



opam33

Denver, Colorado
November 20th, 2025

The logo features the text 'opam33' in a stylized, rounded font. The 'o' and 'p' are orange, 'a' and 'm' are red, and '33' is yellow. A green winter hat with a red pom-pom and colorful patterns is perched on the 'a'. A blue and white patterned scarf is draped around the '33'.

Conference Program

Join the conference organised for and by graduate and postdoctoral researchers where we highlight outstanding early career research on the topics of Object Perception, Attention, and Memory (OPAM).

Organizers: Noah Britt, Dock Duncan, William Narhi-Martinez,
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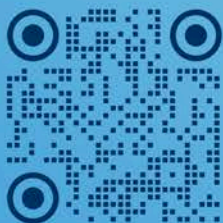
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Where?

Talk Sessions:

Tower Building: Second Level - Grand Ballroom I

Luncheon

Tower Building: Second Level - Grand Ballroom II

Poster Hall:

Plaza Building: Concourse Level - Plaza Foyer

See the map bellow if you are lost...



Map: Talk & Poster Sessions

LOCATION: - Sheraton Denver Downtown Hotel

Tower Building

Mezzanine level

Second level

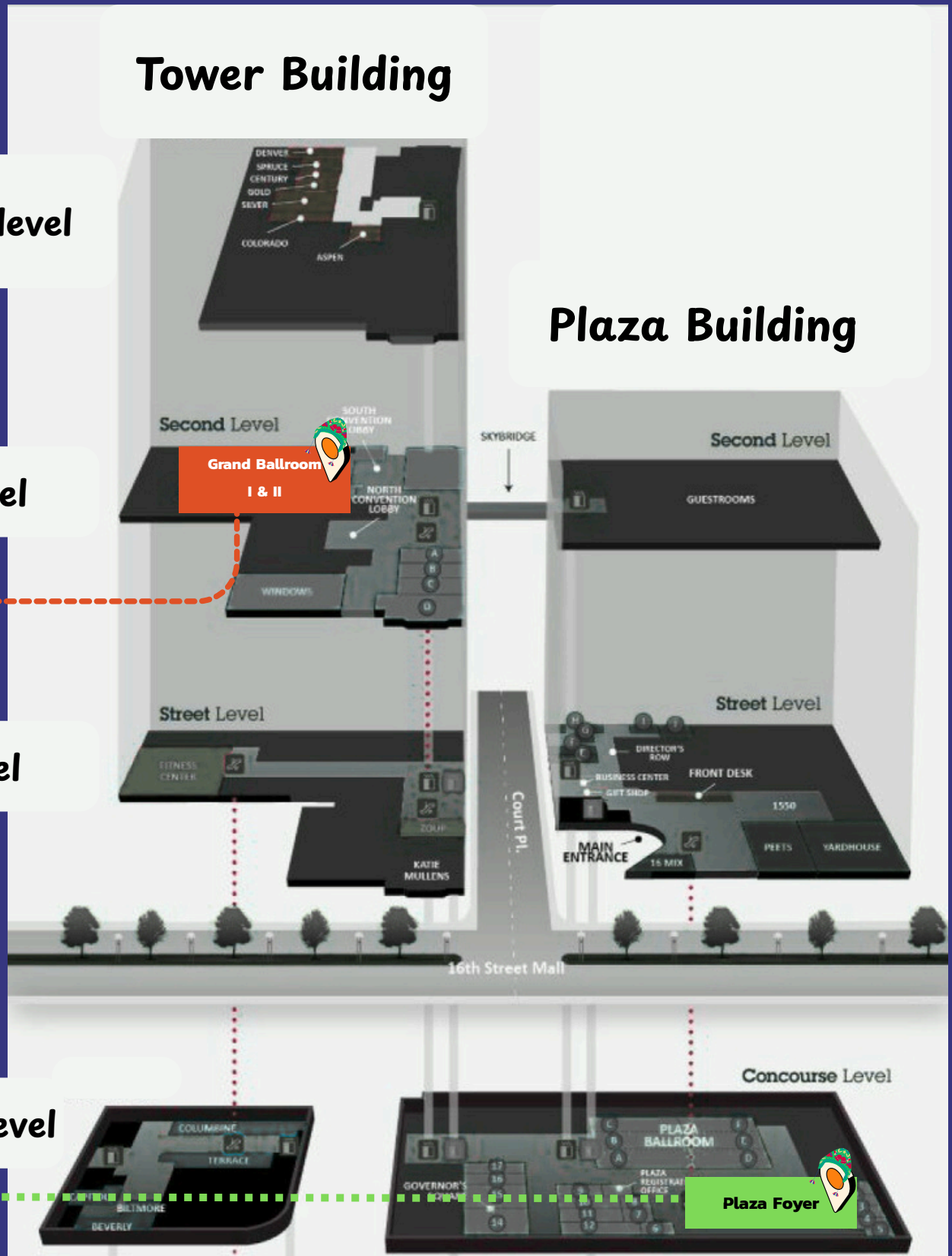
Talk sessions
&
Luncheon

Street level

Concourse level

Poster session

Plaza Building





KEYNOTE | 4-5PM

Dr. Joy Geng



Good enough attentional guidance and naturalistic visual search

Visual search is a common task that humans perform many times throughout the day. Examples include searching for a snack in a supermarket, looking for a misplaced phone in a cluttered room, or finding a friend in a busy restaurant. The efficiency with which we perform these tasks has a significant impact on the quality of our lives. But how do we do this? In this talk, I will describe work in my lab over a few years (and a few PhDs) that looks at how information used to guide visual search flexibly adapts to the visual environment. The studies I will describe show our evolution in thinking that began with well-controlled 2D tasks and now focuses more on complex scenes or immersive 3D environments. We find that under more naturalistic conditions, visual search is hierarchical and the objective of each subgoal is to reduce the spatial area over which search for the target has to occur, until the target is found. Earlier subgoals are frequently accomplished with coarse, or proxy, information and the full veridical target template is only reinstated near the end of the search process. The work highlights the integrated nature of memory and perception in controlling attention during visual search.



