Exploring the Factor Structure of Financial Capacity in Cognitively Normal and Impaired Older Adults

Adam Gerstenecker, PhD[1], **Kristen Triebel, PsyD**[1,2], **Amanda Eakin, MA**[1], **Roy Martin, PhD**[1,2], and **Daniel Marson, PhD, JD**[1]

[1]Department of Neurology, University of Alabama at Birmingham, USA

[2]Alzheimer's Disease Center, University of Alabama at Birmingham, USA

Abstract

Objectives: To investigate the factor structure of financial capacity using a direct-performance measure of financial skills (The Financial Capacity Instrument [FCI]) as a proxy for the financial capacity construct.

Methods: The study sample was composed of 440 older adults who represented the cognitive spectrum from normal cognitive aging to mild cognitive impairment (MCI) to mild dementia: 179 healthy older adults, 149 participants with MCI, and 112 participants with mild Alzheimer's dementia (AD).

Results: Both Velicer's Minimum Average Partial test and Horn's parallel analysis supported a four-factor solution which accounted for 46% of variance. The four extracted factors were interpreted as: (1) *Basic Monetary Knowledge and Calculation Skills*, (2) *Financial Judgment*, (3) *Financial Conceptual Knowledge*, and (4) *Financial Procedural Knowledge*.

Conclusions: The study findings represent an important first step in empirically articulating the financial capacity construct in aging. The four identified factors can guide both clinical practice and future instrument utilization and development.

Clinical Implications: Cognitively impaired older adults with MCI and mild AD dementia are likely to show financial changes in one or more of the four identified financial factors. Clinicians working with older adults should routinely examine for potential changes in these four areas of financial function.

Corresponding Author Daniel Marson, Department of Neurology, University of Alabama at Birmingham, Sparks Center 650 , Birmingham, AL 35294, dmarson@uab.edu.

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Introduction

Financial capacity is a medical–legal construct that represents the ability to independently manage one's own financial affairs in a manner consistent with personal self-interest and values (Marson & Hebert, 2008; Marson, Triebel, & Knight, 2012). Along with driving and mobility, financial capacity is a core aspect of individual autonomy in our society (Marson, 2001; Marson et al., 2012)(Marson & Zebley, 2001). Financial capacity involves not only performance skills (e.g., counting coins/currency accurately, completing a check register accurately, paying bills) but also judgment skills that promote financial self-interest, and values that guide personal financial choices. Financial experience and skills can vary widely among cognitively normal adults and are associated with factors such as education, occupational attainment, and socioeconomic status (American Bar Association & American Psychological Association [ABA/APA] Assessment of Capacity in Older Adults Project Working Group, 2008; Marson et al., 2012).

Although financial capacity is a skill essential for all community dwelling adults, it is a topic that has particular relevance for older adults. In addition to being associated with normal cognitive aging (Marson & Sabatino, 2012), declining financial capacity has been shown empirically to occur in many neurological disorders associated with aging. For example, declining financial skills may be the first functional change in mild cognitive impairment (MCI) (Willis, 1996) and represents an important functional marker in the course of Alzheimer's dementia (Gerstenecker, Triebel, Martin, Snyder, & Marson, in press; Triebel et al., 2009). Thus, declines in financial skills become more pronounced as an older adult progresses through dementia (Marson et al., 2000; Martin et al., 2008; Widera, Steenpass, Marson, & Sudore, 2011).

Despite its importance, until recently little conceptual and definitional work has been conducted in the area of financial capacity (Marson, in press). Initial investigations into financial capacity offered only imprecise schema such as "financial management skills," without hypothesizing the underlying conceptual framework or factor structure of the construct. Although more recent studies have suggested that financial capacity is an advanced instrumental activity of daily living (IADL) (Marson, et al., 2000), a theoretical vacuum has persisted, with few conceptual models being available in the literature and no models being available that were derived from factor structure studies. Investigations into the factor structure of financial capacity are clearly needed.

In this study, we investigate the factor structure of financial capacity in older adults using the Financial Capacity Instrument (FCI) (Griffith et al., 2003; Marson, et al., 2000) as a proxy for the construct. We conducted an exploratory factor analysis using FCI items to identify the underlying relationships between these test items and, thereby, extract the underlying factor structure for financial capacity. We limited our sample to cognitively-normal older adults and to older adults with cognitive impairment due to an AD etiology (i.e., MCI likely due to AD or mild AD dementia). In this way, the obtained results provide information about the construct of financial capacity in older adults with normal cognition and with cognitive impairment due to an AD process.

