

Assessing Financial Capacity in Patients With Alzheimer Disease

A Conceptual Model and Prototype Instrument

Daniel C. Marson, JD, PhD; Stephen M. Sawrie, PhD; Scott Snyder, PhD; Bronwyn McInturff, MS; Tracy Stalvey, MPH; Amy Boothe; Traci Aldridge; Anjan Chatterjee, MD; Lindy E. Harrell, MD, PhD

Objective: To investigate financial capacity in patients with Alzheimer disease (AD) using a new theoretical model and prototype psychometric instrument.

Design: Cross-sectional comparisons of older control subjects (n=23) and patients with mild (n=30) and moderate AD (n=20).

Main Outcome Measures: Financial capacity was measured using the Financial Capacity Instrument, a prototype psychometric instrument that tests financial capacity using 14 tasks of financial ability comprising 6 clinically relevant domains of financial activity: basic monetary skills, financial conceptual knowledge, cash transactions, checkbook management, bank statement management, and financial judgment.

Results: The Financial Capacity Instrument tasks and domains showed adequate to excellent internal, inter-rater, and test-retest reliabilities. At the task level, patients with mild AD performed equivalently with controls on simple tasks such as counting coins/currency and conducting a 1-item grocery purchase, but significantly below controls on more complex tasks such as using a checkbook/register and understanding and using a bank

statement. At the domain level, patients with mild AD performed significantly below controls on all domains except basic monetary skills. Patients with moderate AD performed significantly below controls and patients with mild AD on all tasks and domains. Regarding capacity status outcomes (capable, marginally capable, incapable) on domains, patients with mild AD had high proportions of marginally capable or incapable outcomes (range, 47%-87%), particularly on difficult domains like bank statement management (domain 5) and financial judgment (domain 6), but variability in individual outcomes. Patients with moderate AD had almost exclusively incapable outcomes across the 6 domains (range, 90%-100%).

Conclusions: Financial capacity is already significantly impaired in mild AD. Patients with mild AD demonstrate deficits in more complex financial abilities and impairment in most financial activities. Patients with moderate AD demonstrate severe impairment of all financial abilities and activities. The Financial Capacity Instrument has promise as an instrument for assessing domain-level financial activities and task-specific financial abilities in patients with dementia.

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From the Department of Neurology (Drs Marson, Sawrie, Chatterjee, and Harrell, Mss McInturff, Boothe, and Aldridge, and Mr Stalvey), Alzheimer's Disease Research Center (Drs Marson, Chatterjee, and Harrell), Center for Aging (Drs Marson, Chatterjee, and Harrell), School of Education (Dr Snyder), University of Alabama at Birmingham, and Birmingham Veterans Administration Medical Center (Dr Harrell). Dr Chatterjee is now with the Department of Neurology, University of Pennsylvania, Philadelphia.

LOSS OF higher order functional capacities (Instrumental Activities of Daily Life)¹ is a defining feature of Alzheimer disease (AD).^{2,3} As memory, language, and judgment abilities erode, patients with AD lose the capacity to make medical health care decisions,^{4,5} manage their financial affairs,⁶ drive,^{7,8} use the telephone,⁹ and take medication.¹⁰ Loss of such higher order capacities results in significant patient disability and family caregiving burdens and costs, and can be associated with increased hospitalization time and economic costs,^{11,12} and mortality.¹¹

Considerable progress has been made in understanding the neurocognitive changes that occur in AD.^{13,14} In contrast,

we know surprisingly little about impairment and loss of higher order capacities in dementia and in normal cognitive aging.¹⁵ An important example is financial capacity. Financial capacity comprises a broad range of conceptual, pragmatic, and judgmental abilities important to the independent functioning of older adults.¹⁶⁻¹⁸ Recent aging research has suggested the special character of financial capacity as a higher order capacity. Financial capacity has been found to be an "advanced" activity of daily life (along with using the telephone and eating), conceptually and statistically distinct from "household" activities of daily life (ie, meal preparation, shopping, and light and heavy housework) and "basic" activities of daily life (ie, bathing, dressing, walking, and toileting).¹¹ The advanced activities of daily

