

# Technology, human interactions and dementia Feel the difference?

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# Dementia

Over 45 million people worldwide  
**A diagnosis every 3 seconds!**

Increase to 130 million by 2030

7% of over 65 and 35-40% of over 85 years



Need enhanced understanding & support = Global public health priority

# 10 signs of dementia

(see alzheimer society ay [www.Alzheimer.ca](http://www.Alzheimer.ca))

**Spatial relationships**  
**Language**

Misplacing things

**Disorientation**

**Memory**



**Withdrawal**

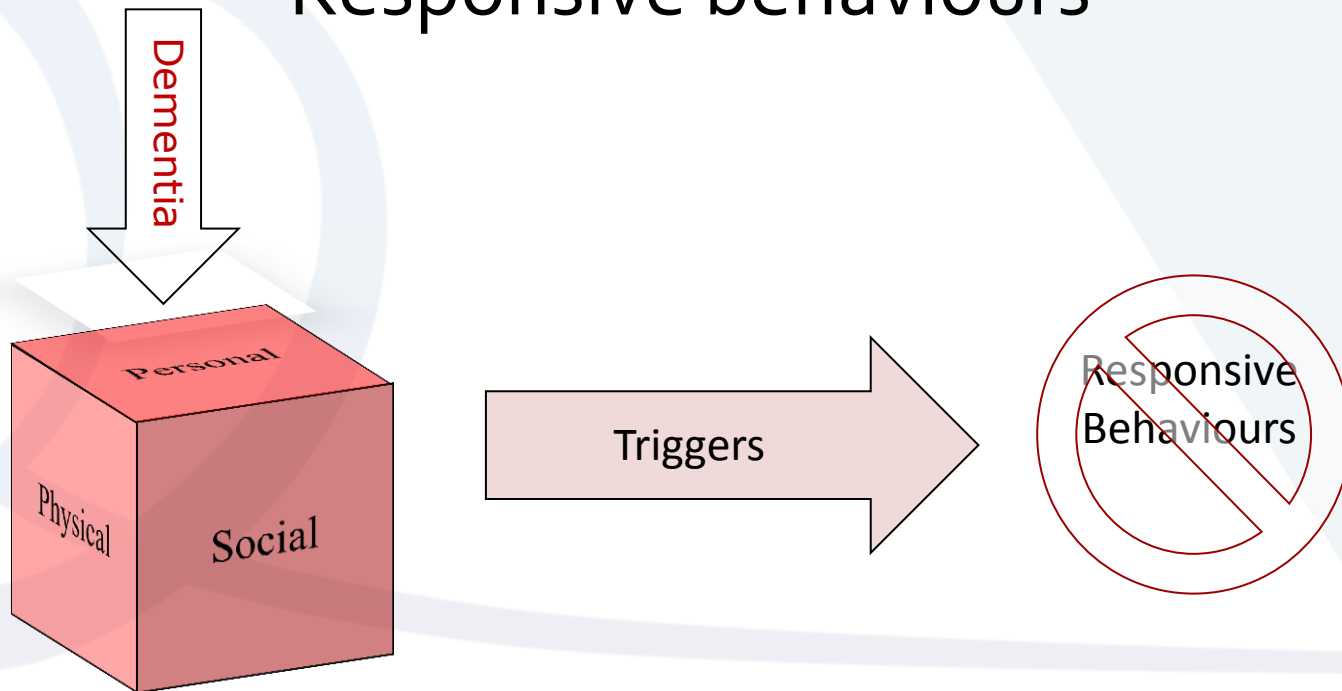
**Mood and personality**

**Judgment**

Familiar tasks

**Planning/problem solving**

# Responsive behaviours



# Anxiety Disorders



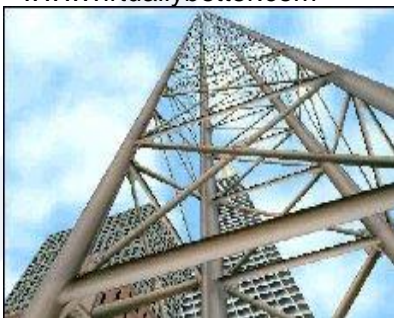
Fear of heights  
[www.virtuallybetter.com](http://www.virtuallybetter.com)



Fear of spiders



Fear of public  
speaking  
[www.virtuallybetter.com](http://www.virtuallybetter.com)



Acrophobia  
[www.virtuallybetter.com](http://www.virtuallybetter.com)



Fear of flying  
[www.virtuallybetter.com](http://www.virtuallybetter.com)



