The Baruch Ivcher Institute for **Brain, Cognition and Technology**

Prof. Amir Amedi
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Ofek Salama
Lab Manager
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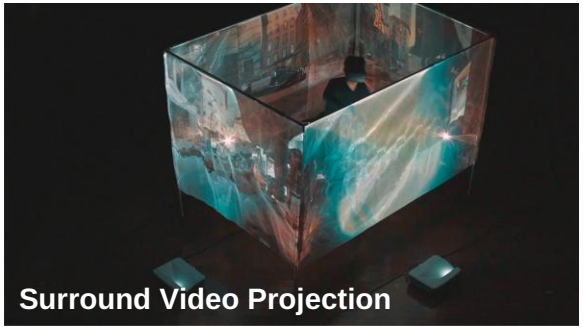
Brain
Cognition
& Technology
Institute

Reichman University | Baruch Ivcher School of Psychology

The Baruch Ivcher Institute for Brain, Cognition and Technology


Ambisonic Audio Room (97 speakers)


Surround Video Projection


Virtual Reality


The Neuro-immunology


Touch via Vibration

Ruth and Meir Rosental Brain Imaging Centre

Prof. Amir Amedi

Undergraduate: biology (brain sciences track), *HUJI* and music, *performance - Jazz department – Rubin music and dance high academy*

Direct PhD: Computational Neuroscience, *ICNC HUJI*

Post doc training: *Harvard Medical school*

Publication record: total citations: 11311 h-index: 44 Over 150 papers published

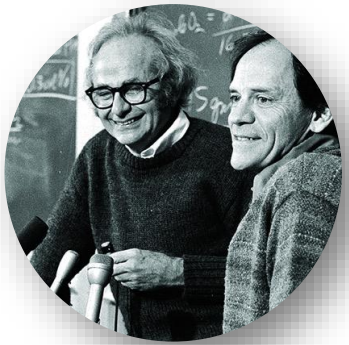
Visiting Fellow at NINDS, NIH; Instructor of Neurology at Harvard Medical School; Visiting Professor at the University of Amsterdam; and Faculty Affiliate at McGill University, Montreal.

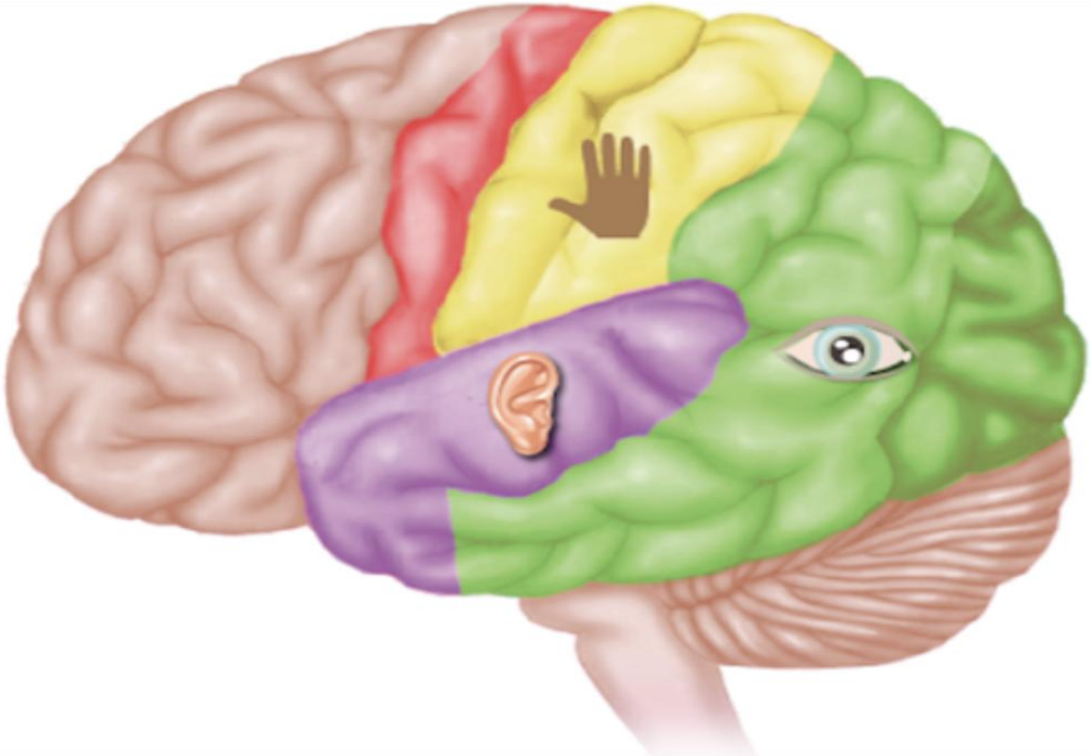
PI - *HUJI*: Senior Lecturer 2007; Associate Prof. 2011; Professor 2017. *IDC* 2019;

Key grants: ERC BrainVisionRehab 1.5M Euro, ERC NovelExperieSENSES: How experience shape brain specializations 2M Euro; GuestXR virtual reality network grant for 4 M euro.
IDC part is 900K Euro

- Co- Founder and Chief Scientist at Remepy, pioneering hybrid medicine combining cognitive therapy with AI-based pharmacological optimization.

Critical Period Theory - Nobel Prize 1981





nature neuroscience

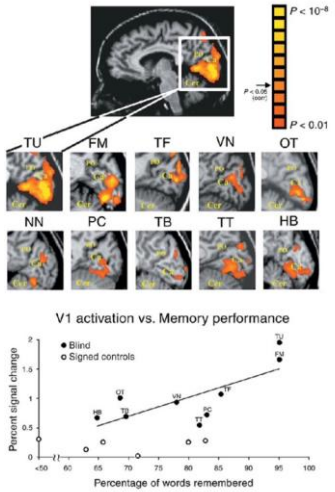
Early 'visual' cortex activation correlates with superior verbal memory performance in the blind

Amir Amedi, Noa Raz, Pazit Pianka, Rafael Malach & Ehud Zohary

Nature Neuroscience **6**, 758–766 (2003) | Cite this article

Transcranial magnetic stimulation of the occipital pole interferes with verbal processing in blind subjects

