

School/Department:	Erasmus School of Social and Behavioral Sciences, Department of Psychology, Education and Child Studies
Project Title:	Grounded Cognition: The Role of Sensory-Motor Modalities in Memory
Abstract:	<p>Cognitive processes such as language understanding and memory may share resources with perception and motor action, as proposed by the <i>embodied cognition</i> framework (Barsalou, 1999, Glenberg, 1997). Experimental evidence from our lab has supported the idea that different sensory modalities contribute to cognition (e.g., Pecher, Zeelenberg, & Barsalou, 2003; Van Dantzig, Pecher, Zeelenberg, & Barsalou, 2008). Especially during learning, perceptual experiences are necessary as input of information. Learners need to see, hear, touch, and so on, in order to encode new information in memory. Initially, new information is represented in sensory-specific processing systems, but will be integrated at a higher level into multi-sensory representations. For example, the experience of being on a train involves the action of stepping on the train, seeing the interior of the wagon and the outside landscape moving by, hearing the sound of the engine and the wheels on the tracks, feeling the movement of the train, and so on. These experiences from the motor, visual, auditory, and tactile systems are first stored in modality specific systems. However, in order to represent a meaningful memory of being on a train, they are then combined into a unitized experience of being on a train.</p> <p>The process of integrating representations from different sensory modalities may result in stronger memory than for representations involving just one modality (Shams & Seitz, 2008). This supposed benefit of multisensory integration has resulted in many educational programs that present to-be-learned information in multi-sensory formats. The role of sensory-motor systems, however, seems to depend on task demands, context, and experience. Thus, the theory that cognition depends on sensory-motor systems needs to be refined.</p> <p>In this project we will test which factors contribute to this flexible use of sensory-motor systems in memory. For this purpose we will design experimental lab studies investigating the role of sensory-motor systems for memory.</p>

	<p>Results from this project will have both theoretical and practical implications. The embodied cognition framework is very powerful and has generated a lot of research. It has also been criticized, however, for being too general. If the process of sensory integration has an effect on cognitive processes such as memory, this will allow us to be more specific about the mechanisms by which cognition and sensory-motor processing interact. In addition, our understanding of how sensory-motor integration contributes to memory will be important for the development of educational programs to take maximal advantage of the benefit of multi-sensory materials to optimize learning.</p>
<p>Requirements of candidate:</p>	<p>Background: Candidates will have a background in cognitive or experimental psychology or cognitive science.</p> <p>Master's degree: Yes</p> <p>EUR requirement: IELTS grade : 7.5 (minimal 6.0 for all components) or TOEFL: 100 (minimal 20 for all components)</p>
<p>Supervisor information:</p>	<p>Supervisor: Prof. dr. Diane Pecher</p> <p>Email: pecher@essb.eur.nl Website: www.memorylab.eu</p> <p>Publications (last 5 years):</p> <p>Thomas, E. R., Stötefalk, N., Pecher, D., & Zeelenberg, R. (In Press). Alignment effects for pictured objects: Do instructions to "imagine picking up an object" prime actions? <i>Journal of Experimental Psychology: Human Perception and Performance</i></p> <p>Pecher, D. (2019). Finding Lisa with SAM: #AS50 and a simple story of forgetting and remembering. Blog post for a digital event of the Psychonomic Society celebrating the Atkinson & Shiffrin (1967) model. https://featuredcontent.psychonomic.org/finding-lisa-with-sam-as50-and-a-simple-story-of-forgetting-and-remembering/</p>