Methods

Participants

Study participants included 440 people who were recruited as part of two longitudinal studies of functional change in MCI: (Cognitive Observations in Seniors 1 and 2) (COINS1 and COINS2) (R01 AG021927). Participants consisted of 179 healthy older controls, 149 participants with MCI and 112 participants with mild AD. All study participants were evaluated at the University of Alabama at Birmingham (UAB).

All participants composing the control group were clinically evaluated by consensus conference team members including a neurologist and neuropsychologist to ensure the absence of medical, neurologic, and psychiatric conditions affecting cognition. Controls in this study received a Clinical Dementia Rating (CDR)(Morris, 1993) staging score of 0 and completed standardized tests of mental status (i.e., Mini-Mental State Examination; MMSE (Folstein, Folstein, & McGugh, 1975), and global cognitive status (Dementia Rating Scale – Second Edition; DRS-2 (Jurica, Leitten, & Mattis, 2001)). Controls were characterized as cognitively normal in the diagnostic clinical consensus conference.

Participants with MCI were recruited through the Memory Disorders Clinic and Alzheimer's Disease Center at UAB and were well-characterized based upon the medical, neurologic, and neuropsychological screening described above. Diagnoses of MCI were made in consensus conference using original Mayo criteria (Petersen et al., 2001). In addition, participants with MCI were further classified according to probable etiology. For the purpose of this study, only participants determined to have MCI likely due to AD were included.

Participants with probable AD were also recruited from the Memory Disorders Clinic. Diagnosis of probable AD was made in the diagnostic consensus conference using NINCDS-ADRDA criteria (McKhann et al., 1984).

Informed consent was obtained from all participants and their caregivers. This study was approved by the UAB Institutional Review Board.

Measures

The Financial Capacity Instrument (FCI) (Griffith, et al., 2003; Marson, et al., 2000) is a performance-based measure that uses 115 items to directly assess a wide range of financial skills across nine domains, 20 tasks, and three different global scores. The FCI was developed conceptually using a pragmatic clinical perspective rather than an *a priori* theoretical model of financial capacity. Drawing from the work of Lawton and Brody (Lawton & Brody, 1969), we conceptualized financial capacity as a broad set of clinically relevant financial skills and activities necessary for independent function in the community. These range from very basic skills of identifying and counting coins/currency and conducting cash transactions, to higher level abilities of managing a checkbook, paying bills, and reviewing a bank statement, to complex activities of making investment decisions. In such a clinical model, financial capacity can be understood to have comprehension, performance and also judgment dimensions (Marson, 2016; Marson, Triebel, & Knight, 2012). Thus to possess financial capacity, a person must be able to understand and perform a

variety of tasks and skills, and exercise judgment in doing so, in order to meet his or her needs within his/her life context—ie., live independently (Marson, 2016).

In the FCI clinical model, tasks consist of items which measure simple (i.e., counting currency) or complex knowledge or skills (i.e., preparing bills for mailing) and are believed to represent the spectrum of activities composing financial capacity. Specific task scores are, in turn, summed to establish domain scores. Domain scores represent higher order financial skills which have independent clinical significance. Domain scores are then summed in different ways to establish global scores. The FCI has demonstrated high levels of reliability, and content and construct validity, in previous studies of healthy controls and persons with MCI and AD (Griffith, et al., 2003; Marson, et al., 2000; Okonkwo et al., 2008).

Procedures

Trained technicians administer and score the FCI using well-operationalized criteria described elsewhere (Marson, et al., 2000). In the present study, the primary FCI variables of interest were item-level scores. Items in Domain 8 were not analyzed because their scores are not based on objective performance but on answers to "yes/no" format questions regarding past experience in financial matters that are corroborated by informants.

Statistical Analyses

We first analyzed the variability of correct responses of all FCI items to determine appropriateness of inclusion in the factor analysis. In total, 32 items testing very basic financial skills were excluded from analyses due to low variance. Thus, the final total number of items examined in this study was 83.

To determine the numbers of factors specified in the exploratory factor analysis, Velicer's Minimum Average Partial (MAP) test and Horn's parallel analysis were conducted using the SPSS R-Menu v2.0 (Courtney, 2013). As previously recommended (Garrido, Abad, & Ponsoda, 2013), polychoric correlations, mean eigenvalue criterion, and column permutations were all specified for the parallel analysis. A polychoric correlation matrix was also specified for Velicer's MAP test. The specified number of sample databases to be generated for the parallel analysis was 1000, in accordance with previous recommendations (O'Connor, 2000). The results of both Velicer's MAP and the parallel analysis supported a four-factor solution.

