Psychology of Aging
A Biopsychosocial Perspective

Brian P. Yochim, PhD, ABPP
Erin L. Woodhead, PhD
Editors

“The book goes well beyond the information in undergraduate texts and provides stimulating and useful coverage of key topics in biopsychosocial aging. I suggest Psychology of Aging: A Biopsychosocial Perspective as required reading for students.”—William E. Haley, PhD, Professor, School of Aging Studies, College of Behavioral and Community Sciences, Tampa, FL

“This book is a must read for undergraduate and graduate students studying aging, and one I will definitely recommend to students new to the area.”—Sherryl A. Beaudreau, PhD, ABPP VA Palo Alto Health Care System and Stanford University School of Medicine

“We finally have a leading-edge course book that offers scholarly knowledge about the most timely and essential topics of the biological, psychological, and social aspects of the aging process. We can now archive our outdated textbooks and replace them with this state-of-the-art resource!”—Margaret Norris, PhD, Clinical Psychologist, College Station, TX

“Psychology of Aging: A Biopsychosocial Perspective is the only graduate text to encompass the full range of issues regarding the psychology of aging. This is the first graduate-level text that offers a comprehensive, in-depth chronicle of issues surrounding the psychology of aging emphasizing psychology, with a foundation in the biology and an expansion into the sociological aspects of aging. The text is divided into three sections: biological underpinnings of aging, psychological components of aging, and social aspects of aging. Among the topics addressed are biological theories of aging, neuroimaging methods in aging research, neuroplasticity, cognitive reserve and cognitive interventions, a detailed overview of neurocognitive disorders in aging such as Alzheimer’s disease and Lewy body disease, relationships in aging, cultural issues in aging, and aging and the legal system, to name just a few critical topics.

With an emphasis on promoting critical thinking, the text is enriched with discussion questions in each chapter along with suggestions for more in-depth readings. Also available are chapter PowerPoints and an Instructor’s Manual with sample syllabi for a 10-week course and a 15-week course. Written for graduate students in multiple gerontology-related disciplines, the text is also of value to individuals studying nursing, medicine, social work, biology, and occupational, physical, and speech therapies.

Key Features:
- Addresses the biological underpinnings of aging, psychological components, and social aspects
- Written by a variety of experts on each area
- Presents discussion questions in each chapter
- Includes PowerPoints and an Instructor’s Manual with sample syllabi
- Tailored to graduate students from multiple disciplines embarking on clinical or research careers involving older adults

11 W. 42nd Street
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www.springerpub.com

See Code Inside
Psychology of Aging
Brian P. Yochim, PhD, ABPP, is board certified in clinical neuropsychology by the American Board of Professional Psychology. He obtained his PhD from Wayne State University and completed an internship in clinical psychology at VA Palo Alto Health Care System in Palo Alto, California. He completed a 2-year postdoctoral fellowship in clinical neuropsychology, with a focus on aging, at VA Northern California Health Care System. In 2006, he became an assistant professor at the University of Colorado at Colorado Springs, where he helped develop a PhD training program in clinical psychology with an emphasis on aging. He next worked as a neuropsychologist at VA Palo Alto Health Care System, where he performed research in the neuropsychology of aging, published the Verbal Naming Test, and supervised postdoctoral fellows, interns, and practicum students in a neuropsychology clinic for older adults. In 2014, he served as the president of the Society of Clinical Geropsychology (Division 12, Section 2 of the American Psychological Association [APA]). He also served as the chair of the Publications and Communications Committee for the Society for Clinical Neuropsychology (Division 40 of the APA) from 2014 to 2017. Since 2006 he has taught graduate courses in the psychology of aging and clinical neuropsychology. In 2016, he returned to his childhood home of St. Louis, Missouri, and accepted a position at the VA St. Louis Health Care System. His professional interests lie in the neuropsychological assessment of older adults, and in teaching and training in psychology of aging and clinical neuropsychology.

Erin L. Woodhead, PhD, is Assistant Professor in the Department of Psychology at San José State University. She completed her undergraduate degree in human development and family studies at the Pennsylvania State University. She completed her master’s and doctoral degrees in clinical psychology at West Virginia University. Dr. Woodhead completed postdoctoral fellowships in geropsychology at Rush University Medical Center and at the Geriatric, Research, Education, and Clinical Center (GRECC) at the VA Palo Alto Health Care System. She teaches classes in the areas of life-span development, psychology of aging, addictions, ethical and legal issues for mental health professionals, and clinical psychology. Dr. Woodhead’s research is in the areas of age-related differences in mental health services use and age-related differences in the symptoms and outcomes of mental health and substance use disorders.
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Erin L. Woodhead, PhD
Editors

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Foreword

I am delighted to have the opportunity to welcome readers of this book! Many of us prefer not to think too much about growing older, given its common associations with illness, loss, and eventual death. It is ironic that, as relatively younger people who generally hope to live long lives, we may have somewhat negative feelings about the people we will eventually become (if we are fortunate). Across health care professions, very few people choose to specialize in care of older adults, leading to a crisis in access to competent geriatric health and mental health care services for most older adults in the United States (Institute of Medicine, 2008, 2012) and internationally (Beard & Bloom, 2015; Mateos-Nozal & Beard, 2011).

The aging of our society has profound implications for the economy, health care system, family structures, housing, transportation, business opportunities, and more. No matter what your field of interest, it will be important to have a solid understanding of the aging experience, including strengths, challenges, and the wide diversity of human aging. This text provides an excellent foundation on biological, psychological, and social aspects of aging to inform your clinical training and practice, research, teaching, policy, and/or business activities. If you are pursuing a career in academic and/or clinical psychology, or other health professions, consider this book a core resource to help you address age/cohort as an important component of individual diversity. Even if you choose to address the health/mental health of children, adolescents, or younger adults, older adults will be significant members of family and community systems whose abilities and needs will be important for you to understand.

Drs. Yochim and Woodhead are particularly well-suited to have led the development of this text. They both trained at leading geropsychology doctoral training programs; completed postdoctoral training in geropsychology and/or neuropsychology; have extensive clinical, teaching, and research experience in the field; and have established themselves as respected leaders in service to the geropsychology profession. In addition to writing several chapters, they assembled a talented team of psychologists to contribute chapters. Many contributing authors are early-to-mid career geropsychologists with impeccable academic and/or clinical training who provide current and rigorous perspectives on their topics.

My great hope is that many of you reading this text will be inspired to devote some of your talents and energies to the field of aging. You are needed. As a clinical
geropsychologist who has spent more than 20 years in the field to date, I feel very fortunate to have discovered such a meaningful, fascinating, and rewarding line of work. As a clinician, interprofessional team member, teacher, supervisor, researcher, administrator, and frequent collaborator with people who work in geriatric health/mental health fields, I am inspired daily by the commitment and generosity of people who dedicate their professional lives to improving the quality of care and quality of life for older people. I am grateful to Drs. Yochim and Woodhead for their work in developing this foundational text on the psychology of aging.

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OVERALL GOAL OF THE BOOK

Older adults now represent a higher proportion of the world population than at any other time in history. By 2030, there will be more people age 60 and older than age 0 to 9 years. However, the number of mental health clinicians trained to work with older adults is not increasing to meet this surge in demand. With this massive growth in the number of older adults worldwide, there is an increasing need for clinicians from multiple disciplines to receive instruction on the psychological aspects of aging.

In 2006, one of the editors (Brian Yochim) was assigned to teach a graduate-level course on the psychology of aging to a class of students working toward their PhDs in clinical psychology. A search of available textbooks did not arrive at a choice that would fit well with this course. There were books about gerontology in general, handbooks that went into depth on specific topics but did not have the same breadth of coverage as a typical textbook, books focused on certain aspects of aging (e.g., mental health), or books on adult development and aging that included coverage of early and middle adulthood that was beyond the scope of this class. I cobbled together a series of articles for my class to read and opted not to have any textbook. Since that time I hoped to find a textbook to use for a class like this, and eventually Erin Woodhead and I were invited to write it. This book fills a gaping void in the selection of textbooks to use in graduate courses on the psychology of aging.

An instructor for a graduate course on the psychology of aging has the challenge of finding a textbook for this area that is tailored to graduate students. This book was written to fill this gap. This book can serve as a primer for any graduate student who is going to work in a clinical setting with older adults, or in a research lab that studies some aspect of the psychology of aging. In reading any of the chapters, students are provided with the requisite foundational knowledge in a given area, as well as introduced to specific areas in greater depth. For example, a reader of Chapter 4 will be prepared to enter a neuroimaging lab that explores neuroplasticity in older adults. Readers of Chapter 9 will have a solid foundation of neurocognitive disorders that may occur in their future patients. The level of depth provided in these chapters is typically not available in undergraduate textbooks on aging, as
textbooks aimed at undergraduates tend to target breadth rather than depth. This book is unique in that it quickly introduces students to the background knowledge needed in order to understand some of the more complex concepts in the psychology of aging. Additionally, this book provides clear explanations of concepts (e.g., genetics of aging research, neuroimaging techniques, understanding of important legal documents for older adults) that, in our experience as instructors for psychology of aging classes, prove to be stumbling blocks for students wanting to learn about aging.

**DISTINGUISHING FEATURES**

While other textbooks include coverage of adults of all ages, this text is unique in that it focuses solely on older adults, providing in-depth coverage of this burgeoning population. The two editors, Brian Yochim and Erin Woodhead, work in full-time clinical and academic positions, and the content of the book is applicable to future academicians or clinicians. Both editors have taught psychology of aging courses at the graduate and undergraduate levels, and are familiar with the textbooks available to instructors in this area.

One unique feature of this book is the amount of coverage on biological aspects of aging, written in such a manner as to be easily comprehensible to graduate students who are not specializing in this area. When students need important biological concepts explained to them, this book can serve as a useful and user-friendly resource. At the same time, students specializing in biological aspects of aging will find the book to be a useful introduction to the psychology of aging, and research methods and findings from psychology will enhance their research in the biology of aging. The book also provides more coverage on cognitive reserve and neurocognitive disorders than other textbooks in the area. This is balanced by coverage of social aspects of aging that one would not find in books on the biology of aging, such as legal aspects of aging or the aging experience for ethnic and sexual minorities.

Instructors can teach a class with this book as the sole collection of readings or can supplement this text with additional articles. Key references for each chapter are indicated by an asterisk, for instructors looking for further depth of coverage in each chapter. Each chapter ends with Discussion Questions that can be used for discussion in class or essay questions for exams in graduate classes. In support of the text, an Instructor’s Manual and PowerPoints are available. **Qualified instructors can request these ancillaries by email: textbook@springerpub.com.**

**INTENDED AUDIENCE**

This book is intended for graduate students or upper-level undergraduate students in psychology, biology, nursing, counseling, social work, gerontology, speech pathology, psychiatry, and other disciplines who provide services for, or perform research with, older adults. Unlike undergraduate textbooks, this text provides a foundation for graduate students across disciplines who want to embark on research, clinical, or health
care careers with older adults. After reading this book, it will serve as a reference that is frequently consulted to provide explanations of many concepts in the field.

**BOOK’S ORGANIZATION AND CONTENT**

Each chapter in this text was authored by experts in the field to ensure appropriate coverage of the area. An introduction to the field is presented in Section I (Chapter 1), which also covers common research methods in the area. Then Sections II to IV move from the cellular level to larger societal aspects of aging. An understanding of the psychological aspects of aging must begin with a core foundation in biological aspects of aging, and this is covered in Section II. This section includes a chapter on general biological theories of aging, such as the free radical theory of aging. Chapter 3 provides a detailed overview of common physical health problems in older adults, and how these conditions impact the quality of life of older adults. This will help any health professional understand the health problems that older adults are facing. Chapter 4 provides an overview of normal changes that occur to the brain with aging, starting with an overview of neuroimaging methods and ending with an introduction to the exciting area of neuroplasticity.

The book then moves into the largest section, Section III. Changes in personality and emotional development are covered in Chapter 5. A discussion of the unique mental health aspects of aging is presented in Chapter 6. Normal changes in cognitive functioning, and how this applies to driving and mandatory retirement requirements, are presented in Chapter 7. Cognitive reserve and interventions for cognitive decline are presented in Chapter 8. Chapter 9 consists of an up-to-date presentation of neurocognitive disorders in aging, including timely topics such as Alzheimer’s disease, delirium, Lewy body disease, frontotemporal dementia, and traumatic brain injuries in older adults. Aging’s impact on relationships and families is discussed in Chapter 10. Working in late life and retirement are covered in Chapter 11, with a focus on helping students understand the complexities of medical coverage and retirement options in the current economic climate.

