Everyday problem solving

Jennifer A. Margrett  
*Iowa State University, margrett@iastate.edu*

Jason C. Allaire  
Tara L. Johnson  
Kate E. Daugherty  
Sarah R. Weatherbee

Follow this and additional works at: http://lib.dr.iastate.edu/hdfs_pubs

The complete bibliographic information for this item can be found at http://lib.dr.iastate.edu/hdfs_pubs/66. For information on how to cite this item, please visit http://lib.dr.iastate.edu/howtocite.html.
Everyday problem solving

Abstract
Within the cognitive aging literature, everyday problem-solving research has gained momentum as proponents point to the value added by using such an approach (see Allaire & Marsiske, 2002).

Comments
Within the cognitive aging literature, everyday problem-solving research has gained momentum as proponents point to the value added by using such an approach (see Allaire & Marsiske, 2002). By focusing on what older adults actually do in their day-to-day lives, clinicians and researchers can improve ecological validity and reduce the artificiality of testing situations often employed in experimental research. Also, gerontological professionals may better approximate how older adults perform in their own real-life settings outside of a contrived laboratory setting. These efforts may lead to increased assessment efficiency as well as beneficial psychosocial consequences, such as increased research participation by older adults and greater self-efficacy when performing familiar and “real” tasks (Marsiske & Margrett, 2006). However, a central issue remains regarding everyday problem solving, namely its relation to daily functioning and, in part, the difficulty identifying an appropriate standard consistent with actual daily demands by which success can be determined (Marsiske & Margrett, 2006).

In the following sections, we examine several issues related to everyday problem solving in adulthood. First, we describe the construct of everyday problem solving and how it differs from the traditional psychometric approach used to assess cognitive ability. Second, several methodological considerations related to everyday problem-solving assessments are outlined, including the nature of the problem, scoring criteria, and content. Such issues are paramount as we consider aging and assessment of everyday abilities. Third, we examine the value added by adopting an everyday
problem-solving approach, namely the relation to older adults’ real-world outcomes, including functioning, cognitive status, and mortality.

DEFINING AND EXAMINING EVERYDAY PROBLEM-SOLVING ABILITY IN ADULTHOOD

Everyday problem solving is difficult to define, even among researchers in the field. As summarized by Marsiske and Margrett (2006), various classifications for this construct include everyday cognition, practical problem solving, and practical intelligence. Reasons for this diversity are likely due to the range of methods employed to assess variables of interest that result from varied theoretical traditions (Marsiske & Margrett, 2006). Everyday problem solving, rather than cognition or intelligence, is often used as a broad term for this approach (Marsiske & Margrett, 2006) because problem solving is easier to explain to research participants and lay persons compared to the latter terms (Willis & Schaie, 1993).

The everyday problem-solving approach can be differentiated from two other approaches common to cognitive aging that focus on the psychometric and clinical features of intellectual abilities (Margrett & Deshpande-Kamat, 2009). The traditional psychometric approach focuses on individual abilities (e.g., working memory, processing speed) and their assessment, particularly as related to age differences and changes. Key questions often focus on how abilities relate to one another, the development of performance norms, and the characterization of changes in abilities over the life course. Also of interest have been trends in these abilities among age cohorts or different generations. In contrast, the clinical approach centers on distinguishing normal from abnormal cognitive ability (e.g., presence of mild cognitive impairment or dementia) as well as understanding of the mechanisms underlying abnormal cognition. A key issue for clinicians is determination of mental status, which is often determined in a dichotomous manner (i.e., Is performance above or below a designated threshold?).

Everyday cognition could be viewed as a blend of the psychometric and clinical approaches. Everyday problem solving is concerned with adults’ real-world functional abilities and capacities and, particularly in older adulthood, being able to care for one’s self and to manage personal affairs (Willis, 1996). Compared to the other two approaches, the field of everyday problem solving faces unique methodological challenges. What the field lacks is a unified approach to skill and competency assessment. From the clinical perspective emerges commonly accepted multidimensional measures of general cognitive status (e.g., Mini-Mental Status Examination [MMSE]; Folstein, Folstein, & McHugh, 1975). Measures such as the MMSE are useful tools in distinguishing broad categories of cognitive functioning (i.e., normal performance from dementia-impaired performance). The problem for many
Everyday Problem Solving

81

clinicians and researchers is that measures such as the MMSE provide a relative lack of sensitivity and the ability to distinguish less disparate groups. A real contribution of the field of everyday problem solving could be the development of measures distinguishing degrees of competency on higher-level cognitive skills. Throughout this chapter we discuss why such a goal is difficult to attain.

The everyday approach to cognitive aging combines a focus on the context in which an individual performs needed tasks (i.e., contextualism), how higher-order cognitive functioning relates to individual skills identified via the psychometric approach (i.e., componentialism), the relation of experience and practice with performance, and understanding the nature of older adults' strategies and solutions (i.e., postformalism; Marsiske & Margrett, 2006). Figure 4.1 depicts the theoretical relation between psychometric cognitive abilities, everyday problem solving, and functioning as well as the factors influencing each of these constructs. Practically, utilizing such an “everyday” approach to the assessment of cognitive skill is beneficial in that researchers can gain a more accurate understanding of how well older adults accomplish the tasks they likely face in their daily lives. Being able to perform everyday tasks is essential for functional health maintenance and independence, therefore, the term everyday cognitive competence is often coined (Willis, 1996). Competence can be viewed as the evaluation of performance or functioning, which is influenced by several factors, including the nature of the task and assessment criteria.

