Aging Well, Sensing Better: Characterizing Patterns of Sensory Loss in Community-dwelling Older Adults

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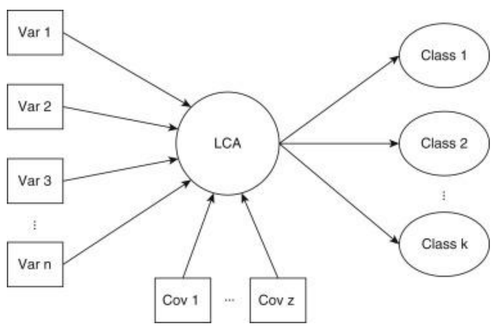
Background

- Sensory decline in older adults (**OAs**) impacts quality of life, consequences like falls, injuries, and malnutrition[1-4]
- The co-occurrence and patterning of multi-sensory loss across the classical five senses has not been characterized in a population-based study.
- Using **Latent Class Analyses (LCA)** to understand these profiles could reveal biologically and clinically meaningful subgroups of older adults with different needs and risks.

Methods

- N=3,005 OAs interviewed in the National Social Life and Health and Aging Project (NSHAP); 1,216 had five senses objectively measured.[5]
- Function for each sense was classified as good, fair or poor.
- LCA defined sensory profile classes with overlapping impairments. Successive models were fitted with 1-10 classes, and the Akaike and Bayesian Information Criteria (AIC, BIC) were used to determine goodness-of-fit.

Figure 1: Latent Class Analysis (LCA) Overview

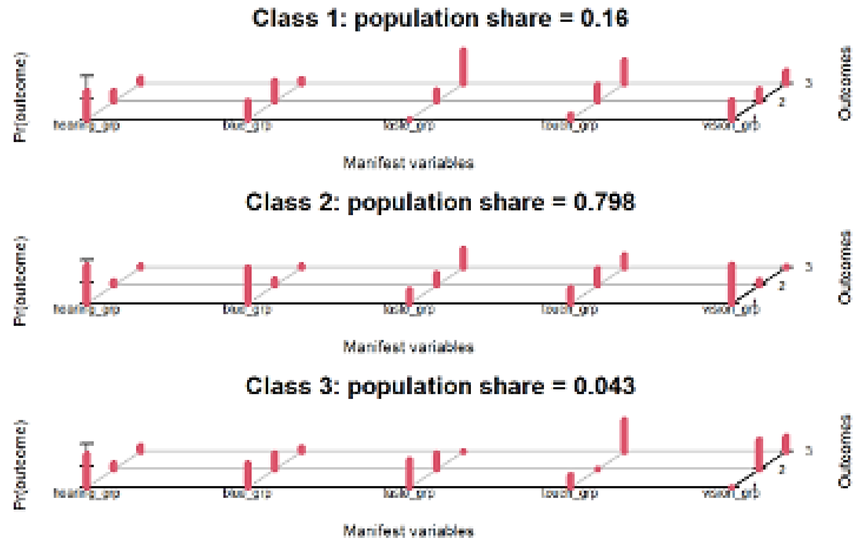


Results

Table 1: Item Response Probabilities by Latent Class (by percentage)

Category	Class1	Class2	Class3	p_value
Smell				
Normal	64.68	86.21	75.65	=0.009
Mild	23.07	10.22	13.66	
Severe	12.25	3.57	10.69	
Hearing				
Normal	43.02	83.08	55.26	<0.001
Mild	46.87	13.62	36.30	
Severe	10.11	3.30	8.44	
Taste				
Normal	0.00	31.40	64.22	<0.001
Mild	25.92	26.51	35.78	
Severe	74.08	42.09	0.00	
Touch				
Normal	10.74	34.97	28.87	<0.001
Mild	37.75	38.33	0.00	
Severe	51.51	26.71	71.13	
Vision				
Normal	44.38	87.73	0.00	<0.001
Mild	27.71	10.76	66.94	
Severe	27.91	1.51	33.06	

Figure 4: Accumulated local effects (ALE) plots account for non-linear correlations of select variables and GSI



16% Class 1 (Predominant taste and touch loss)

79.8% Class 2 (Best sensory function)

4.3% Class 3 (Predominant vision loss)

Class 1

- Predominant losses in taste and touch
  - Taste: 100% Fair/Poor
  - Touch: 77.4% Fair/Poor
  - Relatively preserved hearing (43.0% Good) and vision (44.4% Good)
- Demographics:
  - Intermediate age and socioeconomic profile
- Taste and touch loss may reflect shared somatosensory pathways or systemic metabolic changes

Class 2

- Best function across all five senses
  - Smell: 86.2% Good
  - Hearing: 83.1% Good
  - Vision: 87.7% Good
  - Taste: 31.4% Good
  - Touch: 34.97% Good

Demographics:
- Youngest median age (median = 68; p<0.001)
- Majority White (73.9%; p<0.001)
- Most highly educated (p<0.001)
- Highest median household assets ($250,000)

Class 3

- Predominant losses in vision
  - Worst sense of vision (100% Fair/Poor)
  - Taste: 64.2% Good
  - Significant hearing (44.7% Fair/Poor) and smell impairment (89.3% Fair/Poor)

Demographics:
- Female-predominant (68.5%; p=0.02)
- Lowest median household assets ($45,400 vs. $250,000 in Class 1; p=0.0078)
- Older age distribution

Conclusion

- Sensory loss occurs in distinct patterns in older US adults.
- Socioeconomic disparities are embedded in sensory profiles, suggesting that sensory health inequities track with broader social determinants.
- Understanding how demographics and comorbidities contribute to sensory function profiles, as well as how they result in subsequent health outcomes, would allow us to:
  - Enhance quality of life for older adults
  - Reduce healthcare utilization
  - Strengthen healthy aging initiatives at a population level
- Future work will integrate OAs from Wave 4 of the NSHAP and examine how these sensory profiles relate to cognitive outcomes, social connection, and healthcare utilization across subsequent NSHAP waves.

References

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