We then move into larger social aspects of aging in Section IV. Death, bereavement, and widowhood are covered in Chapter 12. The aging experience in ethnic and sexual minorities is presented in Chapter 13, with a unique section on intersectionality and how this concept applies to older adults. Lastly, the intersection of aging and the legal system is covered in Chapter 14, with explanations of concepts such as durable power of attorney, advance directives, capacity assessment, and elder abuse.

Thank you for your interest in the psychology of aging. We hope you find this learning journey as fascinating as all the authors of this book have. May this book serve as a solid foundation for a career serving older adults wherever you are.
Acknowledgments

BRIAN YOCHIM

I want to thank my friend and colleague Erin Woodhead, PhD, for coediting this book with me. Without you, this book would not have been completed. I hope you are willing to work on future projects with me. I am very grateful to Sheri Sussman (Editorial Director) and Mindy Chen (Assistant Editor) from Behavioral Sciences at Springer Publishing Company for all your help along the way. Thank you for your guidance and immediate responses whenever we needed assistance.

The broad field of gerontology owes its existence to the thousands of older adults who have donated their time to participate in research. We also are indebted to the researchers who have spent their careers tirelessly performing studies to add to our knowledge base, and to the agencies that fund them. This book is a result of your work. Without you, books such as this would not exist.

Thank you to my friends and colleagues who contributed chapters to this book, and waited for the book to come to completion. I want to thank my friends and colleagues at the University of Colorado at Colorado Springs, at the VA Palo Alto Health Care System, and at the VA St. Louis Health Care System. I have learned a great deal from you about aging, how to be a great colleague, and many other things. You will remain my friends and colleagues throughout my career. Thank you to Katie (Brown) Peever and Morgan Nitta, who provided much assistance in my writing of Chapter 1. Thank you to my mentor, Peter Lichtenberg. You have mentored me since taking me on as a young graduate student, and have been everything I could ask for in a mentor throughout my career.

Thank you to my dear brother Mike, author of four books to date and one of my favorite hiking companions. Thank you to my family and to my wife’s family for being so loving and supportive.

Most of all, I thank my dear wife Jill and our son Ellis, who tolerated me spending my weekends and vacation days working on this book. Thank you for reminding me (many times) that life is a highway, Ellis. I look forward to exploring those highways with you and Jill, and I hope they are long and enriching.
Thank you to my coeditor, Brian Yochim, for inviting me to work on this book with him. We helped each other through the process and I look forward to more projects together in the future! We also benefited greatly from the guidance provided by our editors at Springer Publishing Company, who helped us meet our deadlines and shape our materials into a book.

I would also like to thank the mentors I have had over the years at The Pennsylvania State University, West Virginia University, Rush University Medical Center, and the VA Palo Alto Health Care System. I value their mentorship and their assistance with my career path more than I can describe in this section. I am also grateful to my coworkers at San José State University, who have created an environment where balancing work and family life is the norm rather than the exception. They continue to inspire me with their dedication to their research, their students, and their lives outside of academia.

Brian and I also owe a debt of gratitude to all of the clinicians, researchers, and trainees who contributed to this book. They put up with a lot of emails from us and produced excellent work to help train the future generation of gerontologists and geropsychologists.

Finally, I would like to thank my family for supporting my work on this book and my career in higher education and academia. My husband was very helpful in this process, assisting me in managing deadlines and stress while also parenting our 1- and 3-year-old daughters. Watching our daughters grow and develop motivates me every day to work harder at being a good parent, partner, and colleague.
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Nicholas T. Bott and Maya Yutsis

THE CONCEPT OF COGNITIVE RESERVE

Working Definition(s)

The notion of cognitive reserve (CR) refers to the protection, or reserve, afforded to some individuals in the face of neurological insult, whether organic or acquired. In other words, individuals with greater CR demonstrate less functional or cognitive impairment in the face of the same amount of brain pathology. Thus, CR provides an explanation for the individual differences observed in how people process tasks with some compensating better than others with developing brain pathology (Stern, Albert, Tang, & Tsai, 1999). Researchers have proposed various constructs of reserve. Christensen et al. (2007) postulated a brain reserve hypothesis, differentiating between variables related to CR (e.g., intelligence, education) and those associated with brain reserve (e.g., brain and intracranial volume). Similarly, Valenzuela (2008) also hypothesized that reserve is a holistic construct of brain reserve based on tangible “day-to-day observable facts related to complex mental activity” (p. 297). Regardless of the particular “reserve” construct, all CR models share a common concern for how to operationalize and measure the underlying variables/proxies of reserve (e.g., mental activity, education, intelligence). This chapter focuses largely on the concept of CR based on Stern’s conceptualization.

*Key references in the References section are indicated by an asterisk.
CR is a more active conceptualization of “reserve,” which differs somewhat from “brain reserve,” the latter being a more passive conceptualization involving neuro-anatomical differences including brain size and volume, head circumference, and synaptic and dendritic count, which are largely inherited (Katzman, 1993). These quantifiable differences can explain heterogeneity in clinical presentation from similar neural insults. Brain reserve models assume a predefined threshold or cutoff score in accumulated brain pathology beyond which functional decline occurs for everyone. Situated within the concept of brain reserve, neural reserve describes the structural variability in neural networks responsible for cognitive task performance. Neural networks with greater capacity, efficiency, or flexibility may be able to sustain function in the face of more neuropathology than networks with less reserve (Stern, 2009). Along with neural reserve, Stern (2009) describes neural compensation, sometimes described as scaffolding, as the functional recruitment of nonstandard brain structures and networks in the face of pathological disruption of standard processing networks in order to improve or maintain cognitive performance. While the concepts of brain reserve, neural reserve, and neural compensation are involved in CR, the CR model is more active as it postulates that the brain is continuously attempting to compensate using preexisting cognitive processes or new compensatory techniques in order to deal with ongoing pathology (Stern, 2002).

**History and Significance**

The term *reserve* may have first been introduced to the scientific literature by F. A. Pickworth in 1932, who commented with respect to the effect of pathology on clinical presentation that “no clinical abnormality is noticed unless the damage is quantitatively so great as to exceed the reserve” (p. 635). Toward the end of the 20th century Katzman and colleagues (1988) posited that those individuals, who remained nondemented during life, might have had larger brains, and as a result, more neurons, which afforded them reserve against Alzheimer’s disease (AD) pathology during life. The language of reserve, or CR, has continued to the present, but observations of interindividual variability in the face of neuropathology can be seen throughout the 20th century. In 1964, Kay, Beamish, and Roth (1964) posited that the pathology present within the brain, “seems therefore to be only one of several factors determining the threshold at which dementia appears” (p. 146). Similarly, Blessed, Tomlinson, and Roth (1968) commented, “occasionally, the brains of individuals who have never become demented have been found to show quite marked changes” (p. 797).

As a construct, CR was first posited as an explanation for the presence of neuropathological findings of AD at autopsy in individuals who did not show symptoms of cognitive impairment during life (Roe, Xiong, Miller, & Morris, 2007). Since then, CR has been applied across various forms of neurological insult including traumatic brain injury, substance abuse, and neurodegenerative disease (Bigler & Stern, 2015; Pedrero-Perez et al., 2014; Stern, 2012; Xu, Yu, Tan, & Tan, 2015). As the construct of CR has grown to include various forms of neuropathology, so too has the nuance in the underlying construct. CR includes both active and passive components. Passive components of CR include the quantifiable material properties of brain reserve, such as brain size and neuronal count (Stern, 2009). As the name suggests, brain reserve
refers to the extent or amount of insult the brain can sustain and continue to support normal function. Differences in brain size and neural density between individuals explain the heterogeneity in clinical expression of the same amount of brain damage. These aspects of CR are considered passive due to their static and structural nature. A uniform and quantifiable amount of brain damage is required for functional deficits to emerge, and differences in individual brain capacity explain whether an insult crosses the threshold of brain reserve capacity. Whereas passive models of CR focus on static and structural factors, active models of CR posit dynamic and functional factors associated with compensatory processes (Stern, 2002). As a result, active models of CR do not posit thresholds beyond which functional impairments occur; rather, they suggest brain processes allowing for neural recruitment or compensation in the face of brain damage that allow for the maintenance of cognitive function (see Figure 8.1). Second, many proxy variables of CR are said to be dynamic and directly impact the brain structure. For example, physical activity is related to neuronal plasticity, production of brain-derived neurotrophic factor (BDNF), and resistance to cell death (Nascimento et al., 2015; Zoladz & Pilc, 2010). Others studies have further demonstrated that children with higher IQs have larger brain volume (Willerman, Schultz, Rutledge, & Bigler, 1991).

The concept of CR, as formulated by Stern and colleagues in 1999, was formed based on the observations that the rate at which patients with AD declined on the selective reminding test (SRT) reflected their educational and occupational background (Stern et al., 1999). The Buschke’s SRT is a test of word list memory that asks

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**Figure 8.1** Factors and pathways of cognitive reserve on outcome. TBI, traumatic brain injury.
subjects to learn and remember a list of 12 unrelated words over six trials. On trials two through six, a subject is only reminded of the words that the subject missed during the previous trial and asked to recall as many words as possible from the entire list (Buschke, 1973). The overall score is based on the sum of all six trials. Stern et al. (1999) found that patients with higher CR continued to outperform same-aged peers and showed later onset of memory decline. Furthermore, when matched for dementia severity, patients with higher CR had greater pathology (as measured by regional cerebral blood flow [rCBF]) than patients with lower CR, arguing that CR mitigated the clinical impact of AD pathology (Scarmeas et al., 2003). Since these relatively early descriptions, investigators have sought to isolate the effects of intellectual and related forms of brain activity that most closely reflect CR from the quantifiable neuronal aspects of brain reserve such as brain size and volume and brain networks recruitment (Barulli & Stern, 2013; Stern, 2012). Overall, while CR has been most widely studied in the context of AD, a similar concept has been demonstrated with other neurologic, psychiatric, and acquired injuries including Parkinson’s disease (Glatt et al., 1996), traumatic brain injury (Kesler, Adams, Blasey, & Bigler et al., 2003), human immunodeficiency virus (Farinpour et al., 2003), psychiatric disorders (Barnett, Salmond, Jones, & Sahakian, 2006), and multiple sclerosis (Sumowski, Chiaravalloti, & Deluca, 2009).

NEUROPSYCHOLOGICAL PROXY OF CR

Regardless of the model of “reserve” (Christensen et al., 2007; Stern, 2002; Valenzuela, 2008) being referenced, all models of reserve share the common concern for how it is best operationalized and measured (e.g., mental activity, education, intelligence). However, operationalizing CR and its underlying constructs is difficult for at least three reasons. Historically, CR is a theoretical construct in itself. In addition, proxy variables are often used to define CR in order for research to be conducted, but proxies—by definition—are not equivalent to CR. Finally, the clinical outcomes expressed as cognitive and functional decline seen on neuropsychological testing or based on a clinical diagnosis are also not absolute quantifiable measures. Given that direct measures of pathology, for example, amyloid imaging, are not routinely available, it is difficult to quantify the amount of brain pathology and then predict which theoretical construct would predict this “invisible” factor. With this in mind, we describe the most commonly used proxies for CR.

Proxies of CR

The most common proxies are years of formal education, occupational achievement level, linguistic skills, literacy, participation in leisure activity, social engagement, socioeconomic status, measures of IQ (Barulli & Stern, 2013; Bennett, Arnold, Valenzuela, Brayne, & Schneider, 2014; Manly, Touradj, Tang, & Stern, 2003; Snowdon et al., 1996), bilingualism (Craik, Bialystok, & Freedman, 2010), and musical background (Gooding, Abner, Jicha, Kryscio, & Schmitt, 2013). However, most of the aforementioned variables are related to environmental factors such as nutrition, living situation, access to educational resources and health care, and cultural background. The difference in these environmental factors could explain the difference in findings between the studies examining the impact of these proxy variables on cognitive...
decline associated with normal aging, incident rates of dementia, level of pathological burden, rate of decline, and mortality after dementia diagnosis (Sanders, Hall, Katz, & Lipton, 2012; Van Gerven, Van Boxtel, Ausems, Bekers, & Jolles, 2012).