As mentioned by Willis (1996), the majority of real-world problem solving should be similar to what older adults face in their daily lives. However, assessing task performance and “competence” is complicated by the need to consider both individual and environmental contexts. One argument is that performance of everyday problem-solving ability should be evaluated on an individual basis of personal achievement because an older adult’s goals may vary depending on environmental, social, and cultural demands (Blanchard-Fields & Chen, 1996). Performance that is deemed adequate will likely vary based on perspective. For instance, does self judgment, proxy-rating, or comparison with an objective indicator provide the “best” benchmark for determining the minimal level of performance required? It is reasonable to assume that information will vary across data sources and that the factors influencing assessments may be weighed differentially across sources (MacDonald, Martin, Margrett, & Poon, in press). Determination of the veridicality of varying assessments may not be an important aim as varied assessments may provide unique and complimentary information that serves to complete more of the picture.

As implied by the functional/complex nature of these tasks, everyday problem-solving ability is considered to be a higher-order cognitive skill representative of executive functioning and dependent upon constituent intellectual abilities such as memory and reasoning (Marsiske & Willis, 1995). We
now turn to a brief discussion of the relation of everyday problem-solving ability to psychometric cognitive abilities and age-related differences.

EVERYDAY PROBLEM SOLVING:
RELATION TO BASIC COGNITIVE ABILITIES AND AGE DIFFERENCES

Age group differences and intraindividual changes in performance of ability-specific assessments, such as memory, reasoning, verbal ability, and
perceptual speed, are well documented (e.g., Schaie, 2005). Abilities relying on knowledge that becomes “crystallized,” or strengthened by experience, tend to remain stable throughout middle adulthood and early later life (Schaie, 2005). Examples of such abilities are verbal comprehension and vocabulary. In comparison, “fluid” abilities, which are less dependent on experience, tend to peak in young adulthood (Schaie, 2005). These abilities are believed to be more innate and biologically driven and often center on the ability to deal with novel situations (e.g., reasoning). In comparison to the psychometric abilities, less is known about developmental changes in everyday cognition. Readers are referred to two recent reviews of the everyday problem-solving literature, which detail empirical studies in this area (see Marsiske & Margrett, 2006; Thornton & Dumke, 2005). We provide a brief summary here.

As noted by Marsiske and Margrett (2006), most research implementing the everyday problem-solving approach is of a cross-sectional nature. Problem-solving ability as measured by accuracy or efficiency tends to be negatively related to age (Marsiske & Margrett, 2006). In contrast, findings are more complex when considering problem-solving fluency, or the ability to generate multiple or more qualitative solutions. As discussed by Marsiske and Margrett, observed age-related differences on more ambiguous tasks may not represent later life “deficits,” but rather meaningful differences in older adults’ problem-solving goals and style. This harkens back to our discussion of the “best” or most useful assessment, which likely depends on the researcher’s or clinician’s aims and their understanding and appreciation of respondents’ goals. A central issue remains regarding everyday problem solving, namely its relation to everyday functioning and, in part, the difficulty identifying an “appropriate validation criterion” (Marsiske & Margrett, 2006).

In addition to a lack of longitudinal data, there is little research examining everyday cognition in very late life. However, some findings suggest that these skills may be preserved well into late life. For example, within the Georgia Centenarian Study, oldest-old and centenarian participants’ ability to solve everyday problems was quite robust (Poon, Clayton, et al., 1992; Poon, Messner, Martin, & Noble, 1992).

The relation between secondary cognitive abilities (i.e., crystallized and fluid skills) and everyday problem-solving ability has been examined. As noted by Marsiske and Margrett (2006), crystallized and fluid skills both tend to be moderately to strongly correlated with problem-solving ability; this relationship may be due to some degree of overlap in assessments, particularly for fluid skills and well-structured problem-solving tasks. Additional research is needed to understand how changes in basic cognitive abilities (i.e., differentiation of abilities, terminal change and drop; e.g., Bosworth & Siegler, 2002; de Frias, Lövdén, Lindenberger, Nilsson, 2007) relate to changes in everyday problem-solving ability in later adulthood.
METHODOLOGICAL CONSIDERATIONS IN EVERYDAY PROBLEM-SOLVING RESEARCH

Generalizing from empirical studies employing diverse theoretical and methodological perspectives is a challenge to researchers. As detailed by Willis (1991), three commonalities underlying problem-solving ability include the nature of the task, characteristics of the problem solver, and context; all of which must be considered when interpreting study findings regarding age differences. As described by Willis and others, the structure (e.g., less structured tasks with multiple solutions vs. well structured tasks with one correct solution) as well as the content (e.g., interpersonal dilemma vs. instrumental problem) of the task can vary. Individual and group differences are also evident across problem solvers, who may vary in important ways such as degree of knowledge, expertise, and efficacy (Willis). For instance, important caveats to consider are the problem solver’s educational attainment and the problem content (e.g., age relevancy) as they influence cognitive task performance. Third, the context in which older adults solve problems impacts the task process and outcome.

