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ISSUE

WATERLOO RESEARCH IN AGING PARTICIPANT POOL

Our mission: To facilitate research that will further our knowledge of the aging process



UNIVERSITY OF
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Note of Thanks

We are grateful to you for being part of our research!

Your support helps us continue to learn about factors affecting how we age.

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Research Highlights: Wheeled-walker Design and Activities of Daily Living



Arshak Petrosyan, Harvey Marchant, Christian Mele and James Tung, Ph.D.

Rollators, or wheeled walkers, are prescribed to support mobility, strength, and balance. However, users report usability challenges and continue to experience fall-related injuries during use, particularly during transfers. In this study, we compared movement strategies during sit-to-stand and stand-to-sit transfers, maximum reach, straight line walking, object carrying, and tight space navigation. The tasks listed were intended to simulate activities of daily living, such as standing up from a toilet, reaching for a mug in a cupboard, or maneuvering out of an elevator. We recruited ten participants from WRAP to complete these tasks using two rollator devices. The traditional X-frame design of the Nitro rollator was compared to the novel H-frame of the Nuvio One, which was aimed at assisting transfers and reaching. All measurements were taken using wearable sensors, which were attached to the participant using Velcro straps. Participants were also asked to fill out a feedback form after each task where a 1-10 score was assigned to each device for that task.

In general, participants preferred the Nuvio One during the transfer tasks and reaching, praising its dedicated lower transfer handles and hollow frame design. Feedback for the walking tasks was more mixed, with the Nitro being slightly favoured due to its larger front wheels and grippier wheel material. In summary, the Nuvio One makes clear improvements in the stationary tasks it was designed for, but requires further changes to match the walking performance of a traditional rollator design.

Home-cooked Meals

Did you know...a recent study found that cooking at least one meal at home weekly may cut **dementia risk by up to 67%**!

While the cause is still uncertain, one suggestion is that home-cooking promotes:

- healthier eating habits, like greater vegetable and fruit intake
- cognitive activities like meal planning
- physical activities like meal preparation

That may all reduce dementia risk!



Research Highlights: Sounds of the Past: How Music Helps You Remember Your Past



Khalil Husein, Nadya Drury and Myra Fernandes, Ph.D.

Our ability to remember memories from our past often declines with age, and is further reduced in individuals with declining cognitive health. Music can bring back vivid meaningful memories, making it a promising way to support memory retrieval in older adults. In this study, we examined what components of music are most beneficial in evoking personal memories. We also examined whether there are individual traits, such as cognitive status, that affect the ability of music to bring back memories in older adults. To investigate this, we had participants listen to 15-second clips of popular late-1960s songs (e.g., Hey Jude by The Beatles), presented as either unaltered songs or in modified format (lyrics-only, instruments-only, song and artist name). Following each song clip, participants were asked to verbally describe and rate the emotional experience of any memory that was evoked. Participants were recruited from local long-term care homes and from the Waterloo Research in Aging Participant Pool (WRAP).

Preliminary results show that unaltered song cues evoked more personal memories than any of the modified music formats. Lyrics in a song particularly helped to bring back memories. As long as they were familiar with the song, even individuals with greater cognitive impairment experienced memories from music. Participants recalled even more memories when the songs were from their teenage years. Finally, songs tended to evoke memories from the same time period in which the song was most popular (e.g., a song from 1969 tended to evoke memories from the late 60s). Overall, these findings suggest that music remain an effective way to evoke personal memories in older adults, regardless of cognitive status. We propose that songs are particularly effective memory cues because they constrain the search for memories to a specific point in time, facilitating access. We sincerely thank our participants, including the members of WRAP, for allowing us to conduct this research!

Did you know...

Brain-y Fun Facts!

- Our brain can **regenerate!** Through **neurogenesis**, our neurons can regenerate and heal
- **60%** of the human brain is **made of fat**, making it the fattiest organ in the human body! One more reason to enjoy a sweet treat
- A **brain freeze** happens when cold hits the outer brain. Our **arteries rapidly change size**, causing a quick headache!

Research Highlights: Relations Between Anxiety and Parkinson's Disease

The Neurocognition and Mobility Lab, led by Kaylena Ehgoetz Martens, Ph.D.

Anxiety is common in people with Parkinson's disease and can affect many aspects of everyday life. At the same time, Parkinson's can affect how people process sensory information, such as information used to maintain balance and control movement. The PDAnx study conducted at the University of Waterloo, aims to better understand how anxiety, sensory function, and movement may be related in Parkinson's disease. To investigate this, we compared people with Parkinson's with older adults without Parkinson's. Many of our participants without Parkinson's were recruited through the Waterloo Research in Aging Participant Pool (WRAP). Having this comparison group is very important, as it helps us understand which patterns may be specifically related to Parkinson's disease and which may also occur as part of healthy aging.