PARTICIPANTS AND METHODS

CONCEPTUAL MODEL OF FINANCIAL CAPACITY

Financial capacity represents a broad continuum of activities and specific skills. We conceptualized financial capacity as a series of discrete, clinically relevant domains of activity rather than as a unitary construct. A domain-based approach better approximates the multidimensionality of financial capacity and is consistent with the legal doctrine of limited financial competency adopted within most state legal jurisdictions, which recognizes that an individual may be competent to carry out some financial activities and not others.²⁵ In addition to domains, our model identifies specific financial abilities or tasks. For example, the domain of “checkbook management” might draw on specific abilities such as understanding the parts of a checkbook/register, and also pragmatically using a checkbook/register in everyday transactions. Thus our conceptual model of financial capacity has 2 levels: (1) general domains of financial activity clinically relevant to the independent functioning of community-dwelling older adults; and (2) specific financial abilities or tasks, each of which is relevant to and operationalizes individual domains.

FINANCIAL CAPACITY INSTRUMENT

In developing a psychometric instrument, we began by identifying domains of everyday financial activity. Inclusion criteria for domains were (1) theoretical relevance to independent functioning of community-dwelling older adults, (2) clinical relevance to health care professionals who treat older adults and evaluate financial capacity, and (3) general relevance to extant and prior state statutory criteria for financial competency.^{36,37} Based on these criteria, we identified 6 initial domains of financial activity: basic monetary skills; financial conceptual knowledge; cash transactions; checkbook management; bank statement management; and financial judgment (**Table 1**). To operationalize these domains, we developed standardized, quantifiable behavioral tasks specific to each domain. Inclusion

criteria for financial tasks were (1) theoretical relevance to a particular domain; (2) practicality of implementation within a laboratory setting³⁴; and (3) varying task difficulty levels that might be differentially sensitive to dementia level. Financial tasks were generally identified from a review of existing behavioral assessment measures with financial items.^{33,34} However, the actual tasks developed in our laboratory were original and not borrowed from other instruments. Overall, we developed 14 specific financial tasks, which are set forth by their respective domain and difficulty level (simple or complex) in Table 1.

FCI Administration

The FCI tasks are administered according to a standardized protocol. Tasks are presented serially by domain, beginning with task 1a of domain 1 (Table 1). The prototype FCI used in this study took about 30 to 40 minutes to administer to older controls, and 40 to 50 minutes to administer to patients with dementia.

FCI Scoring

Performance scores for the FCI tasks and domains are obtained using a standardized scoring system. Prompts and scoring anchors are incorporated into tasks to facilitate the validity, reliability, and interpretability of scores. On many items, spontaneous response and recall questions are supplemented with recognition format questions so that partial credit is available to patients with amnesia or aphasia. Performance scores for each FCI domain are obtained by summing task scores within that domain. Preliminary cutoff scores for determining capacity outcome status on the FCI domains (capable, marginally capable, incapable outcomes) were established in relation to normal control performance. Cutoff scores for distinguishing capable from marginally capable outcomes, and marginally capable from incapable outcomes, were set at 1.5 SDs and 2.5 SDs, respectively, below the control group mean for the domain. This psychometric approach to classification of capacity status has been used successfully in prior capacity research.⁴

life are specifically associated with cognitive function¹⁹ and their loss differentially predicts hospital contact and mortality.¹¹ Thus financial capacity represents a cognitively complex activity that may be particularly vulnerable to dementia and cognitive aging.²⁰