**Literacy**

In some populations, the degree of literacy may be a more accurate proxy of CR than years of education because literacy level better reflects the quality of education (Manly et al., 2003; Manly, Schupf, Tang, & Stern, 2005). Linguistic ability (i.e., idea content and grammar complexity) is also a potential proxy of CR. Snowdon and colleagues (1996) first published on aspects of language abilities as part of the Nun study. They examined cognitive function of 93 nuns aged 75 to 79, with 14 of these participants with a neuropathologic diagnosis of AD confirmed at the time of death at ages 76 to 96. Two aspects of linguistic ability, content and grammar, were studied based on the autobiographies written by these participants at a mean age of 22 years. The results showed that both lower content density and lower grammar complexity in the autobiographies were related to poorer performance on the neuropsychological tests later in life, with lower content density a stronger predictor of lower scores. Furthermore, at the time of death, all 14 sisters with confirmed AD had low content density in their autobiographical writings at the age of 22.

**Premorbid Estimation of General Intelligence**

Others suggest that a premorbid estimate of IQ (crystallized intelligence measure) may be a better proxy of CR (Albert & Teresi, 1999; Alexander et al., 1997). As we mentioned earlier, the concept of premorbid IQ as a proxy for higher CR is solely based on cognitive testing. Across cognitive tests, people with higher premorbid IQ perform better on most neuropsychological tests. As such, using premorbid IQ as a proxy may simply serve as a confounder between the results and the outcome, where those with lower IQ would show poorer performances on most cognitive tests including memory tasks, which may not necessarily represent a decline, compared to the individual’s baseline level of performance.

**Cognitive Activity**

Others have focused on quantifying the impact of participation in mental activities as a proxy for CR. While some have studied activities that involve cognitive stimulating activity only, others have shown that engaging in any mental and/or leisure activity may be helpful regardless of its cognitive component (Stern et al., 2012; see review Valenzuela and Sachdev, 2005). These leisure activities are varied and include reading, playing games, participation in classes/workshops, participation in social events, managing independent activities of daily living (e.g., bills, mortgage), speaking a nonnative language, writing for pleasure, listening to music, playing a musical instrument, and volunteering.

**Multidomain Proxy of Cognitive Reserve**

Finally, Satz, Cole, Hardy, and Rassovsky (2010) have proposed a way to conceptualize and integrate several models of “reserve” and the associated proxy measures. They have provided a conceptual four-factor model of different domains and the associated measures that encompass brain and CR concepts (see Table 8.1).
<table>
<thead>
<tr>
<th>Factors/Proxy Domains</th>
<th>Measures/Variables</th>
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<tr>
<td>Intelligence “g”</td>
<td><strong>Crystallized Intelligence</strong></td>
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<td>• WRAT-4 (Wilkinson, 1993)</td>
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<td>• WTAR (Whitney, Shepart, Mariner, Mossbarger, &amp; Herman, 2010)</td>
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<td>• Vocabulary subtest on WAIS-III/IV (Wechsler, 1997, 2008)</td>
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<td>• Peabody Picture Vocabulary Test (Dunn &amp; Dunn, 1997)</td>
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<td>Fluid Intelligence</td>
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<td>Mental Activity</td>
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<td>• Activities Scale (Scarmeas et al., 2003)</td>
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<td>• Lifetime of Experiences Questionnaire (Valenzuela &amp; Sachdev, 2007)</td>
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<td>• Premorbid Cognitive Abilities Scale (Apolinario et al., 2013)</td>
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<td>• CR Scale (Leon, Garcia, &amp; Roldan-Tapia, 2011)</td>
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<td>Demographics/Psychosocial Variables</td>
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<td>• Social Networks</td>
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<td>Processing Resources</td>
<td>• Measures of Processing Speed (e.g., Trail Making Test A [Reitan, 1958], Digit Symbol Coding subtest on WAIS-III/IV)</td>
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<td>• Measures of Working Memory (e.g., Digit Span, Arithmetic subtests of WAIS-III/IV)</td>
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<td>• Measures of Divided Attention (Trail Making Test B)</td>
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<td>Executive Function</td>
<td>• Measures of Verbal and Nonverbal Reasoning (e.g., Similarities and Matrix Reasoning subtests of WAIS-III/IV)</td>
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<td>• Measures of Cognitive Switching and Inhibition (e.g., Stroop Task, Trail Making Test B, Wisconsin Card Sorting Test)</td>
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<td>• Measures of Error Monitoring and Selective Attention (e.g., Digit Vigilance Test)</td>
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<td>• Measures of Fluency (e.g., DKEFS Verbal and Design Fluency (Delis, Kaplan, &amp; Kramer, 2001))</td>
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CR, cognitive reserve; DKEFS, Delis Kaplan Executive Function System; NAART, North American Adult Reading Test; WAIS-III/IV, Wechsler Adult Intelligence Scale III/ IV; WRAT-4, Wide Range Achievement Test 4; WTAR, Wechsler Test of Adult Reading.

Adapted from Satz et al. (2011).
Overall, some studies have shown that each of the aforementioned proxies could cumulatively contribute to the overall CR (Evans et al., 1993; Mortel, Meyer, Herod, & Thornby, 1995; Stern et al., 1994; Stern, Tang, Denaro, & Mayeux, 1995). For example, Richards and Sacker (2003) showed that childhood IQ, educational achievement level, and adult occupational level separately and uniquely contributed to predicting an estimated IQ at age 53 (Richards & Sacker, 2003). Interestingly, all of the aforementioned proxy variables including educational attainment, occupational achievement level, lifetime experience, and/or amount of leisure activity could be dynamic and change over the course of someone’s life. Consequently, CR is not a static variable, as it is based on the constellation of the nature and quantity of the aforementioned exposures at any specific time when it is measured.

Most importantly, whenever we discuss proxy variables of CR, we should acknowledge the limitations associated with some of the cognitive measures used in this literature. Cognitive or neuropsychological performances may differ not just because of the underlying CR mechanism. For example, education or number of formal years completed may be related to all neuropsychological performances in older adults for several reasons, namely that: (a) it reflects “reserve,” (b) it is confounded by age, which alternatively impacts both education and test performance, (c) childhood IQ or academic affinity may influence the amount of formal education a person receives, (d) it reflects socioeconomic or cultural factors that impacted the amount of formal education someone receives. As you see, the reasons underlying the impact of education on test performance could be diverse and not necessarily related to “reserve” alone. Similarly, literacy level may also simply reflect the underlying difference in access to, quality of, and importance of academic achievement that could differ between population subgroups based on socioeconomic, cultural, racial, and gender backgrounds (Jones, 2003). Furthermore, the correlation between literacy and neuropsychological performance may reflect the effect of educational quality (school quality) versus the amount of formal years of education (Manly, Jacobs, Touradji, Small, & Stern, 2002).

**CR and Cognitive Debt**

While this section has focused on proximal measures of CR, it is important to point out that more recently Marchant and Howard (2015) have proposed the concept of cognitive “debt” in relationship to AD to describe cognitive processes that can independently deplete CR, thereby increasing one’s susceptibility to clinical impairment as a result of AD pathology. Whereas measures of CR, whether passive or active, represent factors that confer protection against clinical deficits, measures of cognitive debt are thought to reduce the amount of CR an individual has—be that great or small. The cognitive debt hypothesis suggests that the increased risk of AD present in individuals reporting depression, anxiety, sleep disorders, neuroticism, life stress, or posttraumatic stress disorder (PTSD) finds a unifying factor in repetitive negative thinking (RNT). RNT is defined as self-relevant, persistent thoughts that elaborate on negative themes, whether ruminative (past directed) or worrisome (future directed). If Marchant and Howard’s hypothesis is supported, interventions aimed at remediating RNT may provide another means by which to reduce the risk of AD or other mental health conditions in older adults.
EPIDEMIOLOGIC EVIDENCE FOR CR

Because the concept of CR is so closely linked with the initial observations seen in patients with AD, the epidemiology of CR also parallels the course of AD. Researchers have hypothesized that AD pathology begins perhaps decades before the clinical, cognitive, and behavioral manifestations are observed (Schmitz, Spreng, & ADNI Initiative, 2016). AD pathology gradually increases over the years, becomes more pronounced, and consequently results in observable symptoms used by clinicians to make a clinical diagnosis of dementia. Consequently, the incidence rate of dementia should be lower in those with higher CR, despite the same or even greater pathology. This prediction is based on the CR hypothesis, postulating that there will be individual differences in the amount of pathology needed to demonstrate clinical symptoms and subsequent diagnosis of dementia. More specifically, persons with higher CR might be diagnosed at a later age, as a greater amount of pathology (amyloid-β, white matter disease, etc.) will be needed when dementia is diagnosed (see Figure 8.2). Valenzuela and Sachdev (2005) reviewed 22 cohort-based studies to comment on the potential effects of education, occupation, premorbid IQ, and participation in leisure activities on incidence rates of dementia. The majority of studies showed evidence for protective effects of education, occupational achievement, premorbid IQ, and active participation in leisure activities. The authors concluded that higher CR, defined by the educational and occupational level, higher premorbid IQ, and active mental activity were related to a 46% reduction of incidence rates (i.e., a new diagnosis) of dementia.

![Figure 8.2](image-url)

**Figure 8.2** Effect of cognitive reserve on onset of clinical/functional impairment.
**Effects of CR on Disease Course**

The CR hypothesis includes two assumptions: (a) The onset of accelerated cognitive decline appears nearer to the time of clinical diagnosis of dementia in those with a higher level of education and estimated IQ, and (b) The time from the diagnosis of dementia to complete loss of function (i.e., progression of dementia) will be shorter in those with higher CR (Stern et al., 1994, 1999; Stern, 2002, 2007). Both assumptions are based on the underlying belief that persons with higher CR can maintain normal cognition despite accumulating pathology and only show cognitive impairment once the severity of pathology is high (i.e., disease is in the advanced stages). In other words, those with lower CR experience cognitive and memory impairment earlier when the severity of pathology is not as pronounced. Consequently, among patients with dementia (either due to AD, vascular, or other pathology) of comparable clinical severity, memory decline should be more rapid in those with higher CR. Because advanced neurodegenerative pathology (e.g., amyloid-β) is associated with greater mortality, the CR model also assumes that patients with higher CR diagnosed with dementia will have a more accelerated rate to death following the diagnosis (Stern et al., 1995).

**Cognitive Reserve and Accelerated Cognitive Decline**

With respect to the first assumption of the CR hypothesis, Stern and colleagues examined the incident rates of dementia in 593 community-based nondemented participants aged 60 years or older (Stern et al., 1994). After 1 to 4 years of follow-up among 106 participants who were diagnosed with dementia, the incidence of dementia was 2.2 times higher in participants with lower education level (less than 8 years of education) compared to those with 8 to 11 years or more than 12 years of education. Similarly, in those with lifelong low occupational level, the incidence of dementia was increased by 2.25 times. Low occupational level included jobs such as a skilled trade, unskilled/semiskilled employment, or clerical/office work, while higher occupational level included managerial positions, business/government work, or professional/technical jobs (Stern et al., 1994). Risk of dementia diagnosis was highest in participants with both lower education and low occupational achievement levels (relative risk, 2.87 95% confidence interval [CI], 1.32 to 3.84). Finally, participation in leisure activities (i.e., the environmental proxies for CR over time) was associated with a 38% reduction of risk for developing dementia (Scarmeas, Levy, Tang, Manly, & Stern, 2001). These leisure activities included reading, playing games, participation in classes/workshops, and participation in social events.

Finally, literature on age-related cognitive decline also offers some support for the CR model. Manly and colleagues (2005) examined the impact of literacy (assumed to be related to higher educational achievement level) on cognition in a nondemented sample of ethnically diverse older adults. Manly and colleagues found that increased literacy was correlated with slower decline in cognition (i.e., memory, executive skills, and language). Multiple other studies of normal aging show a similar pattern of slower functional and cognitive decline in older persons with higher educational achievement level (Albert et al., 1995; Butler, Ashford, & Snowdon, 1996; Chodosh, Reuben, Albert, & Seeman, 2002; Snowdon, Ostwald, & Kane, 1989; Lyketsos, Chen, & Anthony, 1999). Overall, findings from these studies support the notion that
persons with higher educational level may be better able to cope with cognitive deficits associated with both normal aging as well as dementia.

