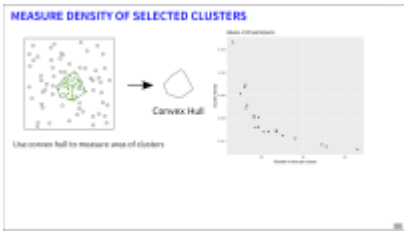
Visual Neuroscience Lab Publications

2024



Link to reveal.js slideshow:

Human perception of clusters in Gaussian-distributed fields of dots

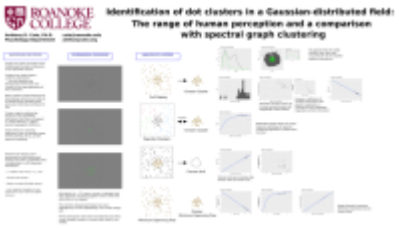
PDF version:

Human perception of clusters in Gaussian-distributed fields of dots

Cate, A. D. (2024) “Human perception of clusters in Gaussian-distributed fields of dots.” Central Virginia Chapter of the Society for Neuroscience Meeting, Blacksburg, VA

2023

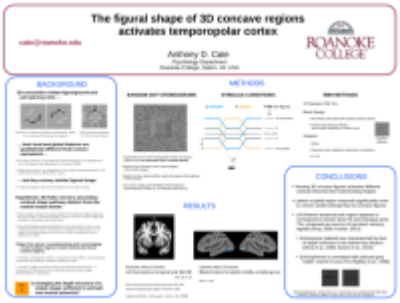
Identification of dot clusters in a Gaussian-distributed field: The range of human perception and a comparison with spectral graph clustering



Cate, A. D. (2023) “Identification of dot clusters in a Gaussian-distributed field: The range of human perception and a comparison with spectral graph clustering.” Society for Neuroscience Annual Meeting, Washington, D.C.

2021

The figural shape of 3D concave regions activates temporopolar cortex



Cate, A. D. (2021). “The figural shape of 3D concave regions activates temporopolar cortex.” Vision Sciences Society Annual Meeting, St. Pete Beach, FL.

2019



Link to reveal.js slideshow:

You Can't Play 20 Questions with an Algorithm and Win

PDF version:

You can’t play 20 questions with an algorithm and win: how to break deep networks productively.

Cate, A. D. (2019). “You can’t play 20 questions with an algorithm and win: how to break deep networks productively.” Algorithms That Make You Think Workshop, Blacksburg, VA.


MODELING VISUAL ENUMERATION USING CUMULATIVE LINK REGRESSION

Anthony D. Cate, Ph.D.

Virginia Tech

Link to reveal.js slideshow:

Modeling Visual Enumeration Using Cumulative Link Regression

PDF version:

Modeling Visual Enumeration Using Cumulative Link Regression.

Cate, A. D. (2019). “Modeling Visual Enumeration Using Cumulative Link Regression.” Computational and Mathematical Models in Vision (MODVIS), St. Pete Beach, FL.

2018

Mathematics at Hand


Mathematics at Hand

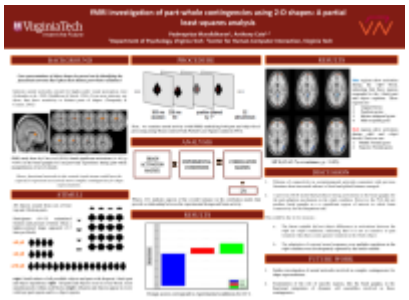
Anderson Norton, Catherine Ulrich
Martha Ann Bell, and Anthony Cate

In a scene atop the Sistine Chapel, Adam languidly gestures a finger toward an eager God, who rides a cloaked wave of cherubim to meet his touch (see Figure 1). Aside from theological implications of the work, scholars have speculated Michelangelo's intentions to convey insights into the human anatomy. Specifically, physician Frank Meshberger (1990) conjectured that "The Creation of Adam" depicts the human brain within God's cloak and that the small gap between the fingers of Adam and his maker represent a synapse within the brain—a conjecture supported by striking similarities between the human brain and the outline of the cloak, as well as the fact that Michelangelo rigorously studied the neural anatomy of cadavers. The manner in which God delivers the spark seems especially appropriate in light of modern day neuroscience and

Norton, A., Ulrich, C. L., Bell, M. A. & Cate, A. (2018). “Mathematics at Hand.” The Mathematics Educator 27(1): 33–59.