Loss of financial capacity has important consequences for patients with dementia and their families. First, there are economic and psychological consequences. Patients with dementia often have difficulties paying bills and handling basic financial tasks,⁶ and are at risk for making decisions that endanger assets needed for their own long-term care or intended for testamentary distribution to family members. Like loss of driving privileges, loss of control over one's own funds can have significant psychological consequences since it implicates a core aspect of individual autonomy in our society.²¹ Second, loss of financial capacity has clinical significance to health care professionals who treat patients with dementia. Impairments

in financial skills and judgment are often early functional changes demonstrated by patients with dementia.²⁰ Third, declining financial capacity is closely linked to legal issues of elder person abuse. Financial exploitation is a form of elder person abuse commonly associated with victims' diminished or impaired mental capacities.²² The media are replete with accounts of older adults victimized in consumer fraud and other scams.²³ Older adults can also be more covert victims of undue influence exercised by family members and third parties.²⁴

Finally, loss of financial capacity implicates important legal issues of competency.²⁵ A disproportionately high number of older adults are subjects each year of conservatorship proceedings, owing to the high incidence of dementias and other mental and medical illnesses affecting financial competency in this age group.²⁵ These legal proceedings involve significant time and expense for families. Loss of financial capacity has implications not only

STUDY PARTICIPANTS

Participants consisted of 23 normal older controls and 50 patients with AD. Controls were cognitively intact, healthy, older adults who were recruited from the community. Mean (SD) Mini-Mental State Examination (MMSE)³⁸ score for controls was 29.2 (0.9). All 50 patients with AD were community-dwelling individuals whose dementia was well characterized using neurological, neuropsychological, and neuroradiological procedures. Diagnosis of probable or possible AD was based on National Institute of Neurological and Communicative Disorders and Stroke–Alzheimer's Disease and Related Disorders Association criteria³ and consensus of a neurologist (L.E.H.) and neuropsychologist (D.C.M.). Mean MMSE score for the total group of patients with AD was 20.4 (4.4). Patients with AD were divided into subgroups of those with mild AD (MMSE score, ≥ 20) (n=30) (mean [SD] MMSE score, 23.5 [1.8]) and those with moderate AD (MMSE score range, ≥ 9 and < 20) (mean MMSE score, 16.0 [3.0]) (n=20). In prior capacity research these MMSE cutoff scores have been successfully used to stage mild and moderate AD.^{4,5}

Controls (mean [SD], 70.3 [6.7] years) did not differ in age from the total group of patients with AD (73.8 [7.6] years) ($t=1.9$, $P=.07$). The sex distributions of both groups were virtually identical ($\chi^2=0.07$, $P=.80$), with about 37% male (9 of 23 controls, 19 of 50 patients with AD) and 63% female (14 of 23 controls, 31 of 50 patients with AD). However, controls (15.2 [1.8] years) had more education than the patients with AD (12.8 [3.3] years) ($t=3.3$, $P<.01$). This difference in educational level was not viewed to be clinically significant. Informed consent was obtained from all controls, and from all patients with AD and their caregivers, as part of this institutional review board–approved research.

Exclusion Criteria: Prior/Premorbid Financial Experience

Because financial capacities can covary with life experience, we sought to establish the prior financial experience of participants before evaluating their current financial abilities. This is an issue that has not been fully addressed in previous research on financial capacity in dementia.^{34,39} As

part of enrollment in the study, a form relating to prior financial experience was completed by control subjects concerning themselves (self-report), and by caregivers of patients with AD concerning these patients. Unfortunately, this prior/premorbid experience data was incomplete and in some cases inaccurate owing to the younger caregivers' (eg, grandchildren) lack of knowledge. Despite these difficulties, we believe that the FCI test results overall were valid and indicative of functional decline in patients with AD. All participants had experience with the fundamental domains of basic monetary skills, financial concepts, simple cash transactions (domains 1-3), and both of the financial judgment domain tasks (mail fraud solicitation, and simple inheritance/investment decision) (domain 6) were accessible to individuals with little or no financial experience. Participant performance on the more complex and experientially variable domains of checkbook management and bank statement management (domains 4 and 5) should be interpreted with a little more caution.

Procedures

All participants were administered the FCI. A subset of controls and patients with AD [n=17] were retested on the FCI to establish the preliminary test-retest reliability. Interrater reliability of the FCI domains and tasks was investigated using 2 independent raters and another subset of controls and patients with AD [n=11].

