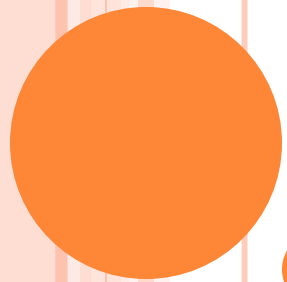




**IS FALLS RISK AN INDEPENDENT
CONTRIBUTOR TO EVERYDAY
PROBLEM SOLVING AS MEASURED
BY THE EPT IN COMMUNITY-
DWELLING SENIORS?**

Lindsay McCaw, Barbara Gartly and Sarah
Nelson



BACKGROUND

AGING POPULATION

- ↑ Aging = ↑ falls risk [1]
- 30% over 65yrs will experience 1 or more falls every year [2]
- Decreased quality of life [3]
- Direct cost of medical care associated with falls in Canada exceeds **2.4 BILLION** [3]



FALLS

○ Risk Factors:

- Increasing age
- Decreased ability to participate in activities of daily living
- Muscular weakness
- Balance problems
- Medications
- Past and current level of physical activity
- Functional limitations
- Visual impairments [2,5-8]

○ Intrinsic vs Extrinsic [9]



COGNITION

- Key risk factor [2]
- Impaired vs normal = 2x risk [2]
- Prospectively predicts falls in community dwelling and nursing home residents [10]



EXECUTIVE FUNCTION

- Definition: higher order cognitive processes that control, integrate and fine tune the more basic mental functions [11-12]
- Sub-processes: set-shifting, working memory, dual tasking, planning, organizing, self-monitoring [11, 13-14]
- Inter-related [13]
- Impaired Executive Functioning without impaired global cognition [11, 15]



EVIDENCE

- Well-established relationship between poor executive function and falls risk among the elderly
- Nevitt et al. [16]
- Lord & Fitzpatrick [17]
- Rapport [18]
- Further Support [11, 19-20]



GLOBAL EXECUTIVE FUNCTION

- Problem solving [21-22]
- Instrumental Activities of Daily Living (IADLs)[23,21]
- Measurement
 - Self report [24, 25]
 - Observed [24]



EVERYDAY PROBLEMS TEST (EPT)

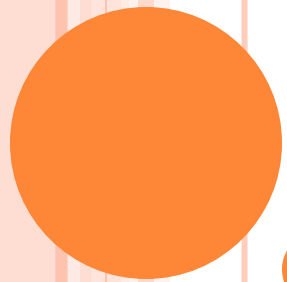
- Objective, performance-based
- Domains
- Reliability 0.94
- Test-retest reliability 0.94
- Validity:
 - self-ratings of IADLs ($r=0.23$, $p \leq 0.05$)
 - spousal scoring of IADLs ($r=0.24$, $p \leq 0.05$) [24, 26]



PURPOSE

- Purpose: examine the relationship between global executive functioning and falls risk
 - Determine independent contribution of falls risk to EPT score
- Hypothesis: Increased falls risk will correlated with lowers scores on the EPT





METHODS

PARTICIPANTS

- Subset of Brain Power Study [27]
- 101 Community-dwelling women
- Age: 65-75
- Inclusion and exclusion criteria



DESCRIPTIVE VARIABLES

- Age
- Years of School
- Global Cognition
- Mood



INDEPENDENT VARIABLE

- Physiological Profile Assessment (PPA) - falls risk [1]
 - 5 validated measures of physiological function
 - Visual contrast sensitivity
 - Proprioception
 - Reaction time
 - Isometric quadriceps strength
 - Postural sway
 - Scores:
 - <0 = low risk
 - $0-1$ = mild risk
 - $1-2$ = moderate risk
 - >2 = high risk



DEPENDENT VARIABLE

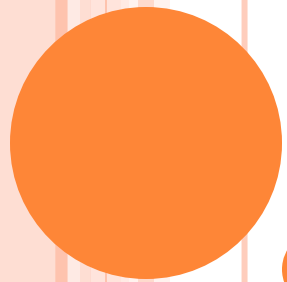
- EPT- global executive functioning [26]
 - Covers 7 domains
 - Medication use
 - Shopping
 - Transportation
 - Meal preparation
 - Telephone use
 - Household management
 - Financial management
 - 42 item multiple choice test given by administrator
 - One point for each correct answer
 - Standardized guidelines and format



STATISTICAL ANALYSIS

- Data was analyzed using SPSS Windows 17.0
- Pearson Product Moment Coefficient
 - EPT, PPA, years of school, age, MMSE, GDS
- Multiple Linear Regression Model
 - To determine independent contribution of falls risk to EPT
 - Variables statistically controlled





RESULTS

DESCRIPTIVE VARIABLES

Table 1. Descriptive Statistics for Descriptors and Outcome Measures of Interest (N=101).