Given the nature of problem solving, its assessment is more complex compared to the psychometric approach to individual intellectual skills. The everyday problem-solving perspective has led researchers to consider a variety of methodological domains within the everyday cognition literature. The strength of this approach is that diverse tasks are considered. However, the difficulty lies in comparisons across tasks when interpreting age differences. This section highlights several methodological challenges apparent in the everyday cognition literature.

Nature of the Everyday Problem

The majority of knowledge obtained related to everyday cognitive abilities relies almost solely on laboratory assessments, which have been characterized as heterogeneous and diverse (Allaire & Marsiske, 1999; Marsiske & Willis, 1995), largely due to variations in task structure, instruction, scoring, and problem domain. As a result of these variations, which likely stem from mixed theoretical roots (Marsiske & Margrett, 2006), the construct validity of such everyday problem-solving assessments is questionable (D’Zurilla, Maydeu-Olivares, & Kant, 1998) as is the generalizability of research findings across laboratories (Neely, 2006). Additionally, investigation of age-related differences and changes may be artificially masked or exacerbated depending on the methodological approach. If these varied methodologies prove to be valid and reliable, the generalizability of results could be strengthened.

Ill-Structured and Well-Structured Tasks

One apparent methodological discrepancy in the everyday cognition literature involves the structure of the problem-solving task. Some problems
are considered ill-structured, others are described as well-structured, and some fall in between. Ill-structured tasks are often open-ended and lack a clear definition of the problem, the means to solve it, and/or an ultimate goal or endpoint (Allaire & Marsiske, 2002; Thornton & Dumke, 2005). As a result of the ambiguous nature of the problem, suggested solutions provided by an individual depend on how that person interprets aspects of the scenario that are not explicitly stated (Blanchard-Fields, 2007). An example of such an item comes from the work of Denney and Pearce (1989) in which respondents were presented with the following scenario: “Suppose an elderly woman needs to go somewhere at night. She cannot see well enough to drive at night and it’s too far to walk. What should she do?” This is an ill-structured item because the situation is ambiguous (e.g., degree of neighborhood safety, availability of alternative transportation) and the goal is unclear (e.g., Is the most important goal to obtain a needed item or to remain safe?).

These types of ill-structured tasks are often described as unpredictable and continually transforming (Blanchard-Fields, 2007); as such, researchers and clinicians may not adequately assess a true “everyday” problem in the life of a particular older adult individual. Also relevant to understanding age-related differences and changes is the role of prior experience. The majority of ill-structured everyday cognitive assessments typically include hypothetical situations in which individuals draw on accumulated knowledge to solve problems (Blanchard-Fields, 2007). Acquired knowledge due to past experiences with problems may allow older adults to perform quite well.

Compared to ill-structured tasks, well-structured tasks are at the other end of the “definedness continuum” (Allaire & Marsiske, 2002). Well-structured tasks, such as completing a tax form correctly, typically draw upon primary cognitive abilities that tend to decline with older age (Blanchard-Fields, 2007). When completing well-defined tasks, the problem solver is presented with a clearly defined problem, the means and information to solve it, and a desired end state (Allaire & Marsiske, 2002). An example of a well-structured everyday task is Willis and Marsiske’s (1993) Everyday Problems Test (EPT). The EPT provides participants with stimuli (e.g., insurance matrix) and asks various questions regarding the information presented (e.g., How much would it cost if Mr. Jones had a 21-day inpatient stay?). This type of task targets an individual’s ability to accurately solve a problem using existing printed information. Another example of a well-structured task is a performance-based task called Observed Tasks of Daily Living, which utilizes real-life props (e.g., a telephone, money; Diehl et al., 2005; Diehl, Willis, & Schaie, 1995). Participants are asked to perform a variety of tasks (e.g., look up a telephone number and dial it, produce change from a lunch bill), behaviors are observed, and proficiency is scored. The
means to solve the problem are clearly defined in both examples, as is the desired endpoint of the problem.

TASK INSTRUCTIONS AND SCORING PROCEDURES

The level of structure, definition, and clarity of ill- and well-defined tasks influences other measurement strategies, such as the task instructions and scoring procedures. Methodological issues as they concern performance differences in adult age groups have not been largely emphasized in recent research, but there is some evidence to suggest that varied instructions and scoring procedures may impact the extent to which age differences in everyday cognition are apparent.

Due to the nature of ill-structured tasks, the instructions are often designed to urge participants to specify multiple ways of solving the problem. Common everyday problem-solving instructions state, “Tell me all the ways you can solve this problem” (e.g., Haught, Hill, Nardi, & Walls, 2000; Heidrich & Denney, 1994) or some similar form of those instructions (e.g., “Generate as many safe and effective solutions as possible”; Allaire & Marsiske, 2002; Margrett & Marsiske, 2002). These types of task instructions advise participants to use their repertoire of coping strategies when encountering everyday problems. Given varying researcher goals, multiple methods exist to “score” participant responses on ill-defined tasks.