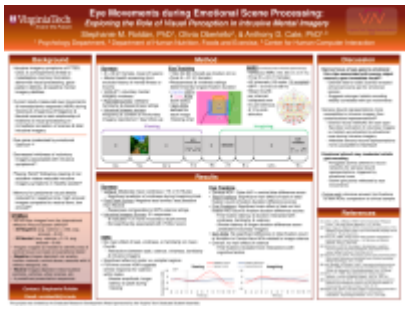
2017

fMRI investigation of part-whole contingencies using 2-D shapes: A partial least squares analysis



Muralidharan, P. & Cate, A. D. (2017). “fMRI investigation of part-whole contingencies using 2-D shapes: A partial least squares analysis.” Cognitive Neuroscience Society Annual Meeting, San Francisco, CA.

Eye Movements during Emotional Scene Processing: Exploring the Role of Visual Perception in Intrusive Mental Imagery



Roldán, S. M., Obertello, O. & Cate, A. D. (2017, May). “Eye Movements during Emotional Scene Processing: Exploring the Role of Visual Perception in Intrusive Mental Imagery.” Vision Sciences Society Annual Meeting, St. Pete Beach, FL.

2016

Empty space is less crowded: stereo-defined 3D letters exhibit less crowding when they are concave than when they are convex



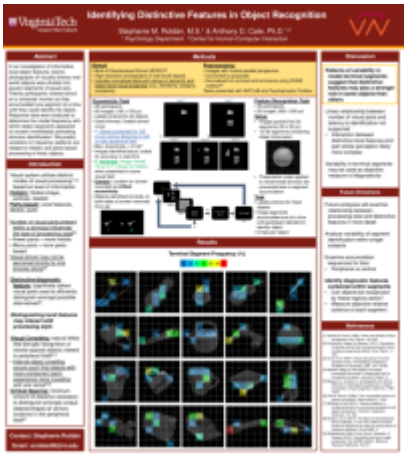
Cate, A. D. & Hartman, M. (2016). “Empty space is less crowded: stereo-defined 3D letters exhibit less crowding when they are concave than when they are convex.” Vision Sciences Society Annual Meeting, St. Pete Beach, FL.

Physical Size and Spatiotopic Cues Modulate Inverted Face Representation



Brown, J. M., Cate, A. (2016). Physical Size and Spatiotopic Cues Modulate Inverted Face Representation . Presented at the Cognitive Neuroscience Society Annual Meeting, New York, NY, USA.

Identifying Distinctive Features in Object Recognition



Roldán, S. M. & Cate, A. D. (2016). “Identifying Distinctive Features in Object Recognition.” Vision

Sciences Society Annual Meeting, St. Pete Beach, FL.

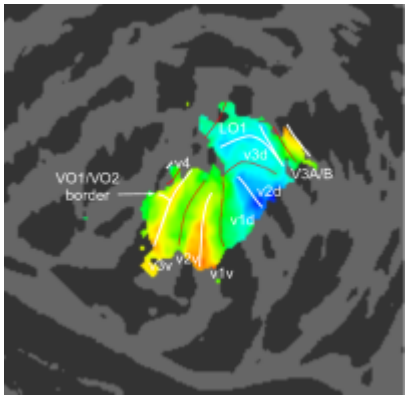
Perceptual Organization in Parkinson's disease: The Role of the Basal ganglia in Shape-Based Object Recognition and Emotion Perception



Muralidharan, P. & Cate, A. D. (2016). “Perceptual Organization in Parkinson's disease: The Role of the Basal ganglia in Shape-Based Object Recognition and Emotion Perception.” Vision Sciences Society Annual Meeting, St. Pete Beach, FL.

2015

Functional and anatomical properties of human visual cortical fields.



Zhang, S., Cate, A. D., Herron, T. J., Kang, X., Yund, E. W., Bao, S., & Woods, D. L. (2015). Functional and anatomical properties of human visual cortical fields. Vision Research, 109, Part A, 107–121.

http://doi.org/10.1016/j.visres.2015.01.015

Concurrent fMRI analysis of part-whole structure and subjective object norms for items from the BOSS (Bank of Standardized Stimuli) data set.



Cate, A., & Roldán, S. M. (2015). Concurrent fMRI analysis of part-whole structure and subjective object norms for items from the BOSS (Bank of Standardized Stimuli) data set. Presented at the Vision Sciences Society Annual Meeting, St. Pete Beach, FL.