**Cognitive Reserve and Compressed Morbidity**

In contrast, the evidence is more limited in support of the second assumption of the CR hypothesis, postulating that higher CR is related to faster cognitive and functional decline once dementia is diagnosed. A series of studies demonstrated that AD patients with higher educational and/or occupational achievement level and equivalent clinical severity of symptoms at the time of initial examination died sooner (Stern et al., 1995) and showed faster cognitive decline (Stern et al., 1999; Scarmeas, Albert, Manly, & Stern, 2006) than those with lower CR. However, until 2007 there was still a lack of epidemiologic evidence that supported the second assumption behind the CR hypothesis. Hall et al. (2007) examined memory performance on the SRT task collected at 12-month intervals from 117 healthy older adults enrolled into the Bronx Aging Study between 1980 and 1983 (mean age at the time of entry into the longitudinal study was 81 years) who were later diagnosed with dementia. The median number of years to dementia diagnosis was 5.6. Half of the subjects (61 participants) followed were diagnosed with possible or probable AD, 20% with vascular dementia, and 7% with other types of dementia. For those with 4 years or fewer of formal education, the median time to accelerated memory decline was 6.35 years before the dementia diagnosis. For those with 12 or more years of education, the accelerated rate of memory decline started 3.82 years prior to the diagnosis. In other words, those with lower estimated CR experienced cognitive decline for almost double the time compared to peers with higher CR. The corresponding estimated annual incidence rate of memory decline in participants diagnosed with dementia was 2.03 for those with 4 or fewer years of education and 3.22 for those with more than 12 years of education. Hall and colleagues provided evidence for the CR model by demonstrating that, for people with higher educational attainment, the onset of cognitive and memory decline was delayed prior to the dementia diagnosis, but the rate of decline was faster after the diagnosis. Figure 8.3 shows a graphical representation of trajectories of memory decline on the SRT memory test based on individuals’ educational achievement levels.

**Cognitive Reserve and Age**

Given that the concept of CR is heavily dependent on cognitive tests used as a proxy for CR, one should also examine whether age could impact the difference in performances on such tasks. Each cognitive test differs in its level of complexity, with age impacting the ability to efficiently perform on the test depending on its complexity. In 2007, Stern wrote that on any cognitive test, any condition, especially age, could impact the overall capacity and efficiency of the individual’s neural network and how it is activated during test performance. For example, regardless of age, the same neural network would be activated during a learning phase on a verbal memory test. In regard to the efficiency of the neural network, remembering a list of three words may be easier for a 20-year-old compared to a 65-year-old. Therefore, this task will be less demanding and consequently would require less neural activation for younger adults, rendering the network more efficient. In other words, the neural network will be less efficient due to greater demand of the task, resulting in increased level of
activation in the older adults, while the overall performance (the overall number of words learned after three trials) may be the same regardless of age. Thus in younger adults, greater activation would be seen on a 16-word memory task, as remembering 16 words is more difficult than remembering 3 words only and may require use of additional compensatory strategies that could be developed with age. As such, with greater task demand, greater activation might be seen in young subjects than in the old. All in all, on the same type of a memory test with varying levels of complexity (i.e., 3- vs. 16-item word list), the level of neural activation would be different based on age. In order to further explore the effect of age on CR, it is crucial to determine whether older and younger adults use the same or different brain networks during similar tasks. Imaging studies could be helpful in illuminating brain network recruitment differences.

**NEUROANATOMICAL CORRELATES OF COGNITIVE RESEARCH**

As mentioned previously, the concept of brain reserve posits that brain size—and neural density by proxy—provides a threshold up to which pathological damage can be sustained before clinical presentation. This passive model of reserve treats the brain as a single entity, with larger brains able to sustain greater amounts of damage. Stern’s CR construct also includes the active processes of neural reserve and neural compensation, providing a basis from which to investigate neuroanatomical correlates of CR.

**Hemispheric Asymmetry Reduction in Older Adults (HAROLD)**

The HAROLD model, originally proposed by Cabeza (2002), posits increased activation in contralateral hemispheric brain regions among older adults during task
completion. This effect is particularly present in the prefrontal cortex. Berlingeri and colleagues (2013) have challenged the HAROLD theory, suggesting that a more generalized compensation-related utilization of neural circuits hypothesis (CRUNCH) model accounts for the recruitment of additional brain regions to facilitate successful task completion. Within the larger CR construct, both models can be interpreted as a form of neural compensation providing for successful task completion, evidencing less neural efficiency when compared to younger subjects.

**Scaffolding Theory of Aging and Cognition (STAC)**

Similar to the CRUNCH model, the scaffolding theory of aging and cognition (Goh and Park, 2009) provides an explanation for neuroplasticity that coheres well with Stern’s conceptualization of CR. In fact, Barulli and Stern (2013) identify STAC as a more generalized theory of neural compensation, with CR representing a factor mediating the success of neural compensation. As the name suggests, STAC explains the process of aging and cognition as one whereby the brain reacts to deficient or inefficient neural activity through the recruitment of additional brain regions to achieve satisfactory function. For example, Steffener and colleagues (2009) investigated working memory performance in older adults and found that only older adults demonstrated increased activation in secondary neural networks as working memory load increased. While this result is in keeping with the STAC hypothesis, the question of whether this recruitment represents neural compensation remains a topic of debate (Park & Reuter-Lorenz, 2009).

**Imaging and CR**

Imaging of CR has grown substantially over the past decade. Stern’s early work incorporating imaging into the study of CR included rCBF among severity-matched patients with AD. Higher education was associated with more depleted flow in areas typically affected in AD (parietotemporal). In other words, patients with higher education were able to tolerate more AD pathology than those with lower education while remaining similar in clinical presentation (Stern, 2009). Given the roles neural reserve and neural compensation play within Stern’s model of CR, structural and functional neuroimaging studies examining the correlates of CR compare old and young individuals’ use of specific brain networks to mediate task performance in order to draw conclusions about the capacity and efficiency of those networks (Zarahn, Rakitin, Abela, Flynn, & Stern, 2007).

**FDG-PET and PIB-PET**

PET imaging has been used to investigate aspects of the CR construct. Yasuno and colleagues (2015) reported levels of amyloid-β deposition in cognitively normal older adults with varying levels of completed education using Pittsburgh Compound B (PIB) PET imaging. Older adults who completed more education showed less cortical amyloid-β deposition than those with fewer years of education. In another study, Ewers and colleagues (2013) found that higher education in older adults...
with amyloid-β deposition—an indication of preclinical AD—was associated with lower fludeoxyglucose PET. This finding suggests that greater CR supports compensatory functioning in the presence of early AD pathology.

**Magnetic Resonance Imaging**

Studies using MRI have also investigated the neuroanatomical correlates of CR. Pet-tigrew and colleagues (2016) examined the role of CR (education, reading, and vocabulary) on structural MRI measures of cortical thickness in cortical regions affected by AD pathology in healthy older adults. CR was associated with cortical thinning up to 7 years from baseline. These results suggest that greater CR compensates for cortical thinning during the early progression of AD. Stern (2016) understands CR as a potential moderator of cognitive task-related brain activation, which can be investigated using functional MRI (fMRI) paradigms.

**Network Connectivity**

Models of neurodegenerative disease understand the spread of neuropathology to be driven by specific functional networks within the brain (Seeley, Crawford, Zhou, Miller, & Greicius, 2009). More recent investigations into the neuroanatomical basis of CR have posited the role of functional network connectivity associated with greater CR. Marques and colleagues (2016) reported that higher levels of CR (defined by greater number of years of completed education) was associated with greater functional connectivity in specific brain regions (occipital and inferior temporal gyrus) and greater global brain network efficiency. The authors concluded that higher CR facilitates more concentrated neural processing, while also facilitating more efficient information processing.

While the cost of imaging presents a barrier for its widespread use in clinical care, imaging studies may provide unique opportunities to quantify CR. Interventions aimed at preventing cognitive decline or promoting increased task efficiency could be measured more precisely with neuroimaging techniques, offering a more substantial outcome measure. Imaging of CR may also prove useful in more precisely staging disease and providing more accurate prognosis. One can imagine a database that allows clinicians to match clinical severity by means of cognitive and functional measures with an imaging database that allows for interindividual comparison of structural and functional measures. These data could then be correlated with clinical trajectories of similarly matched patients.

**COGNITIVE INTERVENTIONS AS MEDIATORS OF CR**

**History of Cognitive Interventions for Older Adults**

Cognitive interventions include various types of treatments aimed at restoring or compensating for declines in cognitive functioning as a result of illness or injury. While there is increasing interest in surgical and pharmacological methods of cognitive enhancement, cognitive interventions have traditionally been nonpharmaco-

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techniques focused on remediating cognitive deficits associated with brain injury and stroke (Parente & Stapleton, 1996), and has since grown to include disease-specific methods, as well as preventative interventions. In addition to injury severity, age is a significant factor contributing to the efficiency and efficacy of cognitive interventions (Flanagan, Hibbard, & Gordan, 2005).

Cognitive interventions to reduce cognitive decline in older adults came from early work that identified a “performance-potential” divide associated with cognitive function in older adults. This divide raised questions about the potential modifiability of cognitive performance among older adults, and the underlying mechanism for this modifiability was dubbed brain plasticity (Verhaeghen, 2000). Baltes and Willis (1982) described plasticity as “the range of intellectual aging under conditions not normally existent in either the living ecology of older persons or in the standard assessment situation provided by classical test of psychometric intelligence” (pp. 355–356). Early interventions for older adults focused on teaching strategies to improve task performance, but as the construct has matured strategy use as an intervention has waned in light of the lack of generalizability to real world task performance, as well as the challenges associated with strategy instruction.

Cognitive Interventions as Primary Prevention

There is growing evidence that a diverse set of risk factors is associated with risk of cognitive decline in adults. These include: diabetes, obesity or hypertension in middle age, low physical activity, depression, smoking, and low educational level. Together, these seven risk factors have been estimated to account for 28% of the risk of developing AD (Shatenstein, Berberger-Gateau, & Mecocci, 2015). As a result, cognitive interventions are increasingly being utilized to prevent or delay the onset of cognitive decline or impairment in healthy and at-risk populations of older adults (Wilson et al., 2002).

In fact, early experiments investigated the efficacy of cognitive interventions for the remediation of cognitive declines in healthy older adults. Schaie and Willis (1986) found that among older adults experiencing decline over a 14-year period, two thirds receiving cognitive training improved their cognitive functioning. Forty percent of those showing improvement demonstrated performance at a predecline level. Longitudinal investigation of performance gains found that the benefits remained 7 years after training in comparison to controls (Schaie, Willis, & O’Hanlon, 1994). More recently, the Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE) study has shown the efficacy of cognitive interventions in healthy older adults. The ACTIVE study was a randomized, controlled single-blind trial (n = 2,832) with three intervention groups and a no-contact control group to determine the effects of cognitive training on cognitive abilities and everyday function over a 10-year period. Each intervention group received an intervention targeting a specific cognitive domain: processing speed, memory, or reasoning. When postintervention performance was analyzed, all groups showed declines from baseline. Participants who received training in reasoning and processing speed, however, showed fewer declines than those in the memory and control groups. These performances remained after 10 years as reported by Rebok and colleagues (2014), with participants in the
reasoning and processing speed intervention groups demonstrating greater frequency of at or above baseline performance levels. Memory performance was similar between the intervention and control groups after 10 years. With respect to functional abilities, individuals in each of the three intervention groups endorsed less subjective difficulty with instrumental activities of daily living (IADLs) than control participants, although objective measure of functional abilities was comparable across intervention and control groups. The relative success of the ACTIVE trial provides support for preventative cognitive interventions in the healthy older adult population. Interventions that extend healthy cognitive aging trajectories could reduce the economic costs associated with cognitive decline and impairment.