STATISTICAL DESIGN

Participant scores were compiled within participant group for the 14 individual tasks and 6 domains. Internal, test-retest, and interrater reliabilities of the tasks and domains were determined using Cronbach α , Pearson r , and the percentage of exact rater agreement, respectively.⁴⁰ Domain and task performance of controls and subgroups of patients with AD were compared using 1-way analysis of variance and the least significant difference post hoc test ($P<.01$).⁴⁰ Capacity outcomes of the patients with AD on the 6 domains were determined using the psychometric cutoff scores described earlier. χ^2 was used to determine the effect of dementia level on capacity outcome within domain.

for protection of the estate (conservatorship), but also for protection of the person (guardianship). It has been suggested that "everyday use of money will be highly correlated to general success in independent living."^{26(p249)} Thus, loss of financial skills is also a litmus for declining capacity to live independently and to care for oneself.

Given its importance, financial capacity has been surprisingly neglected in scientific research.¹⁸ The medico-legal literature contains only a handful of articles and chapters on financial capacity or financial competency,^{25,27-30} and no empirical clinical studies have been found. The lack of clinical research may in part reflect a lack of conceptual models and standardized assessment instruments. Prior gerontological research has yielded only elementary conceptual models for financial capacity, such as "managing finances" or "financial management"^{16,17} functions. Similarly, while established measures of functional capacities in dementia such as the Blessed Dementia

Rating Scale,^{31,32} the Direct Assessment of Function Scale,³³ the Structured Assessment of Independent Living Skills,³⁴ the Everyday Problems Test,^{15,20} and the Independent Living Scales³⁵ include financial items, these tests cover a diverse range of functional living skills and are not specific to financial capacity. Detailed clinical study of financial capacity, thus, requires development of new theoretical frameworks and empirical assessment instruments.¹⁸

In this article we investigate financial capacity in patients with AD using a new theoretical model and related prototype instrument. We first present a domain- and task-based model of financial capacity. We next describe the Financial Capacity Instrument (FCI) and present initial data concerning its psychometric properties. We then use the FCI to investigate financial capacity in AD using a sample of older control subjects and patients with mild and moderate AD.

Table 1. Description of Financial Capacity Instrument Domains and Tasks

	Task Description	Task Difficulty
Domain 1: Basic Monetary Skills		
Task 1a: Naming coins/currency	Identify specific coins and currency	Simple
Task 1b: Coin/currency relationships	Indicate relative monetary values of coins and/or currency	Simple
Task 1c: Counting coins/currency	Accurately count groups of coins and/or currency	Simple
Domain 2: Financial Conceptual Knowledge		
Task 2a: Define financial concepts	Define a variety of simple financial concepts	Complex
Task 2b: Apply financial concepts	Practical application/computation using financial concepts	Complex
Domain 3: Cash Transactions		
Task 3a: 1-Item grocery purchase	Enter into simulated 1-item transaction; verify change	Simple
Task 3b: 3-Item grocery purchase	Enter into simulated 3-item transaction; verify change	Complex
Task 3c: Change/vending machine	Obtain exact change for vending machine use; verify change	Complex
Domain 4: Checkbook Management		
Task 4a: Understand checkbook	Identify and explain parts of check and check register	Simple
Task 4b: Use checkbook/register	Enter into simulated transaction and make payment by check	Complex
Domain 5: Bank Statement Management		
Task 5a: Understand bank statement	Identify and explain parts of a bank statement	Complex
Task 5b: Use bank statement	Identify aspects of specific transactions on bank statement	Complex
Domain 6: Financial Judgment		
Task 6a: Detect fraud risk	Detect and explain risks in mail fraud solicitation	Simple
Task 6b: Make investment decision	Understand investment situation/options; make investment decision	Complex

RESULTS

FCI RELIABILITIES

Table 2 provides internal consistency data for the 6 domains and 14 constituent tasks for the full sample (N=73). Coefficient α was at acceptable levels for all domains, with strong reliabilities demonstrated for domains 1, 4, and 5. Coefficient α for all tasks was also at an acceptable level. Overall, these preliminary analyses indicated that the prototype FCI tasks and domains have sufficient internal reliability to generate meaningful scores.