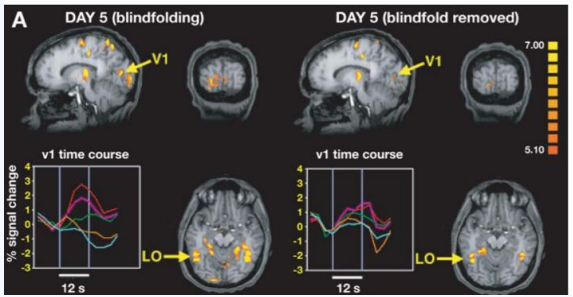
Amir Amedi[1,4,5], Agnes Floel[2,3,5], Stefan Knecht[3], Ehud Zohary[1] & Leonardo G Cohen[2]



ANNUAL REVIEWS

The Plastic Human Brain Cortex

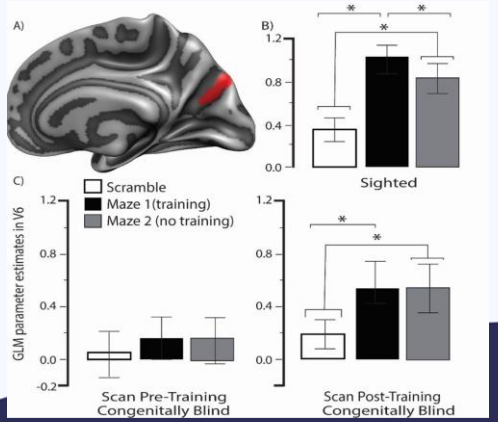
Alvaro Pascual-Leone, Amir Amedi, Felipe Fregni, and Lotfi B. Merabet



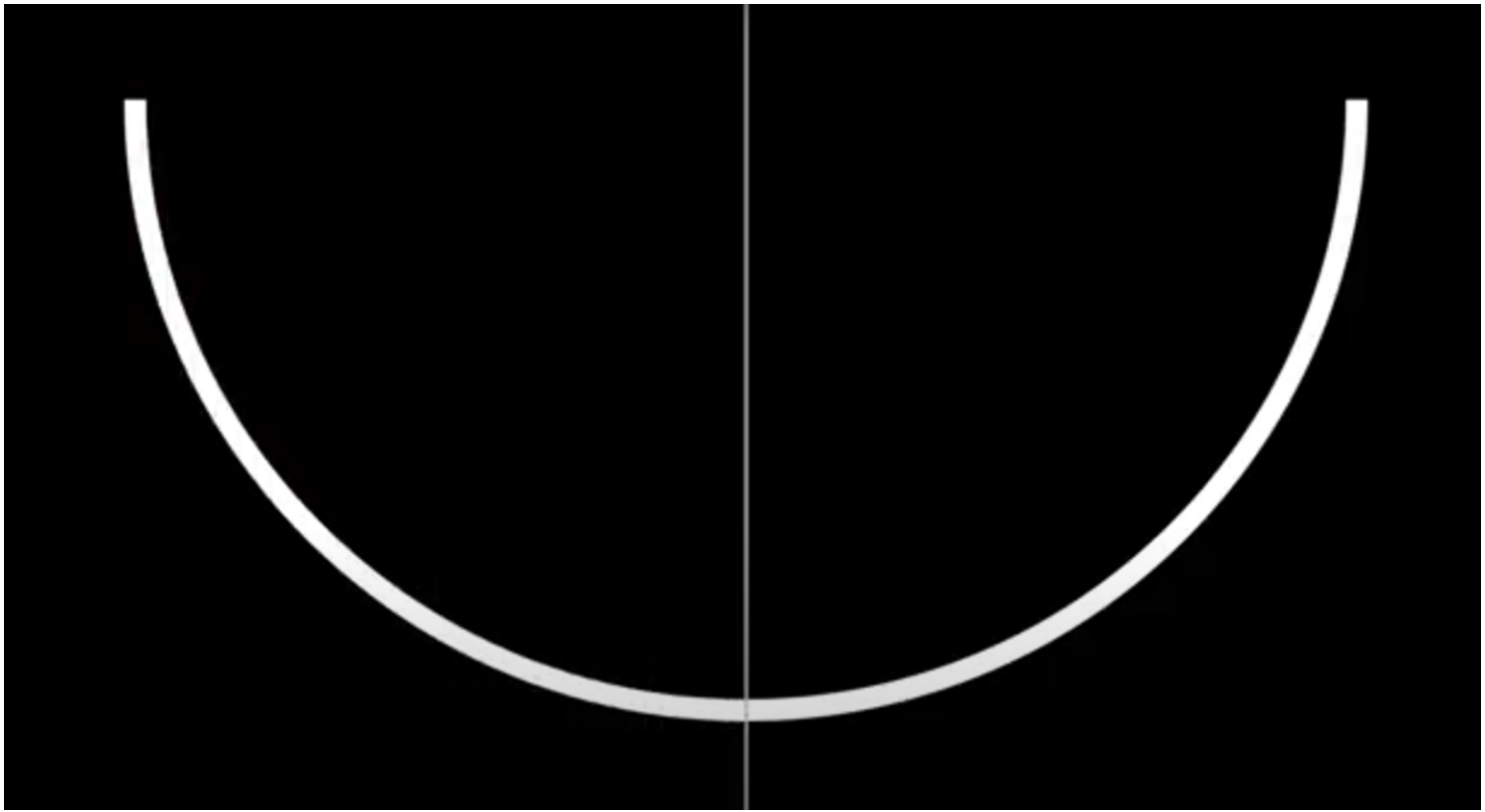
Current Biology

Activation of human visual area V6 during egocentric navigation with and without visual experience

Elena Aggius-Vella • Daniel-Robert Chebat • Shachar Maidenbaum • Amir Amedi [6, 7, 8] • Show footnotes