Increasingly, multidomain approaches for the prevention of cognitive decline are being tested and implemented. This is likely due in part to the multifactorial nature of cognitive decline and dementia (Richard et al., 2012). The most promising results to date have come from the Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER), which provides longitudinal support for the efficacy of multidomain intervention targeting a number of lifestyle-related risk factors associated with subclinical cognitive deficits (Ngandu et al., 2015). Several other randomized clinical trials are employing multi-domain approaches, including the U.S. ENLIGHTEN (Exercise and Nutritional Interventions for coGnitive and Cardiovascular HealTh ENhancement) trial, the Prevention of Dementia by Intensive Vascular Care (preDIVA) study, and the Healthy Aging Through Internet Counseling in Elderly (HATICE) program, which focuses on the management of modifiable risk factors in older people using an Internet-based platform (Shatenstein et al., 2015).

Cognitive Interventions As Secondary Prevention

In addition to older adults without measurable declines in cognition, interventions have also been employed in populations with objective cognitive impairment. Mild cognitive impairment (MCI) is the term used to describe cognitive decline more significant than those due to typical cognitive aging but without the functional impairments associated with dementia (Huckans et al., 2013). The prevalence of MCI among older adults is estimated between 3% and 42% (Ward, Arrighi, Michels, & Cedrabbaum, 2012). Importantly, between 14% and 40% of those diagnosed with MCI return to normal cognitive functioning (Ganguli, Dodge, Shen, & DeKosky, 2004), with others maintaining functioning without further cognitive decline (Manly et al., 2008).

The frontline approach to address cognitive impairment in individuals with MCI is cognitive training aimed at remediating cognitive deficits. This is usually accomplished through the utilization of structured and repeated practice of specific cognitive tasks and mental exercises (Huckans et al., 2013). Cognitive tasks are tailored to the domain(s) of impairment and the individual’s ability level. Structured cognitive training aims to restore or maintain cognitive functioning through the generalization of performance gains beyond performance on the specific training task. For example, Gagnon and Belleville (2012) reported that individuals with single-domain MCI (executive dysfunction) benefited from an attentional control cognitive intervention. Similarly, Belleville and colleagues (2006) demonstrated that episodic memory strategy instruction improves memory performance in individuals with MCI.
the other hand, the extent of generalizability of cognitive performance gains in individuals with MCI remains debated (O’Sullivan, Coen, O’Hora, & Shiel, 2015).

In addition to task repetition, performance gains can be observed through the adoption of information processing strategies. Information processing strategies include storytelling, visual imagery, chunking information, and use of acronyms to more effectively manipulate information. In some cases, information processing strategies incorporate structured problem solving, planning, and mindfulness techniques (Huckans et al., 2013; O’Sullivan et al., 2015). Beyond information processing strategies, cognitive interventions used in this population frequently include the use of “cognitive prostheses” to aid with task performance. These include external aids (e.g., calendars, planners, personal notebooks) as well as navigation devices for visuo-spatial support (Kurz, Pohl, Ramsenthaler, & Sorg, 2009).

Information about lifestyle practices, including risk (e.g., smoking, heavy substance use) and protective factors (e.g., diet, exercise, and cognitively stimulating activities) can be addressed in combination with cognitive training or through motivational interviewing (Huckans et al., 2013; Kurz et al., 2009). While mood and lifestyle factors can be seen as adjunctive components to cognitive interventions in the MCI population (Attix & Welsch-Bohmer, 2006), increasingly, interventions targeting lifestyle factors such as exercise represent effective means of improving cognition (Ströhle et al., 2015). Insofar as specific neuropsychiatric symptoms can contribute to cognitive difficulties, psychotherapeutic interventions can be utilized to augment treatment. These can include cognitive-behavioral interventions, relaxation exercises, and deep breathing (Kurz et al., 2009; O’Sullivan et al., 2015; Huckans et al., 2013). In summary, cognitive retraining, compensatory strategies, modification of lifestyle interventions, and psychotherapy can each play a role in a comprehensive treatment model to improve cognitive function as well as overall quality of life in patients with MCI.

**Cognitive Interventions in Dementia**

Given the progressive nature of neurodegenerative disease, the efficacy (and ethics) of cognitive interventions among older adults diagnosed with dementia remains debatable. Marshall (2005) proposed its unique value when the goal is to improve quality of life as opposed to the return to a previous level of cognitive ability, or the prevention of future decline. The treatment should be patient centered, recognizing the clinical course of the patient, and help support coping. Thus, interventions in this population are focused on optimization of current cognition, and compensation for further cognitive losses, whether through problem solving or environmental optimization (Mountain, 2005).

Interventions for older adults with more severe cognitive impairments are limited to therapies such as reminiscence therapy and reality orientation therapy, among others. The former encourages individuals to recall past life events and experiences, often by means of salient stimuli such as photos or music, in an effort to cue memories. Often, reminiscence therapy is conducted in a group setting to promote social engagement around shared themes (Mountain, 2005). The latter is a technique that presents orientation information (e.g., time, place, social location) with the goal of
improving quality of life through increasing a sense of control in individuals with dementia. Bianchetti and Trabucchi (2001) found reality orientation therapy delayed entry into long-term care and slowed further cognitive decline in older adults with mild to moderate dementia.

**CONCLUSION**

The evidence is growing to support the model of CR and its mediating quality between brain pathology and clinical manifestations of related functional and cognitive decline. While passive models of brain reserve assume that the same amount of brain pathology will inevitably lead to functional decline in all individuals at the same time, the CR model has been deemed more “active” in its conceptualization of reserve. The CR model postulates that people with higher abilities to cope and compensate for developing brain pathology will be able to tolerate greater amounts of pathology than those with lower CR and will develop functional decline later in the disease stage. This model further differentiates between the amount of preexisting within-individual difference in cognitive processing (i.e., neural reserve) and the ability to compensate following the development of disease (i.e., neural compensation). Both the passive and active forms of CR play an important role within this model.

While the differentiation between active versus passive models of reserve was stressed more in the earlier years of this research, recently this delineation does not appear as clear. Physiologically, and from the brain networks perspective, there should be structural and functional changes that underlie the differences in preexisting cognitive processing (i.e., in neural reserve). This difference should incorporate some aspects of the “passive” reserve model that account for differences at the neuronal level. Thus, rather than conceptualizing brain reserve and CR models as separate passive versus active models of reserve, it is more likely that these models complement and supplement one another to allow for more effective compensation in the face of developing pathology.

Imaging studies continue to provide evidence for the complementarity of brain reserve and CR models, although specific theories of regional and network activation remain debated. Investigations of the neuroanatomical correlates of CR indicate a protective role in the face of developing pathology, as well as a role in maintaining cognitive function after the onset of pathology. The clinical utility of imaging CR remains largely unrealized to date, but offers the potential to more precisely quantify the amount of CR present within an individual, and holds promise for more accurate staging and prognosis of pathological decline.

As the demand for cognitive rehabilitation in older adult populations has grown, so too has the interest and development of novel interventions. These interventions include primary and secondary disease prevention, as well as interventions aimed at extending healthy aging cognitive trajectories. Increasingly, the value of cognitive intervention in older adults transcends the clinical benefits afforded to patients; extending the course of healthy cognitive aging trajectories or stabilizing cognition in older adults experiencing cognitive decline is associated with significant societal economic savings. For example, total payments for health care, long-term care, and
hospice for persons with dementia in 2016 are estimated at $236 billion, with costs rising to over $1 trillion in 2050 (Alzheimer’s Association, 2016). Even modest extension of intact cognitive aging trajectories will result in significant economic savings.

**DISCUSSION QUESTIONS**

1. Describe the ways in which “reserve” has been defined in the literature (i.e., passive vs. active models).
2. What are some proxy variables for measuring CR?
3. Describe the effects of CR on the incidence and progression of dementia.
4. Describe cognitive interventions that have been used as primary prevention and those that have been used as secondary prevention.
5. Describe the results of studies on cognitive interventions.

**REFERENCES**


Aging and the Legal System

Sheri Gibson and Magdalene Lim

Health professionals are often called upon to intervene in complex ethical dilemmas that involve respecting an older adult’s autonomy while also considering protective interventions to ensure safety. This chapter addresses the foundational ethical competencies for psychologists and geropsychologists including the unique challenges associated with surrogate decision making, legal, clinical, and psychosocial interventions specific to working with vulnerable older adults, ethical dilemmas that can emerge within various situations including assessment and integrated care settings, detection and intervention strategies in cases of elder abuse, neglect, and exploitation, and ethical approaches to research with older adults. Finally, the authors discuss the multicultural dimensions that influence how ethical and legal issues are conceptualized and addressed.

ETHICAL COMPETENCIES IN GEROPSYCHOLOGY

Psychologists make decisions every day involving fundamental beliefs and values about what is most appropriate in working with older adults, families, health care professionals, and within clinical or academic settings. A psychologist’s comprehensive understanding of treatment is grounded in the ethical guidelines and principles of the American Psychological Association’s (APA) Ethics Code (APA, 2017; www.apa.org/ethicscode/). The APA Ethics Code serves as a standard to direct the actions

*Key references in the References section are indicated by an asterisk.
and decision making of psychologists in their work with clients, families, communities, and colleagues with an emphasis on promoting advocacy for social change.

Within clinical geropsychology practice, the Geropsychology Knowledge and Skills Assessment Tool (Karel, Emery, Molinari, & CoPGTP Task Force on the Assessment of Geropsychology Competencies, 2010) captures the foundational competencies of geropsychology involving legal and ethical standards in four specific areas. Competencies include one’s ability to

...identify complex ethical and legal issues that arise in the care of older adults, analyze them accurately, and proactively address them, including: (a) tension between sometimes competing goals of promoting autonomy and protecting safety of at-risk older adults; (b) decision making capacity and strategies for optimizing older adults’ participation in informed consent regarding a wide range of medical, residential, financial, and other life decisions; (c) surrogate decision making as indicated regarding a wide range of medical, residential, financial, end of life, and other life decisions; and (d) state and organizational laws and policies covering elder abuse, advance directives, conservatorship, guardianship, multiple relationships, and confidentiality (Karel et al., 2010, p. 117).

ADVANCE CARE PLANNING FOR OLDER ADULTS

Many of the ethical issues that psychologists face when working with older adults revolve around health care decisions and whether the older adult is capable of making his or her own health care decisions. There are several terms that are commonly used when discussing health care decision making. Advance directives, also known as living wills, are documents that specify a person’s wishes for end-of-life care. Hospitals are typically required to present information on advance directives prior to admission in accordance with the Patient Self-Determination Act of 1990. Any individual older than the age of 18 can complete an advance directive, though research suggests that only about a quarter of U.S. adults have completed advance directives (Rao, Anderson, Lin, & Laux, 2013). Lack of awareness of advance directives is typically the most common reason for not completing one.

There are several pieces of information that are typically included in an advance directive. For the purposes for planning in the event of becoming unable to make decisions secondary to a disabling circumstance, individuals can specify their preference for medical treatment (full treatment vs. comfort-focused treatment), extraordinary measures (tube feeding, ventilator, etc.), and preferences for cardiopulmonary resuscitation (CPR), also known as a do-not-resuscitate (DNR) order. Individuals can also designate a health care surrogate to make decisions for them if they are unable to; this information may also be included in a medical power of attorney (POA) document, which is discussed in the next section. This person is sometimes referred to as a health care agent or health care proxy. If no surrogate is designated, the default surrogate is the next of kin, typically in the order of spouse/domestic partner, adult child, parent, sibling, or other relative. If no one is available to serve as the health care surrogate, the court may appoint a guardian to make the decisions. A guardian may also need to be appointed if the family is in conflict about the patient’s
wishes, though this is an ethical gray area. We revisit these issues later in the chapter when we discuss potential ethical problems around surrogate decision making.

Some advance directives include POA documents. A POA is a legal document that designates someone to make decisions on your behalf if you are deemed unable to make or express such decisions. With regard to older adults, a POA is typically designated for health care and/or financial matters. A financial POA is typically called a general POA, whereas a health care POA is typically called a medical POA. Individuals can choose whether a POA goes into effect immediately once it is signed (called a “durable POA”) or whether it only goes into effect once the person is unable to make decisions, as verified by a health care professional (called a “springing POA”). Clinicians may be asked to help an older adult complete a living will or POA. It may be beneficial to choose a different person for the medical versus financial POA depending on who is most familiar with the older adult’s views on life and death versus his or her financial affairs. Table 14.1 lists some example options that are typically included in forms that document treatment preferences. One example of this type of form that is used in California is the Physician Orders for Life-Sustaining Treatment (POLST). On the POLST, the patient can list their health care agent though the POLST does not include the level of detail regarding health care decisions that may present in a medical POA or advance directive. The POLST is freely available at www.capolst.org/polst-for-healthcare-providers/forms.