Table 2 also provides the initial test-retest reliability data for the 6 domains and 14 tasks for a small test-retest sample (n=17; 10 controls and 7 patients with AD). The test-retest interval was 22.7 days (SD=9.4 days). These data demonstrated acceptable stability in performance on all domains and tasks, with the exception of task 6a (detecting risk of mail fraud). We have since revised task 6a test items to address this instability.

Table 2 also lists the initial interrater reliability data for the domains and tasks. For each FCI item, we used a conservative criterion of percentage of exact agreement between 2 raters across a subsample of controls and patients with AD (n=11). The percentage of agreement per item was then averaged for each task and domain. Adequate interrater reliabilities (>80% exact agreement) were found for all domains and tasks, with the exception of task 2a (defining financial concepts) which was marginal (67% exact agreement).

PERFORMANCE ON FCI DOMAINS AND TASKS

Table 3 sets forth the performance of the controls and patients with AD on the FCI domains and tasks. Using 1-way analysis of variance and the least significant difference post hoc test ($P<.01$), patients with mild AD per-

formed equivalently with controls on domain 1 (basic monetary skills), but significantly below controls on the other domains. Patients with moderate AD performed significantly below controls and patients with mild AD on all domains. On the FCI tasks, patients with mild AD performed equivalently with controls on simple tasks such as naming coins/currency, counting coins/currency, understanding parts of a checkbook, and detecting risk of mail fraud. Patients with mild AD performed significantly below controls on more complex tasks such as applying financial concepts, obtaining exact change for vending machine use, understanding and using a bank statement, and making an investment decision. Patients with moderate AD performed significantly below controls and patients with mild AD on all tasks.

CAPACITY OUTCOMES ON FCI DOMAINS

Table 4 provides the capacity outcomes for the subgroups of patients with AD on the 6 FCI domains. In the context of an experimental instrument and small control sample with limited heterogeneity (see "Methods" section), these outcomes should be interpreted cautiously. Patients with mild AD demonstrated a bimodal pattern of capacity loss across the domains. While approximately 50% of the patients with mild AD were found capable on domains 1 through 3, less than 30% were found capable on domains 4 and 5 (ie, checkbook management and bank statement management), and less than 15% were found capable on domain 6 (financial judgment). These findings suggested that the FCI domains may form a hierarchy of difficulty for patients with mild AD. Patients with moderate AD, in contrast, demonstrated very high rates of incapable outcomes on all FCI domains (range, 90%-100%). The effect of dementia stage on capacity outcome was robust.

Table 2. Reliabilities of Financial Capacity Instrument Domains and Tasks*

	Coefficient α (n = 73)	Test-Retest r † (n = 17)	% Exact Interrater Agreement (n = 11)
Domain 1: Basic Monetary Skills	0.92	.98	99.7
Task 1a: Naming coins/currency	0.82	.84	100.0
Task 1b: Coins/currency relationships	0.83	.92	99.2
Task 1c: Counting coins/currency	0.85	.88	100.0
Domain 2: Financial Conceptual Knowledge	0.88	.93	87.3
Task 2a: Define financial concepts	0.79	.94	67.0
Task 2b: Apply financial concepts	0.82	.90	98.2
Domain 3: Cash Transactions	0.85	.91	99.1
Task 3a: 1-Item grocery purchase	0.68	.83	98.5
Task 3b: 3-Item grocery purchase	0.73	.83	100.0
Task 3c: Change/vending machine	0.63	.87	98.7
Domain 4: Checkbook Management	0.93	.85	92.5
Task 4a: Understanding checkbook	0.89	.81	88.7
Task 4b: Use checkbook/register	0.88	.92	100.0
Domain 5: Bank Statement Management	0.91	.92	86.4
Task 5a: Understand bank statement	0.88	.78	81.0
Task 5b: Use bank statement	0.79	.82	97.0
Domain 6: Financial Judgment	0.89	.88	88.1
Task 6a: Detect fraud risk	0.72	.50	92.7
Task 6b: Make investment decision	0.88	.92	85.9

*Boldfaced values indicate domain level reliabilities.