The two primary methods cited in the literature to score ill-structured problem responses are fluency and strategy evaluation, which may mask or exacerbate performance differences between age groups. Fluency refers to the sum of unique solutions generated by respondents (e.g., Artistico, Cervone, & Pezzuti, 2003; Berg, Meegan, & Klaczynski, 1999; Heidrich & Denney, 1994; Margrett & Marsiske, 2002; Strough, McFall, Flinn, & Schuller, 2008). A greater number of strategies is believed to indicate superior problem-solving ability, as several responses signify creativity or flexibility in thinking and practically would also serve to increase the likelihood of finding an effective solution (Denney & Pearce, 1989; Sinnott, 1989; Spivack & Shure, 1982).

Older adults may be at a disadvantage when fluency is the scoring procedure used. Denney, Pearce, and Palmer (1982) found that older individuals generated fewer solutions than younger and middle-aged individuals, even when presented with problems considered to be personally relevant to older adults. Other research demonstrates a tendency for older individuals to produce fewer solutions compared to younger individuals on ill-defined tasks (e.g., Berg et al., 1999; Crawford & Channon, 2002). One explanation for older adults' disadvantage on such tasks is their decline in constituent mental abilities related to everyday cognitive abilities (e.g., Allaire & Marsiske, 1999; Diehl et al., 1995). An alternative explanation is that older adults, due
to their past experiences with problems, intentionally limit their solutions (Berg et al., 1999; Blanchard-Fields, Mienaltowski, & Seay, 2007; Labouvie-Vief, Hakim-Larson, & Hobart, 1987). For instance, older adults may write down only the best solutions (e.g., what has worked in the past) and purposely exclude other potential solutions (e.g., ones they would not implement), even when instructed to generate as many strategies as possible. Younger adults, on the other hand, may write down all possible solutions they imagine, including solutions that are likely to be ineffective (e.g., “shoot the dog” as a solution to having a neighbor with a pet that makes noise; Neely, 2005). If multiple ineffective strategies are produced, it could be detrimental to everyday life (e.g., ignoring a potentially dangerous situation, getting arrested). As a result, some researchers who use ill-defined tasks prefer to examine performance based on strategy effectiveness or strategy type rather than only fluency (e.g., Blanchard-Fields et al., 2007; Strough et al., 2008; Strough, Patrick, & Swenson, 2003; Watson & Blanchard-Fields, 1998). Strough and colleagues (2008) specifically argue that relying on fluency takes away from an understanding of the effectiveness of the strategies implemented in a given situation. One way to assess strategy type is to dichotomize participant solutions into categories of solutions such as problem-focused and emotion-focused (e.g., Blanchard-Fields, Stein, & Watson, 2004; Strough et al., 2008). Similarly, Neely (2006) examined four categories of strategies, including avoidance-denial, passive dependence, planful problem solving, and cognitive analysis. When strategy type is examined, older adults typically perform similar to younger adults (e.g., Blanchard-Fields, Jahnke, & Camp, 1995; Neely, 2006). Thus, it appears that this scoring procedure negates the age differences suggested by fluency outcome when completing ill-structured tasks.

Well-structured problems, like their ill-structured counterparts, use instructions that coincide with the nature of the task. Well-structured task instructions often ask individuals to rate the likelihood that a behavior would be used (e.g., Blanchard-Fields et al., 2007; Cornelius & Caspi, 1987), generate one correct solution based on information provided (e.g., Willis & Marsiske, 1993), or perform a task given appropriate props (e.g., Diehl et al., 2005). These instructions influence the scoring procedures used, which are typically in line with the psychometric approach to intelligence (Blanchard-Fields, 2007).

One type of scoring involves mean likelihood ratings provided by judges (e.g., Blanchard-Fields et al., 1995, 2007; Cornelius & Caspi, 1987). With this type of scoring, independent judges who are considered experts in the field rate endorsed behaviors to determine which individuals would be the most effective problem solvers. For example, judges determine if “telling a friend about the gossip” is better or worse than “leaving the situation.” After assessing participants’ endorsements using this scoring procedure, Cornelius
and Caspi (1987) found a positive relationship between problem-solving ability and age. Older adults endorsed more efficient responses compared to younger adults. The results of a study by Blanchard-Fields and colleagues (2007) also indicated that older adults were more effective problem solvers when judges rated endorsed strategies.

Another common scoring method for well-structured tasks emphasizes performance accuracy or correctness of the response (e.g., Burton, Strauss, Hultsch, & Hunter, 2006; Kimbler, 2006; Marsiske & Willis, 1995). Specifically, an individual receives a score for the total number of correct responses. Higher scores indicate better problem-solving ability. The existing research using accuracy or performance-based scoring procedures tends to focus solely on older adults. Future research needs to address whether or not there are age differences using these types of scoring procedures and how the findings compare to scoring procedures used for ill-structured tasks.