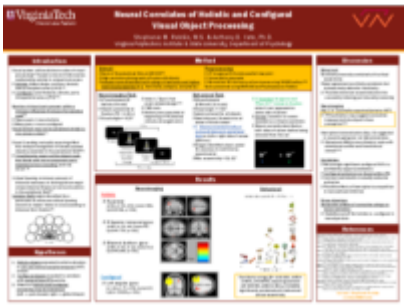
2014

Human cortical visual pathways for the perception of figural shapes that violate Gestalt principles: fMRI of 3D concave shape from stereopsis.



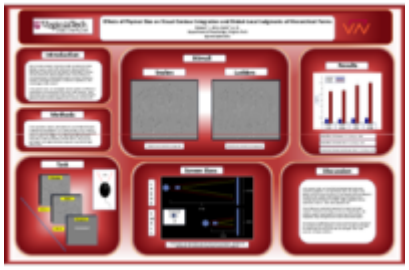
Cate, A. D., Brown, J. M., & Roldán, S. M. (2014). Human cortical visual pathways for the perception of figural shapes that violate Gestalt principles: fMRI of 3D concave shape from stereopsis. Presented at the Society for Neuroscience Annual Meeting, Washington, DC, USA.

Neural correlates of holistic and configural visual object processing.



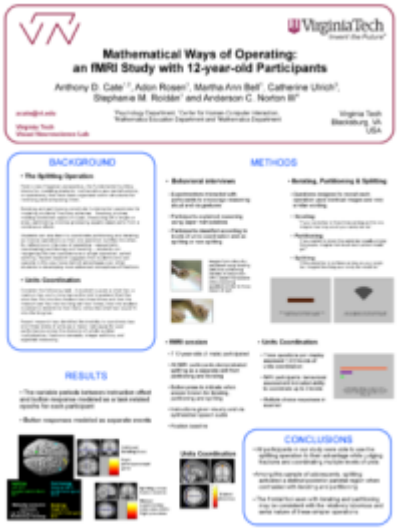
Roldán, S. M., & Cate, A. D. (2014). Neural correlates of holistic and configural visual object processing. Presented at the Society for Neuroscience Annual Meeting, Washington, DC, USA.

Effects of physical size on visual contour integration and global-local judgments of hierarchical forms.



Brown, J. M., & Cate, A. D. (2014). Effects of physical size on visual contour integration and global-local judgments of hierarchical forms. Presented at the Society for Neuroscience Annual Meeting, Washington, DC, USA.

Mathematical Ways of Operating: an fMRI Study with 12-year-old participants.



Cate, A. D., Rosen, A., Bell, M. A., Ulrich, C., Roldán, S. M., & Norton, A. (2014). Mathematical Ways of Operating: an fMRI Study with 12-year-old participants. Presented at the Organization for Human Brain Mapping Annual Meeting, Hamburg, Germany.

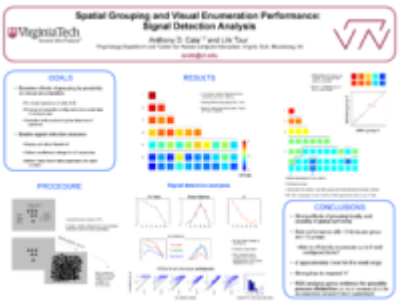
2013

Identifying Parts and Wholes in Real-World Objects: An Application of Critical Spacing

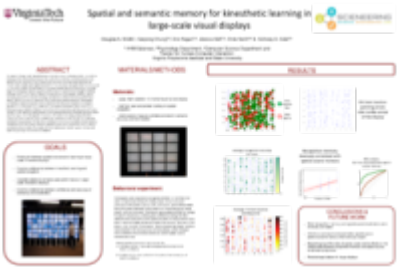


Roldán, S. M., Liu, M., De Roma, J., & Cate, A. D. (2013). Identifying Parts and Wholes in Real-World Objects: An Application of Critical Spacing. Presented at the Object Perception, Attention and Memory, Toronto, ON, Canada.

Spatial grouping and visual enumeration performance: signal detection analysis.



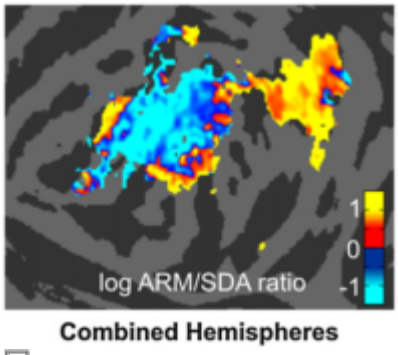
Cate, A. D., & Tzur, L. (2013). Spatial grouping and visual enumeration performance: signal detection analysis. Presented at the Psychonomics Society Annual Meeting, Toronto, ON., Canada.