As has been recommended, a sample size of over 300 participants was utilized for the factor analysis to guard against low intercorrelations, low reliability, varying distributions, and noncontinuous response formats (Gorsuch, 1997). Previous research has noted that polychoric correlations should be conducted when analyzing ordinal data (Basto & Pereira, 2012; Gilley & Uhlig, 1993; Muthen & Kaplan, 1985). Thus, we conducted the factor analysis on the raw-data matrix of polychoric correlations using the SPSS R-Menu v2.0. We expected the extracted factors to be correlated because they represent components of a more general construct (i.e., financial capacity). Thus, an oblique rotation to simple structure was chosen, as has previously been recommended (Reise, Waller, & Comrey, 2000). In addition, we used a threshold of 0.40 to define a salient factor loading, as has also been suggested in previous research (Gorsuch, 1997; Costello & Osborne, 2005).

Factor scores were calculated by summing all items that loaded >0.39 on that factor, regardless of cross-loadings. A series of Kruskal-Wallis one-way analysis of variance tests were then conducted to determine if the mean ranks of performance on the four extracted factors varied according to diagnostic group (i.e., control, MCI, mild AD) (Table 3). A follow-up series of Kruskal-Wallis tests were conducted to determine the specific manner in which the diagnostic groups differed: control versus MCI, control versus mild AD, and MCI versus mile AD (Table 3). An alpha of 0.05 was used for follow-up analyses.

Results

Sample Characteristics

The study sample consisted of 258 women and 182 men, with a mean age of 71 years (SD 8.1, range 50–91) and a mean education of 15 years (SD 2.9, range 6–20). The majority of the sample was either Caucasian (85%) or African-American (14%).

Factor Analysis

The sorted pattern matrix for the exploratory factor analysis can be found in Table 1. The four extracted factors accounted for 46.1% of common variance among the 83 FCI items included in the exploratory, item-level factor analysis. The Kaiser-Meyr-Olkin measure of sampling adequacy was .82, well above the recommended value of .60. Bartlett's test of sphericity was also significant ($\chi^2[3402]=169838$, $p<.001$).

The correlation matrix of rotated factors can be found in Table 2. As anticipated, given that extracted factors were believed to relate to a larger underlying construct, a number of factors were significantly correlated at the $p < 0.01$ level: Factor 1 and Factor 2, Factor 1 and Factor 4, and Factor 2 and Factor 4.

We labeled the first factor *Basic Monetary Knowledge and Calculation Skills*. This factor accounted for 35.8% of shared variance and consisted of 22 items (see Table 1). An additional 8 items loaded on this factor but with loadings subthreshold to the .40 recommended by Gorsuch (1997) to indicate a salient factor loading.

The second factor was labeled *Financial Judgment* and accounted for 5.2% of shared variance. This factor consisted of five items. No additional items with loadings subthreshold to .40 were indicated for this factor.

We labeled the third factor *Financial Conceptual Knowledge*. This factor accounted for 2.6% of shared variance. Five items loaded on this factor at or above the .40 threshold required for a salient factor loading. No additional items with loadings subthreshold to .40 were indicated for this factor.

The fourth and final factor was labeled *Financial Procedural Knowledge*. This factor accounted for 2.6% of shared variance and consisted of 29 items. An additional 14 items loaded on this factor but with loadings subthreshold to .40.

Cronbach's alphas for the four extracted factors ranged from acceptable to excellent: Factor 1 = .87, Factor 2 = .76, Factor 3 = .71, and Factor 4 = .91.

Comparisons of Extracted Factor Performance by Study Group

Main effects of mean ranks by study group were observed for all four extracted factors (Table 3). All post hoc comparisons were significant except for controls versus MCI for factor 3 (i.e., *Financial Conceptual Knowledge*).

Discussion

Financial capacity represents the ability to independently manage one's own financial affairs in a manner consistent with personal self-interest and values (Marson & Hebert, 2008; Marson, Triebel, & Knight, 2012). In practical terms, financial capacity is a term used to describe a person's ability to initiate and complete a range of financial tasks and to make informed, sound decisions about financial matters. As a construct, financial capacity encompasses a wide range of conceptual, pragmatic, and judgment abilities (Marson, et al., 2000). However, to our knowledge, the factor structure of financial capacity has not been previously investigated thus limiting knowledge about the financial capacity construct.

