTANT (NET)
59% Very important
32% Somewhat important
10% NOT THAT/AT ALL IMPORTANT (NET)
5% Not that important
4% Not at all important
* Don't know

In your opinion, where do most people your age go to find out more about the brain and how to keep it fit? Please tell us up to three sources that you think most people use for information.

72% MEDICAL PROFESSIONAL (NET)
65% Doctor/Physician
6% Psychiatrist/Psychologist
6% Hospital
5% Neurologist
4% Medical/Health professionals
2% Various tests (X-ray, brain scan, etc.)
2% Neurosurgeon
1% Health care/Clinics
* Internists
2% Other medical professional mentions
59% MEDIA (NET)
41% Computer/Internet
37% PRINT MEDIA (SUBNET)
10% Magazines
9% Books
8% Library
7% Newspapers
4% Reading
3% Articles/Publications
1% Literature
1% Journals/Periodicals
* Dictionary/Encyclopedia
1% Other print media mentions
10% Television
3% News
2% Media
1% Attend seminars/Lectures
1% Radio
* Other media mentions

At what age do you think most people start to worry about their memory?

1%	20 or younger
*	21-30
9%	31-40
30%	41-50
30%	51-60
27%	61 or older
*	Never
3%	Not sure/Refused
56.5	MEAN

If close friends or family members told you they were concerned about their memory, which ONE of the following would you recommend they do?

74%	See a health professional
9%	Find services to help
6%	Start new activities
5%	Change eating habits
4%	Take medications or diet supplements
1%	Nothing
1%	Don't know/Refused

What new activities would you recommend that they start?

38%	**GAMES/PUZZLES (NET)**
15%	Solve word puzzles (Crossword, etc.)
15%	Solve puzzles/games (unsp)
13%	Solve number games (Sudoku, etc.)
4%	Play chess
3%	Play cards
3%	Other games/puzzles mentions
35%	**SPORT/EXERCISE (NET)**
19%	Exercise
15%	Walk/Jog
3%	Biking/bicycling
2%	Other sport/exercise mentions
43%	**ARTS/CRAFTS/HOBBIES (NET)**
35%	Reading
6%	Pursue hobbies
2%	Dance
2%	Play/listen music
5%	Other creative activities mentions
18%	Be more socially interactive
13%	Be active/mentally active
7%	Avoid watching TV
5%	Good diet
4%	Learn new things
1%	Travel
11%	Other mentions
3%	Don't know

What services would you recommend that they find to help them?

57%	**MEDICAL PROFESSIONAL (NET)**
40%	Doctor/physician
7%	Neurologist
5%	Specialist
3%	Psychiatry
5%	Other medical professional mentions
9%	**HOSPITALS/CLINICS (NET)**
6%	Visit hospital
3%	Other hospital/clinic mentions
7%	Attend groups/programs
6%	Research (library, online, etc)
4%	Senior center
4%	Meet a experienced/ capable person
1%	Exercise
1%	Learning activities/skills
1%	Change eating habits
7%	Other mentions
16%	Don't know/Refused

What eating habits would you recommend that they change?

44%	**INCREASE INTAKE (NET)**
33%	Eat more vegetables
21%	Eat more fruits
2%	Eat more fish
2%	Eat more grains
14%	Other increase intake mentions
38%	**AVOID (NET)**
30%	Avoid fat
19%	Reduce intake quantity
13%	Avoid sugar
3%	Avoid meats
2%	Other avoid mentions
38%	Eat balanced diet
20%	Eat healthy food/Avoid junk food
10%	Exercise/Exert more
5%	Other mentions
5%	Don't know

What medications or diet supplements would you recommend that they take?

31%	**VITAMINS (NET)**
22%	Vitamins (unsp)
9%	Vitamin E
4%	Vitamin B
4%	Vitamin C
2%	Other vitamins mentions
25%	**HERBS (NET)**
16%	Ginkgo biloba
5%	Herbs
5%	Other herbs mentions
17%	Oil
11%	Fruits/Vegetables
6%	Minerals
5%	Ask your doctor
5%	Specific medication brand
14%	Other mentions
2%	None/Nothing
15%	Don't know/Refused

What kind of health processionals in particular would you recommend that they see?