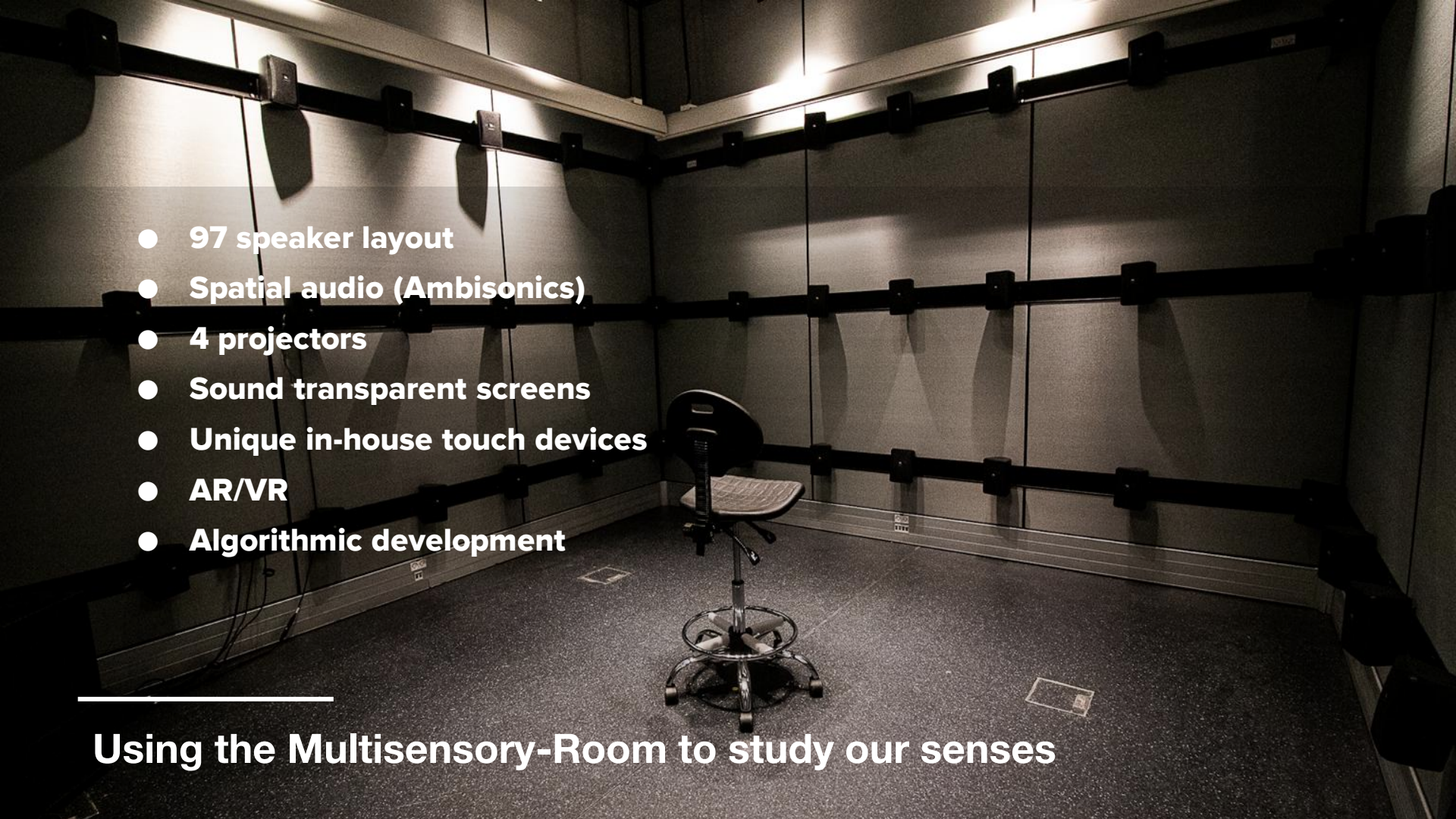


EyeMusic SSD: Seeing through Sound



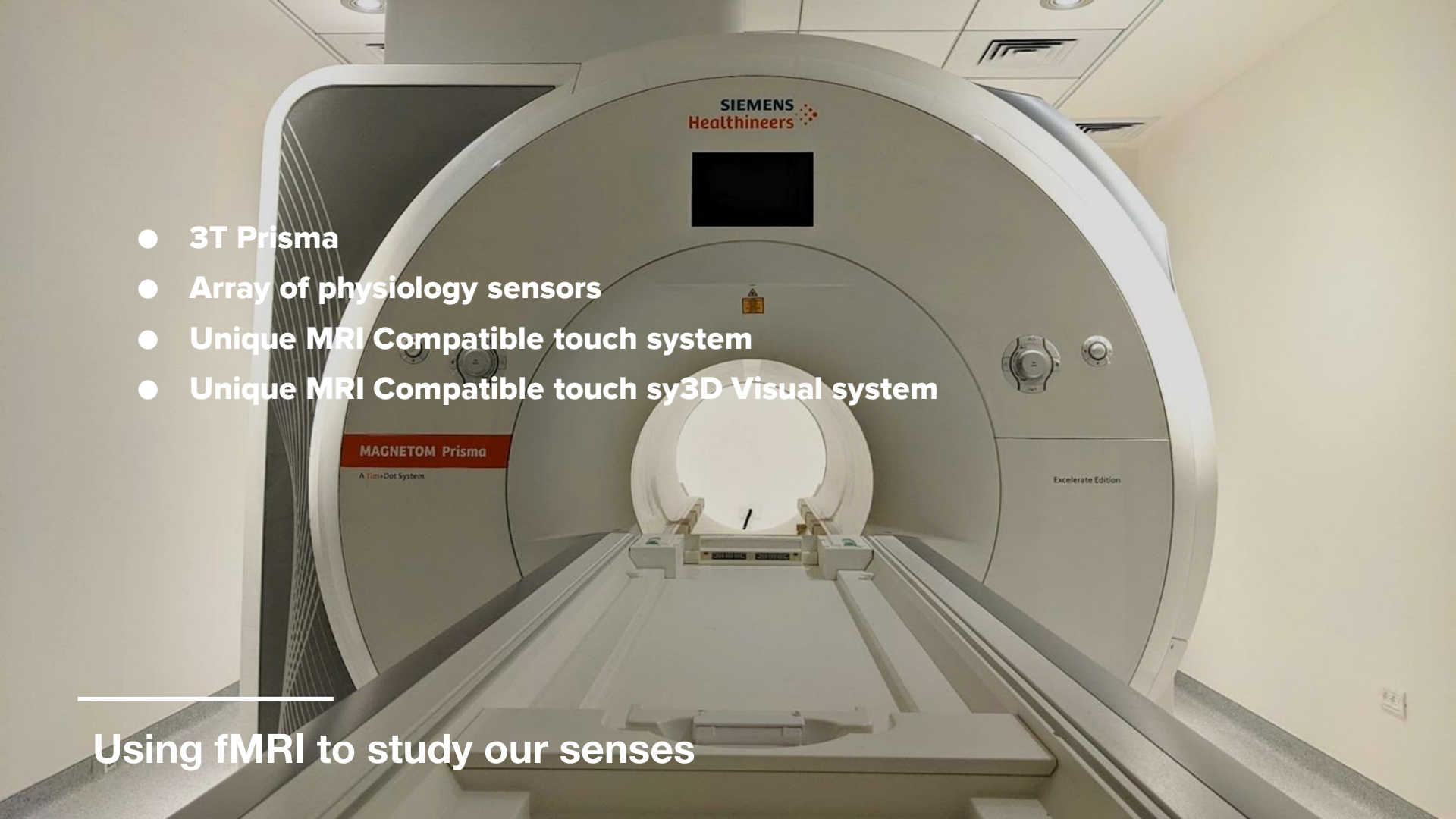
EyeMusic SSD: Seeing through Sound

NATIONAL GEOGRAPHIC
THE NEW YORKER
The New York Times
nature neuroscience
nature COMMUNICATIONS
Neuron
Trends in Cognitive Sciences
JNeurosci THE JOURNAL OF NEUROSCIENCE
Current Biology
NeuroImage