In daily life, the necessary skills to succeed are likely to encompass all aspects of the solutions discussed previously, including creativity and flexibility in thinking as well as problem-solving effectiveness and accuracy. For example, there are incidences when an individual has many options to consider before implementing a strategy, such as when a family member hurts one’s feelings or when criticism is received from one’s boss. On the other hand, there may also be situations in which adults must generate one correct response to function appropriately or healthfully in daily life, such as understanding the dosage of medication necessary to survive or to avoid foods that are high in cholesterol. Although the problem-solving outcomes that are assessed vary substantially in terms of ill- versus well-structured tasks (e.g., Allaire & Marsiske, 2002; Thornton & Dumke, 2005), both types of tasks are pertinent to fully understand everyday cognition and the capacity of older adults to complete meaningful activities of daily living.

**Problem Domain and Content**

In addition to instruction and scoring issues surrounding ill- and well-structured tasks, the content of the problem to be solved also varies both across laboratories and even within individual everyday cognitive assessments (Blanchard-Fields et al., 2007; Marsiske & Margrett, 2006; Strough et al., 2008; Thornton & Dumke, 2005). Researchers have examined performance differences on instrumental or practical tasks as well as the emotionality of the problem. Whether or not the target of the problem is one’s self or another person may also differentially influence problem-solving performance.

**Instrumental and Interpersonal Domains**

Some problems are classified as being more interpersonal in nature because the problem involves other people, whereas other problems are defined as
Everyday Problem Solving

instrumental because they primarily involve concerns regarding competence and individual functioning. Watson and Blanchard-Fields (1998), for example, used the following interpersonal problem in their study, "A person has a 16-year-old daughter who keeps taking the car several times a week. The family only has one car." Artistico and colleagues (2003) used the following instrumental item in their study, "A person finds himself/herself having difficulties getting to sleep at night. What should he/she do?" Some problem types possess both interpersonal and instrumental components, which makes dichotomizing tasks more difficult (Blanchard-Fields et al., 2007). Whether the problem is interpersonal, instrumental, or mixed, the issues to be solved are germane to adults' lives because they target a wide range of situations encountered during daily living. However, a limited number of studies have examined performance differences across age groups on these various problem types.

In a recent everyday problem-solving study, younger, middle-aged, and older adults were compared on fluency and strategy type when completing ill-structured interpersonal (dealing with friend conflicts) and instrumental (dealing with household tasks) issues (Neely, 2006). For the instrumental problems, middle-aged adults generated more solutions compared to older adults. However, when strategy type was assessed, all age groups were equally proactive in their strategy use. For interpersonal problems, Neely found that younger adults generated more solutions compared to older adults in the study; however, when strategy type was assessed, older adults were actually more proactive than younger adults in their reported strategy use. Blanchard-Fields and colleagues (2007) found that when completing instrumental problems, younger adults endorsed more avoidant-denial strategies than older adults, but older adults preferred more passive-dependent, planful problem solving and cognitive analysis strategies. For interpersonal problems, older adults endorsed more avoidant-denial and cognitive analysis strategies than younger adults. Perhaps the patterns of differences varied between these two recent studies because of the issues surrounding scoring, as discussed previously. Neely coded reported strategies on an open-ended task, whereas Blanchard-Fields and colleagues asked participants to endorsed strategies that were provided.

Emotionality of Content

A line of research by Blanchard-Fields and her colleagues has also examined the influence of emotional content on problem-solving strategies. For example, Blanchard-Fields, Jahnke, and Camp (1995) manipulated whether everyday problems were low in emotional involvement (e.g., returning defective merchandise, a tenant's problem), medium in emotional involvement (e.g., wife returning to workforce, moving to a new town), or high in emotional
involvement (e.g., caring for an ill parent, dealing with an alcoholic spouse). They were interested in how the emotionality of problems influenced the types of strategies used to solve the problem (i.e., problem-focused, cognitive-analytical, passive-dependent, or avoidant-denial). Results revealed that highly emotional problems resulted in a greater variety of strategies used, especially for older adults. Overall, problem-focused strategies were used less often during highly emotional problem solving, whereas passive-dependent and cognitive-analytical problems were used more often as the degree of emotional involvement increased.

One criticism of this study was that the problems were hypothetical and may not have adequately addressed the true nature of real-life problem solving. Thus, Blanchard-Fields, Stein, and Watson (2004) instructed participants to describe a personal problem that was not emotional for them (e.g., disagreement with relatives, transferring to a new college) and to also report a problem that was highly emotional for them (e.g., death of a child, parent, or spouse; communication problems). After describing the problem, participants were asked to report the ways in which they handled the situations. The results indicated that highly emotional problems resulted in a higher degree of strategies used, whereas low emotionality of problems resulted in a lower degree of strategies used. Additionally, middle-aged adults were more likely to take action when confronting an emotional problem, whereas younger and older adults reported using more passive strategies.