Fear of Driving

# Virtual reality

## Some of its strengths



Triggering emotions

Realistic & challenging scenario

Adjustable level of difficulty

Possibility of repeating scenario

# The Research Project

**Can VR provide a useful platform for responsive behaviour training?**

Interactive learning experience

Realistic and challenging situations

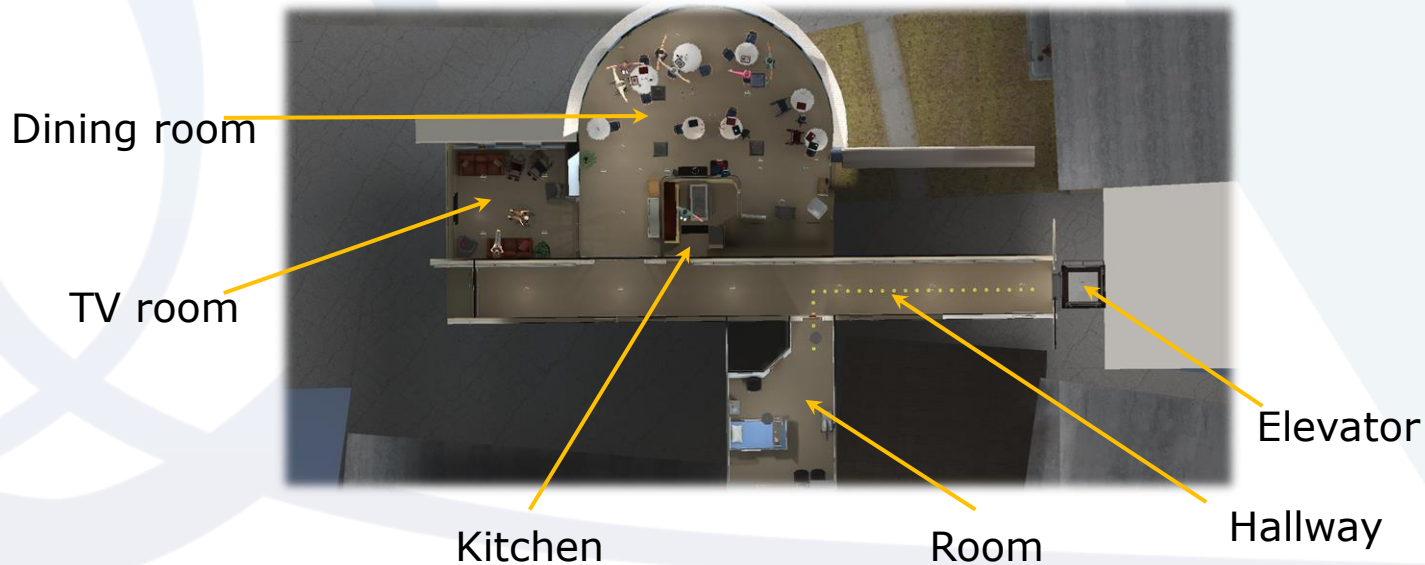
Contribute to transfer of skills to real world situations



Recognition and  
neutralisation of  
factors likely to trigger  
Responsive Behaviours



# The application (birds-eye-view)





# The virtual environment



Coming out of elevator



The room



Entrance to dining room



TV room



Dining room



Kitchen

# The protocol – immersion



Habituation to VR &  
controls



Cognitive exercise –  
increase frustration



Who is the  
grandfather?



Observation

# The Virtual Agents

Person living in LTC  
and nurse

Kitchen staff

Person living in LTC and nurse



PwD & grand-  
daughter

## The scenario (at dining room table with PWD)

### Seven scenes

- Arrival of visitor
- Food on side of mouth
- Cell phone 1
- Water falling on the shirt
- Getting cold
- Help cutting meat /cell phone 2
- Eating with knife instead of fork



# The protocol – Post-immersion

- Data collected via questionnaires
  - Level of simulator sickness
  - Level of presence attained during immersion (ITC-Sense of Presence Inventory)
  - Usefulness of the application as a training tool
  - Usability of the application as a training tool
  - Possibility of training health professionals using VR



# Sample

- 85 participants
- 11 Males /74 Females
- Status
  - 10 Professors
  - 23 Informal caregivers
  - 23 Health human resources (PSW, Nurse)
  - 29 Students (HS, SS, Medicine, PSWC)
- Majority: some training in aging, dementia, some experience interacting with PWD
- 41% had some training on responsive behaviours
- 28% had used VR before



Respond to  
behaviours?  
72% yes  
Felt present!

Visual, life-like  
representation

Spoke out  
loud to the  
characters

Wanted to  
interact and  
speak

Felt  
threatened  
by the knife

Emotionally  
involved

Easy to use? 87% yes



**No labs on  
how to have a  
therapeutic  
interaction  
with patients**

**Reading or  
being told  
what to do is  
different from  
life-like  
experience**

**Everyone  
should have  
VR training**

**Future training  
tool for healthcare  
providers?  
88% yes**

**Should be part  
of a yearly  
performance  
appraisal**

**Training in LTC? 85% yes**

## What do you think the granddaughter in this scenario would have or should have done differently?

She did not understand... her grandfather is very autonomous

Understand that grandfather is his own person

More independence and dignity

Understand difficult to concede independence

## What would you or could you have done in this situation?

Give him a  
choice

Explain why I  
am there

Let resident  
do as much as  
he can for  
himself

# Conclusions

- VR offers a **superb stepping stone** between learning in a classroom and practice in the real world.
- **Believable scenarios** involving virtual individuals with dementia are possible for training purposes. People feel present.
- Next steps:
  - More interactive
  - More scenarios with various responsive behaviours
  - More accessible
  - RCT



## Our team:

- Linda GARCIA, PhD, Full Professor, Founding Director – LIFE Research Institute, Faculty of Health Sciences, University of Ottawa
- Annie ROBITAILLE, PhD, Assistant Professor, Université du Québec à Montréal
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- Oliver Baus, PhD, Project Manager

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- Carol HOLMES-KERR, Caregiver
- Richard PINET, Center for elearning, uOttawa.
- Susan KENNEDY, The Dementia Society of Ottawa and Renfrew County
- Kiran RABHERU, Geriatric Psychiatry, Medicine, uOttawa.

 Federal Ministry  
Labour, Social Affairs, Health  
and Consumer Protection



uOttawa

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# Community partners

sozialministerium.at



Human Rights of Older Persons



*Société Alzheimer Society*  
OTTAWA AND RENFREW COUNTY



Mental Health - Care & Research  
Santé mentale - Soins et recherche



**ALGONQUIN**  
COLLEGE



**Perley Rideau**

The Perley and Rideau Veterans'  
Health Centre Foundation

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Labour, Social Affairs, Health  
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CANADA