

POSTER

Everyday Problem Solving: Measurement, Dimensionality, and Correlates

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Abstract

Investigated was the performance of 111 older adults (44 males and 67 females, mean age = 77.8 years) on three measures of everyday problem solving: the *Everyday Problem Solving Inventory* (Cornelius & Caspi, 1987), *Practical Problems* (Denney & Pearce, 1989), and the *Everyday Problems Test* (Willis, 1990). Of interest was the relationship of performance across these tests and the relationships between tests of everyday cognition and traditional intelligence measures. Older adults (>75 years) performed at mean levels that were not significantly different from those of the young old (68–74 years) on two of the three problem solving measures. Performance on each measure was only slightly related to performance on the other two measures. When factor analyzed, the subscales from the three different measures shared no common cross-measure dimensions. The everyday problem-solving measures also differed substantially in the magnitude of their relationship with traditional factors of intellectual ability. Taken together, the results support suggestions that cognition in everyday contexts is complex and multidimensional, and that individual measures most likely capture only limited aspects of this complexity.

Method

Sample

Subjects were 111 older adults (67 females and 44 males) who were residents of independent dwellings in a Florida retirement community. Participants had a *mean age* of 77.8 years (*SD* = 5.6 years, *range* = 68–94 years). Subjects also had an average of 15.2 years of *education* (*SD* = 2.4 years, *range* = 7–22 years).

Dimensions of Everyday Problem Solving

Subjects received three measures of everyday problem solving:

Everyday Problem Solving Inventory

(Cornelius & Caspi, 1987)

Practical Problems

(Denney & Pearce, 1989)

Everyday Problems Test

(Willis, 1990)

The Appendix “Examples of Everyday Problem Solving Tasks” presents sample items from each measure.

Each measure of everyday problem solving was found to consist of several *subscales*, either through factor analyses in the present study, or by

descriptions from the measures' authors. The subscales are listed below:

Everyday Problem Solving Inventory	Practical Problems	Everyday Problems Test
Consumerism Information Home Family Friendship Work	Social Instrumental	Food Preparation Medication Use Phone Use Consumerism Financial Management Housekeeping Transportation

Additional Measures

Subjects also received a broad intellectual ability battery, including selected scales from the *Culture Fair* tests (Cattell & Cattell, 1961, 1963), the *Kit of Factor-Referenced Cognitive Tests* (Ekstrom et al., 1976), and the *Schaie-Thurstone Adult Mental Abilities Test* (Schaie, 1985). *Factor analyses* revealed that the battery could be described by four second-order dimensions:

- Fluid Intelligence (Gf)
- Crystallized Intelligence (Gc)
- General Memory (Gm)
- General Speed (Gs)

Overview and Study Questions

Everyday problem solving refers to the cognitive processes and strategies typically employed when making decisions and finding answers to the challenges encountered in everyday life. A distinction is often made between *laboratory* and *everyday* tasks, although this distinction may not be pure. In fact, given the diversity of tasks devised to measure everyday problem-solving competence, there does not seem to be a consensus among researchers on the definition of everyday problem solving.

Despite this lack of agreement, a growing number of studies has focused on older adults' functioning on various cognitive tasks of everyday living. From a multivariate perspective, these various approaches to measuring everyday problem-solving competence across studies have negative implications for the meaningful growth of the body of research. Use of single measures without reference to the *aspects* of everyday cognition they represent means that there is little basis for comparing the results of individual studies.

The present study represented an initial attempt to explore the multidimensional nature of

everyday problem solving. Three different measures of everyday problem solving were administered to a sample of older adults, with the goal of exploring the similarities and differences among the measures.

Four questions guided this study:

- (1) What is the pattern of age/cohort differences in everyday problem-solving performance, across multiple measures?
- (2) What is the pattern of relationships among three problem-solving measures, as they are traditionally scored?
- (3) Are there latent dimensions common to the subscales from the three measures? Is there any factorial commonality among measures of problem solving?
- (4) How do the measures of everyday problem solving relate to performance on traditional psychometric factors of intelligence? Are everyday and laboratory conceptions of intelligence similar or distinct?