In the current study, we demonstrated that a four-factor solution was optimal for representing the latent variables comprising our proxy for financial capacity in a large sample of healthy older adults and people with cognitive impairment due to AD. These factors were labeled *Basic Monetary Knowledge and Calculation Skills*, *Financial Judgment*, *Financial Conceptual Knowledge*, and *Financial Procedural Knowledge*. The factor representing *Basic Monetary Knowledge and Calculation Skills* emerged as the predominant factor, but the *Financial Judgment*, *Financial Conceptual Knowledge*, and *Financial Procedural Knowledge* factors were also important. Taken together, these results advance an understanding of financial capacity as a construct and have important implications for both clinical practice and future research.

Our results shed light on the construct of financial capacity in older adults across the dementia spectrum. Specifically, financial capacity, as represented by a performance-based measure, appears to be a multi-dimensional construct comprised of four core factors. The *Basic Monetary Knowledge and Calculation Skills* factor primarily included items involving arithmetic calculation skills (e.g., stating the number of quarters in an amount of money, calculating a tip, and calculating the correct amount of change from a grocery store purchase), and semantic knowledge of coin/currency values (e.g., arranging coins in order of their monetary value). The second factor (*Financial Judgment)* was composed of items examining the ability to detect and avoid telephone and mail fraud scams and, thus, has particular public health significance. The third factor *(Financial Conceptual Knowledge)* included items assessing comprehension of simple financial concepts (e.g., what is a debt, what is a signature line of a check, what are reasons for keeping money in a bank). The fourth factor (*Financial Procedural Knowledge*) included items assessing procedural abilities such as the ability to correctly write out a check, or record a transaction in a check register.

Although significant intercorrelations were observed between most of the factors presented in this paper (see Table 2), the factor structure remained readily interpretable. Intercorrelations were expected given that the extracted latent variables relate to a broader construct of financial capacity. However, only 3 of the 83 items entered into the factor

analysis were observed to load on two factors above a threshold of 0.40. Thus, the large majority of items did not exhibit overlap and did not account for a significant portion of the intercorrelations among extracted factors. In addition, despite the intercorrelations among the four emergent factors, a large amount of unshared variance remained in the factors which supported the validity of our four-factor model. Specifically, while the four-factor structure accounted for 46% of total shared variance another 54% of total variance remained "unique."

The fact that a number of items fell below the factor loading cutoff (i.e., 0.40) warrants discussion. One likely reason relates to restricted variance among a number of items on our financial capacity proxy. First, as noted in the Methods, 32 FCI items testing very basic financial skills were excluded at the outset from analyses due to extremely low variance (i.e., 97% participants answered the item correctly). In addition, other items that were included in the factor analysis nonetheless contained restricted variance (i.e., 90–96% or participants answered the item correctly). It is possible that the restricted variance of these items affected their ability to covary with the other items and thereby load on one of the four factors.

In follow-up analyses, we investigated the performance of the three study groups on the four extracted factors outlined in this paper. As expected, performance varied across the study groups on all four factors in a pattern consistent with disease severity (i.e., controls>MCI>mild AD). In fact, significant differences in the aforementioned factor pattern were observed across all study groups with one exception. For factor 3 (i.e., *Financial Conceptual Knowledge*), performance was similar between the control and MCI groups. However, this finding was not surprising given that our group have previously shown that a group of people with amnestic-MCI were able to understand financial concepts but struggled in the practical application of those concepts (Griffith et al., 2003). Thus, individual group performance analyses supported well the four extracted factors.

The four-factor structure of financial capacity presented in this paper has important clinical implications, as well as important implications for future scale development. For example, as cognitive impairments characteristic of the AD process progress, associated changes in financial ability place these individuals at risk for making poor financial decisions or committing financial errors that threaten the financial assets and well-being of themselves and their families (Overman & Stoudemire, 1988). In this paper, four factors were identified that we believe represent important dimensions of the construct of financial capacity: *Basic Monetary Knowledge and Calculation Skills*, *Financial Judgment*, *Financial Conceptual Knowledge*, and *Financial Procedural Knowledge*. Thus, people suspected of having even mild cognitive changes such as those found in MCI, are likely to show financial changes in one or all of these four financial factors. As such, clinicians working with older adults should routinely examine potential changes in these four areas of financial function. In regards to scale development, the four factors offer a useful framework for researchers seeking to develop a brief screening measure for financial capacity and financial capacity decline. For instance, items loading onto the factors of *Financial Judgment* and *Financial Conceptual Knowledge* were limited and brief. It is also likely that items related to *Basic Monetary Knowledge and Calculation Skills* and *Financial Procedural Knowledge* can be condensed for use in a short financial capacity screen.