While Blanchard-Fields and colleagues' research examined strategy type rather than strategy effectiveness, Weitzman and Weitzman (2001) qualitatively examined four levels of strategy use associated with various types of problems reported by middle-aged women. Their results indicated that lower levels of strategy effectiveness were implemented when a real-life problem involved a high degree of emotional distress. In contrast, higher levels of strategy effectiveness were reported when a personal problem was less emotionally charged. When the findings regarding emotional components of various problems are considered together, it can be concluded that the emotionality of a situation clearly influences one's way of responding to a problem. Thus, researchers who use and also create assessments to examine everyday problem-solving outcome should consider the emotional content of each item included in the task.

In addition to examining the actual emotional components of the task, some researchers have tried to alter the problem-solving setting to induce various emotions when completing a task. Kimbler (2006) manipulated verbal statements provided to middle-aged and older participants before completing a well-structured everyday problem-solving task. Participants received either standard instructions (the control group), practical support (availability of researcher to assist, if needed), or emotional support (appreciation for participation). Study findings indicated that participants who were made to
feel appreciated (emotional component) performed better on the everyday task compared to those who were given practical support or standard instructions. Kimbler's results suggest that even subtle verbal manipulations made prior to completion of an everyday problem-solving task may influence performance.

**Target of the Problem**

Individuals are bound to encounter all sorts of problems during the course of living, and those problems will likely vary in terms of structure, content, and emotionality. Another aspect to consider regarding problem content is whether the individual is dealing with his or her own personal issue or whether the problem is that of others. In other words, the target of the problem may be different (self problem vs. another person’s problem). As illustrated in some previous examples, researchers may ask individuals, “What do you do to solve the problem?” (e.g., Allaire & Marsiske, 2002), whereas other researchers may ask, “What should he/she do to solve the problem?” (e.g., Artistico et al., 2003). When presented with a dilemma, individuals may think differently about their own personal problems compared to consideration of another person’s situation. One’s own personal problems may elicit a greater emotional reaction than when considering a problem affecting someone else. For example, if you have an argument with a loved one and need to figure out what to do yourself; the situation is emotional. However, if your coworker has an argument with a loved one and asks you for help, the situation is much less emotional for you.

Neely (2006) examined whether manipulating the target of the problem affected fluency or strategy types used to solve hypothetical ill-structured tasks. Her findings revealed that younger adults generated more solutions compared to older adults when solving problems that asked, “What should you do to solve the problem?” Middle-aged adults generated more solutions compared to younger and older adults when solving problems that ask, “What should the person do to solve the problem?” However, when strategy types were analyzed, there were no age differences in proactive strategy use for “self” or “other” targets. This finding supports our previous point regarding age differences that may or may not emerge when considering varied methodologies.

Some of the methodological problems discussed previously arise when assessing other aspects of cognition, such as intelligence (e.g., primary abilities, secondary abilities). Perhaps the multiple methods used to examine everyday problem solving are currently essential in the field of everyday cognition to uncover the contextual elements underlying everyday cognitive performance. Various methodologies that use tighter controls may further reveal that everyday cognition is multidimensional, like intelligence, and one unifying
aspect of everyday cognition likely does not exist. Using several assessments to examine the different components of everyday cognition may be essential to fully capture the true nature of it. Further research is needed in order to propose a concrete theoretical model of everyday cognition, and longitudinal work may help reveal what happens to various aspects of everyday cognition over time.

REAL-WORLD CORRELATES

As discussed earlier, the study of everyday cognition was predicated on the notion that traditional measures of cognition may fail to appropriately capture older adults’ cognition in context and that more ecologically valid assessments are needed (e.g., Berg & Sternberg, 1985). Consequently, the literature is replete with varied assessments of everyday cognition and studies examining age differences in and predictors of performance on these measures (e.g., Marsiske & Margrett, 2006; Thornton & Dumke, 2005). Unfortunately, less attention has been paid to addressing the question of whether or not there is value added by assessing everyday cognition (Allaire & Marsiske, 2002; Berg, 2008; Weatherbee & Allaire, 2008). If everyday cognition captures cognition in the real world, then it stands to reason that performance on such measures should be strongly related to real-world outcomes. In fact, everyday cognition should be more related to these real-world outcomes than measures of cognition if the thesis that initiated the field is correct. Otherwise, studying everyday cognition does not “buy” us anything, other than what was afforded by traditional psychometric measures of cognitive functioning.

This section provides a review of the limited work examining the relationship between everyday cognition and important real-world outcomes. These outcomes may vary depending on whether the focus is on instrumental everyday cognition (Allaire & Marsiske, 1999), where the outcome might be daily functioning (e.g., ability to perform instrumental activities of daily living [IADL]), or socioemotional/interpersonal everyday cognition (e.g., Berg & Klaczynski, 2002; Blanchard-Fields & Chen, 1996; Blanchard-Fields et al., 2007), where emotional well-being might be of interest.

Instrumental Everyday Cognition and Outcomes

Most of the attempts to link everyday cognition with real-world outcomes come from the work focusing on instrumental domains. This focus is not surprising given that the ability to solve instrumental everyday problems regarding medication, nutrition, or financial management should have real-world implications (Willis, 1991; Willis & Schaie, 1986). Empirical studies link
Everyday Problem Solving

instrumental everyday cognitive abilities with important outcomes including day-to-day functioning, mortality, and cognitive impairment.

