

Errors on Everyday Financial Problems in Demented and Normal Older Adults

Sherry L. Willis

Rosanna Bertrand

Melissa Dolan

The Pennsylvania State University

Funding for this research was provided by the National Institute on Aging (AG11032) to S. L. Willis. Funding for the MoVIES project was provided by the National Institute on Aging to Mary Ganguli at the University of Pittsburgh (AG06782, AG07562;AG00312). Melissa Dolan received predoctoral traineeship on Training Grant 5T32 MH18904-09 from the National Institute on Mental Health.

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Several years ago while on sabbatical I observed the clinical staff at the Stanford Alzheimer's Research Center making diagnostic decisions regarding patients who had attended the clinic. An impressive amount of medical and clinical data would be presented for each case. However, I became particularly interested in the reasons given by the family for bringing an older relative to the center for assessment. Mismanagement of finances was among the most frequent reasons given. Financial problems took various forms. The patient was making serious errors in balancing the checkbook. Or payment of bills was long overdue and collection agencies were at the door. Or the older adult was spending considerable funds shopping on QVC in the middle of the night when they couldn't sleep. Financial mismanagement appeared to be a "hot button" for triggering concern and actions with regard to the competence of the older adult.

Subsequently we have initiated a program of research examining the ability of cognitively challenged older adults to solve problems related to a variety of tasks of daily living. Two types of cognitively challenged older adults are being studied. These are: 1) Adults who are in the early stages of dementia, and 2) nondemented older adults with low levels of education. While low SES elderly are at greater risk, diagnosis of cognitive impairment very early in disease progression is particularly difficult when studying low functioning elderly. The clinician is faced with the challenge of

differentiating between low levels (and decline) in cognitive functioning due to pathology (e.g., Alzheimer's disease) versus socioeconomic factors (e.g., low education, low income).

In this research we have examined older adults' ability to solve cognitively demanding problems associated with seven domains of everyday activities. These seven activity domains represent the instrumental activities of daily living (IADLs; Lawton & Brody, 1969) that are associated with ability to live independently in our society. The activity domains are: Medication adherence, telephone usage, meal preparation, transportation, household maintenance, shopping and financial management. Given the focus of this symposia, we will report on findings with regard to the activity domains of financial management and shopping.

The present study has two major aims. The first aim is to examine and compare the performance of demented and of low educated nondemented elderly on a recently developed measure of everyday problem solving. The Everyday Problems for Cognitive Challenged Elderly (EPCCE) provides an objective measure of everyday problem solving. The second aim is to examine the relationship between performance on this measure of everyday cognition and on a battery of clinical and neuropsychological measures frequently used in screening for dementia.

Method

Subjects.

Participants included 79 early stage Alzheimer's patients (M = 32; F = 47) who were living in the community and who were enrolled in programs at the Stanford Medical Center's Aging Clinical Research Center or the University of West Virginia Alzheimer's Research Center. All subjects have a diagnosis of probable AD by NINCDS-ADRDA criteria (McKhann, Drachman, Folstein, Katzman, Price & Stadlan, 1984). Mean age of the sample was 74.04 years (SD = 8.2). Approximately 41 percent of the sample had an educational level of 12 years or less. Stage of cognitive decline was measured by the Mini-Mental Status Exam (MMSE; Folstein, Folstein & McHugh, 1975). The average MMSE total score was 20.2 (SD = 4.2) which is well below the cut off point of 24 to determine cognitive decline.

In addition 79 older nondemented older adults who had been screened for dementia were included as a comparison group. Mean age of the sample (M = 32; F = 47) was 79.71 (SD = 4.30). Approximately 59 percent of the nondemented older adults had an educational level of 12 years or less. Nondemented elderly were members of the Monongahela Valley Independent Elders Survey (MoVIES). The primary goals of MoVIES are to identify incident cases of dementia and risk factors for dementia and to examine normal and abnormal patterns of cognitive change over time. Mary Ganguli is the principal investigator.

Procedure.

Both demented and nondemented subjects were in longitudinal studies that involved administration of similar cognitive assessment battery at regular intervals. Demented patients were assessed at 6 month intervals and nondemented subjects were assessed at approximately 18 month intervals. An objective measure of everyday problem solving (EPCCE) was administered in conjunction with the cognitive battery. The data to be reported are on the first administration of the EPCCE.

Measures.