69%	Doctor/Physician
23%	Neurologist/Neurosurgeon
7%	Psychiatrist/Psychologist
4%	Medical/Health professional (unsp)
2%	Internist
2%	Gerontologist
1%	Health associations/centers
*	Nutritionist/Food specialist
2%	Other mentions
5%	Don't know/Refused

Have you ever talked about your memory or about keeping your brain fit with any of the following people?

	Yes	No	DK/REF
Family	47%	53%	*
Friends	42%	58%	*
Doctor	24%	76%	*
Nurse	13%	87%	0%
Clergy	6%	94%	*
Staff at a senior center or program for older adults	6%	93%	*

Thinking about your current brain fitness, would you say it is…

34% Excellent
62% Good
3% Poor
* Don't know/Refused

In general, how would you rate your ability to remember things from 10 years ago or longer?

37% Excellent
57% Good
5% Poor
1% Don't know/Refused

And how would you rate your ability to remember things from last week?

43% Excellent
48% Good
8% Poor
1% Don't know/Refused

Do you think that people can improve their brain fitness, or do you think that people cannot do anything to improve their brain fitness?

88% CAN IMPROVE (NET)
53% Yes, can improve a lot
35% Yes, can improve a little
4% CANNOT IMPROVE (NET)
3% No, cannot do much to improve
2% No, cannot do anything
8% Don't know/Refused

Some people spend time in activities to improve their brain fitness. Which activities do you think are useful for improving brain fitness?

Let's start with activities that involve other people. Is this very useful, somewhat useful, or not at all useful in improving a person's brain fitness?

Which Group Activities Are Useful for Improving Brain Fitness

Being in a group that talks about the current news or books	58	36	3	1
Taking a class or leading a group	58	35	5	2
Working or volunteering	51	42	6	1
Learning a new language	49	34	15	1
Playing board games	40	51	7	1
Singing or acting in a play	39	47	13	1

What about activities that people can do on their own. Is this very useful, somewhat useful, or not at all useful in improving a person's brain fitness?

Which Solo Activities Are Useful for Improving Brain Fitness

Doing Crossword Puzzles	67	27	5	1
Working with numbers	60	36	3	1
Writing letter, memoirs, stories, articles	54	41	4	1
Creative Projects	52	42	5	2
Playing a musical instrument	44	54	10	1
Watching educational TV or listening to the radio	35	54	10	1

Now let's talk about physical activities. Are the following very useful, somewhat useful, or not at all useful in improving a person's brain fitness?

Walking	57	35	8	0
Exercising at home or at a gym	55	39	6	0
Swimming, aerobic or playing a sport	51	42	6	1
Working in the yard or garden	41	48	10	1
Dancing	39	48	12	1

Here are some other actions people can take. Is this very useful, somewhat useful, or not at all useful in improving a person's brain fitness?

Avoiding tobacco	70%	16%	14%	1%
Reducing stress with positive thinking, tai chi, meditation or prayer	64%	31%	5%	1%
Limiting alcoholic drinks to one a day or fewer	63%	23%	12%	1%
Spending time with family or friends	62%	35%	3%	--
Seeing the doctor regularly	61%	33%	6%	--

What about taking supplements? Do you think that this is very useful, somewhat useful, or not at all useful in improving a person's brain fitness?

Taking vitamins or minerals	31%	54%	13%	2%
Taking herbs like Ginkgo Biloba	10%	48%	33%	9%
Taking supplements like hormones	8%	41%	42%	8%

The last topic is about eating certain foods. Do you think that this is very useful, somewhat useful, or not at all useful in improving a person's brain fitness?

Eating fresh fruits and vegetables	67%	30%	3%	1%
Eating foods high in antioxidants such as vitamin A, vitamin C, and vitamin E	53%	41%	4%	2%
Eating fish	50%	42%	6%	1%

Eating a diet that is low in fat	49%	40%	10%	2%

BASE: QUALIFIED RESPONDENTS

Are there activities that you do to keep your brain fit?

84% Yes
16% No

BASE: DO ACTIVITIES [N=831]

What are the top 3 activities that you do to keep your brain fit?