There were several limitations to this study. First, the measure we used as a proxy for financial capacity (i.e., the FCI) was not developed based on an *a priori* theory of the factor structure of financial capacity. Thus, an exploratory factor analysis was utilized in the current study to generate an initial factor analytic framework for the construct. However, to ensure that the study findings were not due to chance, a confirmatory factor analysis should be conducted in future research (Finch & West, 1997) using not only the FCI as a proxy for financial capacity, but also other performance measures of financial capacity as additional proxies (e.g., the Financial Capacity Instrument – Short Form [FCI-SF], and the financial subtest of the Independent Living Scales (ILS) [cite]) . Similarly, sample size constraints limited our ability to conduct a cross-validation confirmatory factor analysis for the current study, and such analyses should be conducted in future studies. Second, our sample was comprised of cognitively-normal controls, people diagnosed with MCI likely due to AD, and people diagnosed with mild AD. Thus, these findings may not generalize to the broader population of healthy older adults or to older adults with cognitive impairment due to etiologies other than AD. Future studies should examine the four-factor structure of financial capacity presented in this paper in healthy older adults and in other disease groups. Third, because some FCI items were excluded from analyses, not all FCI items were entered into the factor analysis. Thus, these results may fail to capture a factor related to very simple or basic financial skills, that might have emerged had a more impaired subgroup (i.e., moderate AD participants) been included. Fourth, as our proxy of the construct of financial capacity, we used the FCI. Although the FCI represents a relatively comprehensive financial capacity measure among those currently available, it nevertheless has limitations, including not currently including items that specifically evaluate a person's ability to navigate more modern internet banking aspects of financial capacity. Thus, potential factors related to financial tasks such as direct deposit, online bill pay, etc. should be investigated in future studies. Finally, it is expected that the four factors introduced in this paper are associated with other variables. For instance, cognitive impairment, neuropsychiatric impairment, and brain atrophy may be associated with each of the four factors. These potential associations should be examined in future research. These limitations notwithstanding, the four-factor structure introduced in this study represents a useful conceptual and clinical addition to our knowledge of financial capacity as a construct.

Acknowledgments

References

Basto M, & Pereira JM (2012). An SPSS R-Menu for Ordinal Factor Analysis. Journal of Statistical Software, 46, 1–29. [PubMed: 22837731]

Costello AB & Osborne JW (2005). Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most From Your Analysis. Practical Assessment, Research and Evaluation, 10*(7).*

Courtney MGR (2013). Determining the Number of Factors to Retain in EFA: Using the SPSS R-Menu v2.0 to Make More Judicious Estimations. Practical Assessment, Research and Evaluation, 18.

Dreer LE, Devivo MJ, Novack TA, & Marson DC (2012). Financial capacity following traumatic brain injury: a six-month longitudinal study. Rehabilitation Psychology, 57(1), 5–12. doi: 10.1037/a0025818 [PubMed: 22369113]

Finch JF, & West SG (1997). The investigation of personality structure: Statistical models. Journal of Research in Personality, 31(4), 439–485.

Folstein M, Folstein S, & McGugh P (1975). Mini-Mental State: A practical guide for grading the cognitive state of the patient for the physician. . Journal os Psychiatry Research, 12, 189–198.

Garrido LE, Abad FJ, & Ponsoda V (2013). A new look at Horn's parallel analysis with ordinal variables. Psychological Methods, 18(4), 454–474. [PubMed: 23046000]

Gerstenecker A, Triebel KL, Martin RC, Snyder S, & Marson DC (in press). Both Financial and Cognitive Change Predict Clinical Progression in MCI. Alzheimer Dis Assoc Disord.

Gilley WF, & Uhlig GE (1993). Factor Analysis and Ordinal Data. Education, 114, 258–264.

Gorsuch RL (1997). Exploratory factor analysis: Its role in item analysis. Journal of Personality Assessment, 68(3), 532–560. [PubMed: 16372866]

Griffith HR, Belue K, Sicola A, Krzywanski S, Zamrini E, Harrell L, & Marson DC (2003). Impaired financial abilities in mild cognitive impairment: A direct assessment approach. Neurology, 60(3), 449–457. doi: 10.1212/wnl.60.3.449 [PubMed: 12578926]

Jurica PJ, Leitten CL, & Mattis S (2001). Dementia Rating Scale - 2: Professional Manual. Lutz, FL: Psychological Assessment Resources.

Lawton MP, & Brody EM (1969). Assessment of Older People: Self-Maintaining and Instrumental Activities of Daily Living1. The Gerontologist, 9(3_Part_1), 179–186. doi: 10.1093/geront/9.3_Part_1.179. [PubMed: 5349366]

Marson D (2016). Conceptual Models and Guidelines for Clinical Assessment of Financial Capacity. Arch Clin Neuropsychol, 31(6), 541–553. doi: 10.1093/arclin/acw052. [PubMed: 27506235]

Marson D, & Zebley L (2001). The other side of the retirement years: Cognitive decline, dementia, and loss of financial capacity. Journal of Retirement Planning, 4, 30–39.