Results

(1) A 2 (Age group: young old, old old) by 3 (Measure) ANCOVA, controlling for cohort differences in education, revealed no overall Age or Age by Measure effects. *Post hoc* analyses of the subscales within each problem-solving measure revealed that while there were no significant age main effects for the *Everyday Problem Solving Inventory (EPSI)* or the *Practical Problems (PP)*, younger subjects performed significantly better than older subjects on all scales of the *Everyday Problems Test (EPT)* ($F[1,108] = 9.01, p < .01$). *Figure 1* presents a summary of these comparisons.

(2) As *Table 1* shows, there were only weak relationships among the three problem-solving measures. Although the *EPT* was significantly related to both other measures, the *EPSI* and the *PP* were not significantly correlated in this study.

(3) Examining the relationship among measures in a more complex way, subscales from each measure were jointly factor analyzed. As *Figure 2* displays, no common cross-measure latent dimensions were found among scales from the three measures.

(4) The three measures also varied substantially in the magnitude of their relationship with intellectual ability factors (see *Table 2*). Performance on the *EPT* was significantly related to performance on all four ability factors, especially Fluid and Crystallized Intelligence. The *EPSI* scores were related, modestly, to Fluid Intelligence only, and the *PP* was related to none of the intellectual ability factors.

Discussion

This study was motivated by questions about the construct and intellectual abilities underlying *everyday cognition*, and about the criterion tasks that can best be used to assess this area. Without a common theoretical base, the results of individual studies of *everyday problem solving* may represent little more than random selections from an unknown distribution of possible everyday tasks. The present study selected three measures of everyday problem solving from the literature. The measures shared superficial commonalities, and this study investigated the empirical relationships among them.

If the findings from this study are generalizable to other investigations of everyday problem solving in adulthood, then it seems that this literature may be a relatively unintegrated body of research on many individual (and possibly unrelated) tasks. While the limited selection of problem solving measures and the composition of the sample may attenuate the generalizability of this study, these results suggest that future *multivariate* research is needed to more clearly connect the findings associated with individual measures of everyday cognition. These findings also point to

the need for a common vocabulary and conceptual structure for the constructs of everyday problem solving, so that the contributions of individual studies can be placed in a broader context.

References

- Cornelius, S. W., & Caspi, A. (1987). Everyday problem solving in adulthood and old age. *Psychology and Aging, 2*, 144–153.
- Denney, N. W., & Pearce, K. A. (1989). A developmental study of practical problem solving in adults. *Psychology and Aging, 4*, 438–442.
- Willis, S. L. (1990). *Everyday Problems Test*. Unpublished test. Department of Human Development and Family Studies, Pennsylvania State University.

Table 1

Relationships among measures of everyday problem solving

	(1)	(2)	(3)
(1) Everyday Problem Solving Inventory (EPSI)	1.00		
(2) Practical Problems (PP)	0.22	1.00	
(3) Everyday Problems Test (EPT)	<u>0.28</u>	<u>0.24</u>	1.00

Note: Underlined coefficients are significantly greater than zero ($p < .05$).

Table 2

Relationships between measures of everyday problem solving and intellectual ability factors

	Fluid Intelligence (<i>Gf</i>)	Crystallized Intelligence (<i>Gc</i>)	General Memory (<i>Gm</i>)	General Speed (<i>Gs</i>)
(1) Everyday Problem Solving Inventory (<i>EPSI</i>)	<u>0.24</u>	0.18	0.16	0.10
(2) Practical Problems (<i>PP</i>)	0.05	0.14	0.01	0.03
(3) Everyday Problems Test (<i>EPT</i>)	<u>0.71</u>	<u>0.65</u>	<u>0.51</u>	<u>0.46</u>

Note: Underlined coefficients are significantly greater than zero ($p < .05$).

