

## REFERENCES

- [1] Jifa Zhang, Yinglu Zhang, Jiaying Wang, Yilin Xia, Jiaxian Zhang, and Lei Chen. Recent advances in alzheimer's disease: Mechanisms, clinical trials and new drug development strategies. *Signal Transduction and Targeted Therapy*, 9(1):211, 2024. doi: 10.1038/s41392-024-01911-3.
- [2] Andrei Gabriel Mangalagiu, Bogdan Mircea Petrescu, Sorin Riga, and Octavian Vasiliu. Pharmacological management of mild cognitive impairment: From symptomatic treatment to disease modification—a narrative review. *NeuroSci*, 7(1):2, 2025. doi: 10.3390/neurosci7010002.
- [3] Isobel E. M. Evans, Anthony Martyr, Rachel Collins, Carol Brayne, and Linda Clare. Social isolation and cognitive function in later life: A systematic review and meta-analysis. *Journal of Alzheimer's Disease*, 70: S119–S144, 2019. doi: 10.3233/JAD-180501.
- [4] Kalpana J. Kallianpur, Kamal H. Masaki, Randi Chen, Bradley J. Willcox, Richard C. Allsopp, Philip Davy, and Hiroko H. Dodge. Weak social networks in late life predict incident alzheimer's disease: The kuakini honolulu-asia aging study. *The Journals of Gerontology: Series A*, 78(4):663–672, 2023. doi: 10.1093/gerona/glac215.
- [5] National Academies of Sciences, Engineering, and Medicine. *Social Isolation and Loneliness in Older Adults: Opportunities for the Health Care System*. National Academies Press, 2020. doi: 10.17226/25663.
- [6] Ross Penninkilampi, Anne-Nicole Casey, Maria Fiatarone Singh, and Henry Brodaty. The association between social engagement, loneliness, and risk of dementia: A systematic review and meta-analysis. *Journal of Alzheimer's Disease*, 66:1619–1633, 2018. doi: 10.3233/JAD-180439.
- [7] Judith L. Poey, Jeffrey A. Burr, and J. Scott Roberts. Social connectedness, perceived isolation, and dementia: Does the social environment moderate the relationship between genetic risk and cognitive well-being? *The Gerontologist*, 57:1031–1040, 2017. doi: 10.1093/geront/gnw154.
- [8] Chun Shen, Edmund T. Rolls, Wei Cheng, Jujiao Kang, Guiying Dong, Chao Xie, Xing-Ming Zhao, Barbara J. Sahakian, and Jianfeng Feng. Associations of social isolation and loneliness with later dementia. *Neurology*, 99:e164–e175, 2022. doi: 10.1212/WNL.0000000000200583.
- [9] Brea L. Perry, William R. McConnell, Siyun Peng, Adam R. Roth, Max Coleman, Mohit Manchella, Meghann Roessler, Heather Francis, Hope Sheean, and Liana A. Apostolova. Social networks and cognitive function: An evaluation of social bridging and bonding mechanisms. *The Gerontologist*, 62(6):865–875, August 2022. doi: 10.1093/geront/gnab112.
- [10] Hiroko H. Dodge, Kexin Yu, Chao-Yi Wu, Patrick J. Pruitt, Meysam Asgari, Jeffrey A. Kaye, Benjamin M. Hampstead, Laura Struble, Kathleen Potempa, Peter Lichtenberg, Raina Croff, Roger L. Albin, Lisa C. Silbert, and I-CONNECT Team. Internet-based conversational engagement randomized controlled clinical trial (i-conect) among socially isolated adults 75+ years old with normal cognition or mild cognitive impairment: Topline results. *The Gerontologist*, 64(4):gnad147, 2024. doi: 10.1093/geront/gnad147.
- [11] Long Ouyang, Jeff Wu, Xu Jiang, Diogo Almeida, Carroll L. Wainwright, Pamela Mishkin, Chong Zhang, Sandhini Agarwal, Katarina Slama, Alex Ray, John Schulman, Jacob Hilton, Fraser Kelton, Luke Miller, Maddie Simens, Amanda Askell, Peter Welinder, Paul Christiano, Jan Leike, and Ryan Lowe. Training language models to follow instructions with human feedback. *Advances in neural information processing systems*, 35:27730–27744, 2022. doi: 10.48550/arXiv.2203.02155.
- [12] Junyuan Hong, Wenqing Zheng, Han Meng, Siqi Liang, Anqing Chen, Hiroko H. Dodge, Jiayu Zhou, and Zhangyang Wang. A-conect: Designing ai-based conversational chatbot for early dementia intervention. In *ICLR 2024 Workshop on Large Language Model (LLM) Agents*, 2024.