- 97 speaker layout
- Spatial audio (Ambisonics)
- 4 projectors
- Sound transparent screens
- Unique in-house touch devices
- AR/VR
- Algorithmic development

Using the Multisensory-Room to study our senses

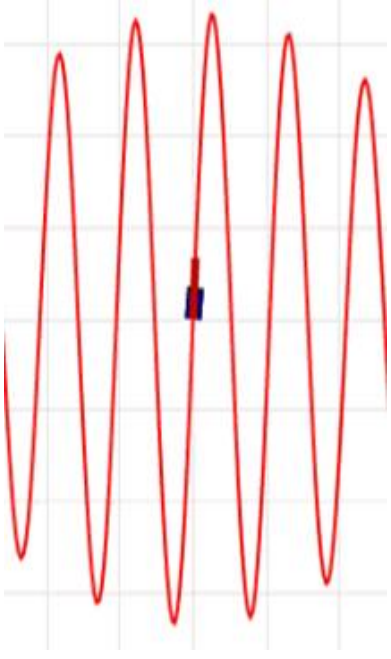


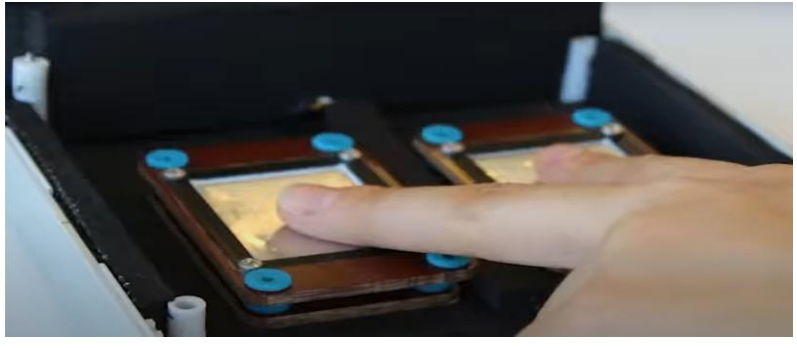
- 3T Prisma
- Array of physiology sensors
- Unique MRI Compatible touch system
- Unique MRI Compatible touch sy3D Visual system