Everyday Problems for Cognitive Challenged Elderly (EPCCE) The EPCCE is a measure of everyday problem solving, developed for use with low SES nondemented elderly and with early stage Alzheimer's patients. The subject is shown printed material encountered in everyday activities and asked to solve a problem associated with the stimuli. Two questions are asked for each of 16 printed materials, for a total of 32 items. A two-month test-retest reliability for low SES nondemented elderly was $r = .93$. The internal consistency as measured by Cronbach's alpha was $.87$. In demented samples, the EPCCE has been found to be significantly correlated with caregiver and patient ratings of functioning in the seven IADL domains. The EPCCE is also significantly related to self IADL ratings in nondemented elderly.

For this paper, only data for the 6 EPCCE items related to financial management and shopping will be presented.

Instrumental Activities of Daily Living (IADL; Lawton & Brody, 1969).

Both the demented individual and the caregiver were asked to make ratings of the patient's level of competence with respect to each of the seven IADL domains. For this study, only the rating for financial management was used. Higher scores indicate greater functional impairment.

Clinical Assessment Battery. Three measures of cognitive functioning were examined in this study.

Mini-Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975). The MMSE is a widely used brief global cognitive screening battery which assesses orientation, immediate and delayed recall, concentration, language, and praxis. The maximum MMSE score is 30.

Alzheimer's Disease Assessment Scale (ADAS; Mohs, 1994). This is a brief cognitive screening battery assessing the following domains: word list immediate and delayed recall, word list recognition, verbal comprehension, confrontation naming, constructional praxis, ideational praxis, and incidental memory.

Trailmaking Tests B. (Reitan, 1955; Reitan & Tarshes, 1959). Trail B requires the ability to maintain and integrate two series simultaneously while alternating between them. It requires the subject to connect 25 numbered and alphabetized circles in order. Trail B has circles numbered 1-13 or lettered A-L which must be connected alternating between numbers and letters. The score is the time to completion measured in seconds; a better score is reflected in a shorter time.

Results

Alzheimer's patients were making errors on an average of 59% of the financial items. In contrast, nondemented low educated elderly were making errors on an average of 26% of the financial items.

Proportion of Subjects Making Errors

In Figures 1-4 the six financial items are presented with the proportion of demented and nondemented subjects missing each item. (Note that although the type on the stimuli is quite small for purposes of presentation, the stimuli presented to subjects was on 8 1/2x11 sheets with enlarged type)

Food Stamps (Item 7B). The subject is show the procedure for applying for food stamps. They are asked to consider the eligibility criteria stated in the form and to determine the financial eligibility for a couple. Two-thirds of the Alzheimer's patients were unable to answer the item correctly, compared to 13% of normal elderly.

NRP Membership Application (Item 9A,B). This is actually the AARP application form that regularly appears in *Modern Maturity*. In the first item the subject is asked to determine the cost of membership over the interval 1990-2000 (10 years). 37% of Alzheimer's patients missed this item. The second item turned out to be surprisingly difficult for both demented and normal subjects. The subject is asked to indicate membership cost for a spouse, assuming the subject is a member. An error is made by 63% of

Alzheimer patients and 53% of normal elderly. The common mistake is to interpret the form to indicate that the membership dues for the spouse are 2.40.

Recipe Book Order Form (Item 10b). This item involves simple computation of the amount of money to be sent for ordering several recipe books. The subject is allowed to calculate with paper and pencil if desired. Again, two-thirds of the Alzheimer's patients made an error on this item, while 38% of normals also made an error.

Telephone Service Application (Item 15A,B). The subject is asked to determine the number of directory listings per new phone line, and to determine the best option for local telephone calls if many local calls are made. On both items, approximately 60% of Alzheimer's patients made errors.

Types of Errors Made.

We were interested in types of errors made by Alzheimer and normal subjects. Were the types of errors similar for the two group, but with a greater proportion of Alzheimer patients making the error. Alternatively, were Alzheimer patients making a qualitatively different type of error.