Marson DC (in press). Conceptual Models and Guidelines for Clinical Assessment of Financial Capacity. Archives of Clinical Neuropsychology.

Marson DC, & Sabatino CP (2012). Financial capacity in an aging society. Generations, 36, 6–11.

Marson DC, Sawrie SM, Snyder S, McInturff B, Stalvey T, Boothe A, . . . Harrell LE. (2000). Assessing financial capacity in patients with Alzheimer disease: A conceptual model and prototype instrument. Archives Of Neurology, 57(6), 877–884. [PubMed: 10867786]

Marson DC, Triebel KL, & Knight AJ (2012). Assessment of financial capacity: A neuropsychological perspective In Demakis GJ (Ed.), Civil capacities in clinical neuropsychology (pp. 39–68). New York: Oxford University Press.

Martin R, Griffith HR, Belue K, Harrell L, Zamrini E, Anderson B, . . . Marson D. (2008). Declining financial capacity in patients with mild Alzheimer disease: a one-year longitudinal study. Am J Geriatr Psychiatry, 16(3), 209–219. doi: 10.1097/JGP.0b013e318157cb00 [PubMed: 18263665]

Martin RC, Triebel KL, Kennedy RE, Nicholas AP, Watts RL, Stover NP, . . . Marson DC. (2013). Impaired financial abilities in Parkinson's disease patients with mild cognitive impairment and dementia. Parkinsonism & Related Disorders, 19(11), 986–990. doi: 10.1016/j.parkreldis.2013.06.017 [PubMed: 23899743]

McKhann G, Drachman D, Folstein M, Katzman R, Price D, & Stadlan EM (1984). Clinical diagnosis of Alzheimer's disease: report of the NINCDS-ADRDA Work Group under the auspices of Department of Health and Human Services Task Force on Alzheimer's Disease. Neurology, 34(7), 939–944. [PubMed: 6610841]

Morris JC (1993). The Clinical Dementia Rating (CDR): current version and scoring rules. Neurology, 43(11), 2412–2414.

Muthen BO, & Kaplan D (1985). A Comparison of some Methodologies for the Factor Analysis of Non-Normal Likert Variables. British Journal of Mathematical and Statistical Psychology, 38, 171–189.

O'Connor BP (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavior Research Methods*, Instruments & Computers, 32(3), 396–402.

Okonkwo OC, Griffith HR, Belue K, Lanza S, Zamrini EY, Harrell LE, . . . Marson DC. (2008). Cognitive models of medical decision-making capacity in patients with mild cognitive impairment. Journal Of The International Neuropsychological Society: JINS, 14(2), 297–308. doi: 10.1017/S1355617708080338 [PubMed: 18282327]

Overman W, & Stoudemire A (1988). Guidelines for legal and financial counseling of Alzheimer's disease patients and their families. American Journal of Psychiatry, 145, 1495–1500. [PubMed: 3057921]

Petersen RC, Doody R, Kurz A, Mohs RC, Morris JC, Rabins PV,Winblad B (2001). Current concepts in mild cognitive impairment. Arch Neurol, 58(12), 1985–1992. [PubMed: 11735772]

Reise SP, Waller NG, & Comrey AL (2000). Factor analysis and scale revision. Psychological Assessment, 12(3), 287–297. [PubMed: 11021152]

Triebel KL, Martin R, Griffith HR, Marceaux J, Okonkwo OC, Harrell L, . . . Marson DC. (2009). Declining financial capacity in mild cognitive impairment: A 1-year longitudinal study. Neurology, 73(12), 928–934. doi: 10.1212/WNL.0b013e3181b87971 [PubMed: 19770468]

Widera E, Steenpass V, Marson D, & Sudore R (2011). Finances in the older patient with cognitive impairment: "He didn't want me to take over". JAMA, 305(7), 698–706. doi: 10.1001/jama.2011.164 [PubMed: 21325186]

Willis SL (1996). Everyday cognitive competence in elderly persons: Conceptual issues and empirical findings.pdf>. The Gerontologist, 36(5), 595–601. [PubMed: 8942103]

Clinical Implications

- In this paper, four factors were identified and presented that we propose represent key aspects of and a foundation for the construct of financial capacity: *Basic Monetary Knowledge and Calculation Skills, Financial Judgment, Financial Conceptual Knowledge*, and *Financial Procedural Knowledge*.