Using fMRI to study our senses

Sound through Touch

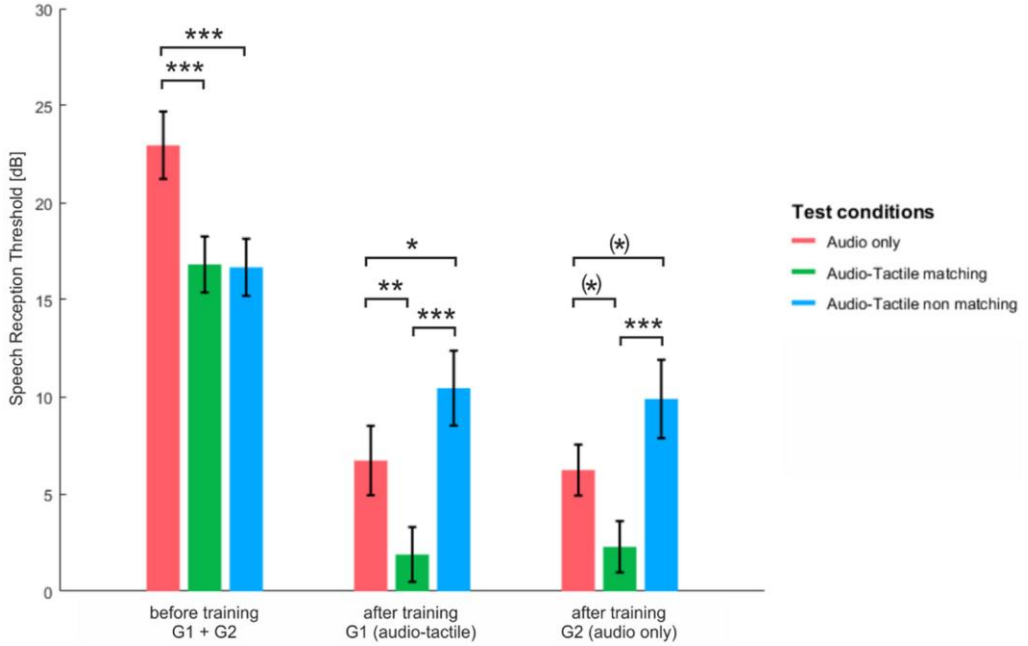
Speech to Touch



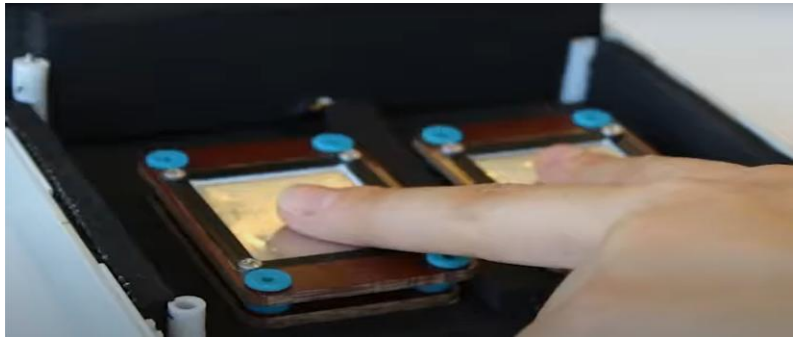


Speech to Touch SSD: Hearing through your fingers

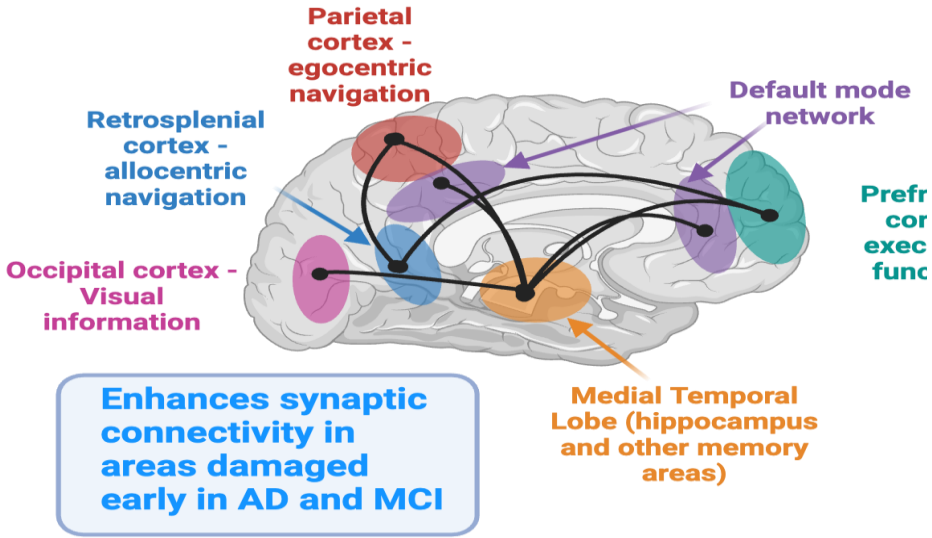
- **No training**: **6dB improvement** in speech comprehension in noise
- **Under an hour training**: **10dB improvement** speech comprehension in noise doubled