We have developed a multilevel hierarchy of error types. For purposes of this presentation we present only the first level of errors, involving four error types. 1) Errors associated in incomplete processing of information needed to solve the problem. Given age-related changes in memory resources and speed of processing, the elderly have been found in many

cognitive tasks to fail to take into account all the information needed to solve a problem. For example, on the Cookbook Order Form (Item 10b), the subject forgets to multiply by 2 (for two cookbooks) before creating a sum. In the Food Stamp Application, the subject reads that all households may have up to \$1,750 and does not read further in the application. 2) Inappropriate Use of Prior Experience. In this error type the subject applies knowledge from their own prior experience inappropriately. For example, on the Telephone Service Application, the subject insists on responding with the type of usage package with which they have had experience. 3) Random Response include responses that have no relationship to the information presented in the stimuli or to the problem. 4) No attempts involved the subject stating that they do not know the answer. Administration of the instrument is untimed so the subject has sufficient time to respond without pressure.

Figure 5 presents the proportion of errors that represent each error type. As found in our prior research, the most common type of error (78%) for nondemented elderly is incomplete processing - failure to take into account all of the information required to solve a problem or to execute critical component processes. In contrast only approximately 50% of errors for Alzheimer patients involved incomplete processing. Thirty percent of the errors were the patient indicating that they did know the answer, making no attempt to answer. In addition 17% of errors were random.

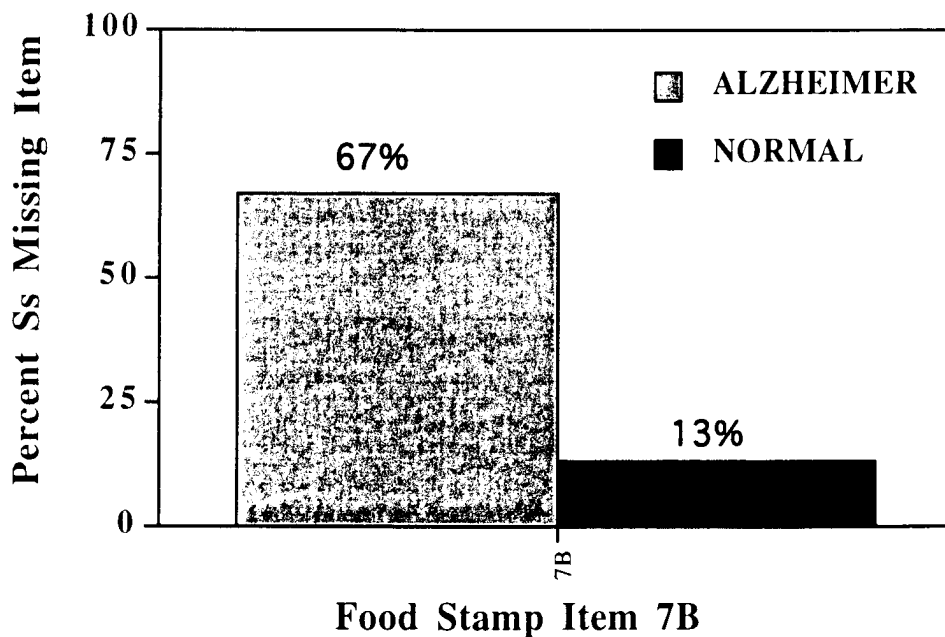
Relation of Errors to Performance on Clinical Measures

Finally we examined the correlation between errors on the EPCCE for Alzheimer's patients and their performance on clinical measures of cognitive functioning that are commonly administered in diagnosis and assessment of disease severity. Errors on the EPCCE were significantly associated with all three cognitive measures: ADAS Cognitive, MMSE, and Trail Making B. EPCCE errors on this limited set of items was not significantly associated with self ratings of financial competence. However, we have found a significant correlation between EPCCE performance and self ratings for the combined 7 IADL domains. Note neither the cognitive nor EPCCE scores are associated with age or education. This lack of association is probably due the small size and to homogeneity of the sample.

7. How to Apply for Food Stamps

1 FILE AN APPLICATION FORM	<ul style="list-style-type: none">•The food stamp office will give you an application form on the same day you ask for one. You can ask for it in person, over the phone or by mail, or someone else may get one for you.
2 HAVE AN INTERVIEW WITH A FOOD STAMP WORKER	<ul style="list-style-type: none">•After you have turned in your application, a worker will hold a confidential interview with you or another member of your household.•If you are 65 or older or disabled and you cannot go to the food stamp office and no one can go for you, let the office know. A worker will arrange to interview you at home or by telephone. Other people who cannot get to the office and who have no one to go for them may qualify for a home or telephone interview, too.
3 MEET ELIGIBILITY RULES AND PROVIDE PROOF THAT YOU ARE ELIGIBLE	<ul style="list-style-type: none">•Resources: All household may have up to \$1,750 worth of resources. Households of two or more persons may have up to \$3,000 if at least one member is age 60 or older.