### Table 14.1 Sample Questions Typically Used When Documenting Treatment Preferences

<table>
<thead>
<tr>
<th>Decision</th>
<th>Description and Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiopulmonary resuscitation (CPR)</td>
<td>If the patient has no pulse and is not breathing Options: Administer CPR or not (DNR order)</td>
</tr>
<tr>
<td>Medical interventions</td>
<td>If patient has a pulse and/or is breathing Options: Full treatment—Prolong life using all medically effective means (for example, intubation, ventilation) Selective treatment—Treat medical conditions but do not intubate (for example, intravenous fluids or antibiotics). Avoid intensive care Comfort-focused treatment—Maximize comfort. Do not use full and selective treatments unless consistent with comfort goals. Examples include oxygen or suctioning</td>
</tr>
<tr>
<td>Artificially administered nutrition</td>
<td>Whether to offer food by mouth is feasible or desired Options: Long-term artificial nutrition, including feeding tubes Trial period of artificial nutrition, including feeding tubes No artificial means of nutrition, including feeding tubes</td>
</tr>
<tr>
<td>Health care proxy</td>
<td>Specify name and contact information of someone who can make decisions for you if you are unable to</td>
</tr>
</tbody>
</table>

DNR, do not resuscitate.
While the POLST is the form used in California, most states have similar forms that capture treatment preferences. For example, Colorado uses the Medical Orders for Scope of Treatment (MOST) form, which is freely available at www.coloradoadvance directives.com/most-in-colorado.

ETHICS IN LONG-TERM CARE

While the majority of older adults receive care from family members, approximately 14% of adults older than the age of 65 receive services in nursing home or long-term care settings, assisted living, or retirement communities (National Alliance for Caregiving [NAC], 2015). Results from the AARP/NAC study suggest that 16% of care recipients residing in retirement communities, assisted living, and skilled nursing facilities have dementia due to Alzheimer’s disease or other causes. Ethical challenges can first emerge from the initial transition from independent living to a higher level of residential care.

For many of us, regardless of age, change can be difficult and typically requires time to adapt to any new circumstance or environment. You might recall events in your life which required changes that were anxiety provoking: the first day of high school; leaving home for college; starting a new job; moving to a new city or immigrating to a different country. Similar anxieties and fears are present for the older individual who may be faced with leaving a home and condensing a lifelong accumulation of sentimental possessions into a small room or apartment. Let us consider the following scenario:

Mr. Watsby, an 83-year-old widowed gentleman, was sent to the emergency department (ED) after he fell while showering in his single-family home. At the ED, he reported that it took him 2 hours to “crawl” from the bathroom to his phone to call for emergency help. He suffered bruises on his left arm and leg, but did not sustain a head injury. Prior to this injury, Mr. Watsby had undergone a left hip replacement for a fracture. He has lived alone for the past 3 years following his wife’s death due to a motor vehicle accident. Mr. Watsby is treated for multiple medical conditions including congestive heart failure (CHF), atrial fibrillation, hypertension, diabetes, and chronic obstructive pulmonary disease (COPD). His two adult sons live out-of-state but each has offered him to live with them due to their increased concerns about his ability to continue living alone. Mr. Watsby had repeatedly declined their offer as well as their suggestion to move to an assisted living facility. His sons did not insist for him to move because they knew that their father’s favorite pastime was to look at his wife’s paintings, which were hung on every wall of the matrimonial family home. There would be too many paintings to bring to any other home.

On examination at the ED, Mr. Watsby was found to have back sores that had ulcerated and was poorly nourished with a weight of 125 pounds, down from 168 pounds the previous year. His mental status deteriorated rapidly on the second day of admission with delirium, but the agitation had resolved by the end of the week. A cognitive screen a week later indicated problems with memory, but Mr. Watsby denied any difficulties managing things on his own,
including his medications. On the day of the hospital discharge, Mr. Watsby declined home-health services and stated he would be sure to carry his cell phone in his pocket to call for help when needed. He denied feeling depressed and expressed excitement at the thought of returning to the comfort of his own home. Mr. Watsby’s sons had spoken to the attending physician and committed to taking turns to check in on their father by phone each day.

Three days after discharge, Mr. Watsby fell again in his home. This time, he fell in the kitchen and was found 9 hours later by paramedics with blood on his forehead. He was lying semiconscious on the floor close to his front door. Although he did not seem to have sustained any major injury, he was hospitalized and given intravenous fluids. The clinical team and one of Mr. Watsby’s sons agreed that in the interest of maintaining his safety, he should be discharged to a subacute rehabilitation stay in a nursing home with plans to transition into long-term care. His sons shared responsibilities for his health care in a springing power of attorney (POA). Mr. Watsby reluctantly agreed but stated a preference to remain in his own home. After 20 days in the rehabilitation facility, his physician determined he was incapacitated and the medical durable POA was activated. Mr. Watsby was transferred to permanent long-term care. His physical and mental health conditions worsened over the next 5 months. The advance directive documents had not been completed and Mr. Watsby was placed on a feeding tube. In the days that followed, he had multiple episodes of breathlessness that required several resuscitation attempts that finally failed. Mr. Watsby died after living 5 months in the nursing home. On review of the admission chart record, he was noted as “depressed and disoriented.”

In Mr. Watsby’s case, several ethical and legal questions arise for psychologists and other health care professionals:

1. To what extent does the health care team promote Mr. Watsby’s autonomy and independence versus implementing protective interventions to maintain his personal safety?

2. What more do we need to know about family dynamics and the strength of the relationship between Mr. Watsby and his two sons? Do his sons have the capacity to serve as surrogate decision makers? To what extent is it our role to ascertain this? If not them, then who? Do they know their father’s values, preferences, and wishes for his care and end-of-life decisions?

3. How much weight do we place on Mr. Watsby’s preference to return home in the face of declined physical functioning? What information do we need to gather to appreciate his refusal to receive care in a rehabilitation or skilled nursing setting?

4. And finally, who on the health care team is responsible for gathering relevant familial and psychosocial information and how is it shared with the family and the rest of the care team? Most importantly, how is the plan of care communicated with Mr. Watsby? Who should be involved in those discussions?
FOUNDATIONAL ETHICS OF DECISION MAKING

To appreciate the underpinnings of ethical dilemmas, clinicians must be familiar with the complexity and range of life events and decisions encountered by older adults, family members, and other health care professionals. Specific decisions have been identified (American Bar Association [ABA] & APA, 2008) and include the following: (a) medical decision making that can range from simple decisions—such as medication management—to complex decisions such as end of life or choosing a medical treatment (Karlawish, Quill, & Meier, 1999); (b) financial decision making ranging from balancing one’s checkbook to managing investments and assets (Marson, 2001); (c) independent living decisions regarding the level of supervision or independence needed in one’s living situation (Moye & Braun, 2007); (d) driving ability—for example, at what point does a person discontinue driving?; (e) decision making around sexual consent and relationships, particularly in situations where either one or both individuals have cognitive impairment; and finally, (f) the ability to make a will (referred to as testamentary capacity; Marson, Herbert, & Solomon, 2005). In addition, a psychologist may be called upon to evaluate the capacity to make a wide range of other decisions (e.g., capacity to marry, capacity to refuse or accept visitors in a hospice setting, etc.).

At the center of developing ethical competencies is the tension between autonomy, protection, and beneficence—the intention to do good and no harm on behalf of the patient (APA, 2010)—all of which must include appreciation for an individual’s right to make life decisions and choices that are consistent with his or her beliefs and values. In most situations, those principles can be a guiding force in treatment planning, provision of education, and discussion with patients and families about interventions and best course of action for the patient. However, in some situations, conflict arises between what the patient wants and what the provider or family believes is best for the patient. A common challenge for professionals is discerning whether or not an older individual can be their own decision maker, particularly in situations where he or she is engaging in seemingly poor decision making. Such situations include neglecting one’s health care needs (i.e., taking psychiatric or other chronic disease medications as prescribed, attending health care appointments, and general hygiene care), changing directives in a last will and testament, entering intimate partnerships or new relationships, or engaging in risky behaviors such as alcohol or substance use, and cigarette smoking.

AUTONOMY AND SURROGATE DECISION MAKING

In situations where others (health care professionals, friends, family, coworkers) question the type of decisions made by an older adult, concerns may be raised about whether the individual has the ability to make decisions and if not, what should be done to protect that individual from endangering himself or herself or others. Two core principles—autonomy and protection—are maximized when responding to these issues. Clinicians and physicians are often called to assess whether an individual has the cognitive capacity to function in any particular domain of decision making. Eight domains of capacity specific to older adults have been identified by
Moye and Marson (2007): (a) independent living; (b) financial management; (c) consent to treatment; (d) testamentary capacity; (e) consent to participate in research; (f) sexual consent; (g) voting; and (h) driving.

Capacity is delineated into either clinical capacity or legal capacity (also called competency). Clinical capacity is based on the judgment of health care professionals and usually revolves around whether the patient has the ability to express a choice, understand the risks and benefits of the decision, appreciate the significance of the decision, and state rational explanations for their decision (ABA & APA, 2008). Clinical capacity determinations are domain specific. As outlined in the eight domains of capacity, an older adult may lack capacity for financial decisions but capacity may be intact for medical decisions/consent to treatment. The assumption behind a capacity assessment is that the individual could possibly eventually regain capacity to make decisions in that area. For example, if the older adult is experiencing delirium due to various medications, the effects of this would be expected to clear over time.

Judgments about clinical decisional capacity are commonly made through informal information-gathering processes that involve interviewing persons within the familial and psychosocial network such as caregivers, family members, clinicians, attorneys, adult protective service caseworkers, and law enforcement. Neuropsychologists, psychologists, and physicians use various formal assessment measures for determining multiple domains of clinical capacity. If a patient is found to lack clinical capacity in a specific domain, the health care team may turn to the surrogate decision maker to provide insight into the person’s wishes. The decisions made by a surrogate should be guided by two standards: (a) substituted judgment and (b) best interests. Substituted judgment involves the surrogate’s understanding and appreciation for the individual’s preferences, values, and wishes, to inform their decision making based on what the individual would have decided if he or she had the capacity to do so (Bush, Allen, & Molinari, 2017). In cases where there is insufficient information to make a substituted judgment, the surrogate’s decision making should be guided by the best interest standard. In other words, the surrogate’s decision would be considered in the best interest of the incapacitated person. Courts may become involved if the surrogate objects to a recommended treatment or if there is conflict within the family about what the patient would want.

The decision of clinical capacity is usually done through clinical interview without a formal measure. However, there are formal measures available that may assist in the interview process, although the ultimate decision about capacity should involve multiple informants and methods and not rely solely on one source of information. Formal measures of decisional capacity are typically domain specific and focus on areas such as the capacity to make medical and/or financial decisions. Instruments typically present hypothetical vignettes, which allow the clinician to understand the individual’s reasoning process in how he or she approaches the vignette. Examples of these type of instruments for capacity to make medical decisions include the MacArthur Competence Assessment Tool for Treatment (Grisso & Appelbaum, 1998), the Hopemont Capacity Assessment Interview (Edelstein, 2000), and the Capacity to Consent to Treatment Instrument (Marson, Ingram, Cody, & Harrell, 1995). More information about these and other capacity assessment instruments is available in a handbook designed for psychologists, Assessment of Older Adults with Diminished Capacity, written jointly by the American Bar Association.
Commission on Law and Aging and the APA (ABA & APA, 2008). This handbook, as well as handbooks designed for lawyers and judges, is freely available at www.apa.org/pi/aging/programs/assessment.

When older adults can no longer manage their affairs and there is no one available to act as surrogates, or the surrogates are in conflict, the court may need to appoint guardians or conservators. This decision is made by magistrates and judges. The judge decides about the level of supervision that may be needed to support or protect the older individual or their assets (Greene & Gibson, 2013). Although it varies by state, the following requirements are typically needed to file for a competency hearing: (a) a disabling condition (dementia, mental, or medical disorder), (b) a lack of cognitive ability to evaluate information and communicate preferences, (c) an inability to care for oneself without intervention, and (d) a determination that guardianship is the only feasible way to protect the person. Two forms of legal protections commonly used by courts are guardianship and conservatorship.