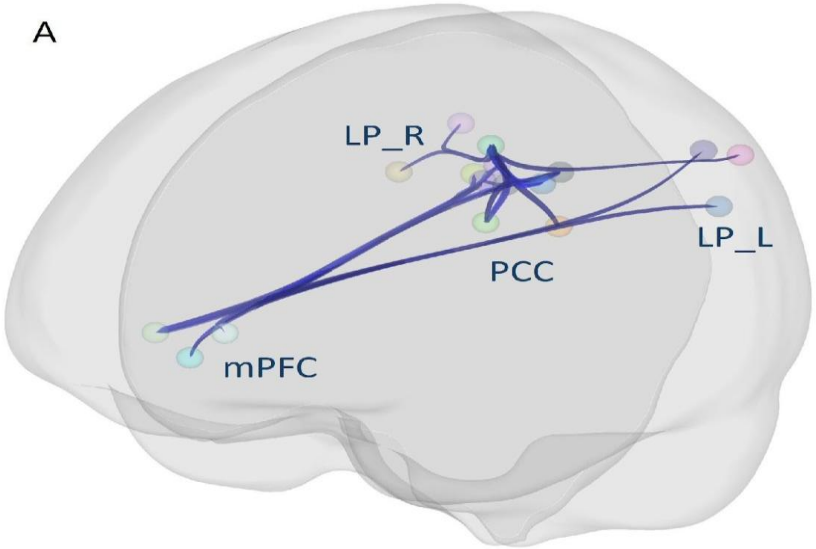


Speech to Touch SSD: Location to Touch



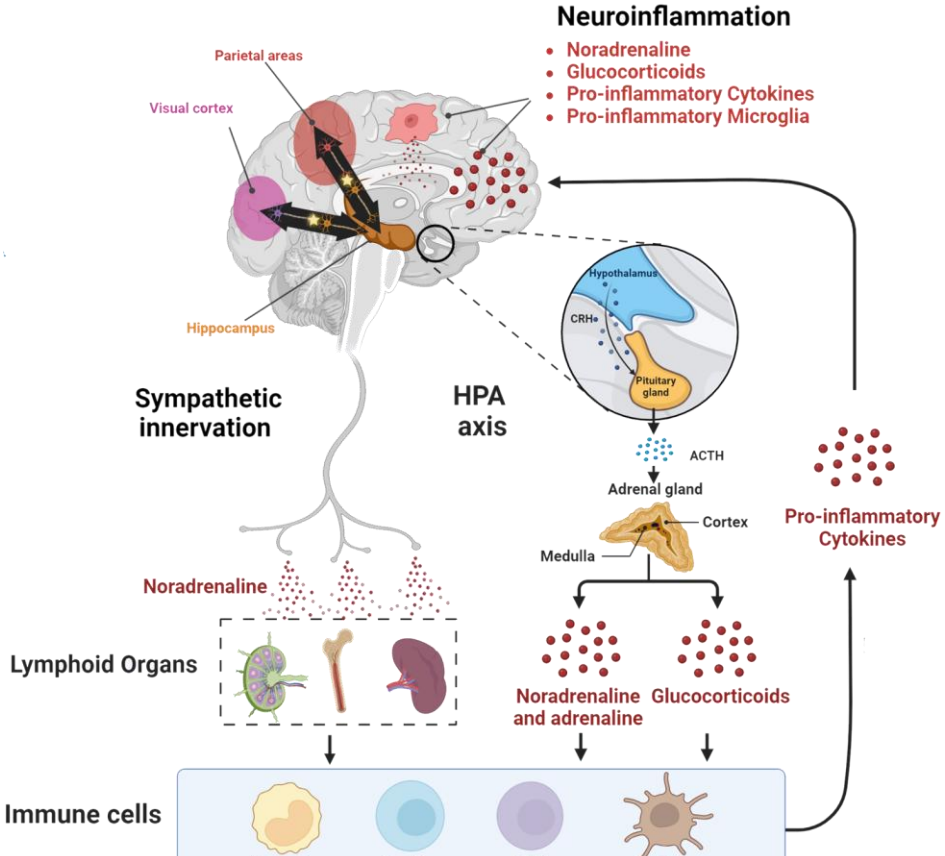
Improving Connectivity



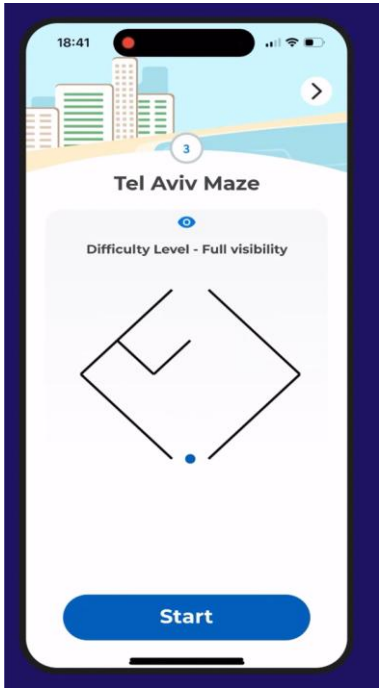


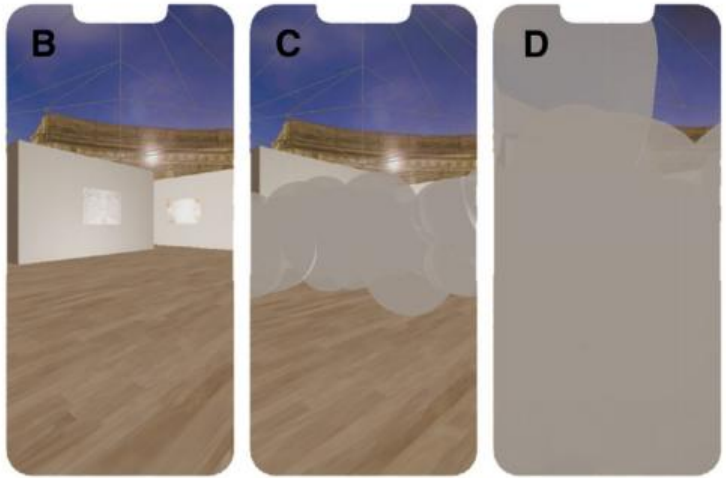
Amedi et al. iSCIENCE 2024

New perspective: connections between brain and body

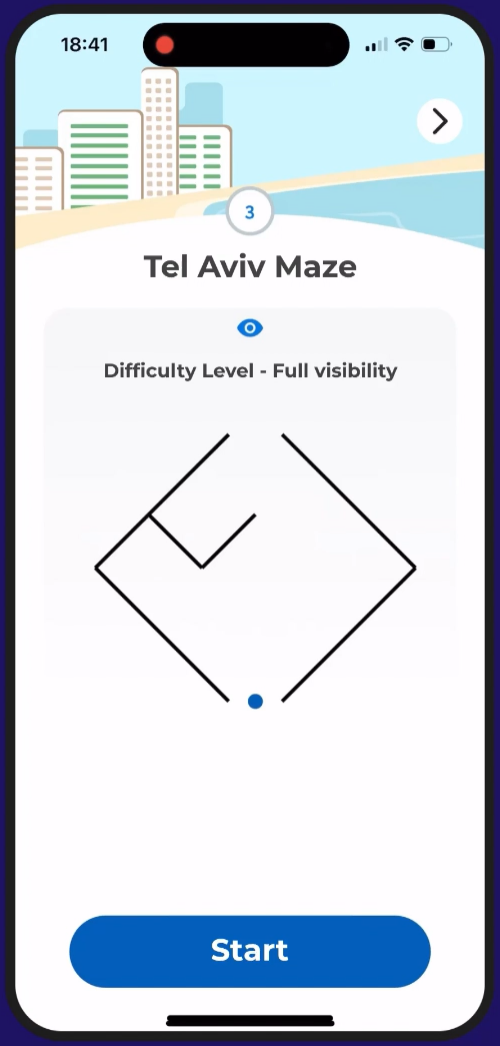


Creating software-drug combinations

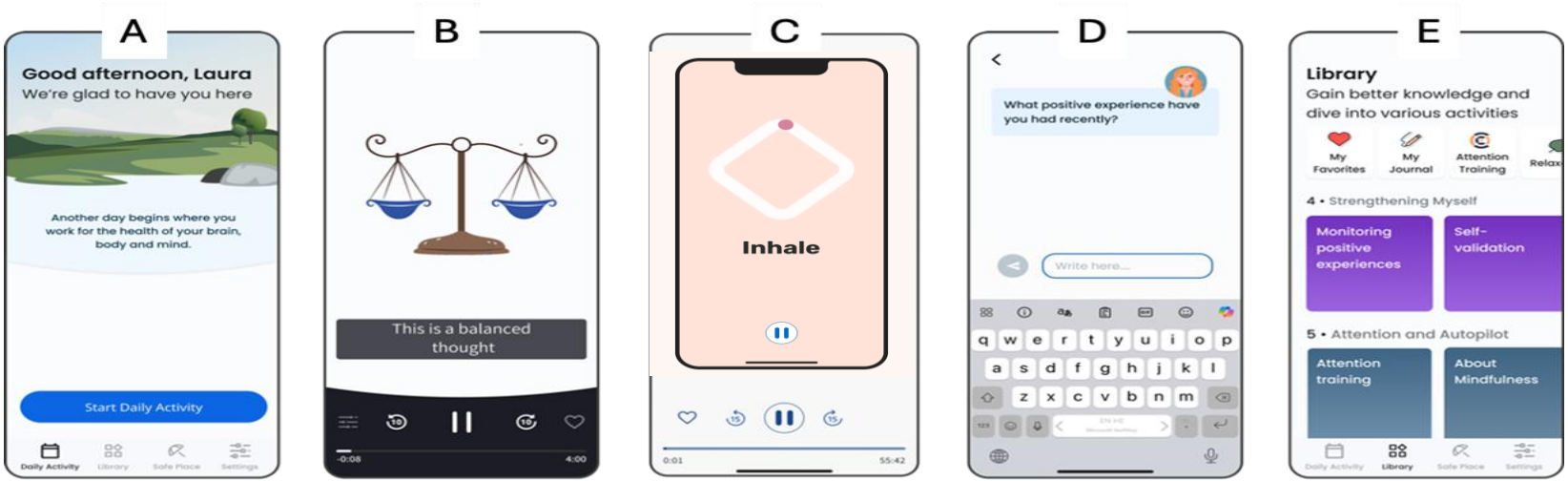




Remepy


18:41
3
Tel Aviv Maze
Difficulty Level - Full visibility
Start

Integrating Exercises From Clinical Psychology



Remepy

Case Study 1: RMPY-007

Digital Monotherapy Phase 1 Trial Results Show Biological Biomarker Improvement, **published in Nature Scientific Reports and iScience**

POC Trial | N=17 | Age 50–55 with SCD | 2 weeks duration

Intervention: RMPY-007 mobile app delivering psychological + spatial training
Modalities: CBT, mindfulness, ACT, psychoeducation, virtual navigation

Assessment: Saliva Samples; rsfMRI; Psychological questionnaires

Key Outcomes:

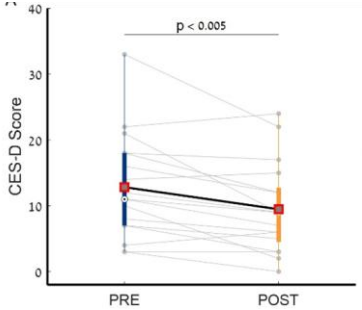
1. **Psychological:** Decreased depression (CES –D score was reduced by 26.6% with a large effect size (d = − 0.829, p=0.004))