Spatial and semantic memory for kinesthetic learning in large-scale visual displays.

Smith, D., Chung, H., Ragan, E., Self, J., North, C., & Cate, A. D. (2013). Spatial and semantic memory for kinesthetic learning in large-scale visual displays. Presented at the Society for Neuroscience, San Diego, CA.

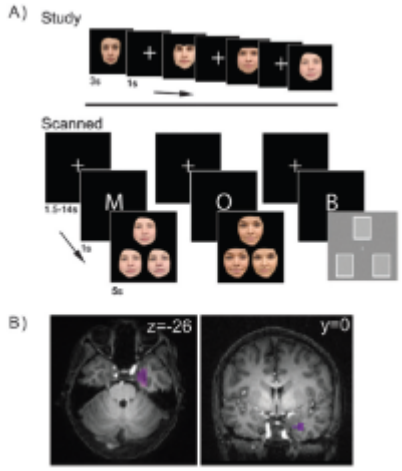
2012



Cate, Herron et al. 2012

Intermodal attention modulates visual processing in dorsal and ventral streams.

Cate, A. D., Herron, T. J., Kang, X., Yund, E. W., & Woods, D. L. (2012). Intermodal attention modulates visual processing in dorsal and ventral streams. NeuroImage, 63(3), 1295–1304. http://doi.org/10.1016/j.neuroimage.2012.08.026



O'Neil, Protzner et al. 2012

Distinct patterns of functional and effective connectivity between perirhinal cortex and other cortical regions in recognition memory and perceptual discrimination.

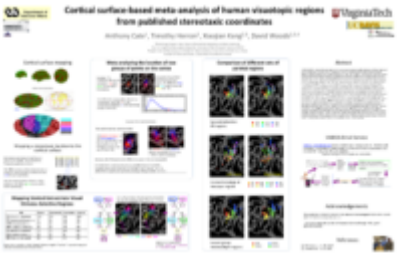
O'Neil, E. B., Protzner, A. B., McCormick, C., McLean, D. A., Poppenk, J., Cate, A. D., & Köhler, S. (2012). Distinct patterns of functional and effective connectivity between perirhinal cortex and other cortical regions in recognition memory and perceptual discrimination. Cerebral Cortex (New York, N.Y.: 1991), 22(1), 74–85. http://doi.org/10.1093/cercor/bhr075


Hemispherically-Unified Surface Maps of Human Cerebral Cortex: Reliability and Hemispheric Asymmetries

Kang, Herron et al. 2012

Hemispherically-Unified Surface Maps of Human Cerebral Cortex: Reliability and Hemispheric Asymmetries.

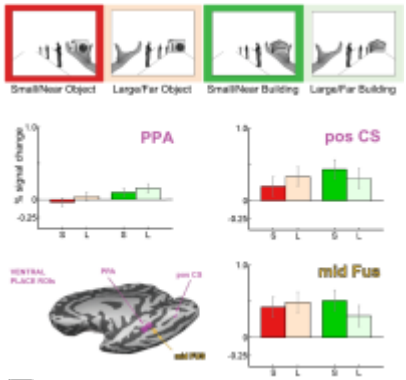
Kang, X., Herron, T. J., Cate, A. D., Yund, E. W., & Woods, D. L. (2012). Hemispherically-Unified Surface Maps of Human Cerebral Cortex: Reliability and Hemispheric Asymmetries. PLoS ONE, 7(9), e45582. http://doi.org/10.1371/journal.pone.0045582



Cortical surface-based meta-analysis of human visuotopic regions from published stereotaxic coordinates.

Cate, A., Herron, T., Kang, X., & Woods, D. (2012). Cortical surface-based meta-analysis of human visuotopic regions from published stereotaxic coordinates. Presented at the Vision Sciences Society Annual Meeting, Naples, FL. In Journal of Vision (Vol. 12, pp. 523–523). Naples, FL. http://doi.org/10.1167/12.9.523

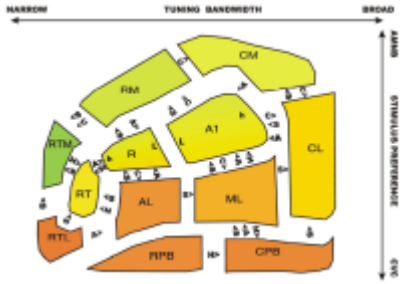
2011



Cate, Goodale & Köhler 2011

The role of apparent size in building- and object-specific regions of ventral visual cortex.