7b. If you are 59 years old and your spouse is 60, what is the maximum financial worth you can have and qualify for food stamps?



9. N R P Membership Application

I want to win with NRP!

I'd like to enroll as a member for:

one year/\$5 three years/\$12.50 ten years/\$35

Name _____
(please print)

Address _____ Apt. _____

City _____ State _____

Zip _____ Date of birth / / _____

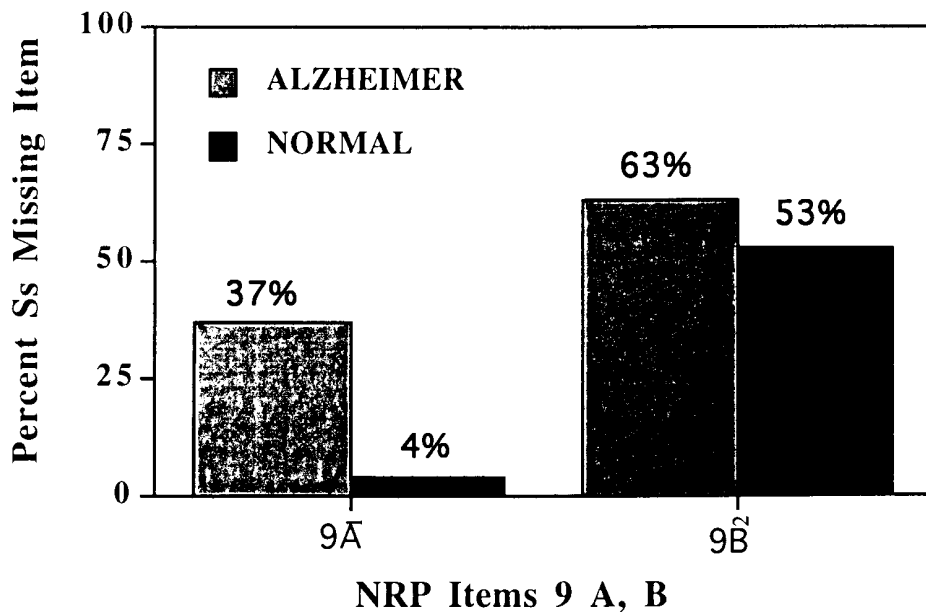
Check or money order enclosed, payable to NRP.
(Please don't send cash.)

If you're an active or retired educator, 50 or over, check here
to join.

Membership also includes spouse.
\$2.40 of dues is Maturity, 85¢ for NRP Bulletin.

9 a. If you buy a membership for the period from 1990 to 2000, how much would you pay?

9 b. If you are married and decide to join NRP, how much would your partner have to pay?

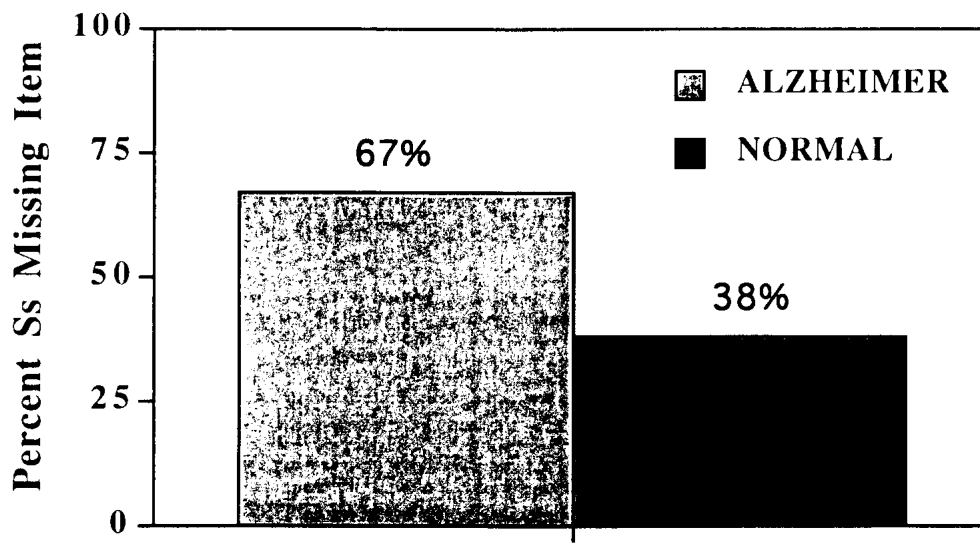


10. Recipe Book Order Form

Please send me the full-color cookbooks I have ordered below. I have enclosed my check or money order and specially marked Proof of Purchase Symbols from Butter.