2. **Immune:** Decreased IL-18 (decreased levels by 25% with a medium effect size (d = − 0.64, p<0.05)

3. **Brain:** Increased rsFC between SN-DMN and MTL, correlated with immune and depression changes

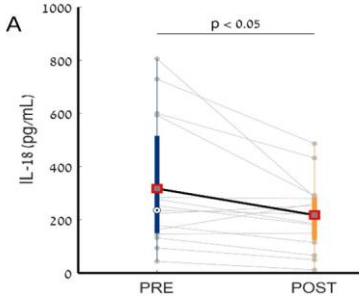
Psychological Eval

Pre and Post intervention

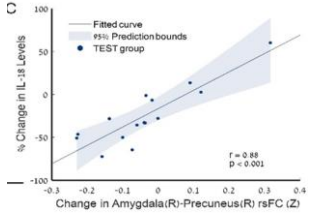


Cytokines

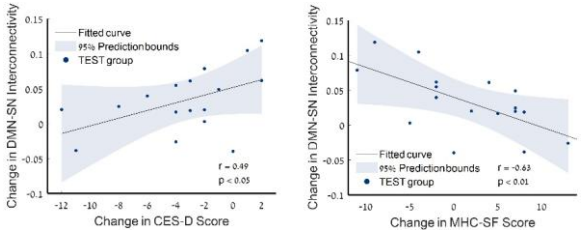
Pre and Post intervention



Cytokines Association between changes in Amygdala connectivity & reductions in IL-18 levels



Psychological Eval Association between changes in DMN-SN connectivity & improvements in psychological scores



Source: **(1)** Amedi et al. Perceptual learning and neural correlates of virtual navigation in subjective cognitive decline: A pilot study, **iScience** 2024; **(2)** Catalogna et al. B*rain connectivity correlates of the impact of a digital intervention for individuals with subjective cognitive decline on depression and IL-18*, **Scientific Reports**, 2025

Case Study 2: RMPY-008

Digital Monotherapy Phase 1 Trial Results Show Biological Biomarker Improvement, **published in Nature Digital Medicine**

Randomized Controlled Trial | N=103 | Age 50–65 with SCD and anxiety | 6 weeks duration

Intervention: RMPY-008 mobile app delivering psychological + spatial training
Modalities: CBT, mindfulness, ACT, psychoeducation, virtual navigation

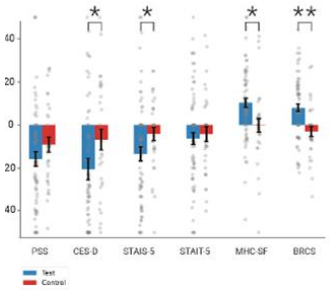
Assessment: Blood Samples; rsfMRI; clinical questionnaires

Key Outcomes:

1. **Psychological:** Statistically significant inter-group reduction in depression and anxiety, along with significant increased resilience and well-being
2. **Immune:** Statistically significant inter-group reduction in: TNF-α, IL-17, IL-23, IL-12, MCP-1, IFN-γ
3. **Brain:** Increased rsFC in insula–mPFC/ACC/dlPFC, correlated with immune and mood changes

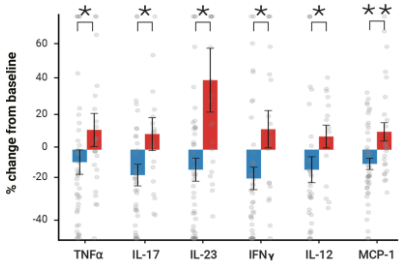
Psychological Eval

Change from baseline for each group



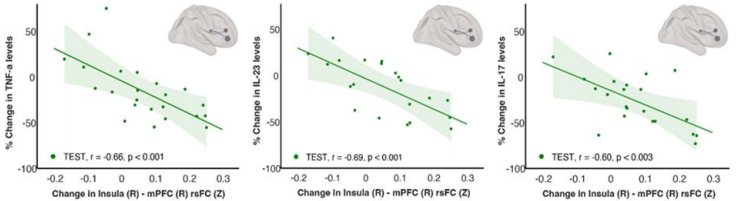
Cytokines

Change from baseline for each group



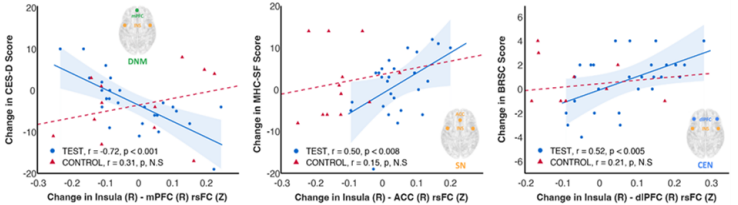
Cytokines

Association between changes in insula connectivity & reductions in cytokines levels



Psychological Eval

Association between changes in insula connectivity & improvements in psychological scores



Source: Catalogna et al. *Mobile application leads to psychological improvement and correlated neuroimmune function change in subjective cognitive decline*, **Nature Digital Medicine** 2025

Case Study 3: Hybridopa

Hybrid Trial Results Show Clinical Improvement

Randomized Controlled Trial | N=41 | Age 45-80 with Parkinson's Disease | 3 weeks duration

Intervention: DopApp mobile app delivering psychological, motor, speech, sleep and cognitive training

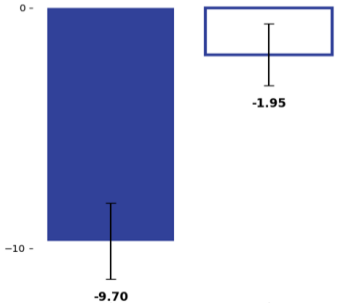
Assessment: UPDRS, PDSS, BDI, Blood Samples, rsfMRI

Key Outcomes:

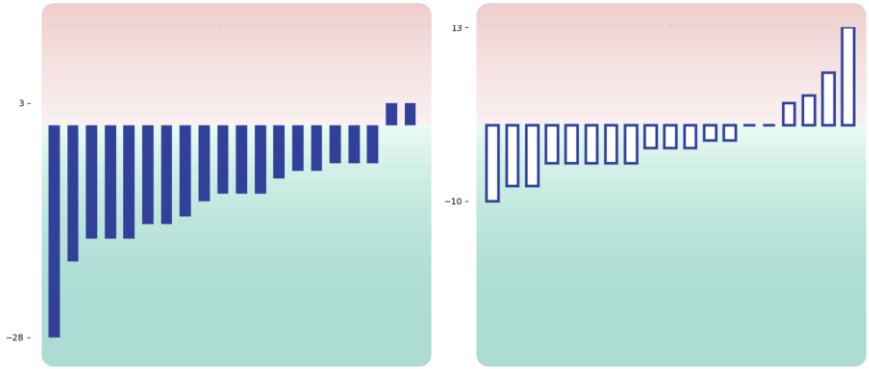
1. **Primary Endpoint:** UPDRS parts I+II+III reduced by 9.7 compared to 1.95 reduction in placebo
2. Response rate 90%
3. **Brain:** Improved rsFC between VLT and primary motor cortex (M1), correlated with UPDRS change
4. **Brain:** Improved rsFC between AVT and Amygdala and hippocampus correlated with change in depression score