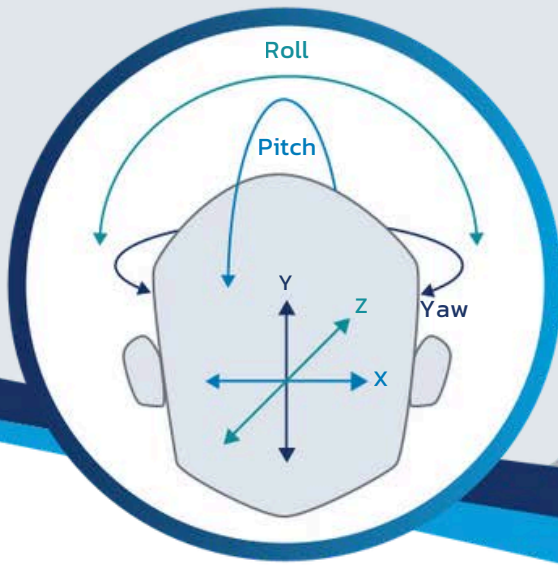
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7AM	Registration opens
7:50–8AM	Opening remarks
8–9AM	Talk Session 1 — Mnemonic Influences
9–9:15AM	Break Poster set up
9:15–10:15AM	Talk Session 2 — Specialized Processing
10:30 - 12PM	Poster Session
12–1:30PM	Lunch Break
1:30–2:30PM	Talk Session 3 — Learning and Prediction
2:30–2:45PM	Break
2:45–3:45PM	Talk Session 4 — Attention & Search
3:45–4PM	Break
4–5PM	Keynote speaker
5–5:15PM	Awards and closing remarks



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TALK SESSION 1 | 8-9AM

Mnemonic Influences

8:00 am - 8:15 am

■ **Does knowing that a potato chip resembles Elvis change your visual memory of it?**

◦ Emma Megla, Ophra A. Atar, Wilma A. Bainbridge — University of Chicago

Does semantic information—like “resembles Elvis”—change our visual memory of that object? Here, we presented participants with ambiguous, two-toned ‘Mooney’ images of objects from the THINGS database, with some of these images presented alongside their category label (e.g., potato chip). By analyzing drawings made from memory for each image, we found that images presented with no category label contained more visual detail, such as more edges, but that the objects within these images were less identifiable to a neural network. This suggests that semantic information can ‘prune’ irrelevant details of a visual memory to better represent its category label.

8:15 am - 8:30 am

■ **Neural representation of action-guiding and non-action-guiding information in visual working memory**

◦ Dennis Boakye, Khayla Santiago, Chunyue Teng — Lawrence University

Visual working memory is highly flexible, with its neural representation shaped by task demands. Importantly, the same information can serve distinct functions, for example, as action-guiding content or as decision-relevant context. The current study examined whether these functional roles influence neural code, using a delayed recall task with identical stimuli (spatial location) serving different functions. Inverted encoding modeling of Electroencephalogram data suggested a shared representation in posterior regions, but function-specific codes in frontal regions. Moreover, action-guiding representations were more generalizable than contextual ones, suggesting that functional relevance shapes both the format and localization of working memory representations.