Variable	Mean (SD)
Total Score	32.7 (6.5)
Age	69.3 (2.8)
Years of School	4.8 (1.3)
Total MMSE Score	28.7 (1.2)
Geriatric Depression Score	.58 (1.4)
PPA Score *	.40 (.80)

Table 1 reports the descriptive statistics for our variables of interest. Overall this group of community dwelling senior women had a PPA score of 0.4 indicating a mild falls risk.



CORRELATION COEFFICIENTS

- Table 2. Pearson Product Moment Coefficients Between EPT, Age, Years of School, MMSE, GDS, And PPA

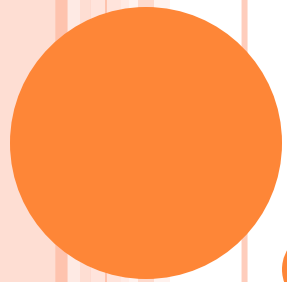
Variables	EPT	Age	Years of School	MMSE	GDS	PPA
EPT	1.00	-0.147	0.366*	0.388*	-0.044	-0.260*

Table 2 shows the correlation coefficients of those variables included in the multi-variable regression model. Of these variables, years of school, MMSE score and PPA score were significantly associated with EPT score ($p < .01$).



LINEAR REGRESSION

Independent Variables	EPT Score				
	R ²	R ² Change	Unstandardized B (SE)	Standardized β	p value
Model 1	.218	.218			
Age			-.119 (.219)	-.050	.589
Years of School			1.38 (.502)	.268	.007
Total MMSE Score			1.55 (5.15)	.292	.003
Geriatric Depression Score			.035 (.442)	.007	.936
Model 2	.279	.061			
Age			.022 (.217)	.009	.920
Years of School			1.48 (.486)	.287	.003
Total MMSE Score			1.51 (.498)	.283	.003
Geriatric Depression Score			.083 (.427)	.017	.846
PPA Score			-2.08 (.735)	-2.54	.006



DISCUSSION

RECAP

- Falls risk independently contributes to global executive function as measured by the EPT
- First study that has examined the independent contribution of falls risk to global executive function in community-dwelling older adults



PAST STUDIES-DIFFERENCES

- Correlation between EPT and GDS
 - We found no significant correlation to exist
 - Cahn-Wiener [28] reported depression as a significant contributor to observed IADL performance
 - We: Excluded participants with clinical depression
- Correlation between EPT and Age
 - We found no significant correlation to exist
 - Marsiske and Willis [29] found age to account for 17% of the variance on EPT
 - We: used a univariate model , Willis used multivariate model



PAST STUDIES-SIMILARITIES

- Increased falls risk is associated with decreased executive function
- Consistently recognized in the literature [1,30]



NOVEL FINDINGS

- Even **mild** falls risk is associated with **reduced** everyday problem solving ability



IMPORTANCE

- Decreased score on EPT may represent difficulties performing IADLs [28,31]
- Willis [26] competence in performing IADLs is essential to independent living within the community
- Inability to adequately achieve these tasks of daily living has been associated with: [21,32]]
 - Institutionalization
 - Decreased quality of life
 - Increased mortality



IMPLICATIONS-SCREENING

- Need comprehensive screening for executive functioning when working with seniors
- Earlier identification of those having difficulties managing IADLs



IMPLICATIONS-INTERVENTION

- Currently interventions tend to focus on physical barriers to independence [15]
- However, ability to problem solve is also necessary for independence
- Clinicians need to focus on both the physical and ability to problem solve



LIMITATIONS

- Cross-sectional design therefore unable to establish causality/directionality
 - Current evidence suggests that reduced physical function and cognitive function are co-occurring conditions
- Population: generally healthy community-dwelling female seniors between ages of 65-75



FURTHER RESEARCH

- Establish causality
- More heterogeneous population
- Feasibility of EPT use for clinicians



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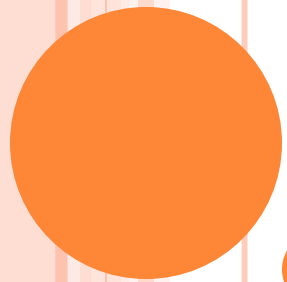


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QUESTIONS