Figure 1

Age/cohort comparisons on three measures of everyday problem solving

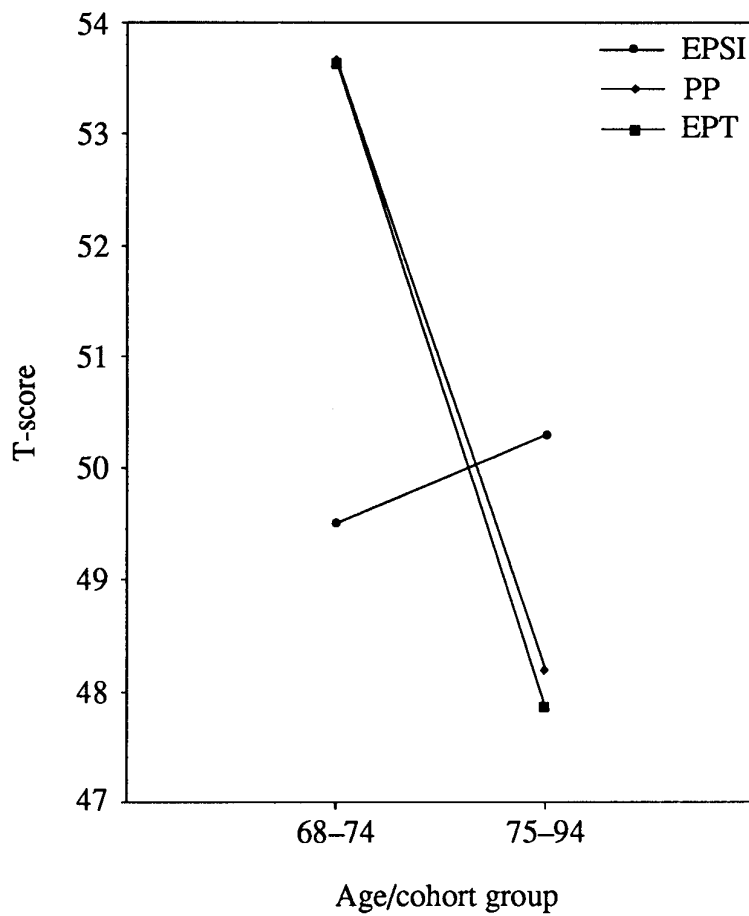
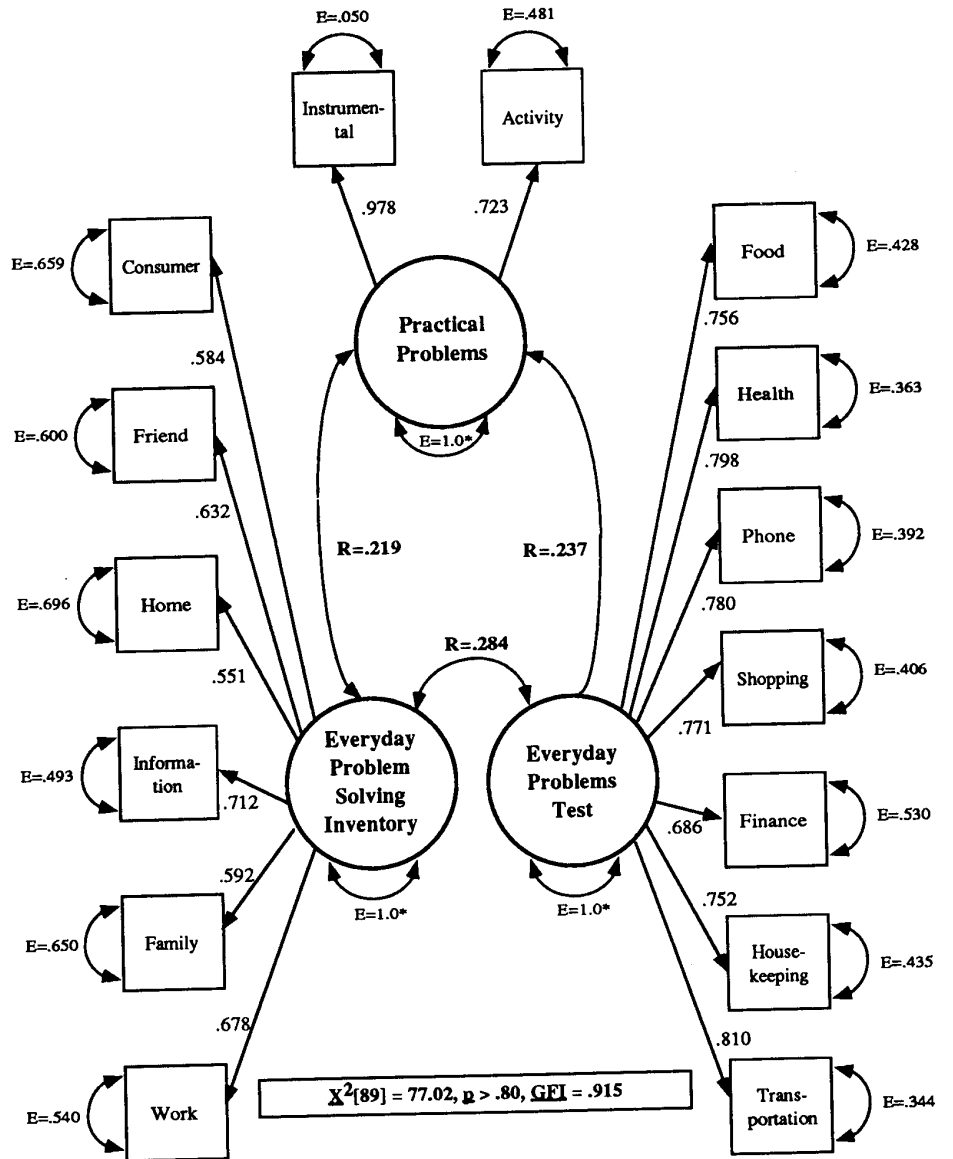