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TALK SESSION 1 | 8-9AM

Mnemonic Influences

8:30 am - 8:45 am

■ Effect of landmark usefulness on working memory representations

- Nicholas R. Schmitz, Sage L. Bendickson, David W. Sutterer — University of Tennessee, Knoxville

Do background landmarks enhance or reduce active working memory maintenance of object locations? To answer this, we recorded electroencephalography (EEG) activity while participants completed a delayed spatial estimation task in which the background alternated between lines intersecting and circles parallel to stimulus locations. We found that lines intersecting remembered locations led to better performance than parallel circles. Applying an inverted encoding model to alpha-band activity patterns revealed enhanced neural representations of remembered locations when the background consisted of intersecting lines versus parallel circles. This demonstrates that useful landmarks at remembered locations enhance sustained spatial memory representations for target locations.

8:45 am - 9:00 am

■ fMRI exploration of mind-wandering and memory consolidation

- Devayani Joshi, Alexa Tomparry, Aaron Kucyi — Drexel University

Mind-wandering, or a shift toward internally generated thought, is often linked to impaired memory. Yet, post-learning rest enhances memory despite promoting mind-wandering. We tested the relationship between mind-wandering and memory consolidation in 40 participants using fMRI. Participants completed an object-scene encoding and a 40-minute post-encoding rest period with intermittent experience sampling to measure mind-wandering, followed by immediate and delayed memory tests. Greater mind-wandering during rest predicted better delayed memory. Multivoxel pattern analysis revealed increased reactivation after learning, which predicted better immediate but worse delayed memory. Coupling between default mode network activity and mind-wandering also predicted this memory tradeoff.



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TALK SESSION 2 | 9:15–10:15AM

Specialized Processing

9:15 am - 9:30 am

▲ **The wisdom of crowds in visual search: How gaze similarity predicts collective performance**

◦ Dyllan Simpson, Timothy F. Brady — University of California, San Diego

We find that the wisdom of crowds effect extends to visual search through scanpath diversity. Analyzing eye-tracking data from two datasets (Ehinger et al., 2009: 14 observers, 912 scenes; COCO-Search18: 10 observers, 4,028 scenes), we examined how the gaze similarity between two different participants relates to simulated collective search benefits. We find strong negative correlations between scanpath similarity and performance improvement on target-present trials, while target-absent trials showed no relationship. This asymmetry reveals that wisdom of crowds in visual search operates through diverse sampling strategies that increase target encounter probability, not through exhaustive verification processes characteristic of target-absent search.

9:30 am - 9:45 am

● **Explicit access to detailed feature distribution representations**

◦ Vladislav Khvostov, Julie D. Golomb, Árni Gunnar Ásgeirsson, Árni Kristjánsson — The Ohio State University

The visual system can quickly process groups of objects (ensembles) and build compressed representations of their features. Traditionally, observers' conscious/explicit access to ensemble representations has been considered minimal – any distributional aspects beyond simple summary statistics cannot be accessed. However, our new paradigm (Feature Frequency Report) provides strong evidence otherwise. Observers briefly viewed 36-color ensembles from different distributions and reported the frequency of a randomly chosen color. The results demonstrate that observers have reliable explicit access to detailed ensemble distributions. We suggest that such distribution representations, not summary statistics, are the default way of representing groups of visual objects.



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TALK SESSION 2 | 9:15–10:15AM

Specialized Processing

9:45 am - 10:00 am

▲ **Rhythmic coordination of visual perception and working memory under competition**

◦ Yifei Wu, Chunyue Teng — Lawrence University

Rhythmic attention coordinates external perception and internal working memory (WM), but how it operates under representational competition remains unclear. We used a dual-task paradigm with variable stimulus onset asynchrony (SOA) to examine rhythmic attentional sampling under high and low task competition. Time-frequency analyses revealed theta and alpha rhythmic fluctuations in both tasks. Although phase offset between WM and perceptual tasks did not differ substantially across conditions, its modulation may serve as a mechanism to resolve competition between internal and external demands. These findings support a shared rhythmic process for dynamically allocating attention across representational domains.

10:00 am - 10:15 am

● **Is number (perceptually) special?**

◦ Gabriel C.L. Waterhouse, Sami R. Yousif — University of North Carolina - Chapel Hill

As long as number has been studied in cognitive science, there has been an idea that it is somehow special — that, among other visuospatial attributes like size and density, number is prioritized such that it is more readily and more accurately perceived and represented. Number's uniqueness has led to it being studied more extensively than other quantity dimensions, and with much greater theoretical emphasis. Here, we question this orthodoxy — presenting evidence from seven experiments demonstrating not only that number is not special, but that at least one other dimension (average size) is consistently prioritized by both adults and children.