†All coefficients were $P < .001$, except Task 6a where $P < .05$.

Table 3. Performance on Financial Capacity Instrument Domains and Tasks by Diagnostic Group*

	Score Range	Controls (n = 23)	Patients With Mild AD (n = 30)	Patients With Moderate AD (n = 20)
Domain 1: Basic Monetary Skills	0-79	77.9† (1.9)	75.5† (3.5)	57.9 (16.3)
Task 1a: Naming coins/currency	0-30	30.0† (0.0)	30.0‡ (0.0)	26.7 (4.7)
Task 1b: Coins/currency relationships	0-37	36.0† (1.8)	34.0‡ (3.0)	22.7 (9.2)
Task 1c: Counting coins/currency	0-12	11.9† (0.3)	11.5§ (0.8)	8.6 (3.8)
Domain 2: Financial Conceptual Knowledge	0-41	35.5†§ (2.7)	29.6‡ (5.4)	19.1 (6.3)
Task 2a: Define financial concepts	0-16	13.0†§ (1.9)	9.7‡ (2.9)	7.1 (2.7)
Task 2b: Apply financial concepts	0-25	22.5†§ (1.4)	19.9‡ (3.6)	12.0 (4.6)
Domain 3: Cash Transactions	0-48	46.2†§ (2.7)	38.6‡ (8.5)	22.2 (10.1)
Task 3a: 1-Item grocery purchase	0-16	15.3† (2.5)	14.4‡ (3.2)	8.6 (4.9)
Task 3b: 3-Item grocery purchase	0-16	15.2†§ (1.3)	10.7‡ (5.0)	4.6 (3.3)
Task 3c: Change/vending machine	0-16	15.7†§ (0.6)	13.6‡ (2.8)	9.0 (4.1)
Domain 4: Checkbook Management	0-62	60.2†§ (2.1)	50.7‡ (8.0)	33.3 (16.1)
Task 4a: Understanding bank statement	0-32	30.7† (1.5)	27.9‡ (3.1)	20.6 (7.6)
Task 4b: Use checkbook/register	0-30	29.5†§ (1.5)	22.8‡ (6.1)	12.2 (9.1)
Domain 5: Bank Statement Management	0-40	37.4†§ (2.2)	28.6‡ (7.6)	14.9 (7.2)
Task 5a: Understand bank statement	0-22	19.7†§ (2.1)	15.0‡ (4.1)	8.0 (3.6)
Task 5b: Use bank statement	0-18	17.7†§ (0.9)	13.6‡ (4.3)	6.9 (4.1)
Domain 6: Financial Judgment	0-37	30.0†§ (3.0)	20.8‡ (5.4)	10.7 (5.1)
Task 6a: Detect fraud risk	0-10	8.6† (2.0)	7.8§ (2.2)	6.9 (2.8)
Task 6b: Make investment decision	0-27	21.4†§ (2.1)	13.0§ (4.4)	5.3 (3.5)

*Boldfaced values indicate domain level performance; AD, Alzheimer disease; numbers in parentheses, the SDs.

†Normal control mean differs significantly from moderate AD mean using least significant difference post hoc test ($P < .01$).

‡Mild AD mean differs significantly from moderate AD mean using least significant difference post hoc test ($P < .01$).

§Normal control mean differs significantly from mild AD mean using least significant difference post hoc test ($P < .01$).