Book	Qty.	Cost	Total Cost
You're Invited..... 8 party themes with 36 recipes, plus ideas for easy entertaining.	_____ @	\$1.50 Each =	\$_____
Irresistible Desserts 50 recipes, from tempting tortes to perfect pies.	_____ @	\$1.50 Each =	\$_____
Country Heritage From America's heartland comes a collection of 100 recipes, from appetizers to desserts.	_____ @	\$1.75 Each =	\$_____
Vegetable A garden-fresh variety of 50 recipes for every season.	_____ @	\$1.25 Each =	\$_____
Chicken & Seafood 50 scrumptious main dishes from Country Chicken Bake to Sole Diane.	_____ @	\$1.25 Each =	\$_____

10 b. To order 2 Irresistible Desserts Recipe Books and 1 Vegetable Recipe Book, how much money should be sent?



Cookbook Order Item 10B

15. Telephone Service Application

Service Application

INSTRUCTIONS - Print all required information below

T N: (814) _____

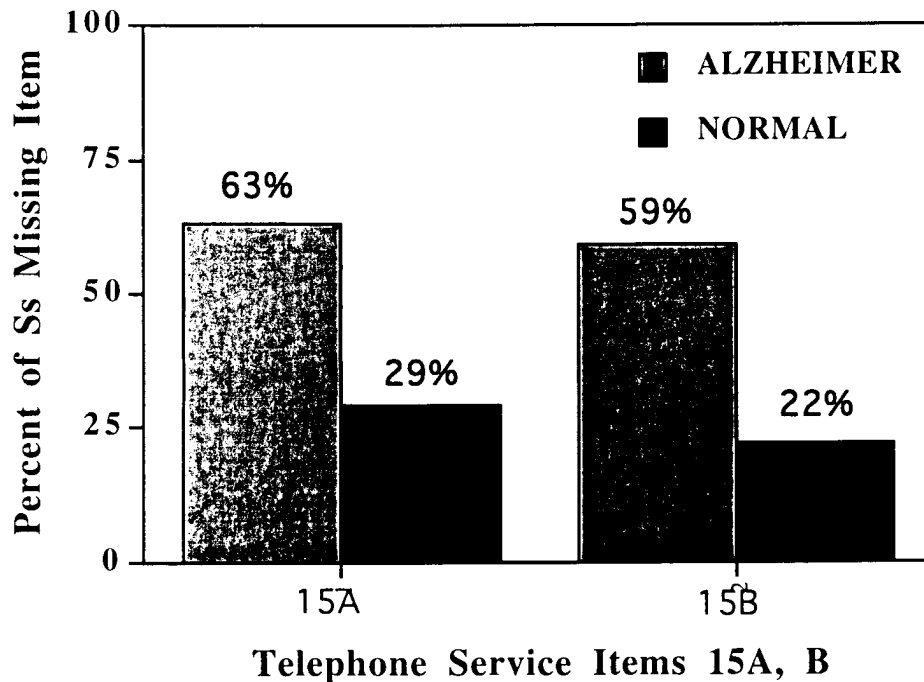
1. Name

1st Free Listing	Last	First	Mid. Init.
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2. Service Address: Street _____
City: _____ State: _____ Zip: _____
3. Location: Apt. #: _____ Or Room #: _____
4. 2nd Free Listing:

Last	First	Mid. Init.
------	-------	------------
5. Billing Address _____
If different from listed address
6. Local Usage Package (Check One): Unlimited Standard Budget
7. Long Distance Company (Check One): MCI ATT ITT US Sprint
8. Touch Tone Line (Check One): Yes No
9. Requested Connection Date: _____
10. Can be Reached Number: () _____

Home Telephone No. () () () () () ()	Home Street Address _____
City _____	State _____
Zip Code _____	

15 a. How many Directory listings can you request for each new phone line without additional charge?
15 b. If you make many local calls, which usage option might be best for you?