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TALK SESSION 3 | 1:30–2:30PM

Learning and Prediction

1:30 pm - 1:45 pm

■ Expectations reveal adaptive integration between perception and visual working memory

◦ Joseph M. Saito, Boheng Li, Timothy F. Brady — University of California, San Diego

Percepts interact with visual working memories to produce biases in memory reports. Some accounts posit that these biases reflect limited shielding of memory representations against unwanted interference. Here, we tested an alternative Bayesian view that observers integrate percepts with memories to overcome noise, especially when percepts are similar and therefore more informative of memory contents. Using a trial history manipulation, we show that simply expecting similarity between memory and perception nearly doubles report biases, consistent with adaptive integration. Moreover, this effect occurs without changes to physical stimulus similarity or representational strength, implying an extra-sensory locus of integration in the brain.

1:45 pm - 2:00 pm

■ Prediction accuracy dynamically modulates prediction-based false memory

◦ Olya Bulatova, Keisuke Fukuda — University of Toronto

Making arbitrary predictions of upcoming events induces false memories of the predicted events even when they never occur (Bulatova & Fukuda, 2025). Here, in a series of four experiments ($n = 126$), we tested whether this prediction-based false memory reflects the adaptability of our predictive processing mechanism by manipulating the likelihood of prediction confirmation across and within experiments. The results showed that the strength of the false memory was dynamically modulated by the likelihood of prediction confirmation, thus demonstrating its adaptability. Furthermore, this dynamic modulation did not require explicit awareness of the change in the likelihood of prediction confirmation.



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TALK SESSION 3 | 1:30–2:30PM

Learning and Prediction

2:00 pm - 2:15 pm

▲ **Learning Under Uncertainty: When Spatial Bias Becomes Flexible or Rigid**

◦ Juhyeon Song, Min-Shik Kim — Yonsei University

Experience shapes attention, but real-world environments where experience occurs contain various uncertainties. The present study explored how outcome uncertainty (fluctuating target probabilities) and environmental uncertainty (shifts in target-rich location) determine whether spatial bias becomes flexible or rigid. Across two preregistered experiments using a location probability learning task, we found a striking pattern: outcome uncertainty during the shift in the target-rich quadrant facilitated updating of bias to the new rich quadrant. Conversely, pre-learning exposure to environmental uncertainty enhanced bias persistence through extinction phases. These findings suggest that concurrent outcome uncertainty during change fosters adaptation, while environmental volatility before learning strengthens persistence.

2:15 pm - 2:30 pm

▲ **Statistical Pattern Learning in Visuospatial Temporal Contexts**

◦ Artyom Zinchenko, Ananya Mandal, Thomas Geyer — LMU, Munich

Human participants display an impressive capability for statistical learning (SL). SL is a central concept in current theories of information processing (such as Bayesian predictive coding), including, besides sensory processing, motor planning, speech perception, language acquisition, and social cognition. Although these paradigms have provided new impetus for models of perceptual decision-making, existing accounts lack fidelity regarding how humans learn regularities from data that is ordered sequentially in time and whether time-based SL also incorporates other contextual factors.





TALK SESSION 4 | 2:45–3:45PM

Attention and Visual Search

2:45 pm - 3:00 pm

▲ Dissociable mechanisms of attention guidance from negative templates maintained in visual working memory and long-term memory

◦ Aditya V. Prakash, Andrew Hollingworth — University of Iowa

Attention can be guided by templates specifying distractor properties. We examined whether negative-template guidance from visual working memory (VWM) and long-term memory (LTM) rely on shared or distinct mechanisms by directly comparing their effects on early oculomotor orienting. LTM-based cues operated proactively from the first saccade during search, whereas VWM-based cues operated reactively, with a pattern of early capture followed by later avoidance. When LTM and VWM templates were placed in conflict (initial avoidance versus initial attraction), VWM-based guidance dominated. These findings reveal dissociable mechanisms supporting VWM- and LTM-based suppression and tentatively suggest a relationship where VWM-based control is prioritized.

3:00 pm - 3:15 pm

▲ Modeling variable visual search strategies

◦ Molly R. McKinney, Mianzhi Hu, Darrell A. Worthy, Brian A. Anderson — Texas A&M University

Using a modified version of the Adaptive Choice Visual Search (ACVS) task, this study investigated the variable visual search strategies individuals use to maximize performance and/or reward. Separate groups of participants received either a high or a low reward for selecting a target found in a smaller subset of potential target items. Participants were not informed about the most efficient way to perform the task (search the smaller subset). Three best-fit strategies emerged: priority for reward, speed, or reward per unit time. These results further substantiate the role of individual differences in the strategic control of attention.