68% ARTS/CRAFTS/HOBBIES (NET)
48% Read
10% Watch television (Game shows, sports, news etc.)
6% Yard work/Gardening
5% Work on computer
4% Play/listen music
4% Write
3% Crochet/Knit
3% Dance/Sing/Theatre
2% House work
1% Draw/Paint
1% Creative things
1% Shop
1% Wood work
1% Work outside
* Pursue hobbies
1% Other arts/crafts/hobbies mentions
44% SPORT/EXERCISE (NET)
26% Exercise (unsp)
13% Walk/Jog
3% Be physically active
3% Play golf
1% Yoga
1% Ride a bike
1% Go fishing
1% Sports (unsp)
1% Swim
1% Go hunting
* Water aerobics
4% Other sport/exercise mentions

35%	**GAMES/PUZZLES (NET)**
15%	Solve crossword puzzles
7%	Solve puzzles (unsp)
6%	Play number games
3%	Play card games (bridge, etc.)
3%	Play games
2%	Play word games
2%	Play board games
1%	Play memory games
*	Play computer/internet games
*	Solve jigsaw puzzles
2%	Other games/puzzles mentions
25%	**WORK (NET)**
17%	Work
4%	Volunteer work
1%	Teach
1%	Work on projects
3%	Other working mentions
22%	**SOCIALIZE (NET)**
12%	Be involved with friends/family
9%	Participate in conversations/discussions
1%	Socialize (unsp)
*	Group activities
1%	Other socialize mentions
13%	**NUTRITION (NET)**
8%	Eat proper diet
3%	Intake vitamins
1%	Take supplements
1%	Eat vegetables
1%	Eat fish
*	Eat fruits
*	Diet
1%	Other nutrition mentions
7%	**LEARN (NET)**
3%	Learn new things
2%	Attend college/classes
1%	Study
1%	Learn new language
1%	Stay current on events
5%	Be mentally active
5%	Working with numbers
5%	Religious activities/prayer
3%	**REST (NET)**

2% Meditate
2% Rest/Sleep
* Listen (unsp)
1% Spend time with pets
1% Remember things
1% See doctor
1% Stay healthy
* Research (unsp)
* Memorize
14% Other mentions
1% None/Nothing
* Don’t know/Refused

About how often do you do the [activity/activities] you just mentioned?

TOP MENTIONED ACTIVITIES

ARTS/CRAFTS/HOBBIES (N=566)
84% Daily
24% A few times a week
7% A few times a month
2% A few times a year
1% Don't know

SPORTS/EXERCISE (N=365)
48% Daily
55% A few times a week
3% A few times a month
3% A few times a year
* Don't know

GAMES/PUZZLES (N=289)
59% Daily
36% A few times a week
12% A few times a month
1% A few times a year

WORK (N=205)

67% Daily
24% A few times a week
7% A few times a month
3% A few times a year

SOCIALIZE (N=181)

72% Daily
26% A few times a week
4% A few times a month

NUTRITION (N=109)

81% Daily
17% A few times a week
3% A few times a month

Right now are you…

40% Employed full time
10% Employed part time
33% Retired
8% Self-employed
6% Doing volunteer or unpaid work
2% Looking for paid work
2% Don't know/Refused

Are you active in a church, mosque, synagogue, or other faith community?

51% Yes
49% No
* Don't know/Refused

And just to confirm, what is your gender?

53% Female
47% Male

What was the last grade or class you completed in school?

2% Up to 8th grade
5% Some High School
39% High School graduate or GED
5% Technical Trade or vocational school after high school
20% Some college (including an associates degree)
16% College or university graduate (4-year degree)
3% Some Post graduate or professional school after college
9% Post graduate or professional degree
* Don't know/Refused

BASE: ALL RESPONDENTS

To ensure a representative sampling of opinions, which ONE of the following categories best describes your household's income in 2005?

10% Less than $15,000
10% $15,000 to less than $25,000
9% $25,000 to less than $35,000
12% $35,000 to less than $50,000
17% $50,000 to less than $75,000
11% $75,000 to less than $100,000
18% $100,000 or more
11% Don't know/Refused

Are you of Hispanic origin, such as Latin American, Mexican, Puerto Rican, or Cuban?

5%	Yes, of Hispanic origin
94%	No, not of Hispanic origin
1%	Don't know/Refused

BASE: QUALIFIED RESPONDENTS

What ethnic group or race do you mainly identify with?

78%	White
9%	Black/African American
1%	American Indian
1%	Asian or Pacific Islander
7%	Other Race
1%	Mixed Race
3%	Don't know/Refused

REGION

26%	East
26%	South
24%	Midwest
24%	West

14%	East N Central
6%	East S Central
13%	Middle Atlantic
10%	Mountain
10%	New England
14%	Pacific
14%	South Atlantic
11%	West N Central
9%	West S Central