COMMENT

As our society ages, clinical assessment of higher order functional capacities has become increasingly important. In areas like financial capacity, medical decision-making capacity, medication compliance, and driving, society has a strong interest in accurately discriminating intact from impaired functioning. As noted in the intro-

duction, nowhere is this societal interest more pressing than in the area of financial capacity and AD. Every year large numbers of patients with dementia and their families suffer challenges and hardships related to loss of financial abilities. While in some cases families respond promptly and appropriately to these functional changes, in many other cases tragedies involving financial exploitation or unintentional self-improvement occur.²² Ac-

Table 4. Capacity Outcomes on Financial Capacity Instrument Domains for Subgroups of Patients With Alzheimer Disease (AD)

	% of Patients (No. of Patients/Total No. of Patients in Subgroup)			P*
	Capable	Marginally Capable	Incapable	
Domain 1: Basic Monetary Skills				
Patients with mild AD	53 (16/30)	17 (5/30)	30 (9/30)	<.001
Patients with moderate AD	10 (2/20)	0 (0/20)	90 (18/20)	
Domain 2: Financial Conceptual Knowledge				
Patients with mild AD	47 (14/30)	13 (4/30)	40 (12/30)	.002
Patients with moderate AD	5 (1/20)	5 (1/20)	90 (18/20)	
Domain 3: Cash Transactions				
Patients with mild AD	47 (14/30)	10 (3/30)	43 (13/30)	<.001
Patients with moderate AD	0 (0/20)	0 (0/20)	100 (20/20)	
Domain 4: Checkbook Management				
Patients with mild AD	27 (8/30)	13 (4/30)	60 (18/30)	.02
Patients with moderate AD	0 (0/20)	5 (1/20)	95 (19/20)	
Domain 5: Bank Statement Management				
Patients with mild AD	27 (8/30)	16 (5/30)	57 (17/30)	.003
Patients with moderate AD	0 (0/20)	0 (0/20)	100 (20/20)	
Domain 6: Financial Judgment				
Patients with mild AD	13 (4/30)	37 (11/30)	50 (15/30)	.007
Patients with moderate AD	0 (0/18)	6 (1/18)	94 (17/18)	

*Significance of difference between dementia subgroup outcomes using χ^2 test.

cordingly, just as there is growing awareness of public health issues regarding dementia and driving capacity,^{7,8} so equally there needs to be increased public attention to loss of financial capacity in dementia.⁴¹ Early clinical detection of impaired financial abilities will help protect both the economic resources and emotional well-being of dementia patients and their families.

The prototype FCI was developed to assess everyday financial activities and abilities relevant to community-dwelling older adults, and likely to be compromised by dementia. The FCI represents a potential advance in functional assessment because it (1) is specific to the construct of financial capacity; (2) conceptualizes financial capacity as a series of discrete clinical spheres of activity (domains) linked to independent community function—a new theoretical approach that is flexible and clinically oriented; (3) operationalizes domains with tests of specific financial abilities (tasks), which are objective and behaviorally anchored; (4) classifies task difficulty at 2 levels—simple and complex; (5) includes recognition items on many tasks to support the performance of patients with amnesia and aphasia; (6) quantifies performance on tasks and domains, and establishes capacity outcomes on domains; (7) demonstrates initial psychometric properties of reliability; (8) demonstrates initial face and content validity; and (9) demonstrates initial construct validity by discriminating performance and capacity outcomes of controls and patients with mild and moderate AD.

The initial psychometric data indicated that the FCI is a reliable instrument (Table 2). Internal reliability for the FCI domains was quite high, with coefficient α greater than 0.85 for all domains, and greater than 0.90 for 3 domains (domains 1, 4, and 5). Both test-retest and interrater reliabilities were also at good levels for all domains and virtually all tasks.

Analyses demonstrated that the FCI domains and tasks discriminated well the performance of controls and

patients with mild AD and patients with moderate AD (Table 3). Patients with mild AD performed equivalently with controls on domain 1 (basic monetary skills) but significantly below controls on the other 5 domains. For the FCI tasks, patients with mild AD performed equivalently with controls on simple tasks such as conducting a 1-item grocery store purchase or detecting risk of fraud but significantly below controls on more complex tasks. Patients with moderate AD performed significantly below controls and patients with mild AD on all domains and tasks.

