



***The role of cognitive functioning on
everyday functioning among oldest
old physically frail***

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Everyday functioning (EF) and aging

- EF can be defined as including :

- Instrumental Activity of Daily Living (IADL)
- Basic Activity of Daily Living (BADL)

Lawton & Brody, 1969;
Gold, 2012

- EF performance is multi-determined:

- Socio-demographic variables (age, gender, marital status, etc.)
- Cognitive abilities (executive functioning, episodic memory)
- Physical aptitudes (sensory and motor functioning)

e.g. Avlund et al., 2003


Gross et al., 2011

Seidel, Brayne & Jagger, 2011



Relations between these variables ?

Relation between cognitive and physical functioning with aging

- Largely reported in the literature using dual tasks (e.g., Lindenberger et al., 2000)
 - Sensory deficit theory Dennis & Cabeza, 2008
 - Role of sensory decline in cognitive decline Lövdén et al., 2005
- Compensatory role of cognitive functioning to perform EF:
(SOC model (Selection, Optimization, Compensation), Lindenberger & Baltes, 1994)
 - Observed for sensory impaired older adults and associated with an increased EF complaint Heyl & Wahl, 2012
 -  Deliberate adaptive strategy to manage the sensory deficit
- Extensible to physically impaired older adults?

Objectives



Study the compensatory role of cognitive resources in EF among cognitively healthy older adults, but with reduced physical functioning

- Two groups of participants depending on their physical performance (Low vs. High physical functioning)
- Compare their EF on:
 - Objective performance
 - Self-reported performance (EF complaint)
- Assess the mediating effect of cognitive functioning

Participants

- 50 cognitively healthy old participants (MMSE > 27)
- Assessment of cognitive functioning (CF) (max score : 174) :
 - Dementia Rating Scale-2 Jurica, Leitten & Mattis, 2001
 - Frontal Assessment Battery Dubois et al., 2000
- Assessment of physical functioning (PF) (max score : 24) :
 - Body strength (Five Chair Stand, body mass)
 - Mobility (Timed Get Up and Go Test, gait speed)
 - Static Balance (Tandem stand)
 - Sensory Abilities Guralnik et al., 1994

Low PF group :		N = 25	High PF group :	
age	82.12 (1.30)	←	age	80.24 (1.10)
5 males and 20 females			→	4 males and 21 females
CF score	146.20 (1.45)		CF score	148.61 (1.46)
PF score	14.40 (0.71)		PF score	20.14 (0.33) ***

*** : p < .001

Method



- Assessment of EF :

- Objective measure: Timed-IADL

Owsley et al., 2002

- Ex: “Voici des ingrédients présentés sur une étagère. Pouvez-vous aller me chercher la boîte de soupe à la tomate et une boîte de raviolis ?”

- Self-reported EF performance: Lickert-scale

- Ex:



Lawton et al., 1982

9. Pour vous, faire les courses est-ce... ?

Pas difficile	Peu difficile	Moyennement difficile	Difficile	Très difficile	N/A

Results: Comparison of EF scores

Performance-based and self-reported measures of everyday functioning compared between the two groups of older participants (High vs. Low PF groups)



Assessment of EF	High Physical Functioning		Low Physical Functioning
	6.24 (0.45)	$p < .900$ =	6.24 (0.38)
	24.16 (1.28)	$p < .01$ ↗	29.48 (1.42)



Although the two groups perform equally, older adults with physical impairment report more difficulties in everyday functioning

Results: Mediating effect of cognitive resources


ANCOVAs results controlling cognitive resource variable

	Group	Cognitive Resources	Interaction Group*Cog resources
	ns	$p < .001$ ($\eta^2 = .25$)	ns
	$p < .01$ ($\eta^2 = .16$)	ns	$p < .01$ ($\eta^2 = .17$)

- Cognitive resources mediate EF performance irrespective of group conditions
- Subjective EF performance is mediated differently by cognitive resources for the two group conditions:
 - **Negative** correlation between EF complaint and cognitive resources is observed for High PF group
 - **Positive** correlation between EF complaint and cognitive resources is observed for Low PF group

Discussion-Conclusions


- ① Objective EF performance is maintained in cognitively healthy old adults with low physical functioning,
But an increased EF complaint is reported
- ② Strong involvement of cognitive functioning is observed to maintain EF performance irrespective of physical conditions
- ③ EF complaint is strongly correlated to cognitive functioning for older adults with Low physical condition



Overall, these results support the compensatory role of cognitive functioning in physically impaired old adults in the management of EF performance

Discussion-Conclusion

Limitations

- Small sample size
- General measure of cognitive functioning
-  • Role of specific component (executive functioning, memory, etc.)

To conclude,

- The complaints and continuous cognitive efforts by Low PF old adults to manage everyday functioning deserve a clinical consideration



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