- Older adults with cognitive decline, including persons with MCI and mild AD dementia, are likely to show financial changes in one or more of these four financial factors.

- Clinicians working with cognitively impaired older adults should routinely examine for potential changes in these four areas of financial function.

Table 1.

Sorted Pattern Matrix (*N*=440)

Item	F1	F2	F3	F4
How many nickels is a dollar worth?	**.99**	−.20	.08	−.47
How many quarters are in 6.35?	**.99**	.16	−.06	−.18
How many dimes are in 1.30?	**.98**	.14	−.00	−.11
How many nickels is a 5 worth	**.88**	−.02	.02	−.12
Have a dollar and want to buy something for 59 cents. How much change should you get back	**.82**	.01	.01	−.15
How many quarters is a 5 worth	**.73**	.11	−.00	.10
If you were to invest 10,000 in the bank account, how much money would your investment earn in a year	**.62**	−.06	−.07	.10
Please calculate a tip based on this bill. Show me how much money you would leave	**.62**	02	.04	−.03
Have a five. Total is 3.19. How much change should you get back	**.62**	−.06	.00	.12
Which bank has the best interest rate	**.56**	−.01	−.09	.13
How much of your bill will your insurance pay	**.56**	−.09	.05	.19
If you were to invest 20,000 in the computer stock, how much money would your investment earn in a year	**.52**	−.08	−.07	.25
How much will his taxes be with the credit	**.52**	.14	−.18	.35
What is the interest rate for this account	**.47**	.02	.08	.28
How much will your friends taxes be this year	**.47**	.07	.02	.27
Need change for a dollar to buy a 55 cent soda. How would you like change for your dollar	**.47**	.00	.23	.30
What is a bank statement used for	**.44**	−.13	−.11	.18
Hand the examinee a bill. What goods or services are you being billed for here	**.42**	.08	−.20	.35
Arrange money by value.	**.42**	−.06	−.11	.17
Point to the interest rate. What does an interest rate of 1.49% mean	**.42**	.05	−.13	.09
Point to the checks cleared section. What does this section mean	**.40**	−.14	−.15	.01
How much is a dollar, two quarters, a nickel, and two pennies worth	**.40**	.02	.23	.07
Put bill in front of examinee. Why would you need to pay this bill first [*]	.39	.13	.00	.10
What is a budget [*]	.39	−.20	−.13	.03
Point to the column designated for the check amount on the register. What is this part for [*]	.38	.08	.01	.19
Of your 20,000 inheritance, how many dollars would you invest in the bank and how many in the stock [*]	.37	−.07	−.02	.28
Generally, when dining in a restaurant, are you required to leave a tip for the waiter or waitress [*]	.35	−.13	−.01	−.09
Show me where on the bank statement you would look to see if your account was overdrawn [*]	.34	.09	.08	.18
Point to box on check for numeric amount. What is this part for [*]	.34	.08	−.13	.28
What is your friends taxable income this year [*]	.33	.04	−.14	.33
Would you send the 2000	−.18	**−.99**	.09	−.05
You received an investment offer in the mail today. Is this a good investment opportunity	−.23	**−.99**	.03	.05
Would you send your information, as requested	.09	**−.98**	.02	−.24
Why or why not is this a good/bad investment opportunity	.11	**−.87**	−.07	−.03
Will you give me your credit card number to help clothe underprivileged children	−.02	**−.57**	−.01	−.01
What are two reasons for keeping your money in a bank	.11	−.16	**−.58**	−.21
What is the conventional percentage amount to tip for good service in a restaurant	.40	−.15	**−.46**	.17