The responsibilities and duties associated with designated guardians or conservators vary from state to state. In most states, a guardian is a person who is legally responsible for someone who is unable to manage his or her own affairs, which can include domains of health care, personal affairs, and financial management. They are typically responsible for making sure that the individual receives appropriate services. A conservator is typically and primarily responsible for protecting and handling financial affairs for a person who is deemed incompetent. Federal laws do not govern guardianship practices; thus, duties or responsibilities associated with a guardianship role are left to individual states and jurisdictions to outline and uphold. Most determinations are made in probate court. Probate court is part of the state court system where cases involving wills and estates are presented to and ruled by a magistrate. In contrast, criminal courts are designated for criminal cases that typically involve a juried trial.

When a guardian or conservator is designated by the court, the older adult loses his or her right to make independent and autonomous decisions about living arrangements, medical treatment, selling or purchasing property, changing a will, driving, entering marriage or getting a divorce. Surrogate decisions can even be made and upheld despite objections from the incapacitated adult (Grisso, 2003). That said, the guardian or conservator is encouraged to always keep the older adult’s preferences and values at the forefront of his or her decision making. Consider the following example:

Ms. Samson is a 78-year-old widowed, Caucasian woman who resides in an assisted-living facility following a stroke that resulted in cognitive, speech, and mobility impediments. Her sister-in-law, who is also widowed, is designated as Ms. Samson’s guardian for all decision making around medical, personal, and financial affairs. Ms. Samson is a lifelong tobacco user. Her sister-in-law purchases cigarettes weekly and drops them off at the care facility. After the first of the year, the sister-in-law decides to quit smoking and simultaneously, stops bringing cigarettes to Ms. Samson. The facility staff notices increased negative behaviors such as agitation, bouts of crying, decreased attendance of activities, and isolation in her room. The facility administrator speaks to the sister-in-law about staff’s observations and gently
reminds her of Ms. Samson’s preference to continue smoking. The sister-in-law agrees to purchase cigarettes and Ms. Samson’s behavior returns to a pleasant and content baseline.

Recall that decisions made by surrogates should be guided by the standards of substituted judgment and the patient’s best interests. In Ms. Samson’s situation, the sister-in-law likely understood her preference to continue smoking although Ms. Samson was unable to effectively communicate her preferences. In the absence of knowing a person’s preferences or wishes, surrogate decision makers base their decisions on what would be in the best interest of the individual. Again, in Ms. Samson’s case, the surrogate substituted her own values (to quit smoking) for the values of Ms. Samson. This illustrates the risk that surrogate decision makers take, either intentionally or unintentionally, when making decisions for an incapacitated person. Hence, it is important for surrogate decision makers to evaluate their own biases and preferences regarding the individual’s care so as to not pervert their decision-making processes.

The previous paragraphs focus mostly on a person’s capacity to make medical decisions. As noted in the beginning of this section, there are other domains of capacity, some of which are encountered more often in working with older adults. If an older adult is giving money to someone or spending a lot of money in a potentially irresponsible way (i.e., gambling), a provider may begin to question the person’s capacity to make financial decisions. As discussed earlier, a financial POA may need to be appointed if the person is found to lack capacity to make financial decisions. One formal measure of financial capacity, the Financial Capacity Instrument (Marson et al., 2000) enables a clinician to obtain more detailed information about an older adult’s ability to understand financial activities such as cash transactions, checkbook management, and financial judgment. Other capacity assessment instruments such as the Hopemont Capacity Assessment Interview (Edelstein, 2000) or the Independent Living Scales (Loeb, 1996) include a section on financial decision making, which can be used to inform a decision about financial capacity. The Lichtenberg Financial Decision Rating and Screening Scales (Lichtenberg et al., 2016) provide a structured interview to assess an older adult’s ability to make a sentinel financial decision, such as making a large donation or entering into an annuity.

Other areas of decisional capacity include whether an older adult has the capacity to enter into a sexual relationship or to continue driving. These types of decisions are often challenging for family and health care professionals. Most of the concerns around capacity to enter into sexual relationships center on patients with dementia. Consider a situation where two older adults are living in a long-term care setting and want to initiate a sexual relationship. There may be concern that one or both of the individuals are unable to understand the pros and cons of this type of relationship due to the dementia (Moye & Marson, 2007). Alternatively, consider a situation in which a person with dementia lives in a long-term care setting and his or her long-term partner lives in the community and does not have dementia. Would you have concerns about them continuing to have sexual intercourse, even as the person with dementia continues to experience cognitive decline?

Although sexual consent decisions are rarely a legal concern, it can become complicated due to balancing the principles of autonomy and to do no harm, while also
considering the negative attitudes that exist regarding older adults’ sexuality (Tarzia, Fetherstonhaugh, & Bauer, 2012). Lichtenberg and Strzepek (1990) suggest that an assessment of sexual consent capacity should include the patient’s awareness of the relationship, the patient’s ability to avoid exploitation, and the patient’s awareness of potential risks such as sexually transmitted diseases. Any assessment of sexual consent capacity should include a review of medical records (including an assessment of conditions that may impact sexual functioning), a clinical interview to assess values around sex as well as understanding, reasoning, and choice, collateral interviews (i.e., family or nursing home staff), neuropsychological testing, and discussion with other team members at the facility (Syme & Steele, 2016). Even if the older adult is found to lack capacity to consent to sex, some researchers advocate that certain sexual behaviors may still be allowable based on a committee decision that includes nursing home staff and family members (Wilkins, 2015). This approach is suggested to avoid a condescending attitude toward sexual expression among older adults with dementia.

Determining an older adult’s capacity to continue driving is also complex. For many individuals, the decision to stop driving has a major impact on perceived independence. However, family members may become concerned that an older adult with dementia lacks the judgment to continue driving, depending on the severity of the condition. In a longitudinal study of men with dementia, the decision to stop driving was often made abruptly after a physician recommendation (Adler & Kuskowski, 2003). Follow-up interviews 2 years later indicated that approximately half of the participants had stopped driving but the other half continued to drive up to 5 days per week.

Psychologists are often asked to assist with the decision to stop driving, either in terms of assessing the older adult’s functioning with regard to skills involved in driving, or by initiating a discussion with the older adult around his or her views about driving and whether the individual has any concerns or motivation to reduce or stop driving. There are several components of a driving evaluation, including a medical exam, psychological exam, and an evaluation by a driving specialist (ABA & APA, 2008). Although the core part of the psychological exam should focus on cognitive functioning, it should also include assessment of symptoms of depression and anxiety, as these conditions can impair reaction time and lead to distraction when driving (ABA & APA, 2008). The evaluation by a driver specialist is critical because impairments observed in psychological testing may or may not impact driving skills.

Although this varies across jurisdictions, there are steps that health care professionals and family members can take if they are concerned about an older adult’s ability to drive safely. In California, for example, physicians are required to report a medical condition, such as dementia, to the Department of Motor Vehicles (DMV), which will trigger a reexamination of driving ability. In some cases, based on the physician’s report, the DMV may decide that the diagnosis is not severe enough yet to require a reexamination. Therefore, when a physician provides this information to the DMV, it does not necessarily mean that the person’s license will be revoked. In some states, certain health care professionals are required to notify the DMV when certain conditions are diagnosed, whereas in other states, health care professionals
are not allowed to share this type of private health information. In most states, family members can file a report with the DMV that will trigger a reexamination of driving ability.

**ELDER MISTREATMENT, NEGLECT, AND EXPLOITATION**

An important area where ethical and legal tensions arise is in cases of suspected or identified elder abuse and exploitation. According to the Centers for Disease Control and Prevention, elder abuse is defined as “an intentional act or failure to act by a caregiver or another person in a relationship involving an expectation of trust that causes or creates a risk of harm to an older adult” (Hall, Karch, & Crosby, 2016, p. 25). Various forms of elder abuse have been identified and include physical, sexual, emotional, caregiver and self-neglect, and financial exploitation. Important to note is that most states vary in their definitions of the various forms of abuse to older or at-risk adults, thus creating barriers for collecting and analyzing national data to describe the prevalence and incidence rates of elder mistreatment and exploitation. Some scholars have attempted to provide empirical evidence for the prevalence of elder abuse. The most recent prevalence study published by Acierno and colleagues (2010) used randomized telephone dialing methodology to survey 5,777 older adults. Results suggested that one in 10 respondents reported experiencing some form of abuse in the past year. The highest prevalence rate reported was financial abuse by a family member (5.2%), followed by potential neglect (5.1%), emotional abuse (4.6%), physical abuse (1.6%), and finally, sexual abuse (0.6%). The authors concluded that the most consistent correlates with abuse were low social support and previous exposure to a traumatic event.

Several risk factors increase older adults’ vulnerability to mistreatment and exploitation. Factors include physical, cognitive, and sensory deficits, emotional instability (i.e., mental illness), physical and psychosocial isolation, a recent major life transition (i.e., widowhood), relocation, and/or poor access to resources such as medical care, mental health treatment, or spiritual/social activities. Several studies have investigated the association between dementia and older adult victimization. Aggregated findings suggest a higher prevalence of abuse among older individuals with a diagnosis of dementia (Cooper, Selwood, & Livingston, 2008) with upward of 50% of persons with dementia experiencing some form of abuse (Cooper et al., 2009). Another study, which surveyed caregivers of older adults with dementia, reported 47% of care recipients had been mistreated by their caregivers (Wigglesworth et al., 2010).

The ethical dilemmas in most cases of elder mistreatment, neglect, and exploitation return to the principles of autonomy and beneficence. As discussed earlier in the chapter, all persons are viewed to be competent unless determined otherwise by a physician or psychologist. Law enforcement and adult protective services—the human services agency commonly involved in investigating and intervening in cases of elder abuse—are sometimes confronted with an older adult’s right to refuse services, particularly if the older person appears capable of understanding the consequences of doing so. Self-determination is an important component in intervention and can be a limitation to implementing services and resources. For example,
a caseworker may determine that an at-risk adult may benefit from meal preparation services and home health care. The at-risk individual has the right to accept meal services yet refuse home health care. Unless there is a law, code, or ordinance prohibiting or limiting a person’s choice, the at-risk adult has the right to make lifestyle choices that others may feel is objectionable or even dangerous, such as:

- Refusing medical treatment
- Refusing to take necessary medication
- Choosing to abuse alcohol or drugs
- Living in a dirty or cluttered home
- Continuing to live with a perpetrator
- Keeping a large number of pets
- Engaging in other behaviors that may not be safe (i.e., gambling, having multiple intimate partners)

Regardless of mental capacity, most states mandate health care professionals to report suspected or confirmed maltreatment; still, several states are not legally mandated to report and each state may have a different definition or criteria to identify an “at-risk adult.” Health care professionals, including psychologists, need to be familiar with state laws guiding the reporting of mistreatment of older adults in their jurisdiction. A list of national resources for information about elder rights and protections can be found in Table 14.2. Familiarization can help psychologists identify a course of action to either protect or prevent abuse of an at-risk older adult (Bush et al., 2017).

<table>
<thead>
<tr>
<th>Organization</th>
<th>Website</th>
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<tbody>
<tr>
<td>Administration on Aging</td>
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</tr>
<tr>
<td>American Bar Association Commission on Law &amp; Aging</td>
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<tr>
<td>National Adult Protective Services Network</td>
<td><a href="http://www.apsnetwork.org">www.apsnetwork.org</a></td>
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<tr>
<td>National Center on Elder Abuse</td>
<td><a href="http://www.ncea.acl.gov">www.ncea.acl.gov</a></td>
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<tr>
<td>National Clearinghouse on Abuse in Later Life</td>
<td><a href="http://www.ncall.us">www.ncall.us</a></td>
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<tr>
<td>National Committee for the Prevention of Elder Abuse</td>
<td><a href="http://www.preventelderabuse.org">www.preventelderabuse.org</a></td>
</tr>
<tr>
<td>Psychologists in Long-Term Care (PLTC)</td>
<td><a href="http://www.pltcweb.org/index.php">www.pltcweb.org/index.php</a></td>
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Respecting Cultural Differences in Cases of Elder Abuse

Cultural competence and respect for normative practices among all individuals from diverse backgrounds must be the first guiding principle when caring for older adults and when determining whether elder abuse has occurred. Introspection of any biases or awareness of any lack of knowledge of the relevant culture might be a helpful start in determining the course of action necessary to be a competent clinician. Culture and diversity in this context are not limited to understanding different racial and ethnic practices, but includes knowledge of how different groups embrace the meaning of being disabled, homosexual, or bisexual, gender role expectations, loyalty to family, caregiving, financial dependence, intergenerational communication, and perception of age or illness-related burden. This is obviously not an exhaustive list as every micro- and macrosystem of function brings with it different complexities as well as creativity for problem resolution and life celebrations. As in all clinical work, there are several ways to ensure that a reasonable amount of consideration has been made not to cause any additional harm to the older adult identified for protection. Any underestimation of the needs and efforts to clarify the situation from which elder abuse is suspected could be detrimental. Not only could it hurt the well-being of the identified older adult, it could also likely place a tremendous amount of emotional burden on that individual due to feelings of shame for being the cause of the family’s additional hardship as imposed during investigations (Lee & Eaton, 2009).