The capacity outcome findings on the FCI domains offered an additional perspective on loss of financial abilities in dementia. Approximately 15 (50%) of the patients with mild AD were found capable on fundamental financial activities such as basic monetary skills, knowing/using financial concepts, and conducting cash transactions (domains 1-3) (Table 4). On more difficult financial activities like checkbook management, bank statement management, and financial judgment (domains 4-6), only about 8 patients (25%) or fewer of the 30 patients with mild AD were found to be capable. This pattern of pronounced capacity loss on more difficult domains probably reflects the higher order neurocognitive deficits characteristic of mild AD—in abstract reasoning, executive function, semantic knowledge, as well as short-term recall.^{13,42,43}

In contrast to patients with mild AD, few if any of the patients with moderate AD were found to be capable on the FCI domains. As a group, the patients with moderate AD demonstrated virtually global incapable outcomes on the domains (range, 90%-100%)(Table 4). Neurocognitive deficits are global and advanced in moderate AD and involve basic attentional^{44,45} and receptive language capacities,⁴⁴ as well as memory, calculations, and basic semantic knowledge, and executive function.^{13,43} These deficits potentially impair performance of even simple, previously automatic tasks such as counting coins/

currency or carrying out simple grocery store transactions and, thus, lead to incapacity in even the most basic financial activities.

Given these findings, there not surprisingly was a robust relationship between dementia stage and capacity outcome across the domains (Table 4). However, in contrast with patients with moderate AD, considerable variability was noted in the individual capacity outcomes for patients with mild AD. There were a number of capable and marginally capable outcomes for patients at the lower end of the mild AD range (ie, MMSE scores ≥ 20 and ≤ 23). It appears that capacities to carry out different financial activities can still vary among patients with mild AD, to some extent irrespective of relative dementia level. In contrast, patients with moderate AD demonstrated virtually complete incapacity across the same domains—even those patients at the upper end of the moderate range (eg, MMSE scores ≥ 17 and < 20). These findings again suggest that as patients with AD enter the moderate stage there is increasingly global loss of financial capacity.

The findings discussed earlier represent perhaps the first systematic effort to investigate psychometrically loss of financial capacity in dementias like AD. The findings have important clinical implications. They suggest that, early on in AD, there is significant impairment of financial capacity. Patients with mild AD appear to experience deficits in complex financial abilities, and some level of impairment in almost all financial activities. Patients with moderate AD appear to experience loss of both simple and complex financial abilities, and demonstrate severe impairment across all financial activities. Accordingly, we propose the following preliminary clinical guidelines:

- Patients with mild AD are at significant risk for impairment in most financial activities, in particular complex activities like checkbook and bank statement management. Areas of preserved autonomous financial activity should be carefully evaluated and monitored.
- Patients with moderate AD are at great risk for loss of all financial activities. Although each patient with AD must be considered individually, it is likely that most patients with moderate AD will be unable to manage their financial affairs.

Some limitations of this study should be noted. First, this was an initial and exploratory study, with relatively small samples of controls and patients with mild and moderate AD. Studies that include a larger and more heterogeneous control sample are needed, particularly for establishing clinically meaningful psychometric cutoff scores for identifying capacity status. As discussed elsewhere,^{4,46} such cutoff scores are not intended to displace the clinician, but to provide objective reference points to better support clinical decision making. Second, methodological issues concerning participants' premorbid financial experience will need attention. Reliable and accurate assessment of premorbid financial abilities appears to be an integral aspect of research into financial capacity. Finally, neuropsychological studies of loss of financial capacity in dementia will be valuable. Such studies can reveal neurocognitive changes in AD associated with loss of different financial abilities and may thereby establish clinical markers of financial incapacity.

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Corresponding author: Daniel Marson, JD, PhD, Department of Neurology, University of Alabama at Birmingham School of Medicine, 625 19th St S, 1216 Jefferson Tower, Birmingham, AL 35233-7340 (e-mail: dmarson@uab.edu).

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