Everyday Functioning

Diehl and colleagues (1995) administered an objective measure of everyday cognition in which older adults use actual stimuli, such as a medication bottle or a page from the phone book, and are asked to solve everyday problems based on those stimuli. Performance on this measure predicted older adults’ performance on an in-home behavioral observation of IADL performance. Allaire and Marsiske (2002) examined the relationship between older adults’ self-ratings of competency performing instrumental tasks of daily living and performance on the Everyday Cognition Battery (ECB; Allaire, 1998; Allaire & Marsiske, 1999), which assesses older adults’ memory, reasoning, and knowledge abilities within the instrumental domains of medication use, financial management, and food preparation/nutrition. Using an ethnically heterogeneous sample of 174 older adults ranging from 60 to 91 years, performance on the ECB was positively and significantly associated with older adults’ everyday competency. More importantly, the ECB explained all of the variance associated with basic cognitive abilities as well as providing unique predictive salience in accounting for almost 50% of the variance in older adults’ everyday competency.

Mortality

In addition to everyday functioning, previous cognitive aging research has examined mortality as an outcome of everyday cognitive functioning. This area is important for the validity of everyday cognitive assessments given that previous cross-sectional research has established a link between decline in basic cognitive functioning and an increased risk of mortality (Bosworth, Schaie, & Willis, 1999; Johansson et al., 2004; Maier & Smith, 1999; Small & Bäckman, 1997; Swan, Carmelli, & LaRue, 1995). Weatherbee and Allaire (2008) identified 56 participants from the original ECB data collection (Allaire & Marsiske, 1999, 2002) who were deceased and used performance on three of the ECB subtests (Reasoning, Memory, and Knowledge) in 1996 to predict time to death. Results indicated that better performance on two of the tests, the ECB Knowledge and ECB Reasoning tests, was significantly associated with a decrease in the risk of death. Moreover, the ECB Knowledge test, which captures domain-specific knowledge, remained significant even after controlling for performance on basic cognitive abilities as well as self-rated health. It is possible that limitations in everyday knowledge could actually be associated with real-world behaviors that potentially compromise competency and put older adults at risk for serious adverse outcomes such as death.
(i.e., Maier & Smith, 1999). This mechanism makes intuitive sense given that ECB taps adaptive knowledge regarding medication usage, nutrition, and financial management.

Similar results were reported by Allaire and Willis (2006), who used data from 773 rural older adults assessed at two time points separated by 2 years. After controlling for general cognitive status as assessed by the MMSE (Folstein et al., 1975), better performance on a measure of instrumental everyday cognition at Time 1 was associated with a decreased risk of mortality. In addition, decline in performance from Time 1 to Time 2 was significantly associated with an increased risk of mortality.

**Mild Cognitive Impairment**

Mild cognitive impairment (MCI) is hypothesized as the transitional period between normal aging and dementia, where conversion rates from MCI to dementia range from 6%–25% depending on the assessment method and study duration (Petersen et al., 2001). MCI is marked by reduced cognitive capacity defined by a number of different criteria (Jorm, Christensen, Korten, Jacob, & Henderson, 2001; Jorm et al., 2004; Petersen, 2000). The maintenance of activities of daily living is one of the factors differentiating mild cognitive impairment (MCI) from dementia (Petersen). However, there is growing evidence to suggest that difficulties performing more complex instrumental everyday tasks might be observed in older adults with MCI (e.g., Farias et al., 2006; Griffith et al., 2003; Okonkwo, Wadley, Griffith, Ball, & Marson, 2006; Perneczky et al., 2006; Wadley et al., 2007). Therefore, performance on real-world measures of everyday cognition may be useful in identifying older adults with or at risk for MCI.

In the longitudinal study of rural older adults by Allaire and Willis (2006), discussed earlier, older adults were assigned ratings using the Clinical Dementia Rating scale (CDR; Hughes, Berg, Danziger, Coben, & Martin, 1982). Participants that received a CDR of 0 (no impairment) were assigned to the intact group, older adults with ratings of possible/incipient impairment (CDR = .05) were assigned to the possible impaired group, and those participants with a CDR of 1 or greater were assigned to the impaired group. At both occasions of measurement (separated by 2 years), the nonimpaired participants performed significantly higher, on average, than the possible impaired and impaired groups. In addition, the impaired group performed significantly worse than the possible impaired group. Everyday Problems for the Cognitively Challenged Elderly (EPCCE) performance of the nonimpaired group was approximately 1.68 and 1.76 SD units above that of the impaired group at Time 1 and Time 2, respectively. In addition, relative to the nonimpaired participants, decline in everyday problem-solving performance over the 2-year interval was significantly greater for impaired
participants and those participants who transitioned from nonimpaired to impaired over the course of the study.

Conclusions and Future Directions

As discussed throughout this chapter, compared to a traditional, psychometric approach, adopting an everyday approach can afford clinicians and researchers an opportunity to assess skill and performance on tasks that older adults are more likely to encounter in their own daily lives. The everyday cognition field has propelled cognitive aging research forward beyond the laboratory. The fruits of this effort have been development of more naturalistic tasks and appreciation of task and problem-solver context. The next challenge appears to be careful consideration of how best to evaluate performance. Along with the flexibility and benefits related to adopting an “everyday” approach to the assessment and study of cognitive development, several areas need to be explored in order to advance this line of inquiry. This review of the everyday problem-solving literature suggests several avenues for future research with the underlying objective of developing assessments that are both sensitive to individual contexts and useful in detecting and predicting meaningful change.