Cate, A. D., Goodale, M. A., & Köhler, S. (2011). The role of apparent size in building- and object-specific regions of ventral visual cortex. Brain Research, 1388, 109–122. http://doi.org/10.1016/j.brainres.2011.02.022



Woods, Herron et al. 2011

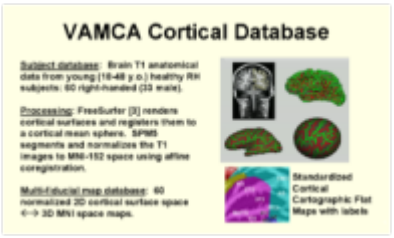
Phonological processing in human auditory cortical fields.

Woods, D. L., Herron, T. J., Cate, A. D., Kang, X., & Yund, E. W. (2011). Phonological processing in human auditory cortical fields. Frontiers in Human Neuroscience, 5, 42. http://doi.org/10.3389/fnhum.2011.00042



Part-whole integration of 2D shapes in the hippocampus and the basal ganglia.

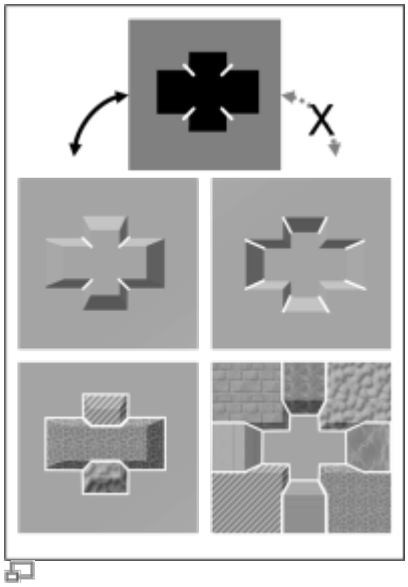
Cate, A., Kang, X., Herron, T., & Woods, D. (2011). Part-whole integration of 2D shapes in the hippocampus and the basal ganglia. Presented at the Vision Sciences Society Annual Meeting, Naples, FL. In Journal of Vision (Vol. 11, pp. 1094–1094). Naples, FL. http://doi.org/10.1167/11.11.1094



VAMCA: A toolbox for the visualization and metaanalysis of functional organization of the cortex using an anatomical database.

Herron, T. J., Cate, A. D., Kang, X., & Woods, D. L. (2011). VAMCA: A toolbox for the visualization and metaanalysis of functional organization of the cortex using an anatomical database. Presented at the 4th INCF Congress of Neuroinformatics, Boston, MA. In Frontiers in Neuroinformatics. Boston, MA. http://doi.org/10.3389/conf.fninf.2011.08.00107

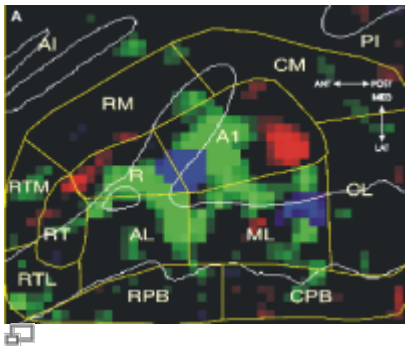
2010



Cate & Behrmann 2010

Perceiving parts and shapes from concave surfaces.

Cate, A. D., & Behrmann, M. (2010). Perceiving parts and shapes from concave surfaces. Attention, Perception & Psychophysics, 72(1), 153–167. http://doi.org/10.3758/72.1.153



Woods, Herron et al. 2010

Functional properties of human auditory cortical fields.

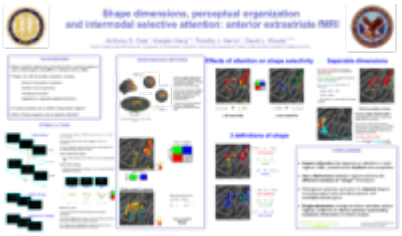
Woods, D. L., Herron, T. J., Cate, A. D., Yund, E. W., Stecker, G. C., Rinne, T., & Kang, X. (2010). Functional

properties of human auditory cortical fields. Frontiers in Systems Neuroscience, 4, 155. http://doi.org/10.3389/fnsys.2010.00155



Divergence modeling: Analyzing perceptual representations via stimulus similarity and information theory.