- [13] Xinyu Zhao, Zhen Tan, Maya Enisman, Minjae Seo, Marta R. Durantini, Dolores Albarracin, and Tianlong Chen. Transferring expert cognitive models to social robots via agentic concept bottleneck models. *arXiv preprint arXiv:2508.03998*, 2025.
- [14] PhenX Toolkit. Client satisfaction, 2025. URL <https://www.phenxtoolkit.org/protocols/view/590701>.
- [15] Gill Livingston, Jonathan Huntley, Andrew Sommerlad, David Ames, Clive Ballard, Sube Banerjee, Carol Brayne, Alistair Burns, Jiska Cohen-Mansfield, Claudia Cooper, Sergi G Costafreda, Amit Dias, Nick Fox, Laura N. Gitlin, Robert Howard, Helen C. Kales, Mika Kivimäki, Eric B. Larson, Adesola Ogunniyi, Vasiliki Orgeta, Karen Ritchie, Kenneth Rockwood, Elizabeth L. Sampson, Quincy Samus, Lon S. Schneider, Geir Selbæk, Linda Teri, and Naaheed Mukadam. Dementia prevention, intervention, and care: 2020 report of the lancet commission. *The Lancet*, 396:413–446, 2020. doi: 10.1016/S0140-6736(20)30367-6.
- [16] Hiroko H. Dodge, Jian Zhu, Nora C. Mattek, Molly Bowman, Oscar Ybarra, Katherine V. Wild, David A. Loewenstein, and Jeffrey A. Kaye. Web-enabled conversational interactions as a method to improve cognitive

- functions: Results of a 6-week randomized controlled trial. *Alzheimer's & Dementia: Translational Research & Clinical Interventions*, 1(1):1–12, 2015. doi: 10.1016/j.trci.2015.01.001.
- [17] Kexin Yu, Katherine Wild, Kathleen Potempa, Benjamin M. Hampstead, Peter A. Lichtenberg, Laura M. Struble, Patrick Pruitt, Elena L. Alfaro, Jacob Lindsley, Mattie MacDonald, Jeffrey A. Kaye, Lisa C. Silbert, and Hiroko H. Dodge. A web-based platform for conducting the I-CONNECT trial: Design and methods. *Frontiers in Digital Health*, 3:714813, 2021. doi: 10.3389/fdgth.2021.714813.
- [18] Mihoko Otake-Matsuura, Seiki Tokunaga, Kumi Watanabe, Masato S. Abe, Takuya Sekiguchi, Hikaru Sugimoto, Taishiro Kishimoto, and Takashi Kudo. Effects of picture book-based intervention on older adults: A randomized controlled trial. *Frontiers in Robotics and AI*, 8:633076, 2021. doi: 10.3389/frobt.2021.633076.
- [19] Kumi Watanabe Miura, Takuya Sekiguchi, Seiki Tokunaga, Hikaru Sugimoto, Taishiro Kishimoto, Takashi Kudo, and Mihoko Otake-Matsuura. Effects of participant-driven reminiscence using the photo-integrated conversation moderated by robots (PICMOA) on cognitive function, mental health, and quality of life in older adults: A randomized controlled trial. *BMC Geriatrics*, 25(1):774, 2025. doi: 10.1186/s12877-025-06444-0.
- [20] OpenAI. Api pricing, 2024. URL <https://openai.com/api/pricing/>.
- [21] Chat support salary in us, 2024. URL <https://www.ziprecruiter.com/Salaries/Chat-Support-Salary--in-US>.
- [22] Michelle R. Bennion, Gemma E. Hardy, and Roger K. Moore. Usability, acceptability, and effectiveness of web-based conversational agents to facilitate problem solving in older adults: Controlled study. *Journal of Medical Internet Research*, 22(5):e16794, 2020. doi: 10.2196/16794.
- [23] L. L. Kramer, Lex van Velsen, and Julia L. Clark. Use and effect of embodied conversational agents for improving eating behavior and decreasing loneliness among community-dwelling older adults: Randomized controlled trial. *JMIR Formative Research*, 6(4):e33974, 2022. doi: 10.2196/33974.
- [24] S. H. Lee, B. Kim, and M. Y. Chun. The effects of 12-week smartphone-based cognitive intervention with a chat-bot on white matter integrity in older adults with subjective memory complaint. *Neurology*, 96(15 Supplement):2698, 2021. doi: 10.1212/WNL.96.15\_supplement.2698.
- [25] S. Tokunaga, K. Tamura, and M. Otake-Matsuura. A dialogue-based system with photo and storytelling for older adults: Toward daily cognitive training. *Frontiers in Robotics and AI*, 8:644964, 2021. doi: 10.3389/frobt.2021.644964.