Participants completed questionnaires about anxiety and other aspects of daily life, as well as several tests of balance and sensory function. They also performed walking tasks while wearing a virtual reality headset. The virtual environments ranged from relatively simple to more challenging situations, such as navigating a cluttered sidewalk, crossing a road under time pressure, and walking at a simulated height. During these tasks, we measured participants' walking patterns, heart rate, and skin responses and asked them how they felt. Data collection has now been completed, and we are analysing the results. We are particularly interested in whether differences in sensory function are related to anxiety, and whether anxiety and the body's response to challenging situations are associated with changes in walking. We will also investigate whether these relationships differ between people with and without Parkinson's disease. Together, these findings will help us better understand the different factors that contribute to anxiety and movement difficulties in Parkinson's. We are very grateful to all WRAP participants whose involvement has made these comparisons possible.

Sudoku Games

Fill in the blanks so that each row, each column, and each of the nine 3x3 grids contain one instance of each of the numbers 1 through 9.

Answers are on the last page.

4	5	7	8	2	9			
2	1	6	5	3			4	
	9					5		
	4	2	1		3			8
8	3	5	2			1	7	
1			4	8	5	2	3	
9		3			2		1	
	6							
				4		8		

Game 1 (Beginner)

	1		8					
3					9	7	4	
						1		3
5		9	2	7	3		1	6
8			5					
		1						
	5	8	3	6	4			2
7	3			9				
4				5			3	

Game 2 (Hard)

Research Highlights: Streetlight Illumination Effects on Driver Safety and Comfort

Shene Abdalla and Siby Samuel, Ph.D.



Nighttime driving can be challenging, particularly as we get older. Reduced visibility can make it harder to see pedestrians, cyclists, road signs, and other potential hazards. While streetlighting is intended to make nighttime driving safer, an important question remains: does brighter lighting always lead to safer and more comfortable driving? My study explored how different levels of roadway lighting affect drivers of different ages. Thirty licensed drivers participated, including 15 younger adults between 20 and 45 years old and 15 older adults aged 65 and above. Participants drove through a realistic virtual roadway environment using a high-fidelity driving simulator and experienced three nighttime lighting conditions: low, medium, and high. During the drives, participants encountered situations that required them to notice and respond to potential hazards, including a cyclist entering the roadway, a pedestrian approaching a crosswalk, a construction zone, and a vehicle attempting to merge. We examined how quickly drivers noticed and responded to these situations, where they looked, their physiological responses, and how they rated the visibility, comfort, and safety of each lighting condition.

The results showed that more light was not always better. Low lighting was associated with slower hazard detection and response, greater physiological demand, and poorer ratings of visibility, comfort, and safety. Moving from low to medium lighting produced the clearest overall improvements. However, increasing the lighting from medium to high provided relatively little additional benefit and, for some participants, introduced concerns about glare or excessive brightness. Older and younger drivers showed some differences in their responses, but both groups generally followed the same pattern across the lighting conditions. These findings suggest that effective nighttime roadway lighting may depend not on making streets as bright as possible, but on providing moderate, well-distributed lighting that supports visibility, driver response, and comfort for people across different age groups.

For anyone interested in learning more, the full thesis is available through the University of Waterloo's institutional repository: <https://hdl.handle.net/10012/23005>. This work was also recognized through the Sharratt Scholarship at the University of Waterloo, a competitive graduate award supporting research with societal impact. Thank you again to WRAP and to all the participants who supported this research. Their participation was very valuable to the study.

Brain Teasers

1. I am a box that holds keys without locks, yet they can unlock your soul. What am I?
2. A sundial has the fewest moving parts of any timepiece. Which has the most?
3. I can't be bought, but I can be stolen with a glance. I'm worthless to one but priceless to two. What am I?
4. What runs all around a backyard yet never moves?
5. Which word logically comes next in the sequence? Spot, tops, pots, opts,...
6. How can a man who shaves several times a day still sport a long beard?

7.



8.



Answers

1. A piano | 2. An hourglass | 3. He's a barber | 4. A fence | 5. Stop | 6. Love | 7. Eiffel Tower | 8. In Between Jobs

Are you a cognitively healthy older adult that might be interested in joining WRAP? Do you know someone that might be interested?

Please contact us!

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Game 1

4	5	7	8	2	9	3	6	1
2	1	6	5	3	7	8	4	9
3	9	8	6	4	1	5	2	7
6	4	2	1	7	3	9	5	8
8	3	5	2	9	6	1	7	4
1	7	9	4	8	5	2	3	6
9	8	3	7	6	2	4	1	5
5	6	4	3	1	8	7	9	2
7	2	1	9	5	4	6	8	3

Game 2

6	1	4	8	3	7	5	2	9
3	2	5	6	1	9	7	4	8
9	8	7	4	2	5	1	6	3
5	4	9	2	7	3	8	1	6
8	6	3	5	4	1	2	9	7
2	7	1	9	8	6	3	5	4
1	5	8	3	6	4	9	7	2
7	3	6	1	9	2	4	8	5
4	9	2	7	5	8	6	3	1