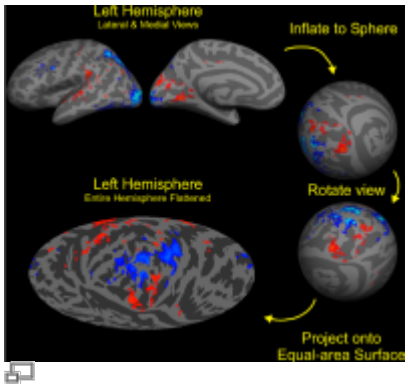
Cate, A. D., Herron, T. J., & Woods, D. L. (2010). Divergence modeling: Analyzing perceptual representations via stimulus similarity and information theory. Presented at the Society for Neuroscience, San Diego, CA.



Shape dimensions, perceptual organization and intermodal selective attention: anterior extrastriate fMRI.

Cate, A., Kang, X., Herron, T., Yund, E. W., & Woods, D. (2010). Shape dimensions, perceptual organization and intermodal selective attention: anterior extrastriate fMRI. Presented at the Vision Sciences Society Annual Meeting, Naples, FL. In Journal of Vision (Vol. 10, pp. 1205–1205). Naples, FL. http://doi.org/10.1167/10.7.1205

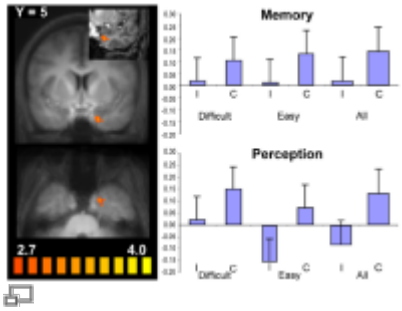
2009



Cate, Herron et al. 2009

Auditory Attention Activates Peripheral Visual Cortex.

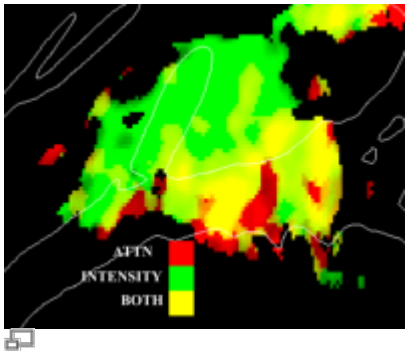
Cate, A. D., Herron, T. J., Yund, E. W., Stecker, G. C., Rinne, T., Kang, X., … Woods, D. L. (2009). Auditory Attention Activates Peripheral Visual Cortex. PLoS ONE, 4(2), e4645. http://doi.org/10.1371%2Fjournal.pone.0004645



O'Neil, Cate & Köhler 2009

Perirhinal Cortex Contributes to Accuracy in Recognition Memory and Perceptual Discriminations.

O'Neil, E. B., Cate, A. D., & Kohler, S. (2009). Perirhinal Cortex Contributes to Accuracy in Recognition Memory and Perceptual Discriminations. J. Neurosci., 29(26), 8329–8334. http://doi.org/10.1523/JNEUROSCI.0374-09.2009



Woods, Stecker et al. 2009

Functional maps of human auditory cortex: effects of acoustic features and attention.

Woods, D. L., Stecker, G. C., Rinne, T., Herron, T. J., Cate, A. D., Yund, E. W., … Kang, X. (2009). Functional maps of human auditory cortex: effects of acoustic features and attention. PloS One, 4(4), e5183. http://doi.org/10.1371/journal.pone.0005183

Earlier

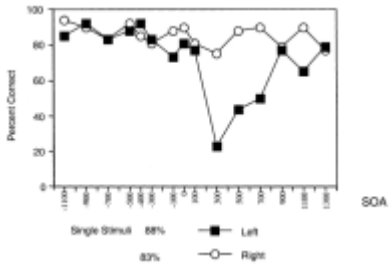

The missing whole in perceptual models of perirhinal cortex

Anthony D. Cate and Stefan Köhler

Cate & Köhler 2006

The missing whole in perceptual models of perirhinal cortex.

Cate, A. D., & Köhler, S. (2006). The missing whole in perceptual models of perirhinal cortex. Trends in Cognitive Sciences, 10(9), 396–397. http://doi.org/10.1016/j.tics.2006.07.004



Cate & Behrmann 2002

Spatial and temporal influences on extinction.

Cate, A., & Behrmann, M. (2002). Spatial and temporal influences on extinction. Neuropsychologia, 40(13), 2206–2225.

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