- [26] Eddy Wianto, Ching-Hung Chen, and Chia-Chen Chen. Chatty bot: An alternative to implement a memory training option for the upcoming older adults in indonesia. In *Advances in Human Factors and Ergonomics in Healthcare and Medical Devices*, volume 263 of *Lecture Notes in Networks and Systems*, 2021. doi: 10.1007/978-3-030-80744-3\_48.
- [27] Andy Zou, Zifan Wang, Nicholas Carlini, Milad Nasr, J Zico Kolter, and Matt Fredrikson. Universal and transferable adversarial attacks on aligned language models. *arXiv preprint arXiv:2307.15043*, 2023.
- [28] Rauno Arike, Elizabeth Donoway, Henning Bartsch, and Marius Hobbhahn. Technical report: Evaluating goal drift in language model agents. *arXiv preprint arXiv:2505.02709*, 2025.
- [29] Chao-Yi Wu, Ke Yu, Steven E. Arnold, Sandip Das, and Hiroko H. Dodge. Who benefited most from the internet-based conversational engagement rct (i-conect)? application of the personalized medicine approach to a behavioral intervention study. *The Journal of Prevention of Alzheimer's Disease*, 11(3):639–648, 2024. doi: 10.14283/jpad.2024.41.
- [30] Ruiyi Wang, Stephanie Milani, Jamie C. Chiu, Jiayin Zhi, Shaun M. Eack, Travis Labrum, Samuel M. Murphy, Nev Jones, Kate Hardy, Hong Shen, Fei Fang, and Zhiyu Zoey Chen. Patient- $\psi$ : Using large language models to simulate patients for training mental health professionals. *arXiv preprint arXiv:2405.19660*, 2024.
- [31] Sofiia Kononovych, Ostap Kilbasovych, Kateryna Bilyk, Yuliia Vistak, Zhiwen Fan, and Junyuan Hong. Can visual stimulation enhance reminiscence-therapy chatbot? In *The Second Workshop on GenAI for Health: Potential, Trust, and Policy Compliance*, 2025.
- [32] Zhen Xiang, Linzhi Zheng, Yanjie Li, Junyuan Hong, Qinbin Li, Han Xie, Jiawei Zhang, Zidi Xiong, Chulin Xie, Carl Yang, Dawn Song, and Bo Li. Guardagent: Safeguard llm agents by a guard agent via knowledge-enabled reasoning. In *International Conference on Machine Learning (ICML)*, 2024. doi: 10.48550/arXiv.2406.09187.
- [33] Bao Hoang, Yijiang Pang, Hiroko H. Dodge, and Jiayu Zhou. Subject harmonization of digital biomarkers: Improved detection of mild cognitive impairment from language markers. In *Pacific Symposium on Biocomputing 2024*, pages 187–200, 2024.

- [34] Yunhao Yang, Junyuan Hong, Gabriel Jacob Perin, Zhiwen Fan, Li Yin, Zhangyang Wang, and Ufuk Topcu. Ad-vf: Llm-automatic differentiation enables fine-tuning-free robot planning from formal methods feedback. *arXiv preprint arXiv:2509.18384*, 2025.
- [35] Tamara G. Fong, Michael A. Fearing, Richard N. Jones, Peilin Shi, Edward R. Marcantonio, James L. Rudolph, Frances M. Yang, Dan K. Kiely, and Sharon K. Inouye. Telephone interview for cognitive status: Creating a crosswalk with the mini-mental state examination. *Alzheimer's & Dementia*, 5(6):492–497, 2009. doi: 10.1016/j.jalz.2009.02.007.
- [36] James Lubben, Eva Blozik, Gerhard Gillmann, Steve Iliffe, Wolfgang von Renteln Kruse, John C. Beck, and Andreas E. Stuck. Performance of an abbreviated version of the lubben social network scale among three european community-dwelling older adult populations. *The Gerontologist*, 46(4):503–513, 2006. doi: 10.1093/geront/46.4.503.
- [37] Dan Russell, Letitia Anne Peplau, and Mary Lund Ferguson. Developing a measure of loneliness. *Journal of Personality Assessment*, 42(3):290–294, 1978. doi: 10.1207/s15327752jpa4203\_11.
- [38] Jerome A. Yesavage, T. L. Brink, Terence L. Rose, Owen Lum, Virginia Huang, Michael Adey, and Von Otto Leirer. Development and validation of a geriatric depression screening scale: A preliminary report. *Journal of Psychiatric Research*, 17:37–49, 1982. doi: 10.1016/0022-3956(82)90033-4.
- [39] Holly Skodol Wilson and Andrew Skodol. Special report: Dsm-iv: overview and examination of major changes. *Archives of Psychiatric Nursing*, 8(6):340–347, 1994. doi: 10.1016/0883-9417(94)90002-7.