It is prudent for clinicians to refer to the APA Ethics Code (2010) that clearly states under the general principles that psychologists “do no harm” (Principle A: Beneficence and Nonmaleficence), “exercise reasonable judgment and take precautions to ensure that their potential biases, the boundaries of their competence . . . do not lead to . . . unjust practices” (Principle D: Justice), and “respect the dignity and worth of all people, and the rights of individuals to . . . self-determination . . . are aware of and respect culture, individual and role differences . . .” (Principle E: Respect for People’s Right and Dignity). Unless the older adult is determined through assessment to be clinically or legally incapacitated and therefore unable to self-protect or self-determine the desirable treatment from others, professionals who are often mandated to report elder abuse (psychologists and others) are encouraged to carefully navigate the terrain of varied and even conflicting information before taking any action.

Harbison and colleagues (2005) highlighted the tendency of elder abuse legislators to ignore the wishes of older adults, specifically those living in rural areas, by reporting elder abuse that would consequently subject the older adult to increased emotional turmoil such as shame and also fear of being further abused. They pointed to the possibility of achieving a more successful intervention outcome by attending to the specific culture of older adults living in rural settings. There are implications for professionals to more thoughtfully and collaboratively work with older adult victims. In so doing, mandated reporters and legislators could better help balance older adults’ rights and wishes with what seems to be in the best interest of the victims. Other research involving different ethnic groups and individuals from diverse cultures also lends support to the need for an in-depth understanding of the context.
from which such important decisions pertaining to claims of elder abuse are usually made. Consider the following examples:

1. Financial/material exploitation:

An 85-year-old woman with end-stage cancer and fluctuating mental status lives at her oldest daughter’s home. Although physically frail, she is still able to ambulate with some assistance. Her son visited and took her to the bank to transfer a substantial amount of money into his account because he recently lost his job. Her oldest daughter filed a report of elder abuse because her mother did not have enough funds needed for her medical treatment.

Cultural/ethical query: How would knowing the cultural background make a difference when understanding whether or not elder abuse had occurred?

2. Emotional abuse:

A 94-year-old man lives in his matrimonial home with his youngest son. Most friends and family are aware that he has an enmeshed relationship with his son. This enmeshment has been known to involve occasional arguments followed by reconciliations and mutual overprotection from the criticism of others. Alcohol abuse within the family has been a norm and altercations are frequent among male siblings and relatives after an evening of binge drinking together at the older adult’s home. Such behaviors affect the older adult emotionally as his son yells vulgarities when intoxicated and then apologizes the next morning when sober. The older adult, when interviewed, denied any evidence of abuse despite noticeable bruises on his forearm.

Cultural/ethical query: Are there any specific ethnic groups that might tolerate such a pattern of coexistence whereby a report of elder abuse would bring more hardship to the older adult?

Although elder abuse is largely defined to include seven different types, mainly physical abuse, sexual abuse, emotional abuse, financial/material exploitation, neglect, abandonment, and self-neglect (Hall et al., 2016), the definition of “abuse” could be different for older adults in minority ethnic groups, especially when the concept could only be translated to mean “violence” or when disrespect could be considered “a major form of abuse” such as within the Chinese community (Bowes, Avan, & Macintosh, 2012). Lee and colleagues (2012) argue that the existing definition of financial abuse may be inaccurate because it is based on perceptions of supposedly highly educated professionals and policy makers, but not from older adults. In their study, for example, they found that Korean immigrants defined financial abuse as adult children either taking (stealing) possessions and/or assets from their parents or failing to financially support their parents.

Similarly, in an attempt to define elder abuse in culturally relevant terms, Parra-Cardona and colleagues (2007) sought to identify the “ecological framework” that could be at play for sustaining elder abuse and neglect among Latino older adults. They noted that acculturation status and differences in cultural beliefs and identity
between the family caregiver and the older adult care recipient may be viewed as important factors for understanding elder abuse in Latino families. For example, the younger generation of Latinos are perceived to value traditional cultures less than their immigrant parents. This might explain their lack of awareness and also their likely different definition of elder abuse. Similarly, the family’s financial standing and beliefs about aging should be considered when determining whether elder abuse or neglect has occurred because multiple ecological stressors could have been responsible for the outcome. Consequently, attending to these factors might help the development of interventions that would avoid placing blame solely on the abuser.

There remain many controversies regarding the meaning and definition of elder abuse and it is therefore not surprising that there is a lack of consensus and even confusion among health care professionals. Elder abuse is further made difficult to define due to the lack of training in geropsychology for psychologists, which would otherwise allow a greater appreciation of diversity issues in the competent care of older adults (Scheiderer, 2012). Koocher and Kieth-Spiegel (2016) proposed a six-item self-assessment as part of training in diversity to reflect upon one’s biases and cultural competence. One item relevant for decision making in reporting elder abuse involves the question: “As I seek to protect myself, what are my ethical obligations when I notice a cultural incongruity in values between my professional association, my employer, legal obligations, and the people I serve?” (p. 132).

A review of the prevalence and risk factors for elder abuse in Asia (China, India, Singapore, Japan, and Korea) emphasized the need for sensitivity to the different normative definitions of elder abuse. They stressed the importance of establishing rapport with suspected older adult victims due to their unwillingness to share their experience of abuse that they likely perceive to be shameful or determine as a family affair to be kept private (Yan, Chan, & Tiwari, 2015). Hence, elder abuse might not simply be a matter of whether reporting is warranted, but rather, a term to be sensitively considered in the context of culture, diversity, and socioeconomic status. It is important to be mindful of different perceptions of older adults from minority groups and their sociocultural barriers to seeking help, such as lack of dominant language proficiency and isolation (Zannettino, Bagshaw, Wendt, & Adams, 2014).

**ETHICS IN RESEARCH**

Adhering to ethical standards when recruiting prospective research participants should be the standard practice of every researcher. Specifically, researchers are responsible for ensuring that best efforts are made to help participants understand as fully as possible the information depicted on informed consent forms. Older adults and individuals with lower education can be more vulnerable to inadequately understanding informed consent (Sugarman, McCrory, & Hubal, 1998). With the projected exponential increase in the geriatric population in the coming decades (see Chapter 1 and Ortman, Velkoff, & Hogan, 2014), it is expected that research on aging using older adults as participants will also increase accordingly. There have been concerns and fears over the unethical inclusion of older adults with cognitive impairment in research, but the exclusion could deprive them the opportunity to
benefit from research where their well-being and quality of life could otherwise be improved.

These considerations bring rise to an important question of participants’ varying levels of cognitive functioning. How might researchers ethically obtain consent from older adults who may present with impaired cognition without violating the ethical code to protect individuals from any potential harm as a research participant? As mentioned earlier, education level could also impact the understanding of informed consent information, but if cognition is also impaired, the challenge is much greater to warrant additional attention. One other important question is: Should the participants or the authorized representative consent to research when prospective participants are cognitively impaired? Several studies have attempted to provide guidance, which are summarized as follows.

Capacity to consent or decisions about who should provide consent on behalf of the older adult participant undoubtedly requires careful consideration. Specifically, it has been noted that ethical dilemmas begin at the level of capacity evaluation where the full range of contextual biopsychosocial information, including medical conditions, family relation, social function, and financial situation, need to be considered for accuracy of capacity judgment (Jimenez, Esplin, & Hernandez, 2015). Feliciano and colleagues (2011) explained how the capacity to consent for research participation is dependent on the older adult’s cognitive ability and the study’s complexity. They discussed the “principle of proportionality of the capacity to consent” wherein the amount of risk, time, and benefit involved in the study would determine how stringent the “standards of capacity to consent” should be (p. 477). That is, if a study involves more risk and time, the greater the importance to show adequate capacity to consent, whereas, if benefits are involved, the lesser the need to prove adequate capacity. In the same light, Bravo and colleagues (2003) found in their survey of older adults, informal caregivers, researchers, and institutional review board members, a unanimous opinion that for older adults with dementia, the need for a legal guardian’s consent to participate in research becomes greater as the risks of the study increase. Despite the consensus, it was highlighted that many cognitively impaired older adults do not have a legal guardian. In a survey of older adults, informal caregivers, physicians, researchers, and research ethics board members, level of comfort with using proxy consent increased when risks to participants with dementia was lower (Dubois et al., 2011).

Some brief screening tools can assist a researcher in evaluating capacity to consent to research participation. Resnick and colleagues (2007) validated a five-item Evaluation to Sign Consent (ESC) measure in a randomized controlled trial using mainly European American nursing home residents aged 79 to 93 with a mean Mini Mental Status Examination (MMSE) score of 18. They found 63% of residents did not pass the ESC. As a comparison, a similar four-item capacity-to-consent screen was also validated for older adults in Korea using culturally and educationally appropriate questions (Lee, 2010). The majority (72%) had either no education or completed only elementary school. Lee demonstrated sensitivity to demographic backgrounds of participants by asking, “If you don’t want to, do you have to be in the study?” versus Resnick and colleagues’ directive, “Explain what he or she would do if he or she was experiencing distress or discomfort,” which was more suitable for the study’s predominantly White participants. Such attention to language when designing
capacity measures is essential for protecting the rights and interests of research participants. While thoughtful planning is required when working with older adults with cognitive impairment, Gatz (2006) reminded researchers of the complexities of evaluating older adults’ abilities to consent to participate in research or medical treatment. Gatz cautioned against the assumption that normal cognition equates to sound decision-making capacity because of the potential for cognitive changes in the older population and the existence of “a range of statuses between cognitive competence and decisional incapacity” (p. 468). Hence, it is important that researchers carefully weigh the risks and benefits of their study as well as attend to the nuances of capacity to consent that might not depend only on cognitive status at the time of recruitment. Researchers are also encouraged to observe legislative guidelines for research in their practice jurisdiction to ensure that prospective participants with impaired decision-making capacity are protected accordingly, such as whether proxy consent is absolutely required for research regardless of risks (Bravo, Duguet, Dubois, Delpierre, & Vellas, 2008).

CONCLUSION

As the U.S. older adult population grows, a number of ethical issues—only a few of which were discussed in this chapter—are increasingly coming into view for clinicians and health care providers. The micro- and macrosystems in which older adults live and thrive require a level of cultural sensitivity, an understanding of aging processes, and knowledge about professional ethics and legal standards involved in decision making. We have discussed the complexities of elder abuse and victimization, which involves complex judgments about capacity and potential surrogate decision making for an older adult. At the heart of ethical principles and guidelines is the challenge between autonomy and protection. We have also documented some of the real-world dilemmas faced by practitioners and families navigating long-term care placement and information sharing that occurs between providers, older adults, and the family. And finally, we addressed the ethical standards required for older adults to consent to participate in research—an important component to furthering the science and thus, expanding our knowledge and understanding of aging adults and families, and the communities in which we flourish together.

DISCUSSION QUESTIONS

1. Define the following terms and provide an example of when it would be useful to have each document: advance directive, power of attorney, health care surrogate.

2. Describe the difference between clinical capacity and legal capacity (competence), and discuss instruments used to assess capacity in older adults.

3. Define the domains of capacity discussed in the chapter and provide examples of ethical challenges that may be encountered in each domain.

4. Describe the concern when working with older adults about balancing the principles of autonomy and beneficence.
5. Discuss the prevalence of elder abuse and the cultural issues that are important to consider when determining the severity of elder abuse.

6. In the context of research with older adults, describe proxy consent and the ethical concerns about it.

REFERENCES


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