Source: Amedi et al. *Significant Improvements in Motor and Non-Motor symptoms with Corresponding Neuroimaging Changes Following Hybrid Levodopa-Digital Application Treatment in Parkinson's Patients.* **Parkinsonism & Related Disorders** 2025

Primary Endpoint: Total MDS-UPDRS (I+II+III) intergroup difference



Inter-Group Average Difference= 7.75
P-Value Inter-Group Difference: 0.0005

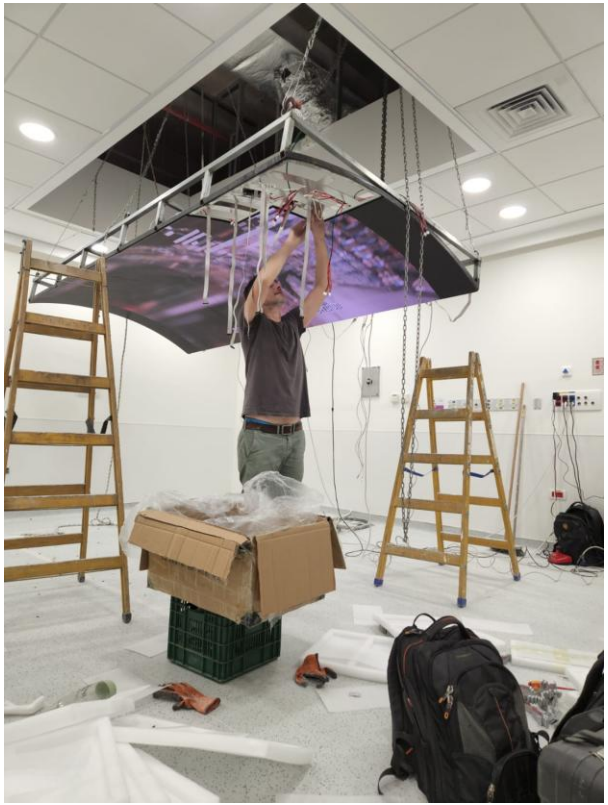


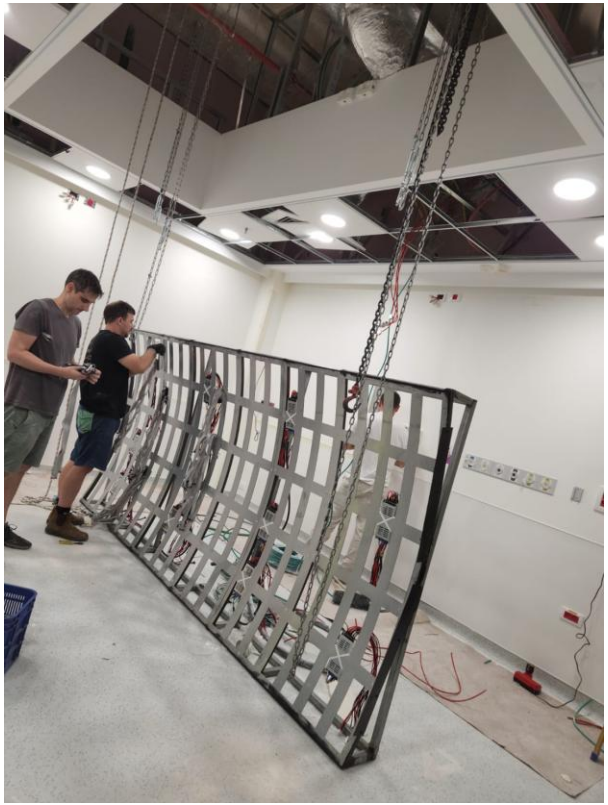
Subjects (ordered by difference)

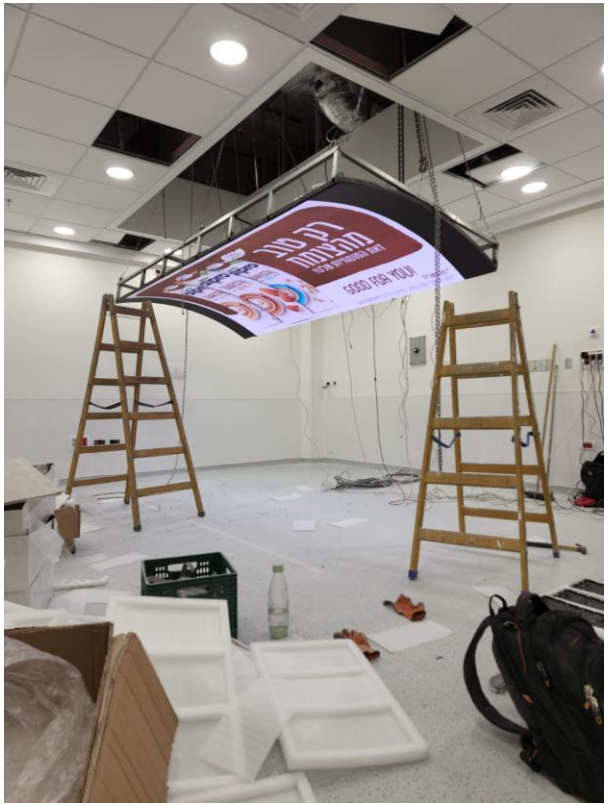
Threshold	DopApp	Placebo App	P-Value
Minimal Response Rate (≤ -3 pts)	90.0%	57.89%	0.031
Medium Response Rate (≤ -5 pts)	90.0%	42.11%	0.0022
Strong Response Rate (≤ -7 pts)	65.0%	15.79%	0.0031

Sha’arei Zedek Cancer Treatment Center


SIEMENS
Healthineers
SOMATOM go.Open Pro







Neuro-wellness - CT environment at oncology department

The Baruch Ivcher Institute for **Brain, Cognition and Technology**

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Brain Cognition & Technology Institute

Reichman University | Baruch Ivcher School of Psychology