	<p>Pecher, D., Roest, S., & Zeelenberg, R. (2019). The effect of grasp compatibility in go/no-go and two-choice tasks. <i>Memory & Cognition</i>. https://doi.org/10.3758/s13421-019-00917-5</p> <p>Pecher, D., & Zeelenberg, R. (2018). Boundaries to grounding abstract concepts. <i>Philosophical Transactions of the Royal Society B: Biological Sciences</i>, 373. https://doi.org/10.1098/rstb.2017.0132</p> <p>Canits, I., Pecher, D., & Zeelenberg, R. (2018). Effects of grasp compatibility on long-term memory for objects. <i>Acta Psychologica</i>, 182, 65-74. https://doi.org/10.1016/j.actpsy.2017.11.009</p> <p>Pecher, D. (2018). Curb your embodiment. <i>Topics in Cognitive Science</i>, 10, 501–517. https://doi.org/10.1111/tops.12311</p> <p>Zwaan, R.A., Pecher, D., Paolacci, G., Bouwmeester, S., Zeelenberg, R., Verkoeijen, P., & Dijkstra, K. (2018). Participant nonnaïveté and the reproducibility of cognitive psychology. <i>Psychonomic Bulletin & Review</i>, 25, 1968–1972. https://doi.org/10.3758/s13423-017-1348-y</p> <p>Carr, E. W., Huber, D. E., Pecher, D., Zeelenberg, R., Halberstadt, J., & Winkielman, P. (2017). The ugliness-in-averageness effect: Tempering the warm glow of familiarity. <i>Journal of Personality and Social Psychology</i>, 112, 787-812. https://doi.org/10.1037/pspa0000083</p> <p>Pecher, D. & Zwaan, R. A. (2017). Flexible concepts: A commentary on Kemmerer (2016). <i>Language, Cognition and Neuroscience</i>, 32, 444-446. https://doi.org/10.1080/23273798.2016.1274413</p> <p>Topolinski, S., Boecker, L., Erle, T., Bakhtiari, G., & Pecher, D. (2017). Matching between oral inward-outward movements of object names and oral movements associated with denoted objects. <i>Cognition and Emotion</i>, 31, 3-18. https://doi.org/10.1080/02699931.2015.1073692</p> <p>Pecher, D. & Van Dantzig, S. (2016). The role of action simulation on intentions to purchase products. <i>International Journal of Research in Marketing</i>, 33, 971-974. https://doi.org/10.1016/j.ijresmar.2016.03.006</p> <p>Roest, S., Pecher, D., Naeije, L., & Zeelenberg, R. (2016). Alignment effects in beer mugs: Automatic action activation or</p>
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	<p>response competition? <i>Attention, Perception, & Psychophysics</i>, 78, 1665-1680. https://doi.org/10.3758/s13414-016-1130-7</p> <p>Zeelenberg, R. & Pecher, D. (2016). The role of motor action in memory for objects and words. In B. Ross (Ed.). <i>The Psychology of Learning and Motivation</i>, vol. 64 (pp. 161-193). Cambridge, MA: Academic Press.</p> <p>de Jonge, M., Tabbers, H. K., Pecher, D., Jang, Y., & Zeelenberg, R. (2015). The efficacy of self-paced study in multitrial learning. <i>Journal of Experimental Psychology: Learning, Memory, and Cognition</i>, 41, 851-858. https://doi.org/10.1037/xlm0000046</p> <p>Pecher, D., Van Mierlo, H., Cañal-Bruland, R. & Zeelenberg, R. (2015). The burden of secrecy? No effect on hill slant estimation and beanbag throwing. <i>Journal of Experimental Psychology: General</i>, 144, e65–e72. https://doi.org/10.1037/xge0000090</p> <p>Pecher, D., & Zeelenberg, R. (2015). Embodied Knowledge. In Robert Scott and Stephen Kosslyn (eds.), <i>Emerging Trends in the Social and Behavioral Sciences</i>. Hoboken, NJ: John Wiley and Sons. https://doi.org/10.1002/9781118900772.etrds0100</p> <p>Van Weelden, L., Schilperoord, J., Swerts, M., & Pecher, D. (2015). The role of shape in semantic memory organization of objects: An experimental study using PI-release. <i>Experimental Psychology</i>, 62, 181-197. https://doi.org/10.1027/1618-3169/a000284</p> <p>Zeelenberg, R., de Jonge, M., Tabbers, H. K. & Pecher, D. (2015). The effect of presentation rate on foreign language vocabulary learning. <i>Quarterly Journal of Experimental Psychology</i>, 68, 1101-1115. https://doi.org/10.1080/17470218.2014.975730</p> <p>Zeelenberg, R., & Pecher, D. (2015). A method for simultaneously counterbalancing condition order and the assignment of stimulus materials to conditions. <i>Behavior Research Methods</i>, 47, 127-133. https://doi.org/10.3758/s13428-014-0476-9</p> <p>Pecher, D. (2014). The role of motor affordances in visual working memory. In Edouard Machery and Jesse Prinz (eds.). <i>The Baltic International Yearbook of Cognition, Logic and</i></p>
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	<p><i>Communication: Perception and Concepts</i>. New Prairie Press. https://doi.org/ 10.4148/1944-3676.1087</p> <p>Quak, M., Pecher, D., & Zeelenberg, R. (2014). Effects of motor congruence on visual working memory. <i>Attention, Perception, and Psychophysics</i>, 76, 2063-2070. https://doi.org/10.3758/s13414-014-0654-y</p> <p>Topolinski, S., Maschmann, I. T., Pecher, D., & Winkielman, P. (2014). Oral Approach-Avoidance: Affective Consequences of Muscular Articulation Dynamics. <i>Journal of Personality and Social Psychology</i>, 106, 885-896. https://doi.org/ 10.1037/a0036477</p> <p>Zanolie, K. & Pecher, D. (2014). Number-induced shifts in spatial attention: A replication study. <i>Frontiers in Psychology</i>, 5:987. https://doi.org/ 10.3389/fpsyg.2014.00987</p>
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