Percent of Each Error Type: Alzheimer & Normal Subjects

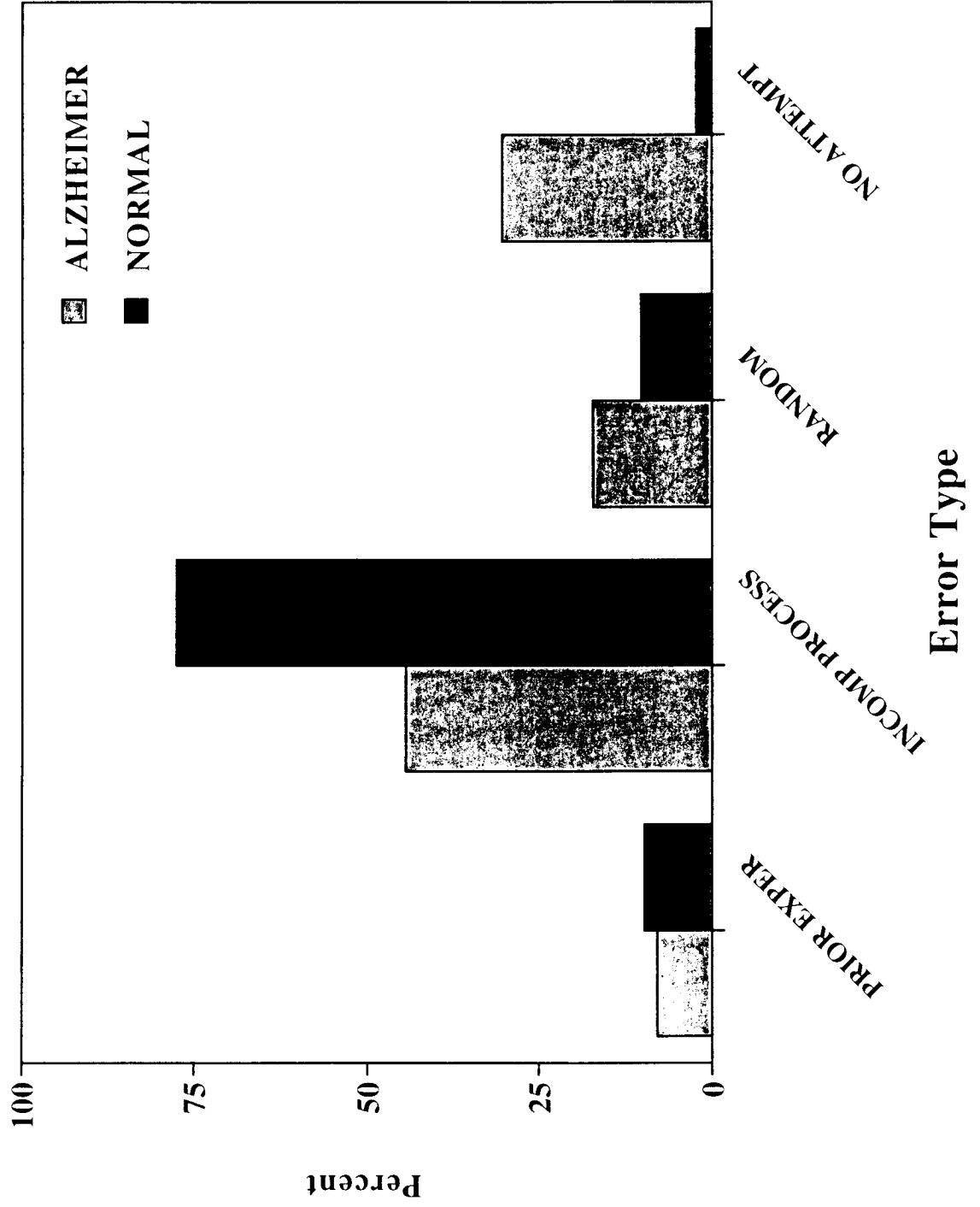


Table 1
Correlation of Financial Errors with Clinical Measures, IADL Rating, Age, Education: Demented Subjects

Variable	1	2	3	4	5	6	7
ADAS Cognitive							
MMSE	-.67***	.					
Trail Making - B	.53***	-.48***					
Financial Errors	.59***	-.47***	.45***				
IADL Financial	.22	-.16	-.04	.03			
Age	.16	-.20	.18	.04			
Education	-.19	.19	-.15	-.08	-.41***	-.16	

N = 79