Item	F1	F2	F3	F4
Point to the signature line. What is this part for	−.04	.10	**−.44**	.24
What is a debt	.24	−.05	**−.40**	.01
What are income taxes	.16	−.14	**−.40**	.24
Make out a check. Payee field	−.31	−.05	.12	**.99**
Make out a check. Signature	−.38	−.11	.01	**.97**
What are the potential risks of giving your credit card number	−.26	−.12	−.08	**.85**
Make out a check. Description of transaction in register	.06	.15	.16	**.79**
What is the ending balance on the bank statement	−.03	.10	.09	**.76**
Make out a check. Date	.03	.14	.11	**.76**
Make out a check. Numeric amount of check	.02	.01	.20	**.72**
Make out a check. Correct date in register	.17	.08	.09	**.71**
In the story, what are the two investment choices available for using this money	−.05	.13	−.22	**.69**
Make out a check. Written amount of check	.17	.07	.14	**.69**
What was the amount of quarterly interest earned on this account	.05	−.01	.13	**.68**
Here is another check. Using this check, please identify an error appearing on your statement	.26	−.01	.08	**.68**
What total number of checks cleared during this period	.13	.04	.36	**.68**
What is the time period for this bank statement	.12	.19	−.13	**.68**
How many gaps in the check sequence occurred during this statement	.28	−.06	.29	**.61**
Make out a check. Number of check in register	.30	.07	.12	**.57**
Make out a check. Amount of check in register	.45	.11	.03	**.55**
What is sales tax	.13	−.08	−.17	**.54**
Make out a check. New account balance in register	.42	−.01	.06	**.53**
Your change should be 1.81. Have I given you the correct change	.10	−.10	.04	**.52**
Point to the check register. What is this part of the checkbook used for	.21	.04	.15	**.51**
Please review this cleared check. Indicate where on the bank statement this check appears or is referenced	.27	−.07	.33	**.51**
How much of your bill will your insurance pay	.27	.06	−.18	**.48**
Point to ATM withdrawal. What does ATM withdrawal mean	−.00	−.19	−.08	**.46**
What was the date of the withdrawal payment to Alabama Gas	.30	.16	−.02	**.45**
What are some reasons for paying your bills	.14	−.02	−.23	**.45**
Point to bank statement. What is this called	.28	−.04	−.06	**.43**
What is a bill	.18	.03	−.13	**.41**
What is a loan	−.04	−.14	−.08	**.40**
In the story, what is the main disadvantage of the stock investment [*]	−.03	.04	−.12	.39
Present the check register. What is this part of the checkbook called [*]	.08	−.01	.07	.39
Point to the deposits section. What does this section mean [*]	.10	−.02	−.05	.37
Point to minimum balance. What does minimum balance mean [*]	.31	−.00	−.05	.37
Point to the account fee. What does monthly account fee mean [*]	.19	.08	−.29	.35
What are the reasons you invested the way you did [*]	.22	−.07	−.03	.33
What are savings [*]	.08	−.09	−.09	.31
Point to payee line on the check. What is this part for [*]	.13	−.08	−.01	.31

Item	F1	F2	F3	F4
Why or why not [*]	.00	−.03	−.17	.29
Point to the column designated for the current balance on the register [*] What is this part for/What goes here [*]	.06	.12	−.22	.29
Point to written amount line on the check. What is this part for [*]	.21	.03	−.19	.27
Please calculate a tip based on this bill. Show me how much money you would leave [*]	.17	−.03	−.03	.24
Hand the stack of bills to the examinee. Which of these bills, if any, requires immediate attention [*]	.15	.10	−.06	.24
How much is a five, three dollars, a quarter, two dimes, a nickel, and four pennies worth [*]	.14	−.18	.15	.23

Note.

[*] =Item that did not meet .40 threshold on any factor. Factor 1= Basic Monetary Knowledge and Calculation Skills, Factor 2 = Financial Judgment, Factor 3 = Financial Conceptual Knowledge, and Factor 4 = Financial Procedural Knowledge.

Table 2.

Correlation Matrix of Rotated Factors

Factor	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.0			
Factor 2	−0.45[*]	1.0		
Factor 3	−0.15	0.15	1.0	
Factor 4	0.61[*]	−0.49[*]	−0.20	1.0

Note.

[*] = $p < 0.01$. Factor 1= Basic Monetary Knowledge and Calculation Skills, Factor 2 = Financial Judgment, Factor 3 = Financial Conceptual Knowledge, and Factor 4 = Financial Procedural Knowledge.

Table 3.

Performance of Study Groups on Extracted Factors.

Factor	Study Group			Kruskal-Wallis		Post Hoc		
	Control	MCI	Mild AD	Chi-Square	*p*	Control>MCI	Control>AD	MCI>AD
1	49.3 (8.8)	46.2 (9.7)	33.1 (13.3)	45.5	<0.001	X	X	X
2	10.9 (2.0)	10.0 (2.8)	9.4 (2.4)	16.0	<0.001	X	X	X
3	8.1 (1.1)	8.1 (1.0)	7.3 (1.8)	7.7	0.021		X	X
4	53.7 (5.2)	50.1 (6.7)	38.5 (12.7)	76.9	<0.001	X	X	X

Note. Cells for Control, MCI, and Mild AD are the mean and (standard deviation) scores on the extracted factors. MCI = mild cognitive impairment; AD = Alzheimer's disease. Factor 1= Basic Monetary Knowledge and Calculation Skills, Factor 2 = Financial Judgment, Factor 3 = Financial Conceptual Knowledge, and Factor 4 = Financial Procedural Knowledge.