First, we agree with Marsiske and Margrett (2006) that to advance the field it is critically important that researchers establish and validate everyday problem-solving performance against criteria meaningful within older adults’ lives. It is clear that criteria are needed by which to assess performance and judge competency. This is not an easy or straightforward task because the nature of everyday cognition is quite complex and can vary from person to person; even for one person, ability can vary from task to task and certainly over time as ability and goals change. Adding to the complexity is the diversity of tasks discussed throughout this chapter and the degree of domain specificity, which has not been fully explicated. Several important outcomes related to everyday problem-solving ability are evident, such as IADL and functional ability, mental status, and mortality; however, it is less clear how to distinguish competency within the realm of everyday problems. Determining competency may be more concrete for instrumental tasks that are well structured and require a linear or rationale approach (e.g., completing an insurance form). The task is more daunting for ill-structured problems, including those of a socioemotional nature, which vary due to individual perceptions, expectations, and goals (e.g., resolving a disagreement with a family member).

A second issue central to this line of inquiry is the question, “What is an ‘everyday’ cognitive ability?” This question is increasingly complex as the nature of everyday life changes, seemingly at a faster and faster rate. The answer may lie in considering how skills vary by problem-solver characteristics
and context as noted by Willis (1991). The cognitive skills needed to survive and excel throughout one's life certainly vary by cultural and age-cohort context. Within the psychometric approach to cognition, researchers have documented cohort or generational differences in cognitive development and ability. For example, mathematical ability decreased across successive generations—a change speculated to be the result of the handheld calculator, which freed individuals from regularly performing mathematical operations mentally or by hand (Schaie, 2005). Additional research is needed to investigate analogous cohort changes within everyday problem-solving ability. In contemporary societies, which skills are needed and thus further developed versus which skills are no longer an "everyday" necessity? Technology seems central to this question. For example, during the course of the 2008 U.S. presidential election, debate ignited following remarks by Senator John McCain alluding to the limited scope of his computer literacy and knowledge (Leibovich, 2008). Many Americans voiced the opinion that technological abilities are a necessary and crucial everyday skill in contemporary society. The debate likely symbolizes a "technological divide" across cohorts. With rapidly increasing technology use, it is not clear what impact technological skills will have on the field of everyday cognition and cognitive intervention. There is a rise in computer-assisted technologies to enhance the lives of older adults and persons with disabilities; however, it is not clear that the technological solutions posed will resonate with or be effectively used by these consumers.

In addition to technology and cohort-related differences in everyday skill perceptions and use, current demographics compel us to consider cultural context. Several pertinent research questions arise when we consider the aforementioned issues and investigations incorporating multiple cultures. Issues related to task, learner, and context should be in the forefront of cognitive research (e.g., Manly, Bryd, Touradji, & Stern, 2004; Prince, 2000; Willis, 1991). Several key issues emerge related to age and culture and their effects on clinical and research efforts. First, the question arises as to which cognitive skills are nurtured and required throughout an adults' life. Relevant to the current discussion is identification of skills that are expected, supported, and/or practiced in later life. Second, what is the degree of cultural specificity as related to needed everyday cognitive skills? How does cultural context and background impact the criterion by which we assess everyday competency in adulthood and older age? How do individuals from multicultural backgrounds fare in late life? Finally, we might inquire if the theoretical hierarchy relating cognitive abilities, problem solving, and functioning holds across cultural groups. These questions are reminiscent of prior theoretical and empirical work examining cognitive development in childhood as well as the work of individuals examining culturally relevant skills in early childhood and the equivalence of measures.
A final issue is sensitivity of assessment. As noted earlier, changes in the ability to perform needed daily activities are evident in dementia and may signal significant decline within the context of mild cognitive impairment. Measures that capture real-time change and can assist prevention and intervention efforts are warranted. Yet to be fully explored is the nature of change in everyday problem-solving ability (see Nesselroade, 2001, for a discussion). In addition to traditional longitudinal work, empirical studies of intraindividual variability in everyday problem solving are needed. Such an approach assumes that the everyday cognitive competency captured at one occasion of measurement might not represent performance the previous or following days. That is, older adults' abilities to solve cognitively complex tasks might fluctuate from one day to the next depending on factors such as stress, affect/mood, or alertness.

In summary, the everyday cognition perspective has helped to advance the ecological validity of cognitive aging research via development of more naturalistic assessments, consideration of individual contexts, and recognition of the diversity of problem outcomes, which may not fall neatly into a dichotomous division of correctness. However, much work lies ahead as researchers attempt to further bridge the psychometric and clinical approaches. Researchers must grapple with developing appropriate validation criteria, addressing issues of more macro-focused context, such as culture and technology, and improving methodological approaches that are sensitive to change.

REFERENCES