Figure 2

Latent dimensionality of three measures of everyday problem solving



Appendix

Examples of Everyday Problem-Solving Tasks

Everyday Problem Solving Inventory (Cornelius & Caspi, 1987)

Problem:

You have a landlord who refuses to make some expensive repairs you want done because he or she thinks they are too costly.

Possible solutions:

- A. Try to make the repairs yourself.
- B. Try to understand your landlord's view and decide whether they are necessary repairs.
- C. Try to get someone to settle the dispute between you and your landlord.
- D. Accept the situation and don't dwell on it.

Rating scale for each solution:

- 1 = Definitely would not do
- 2 = Probably would not do
- 3 = Uncertain; may or may not do
- 4 = Probably would do
- 5 = Definitely would do

Practical Problems (Denney & Pearce, 1989)

Instrumental problem:

An elderly woman can drive her car to run errands, except in winter when the weather is bad. What should she do about getting groceries and other necessities when the weather is bad?

Social/activity problem:

Let's say that a 65-year-old woman has just been widowed and now lives alone. What can she do to continue associating with people?

The task:

Subjects must generate as many safe and effective solutions as they can to each problem. They are prompted for as many solutions as they can possibly generate. The score is the number of safe and effective solutions generated for each problem.

Everyday Problems Test (Willis, 1990)

Check these points *before* you call for service.

If your washer

Won't agitate or fill	Won't spin or drain	Stops	Possible reason—do this to correct
o	o	o	Replace fuse. Reset circuit breaker.
o	o	o	Turn control past "OFF," pull out.
o	o		Straighten hoses. Eliminate kinked hoses.
	o		Off-balance load. Turn control "OFF" Redistribute clothes evenly. Restart Control.
	o		Suds lock—caused by too much suds. Re- wash without deter- gent. Use correct amount of low-suds- ing detergent.
o			Hose filter screens plugged. Remove hoses from faucets. Clean screens and reinstall hoses.

Question A

Stretching hoses or removing bends in hoses could solve which two problems?

Question B

Your washer won't fill or agitate. However, the spin and drain cycles work properly. What is a likely problem?