TALK SESSION 4 | 2:45–3:45PM

Attention and Visual Search

3:15 pm - 3:30 pm

▲ **Attentional blink dynamics are modulated by categorical color changes between targets**

◦ Eben W. Daggett, Michael C. Hout — New Mexico State University

The role of target-target similarity in the Attentional Blink (AB) has received limited attention in the AB literature. The present study investigated the role of categorical color switching between targets in the AB in a series of four experiments that manipulated target-target similarity, discriminability of targets, and participant fore-knowledge of target color composition. Results showed that the AB effect is consistently enhanced when targets are different colors, regardless of the relative discriminabilities of the colors or the participant's a prior knowledge of target colors in a trial. These results shed new light onto the potential origins of the AB phenomenon.

3:30 pm - 3:45 pm

▲ **Searching within and across categories**

◦ Victoria Jacoby, Jeremy M. Wolfe — Brigham and Women's Hospital, Harvard Medical School

How does the structure of the target set influence visual search performance? Observers searched for targets from a superordinate category (e.g., “animals”). In Condition 1, targets were randomly selected. In Condition 2, most targets came from a subordinate category (e.g., cats). In Condition 3, most targets were one specific item. In Condition 4, all targets were the same item. Specific targets were faster than categorical ones. For categorical search, high frequency of a single item improved detection of that item alone, while distributing frequency across a subcategory benefited all subcategory members—both resulting in impaired performance for all other targets.



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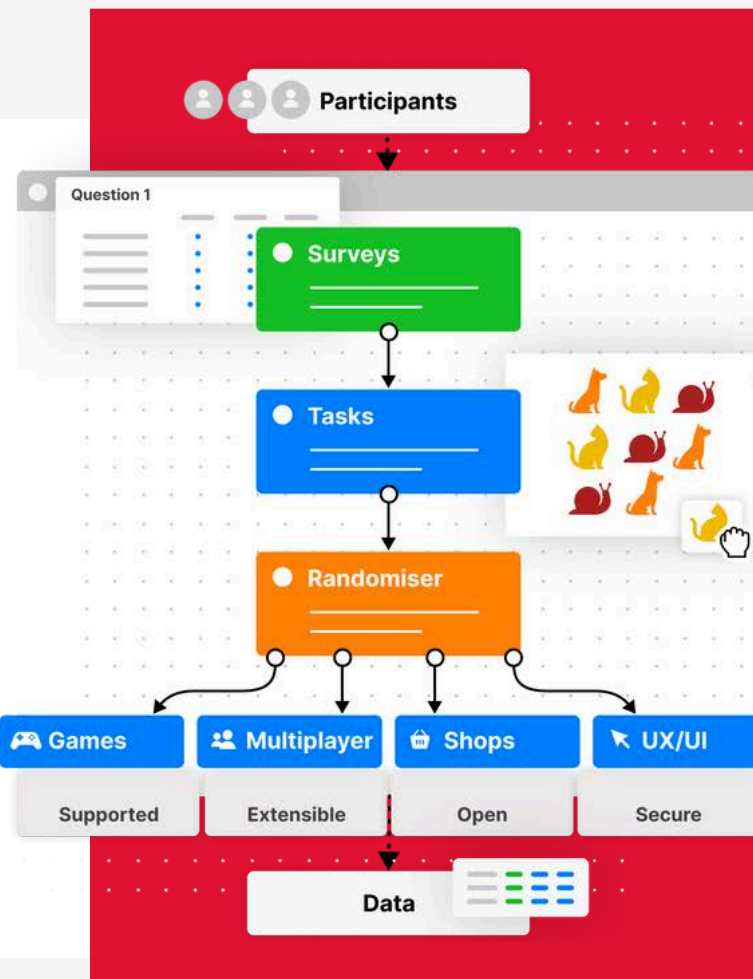
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■ MEMORY ▲ ATTENTION ● OBJECT PERCEPTION

POSTER SESSION | 10:30AM - 12PM

Memory

01 Spatial rehearsal in visual working memory: Eye movement evidence for prioritization after retro-cueing

◦ Haley M. Bennett, Nancy B. Carlisle — Lehigh University

This study tested whether spatial attention acts as a form of rehearsal in visual working memory. We examined whether participants looked back at the location of a prioritized item after receiving a high validity retro-cue. Eye movements were recorded during two delay periods before the memory test. We predicted no fixation differences before the cue, but more and/or longer fixations to the cued location after the cue. As expected, participants showed higher accuracy and faster responses for retro-cued items. Eye-tracking confirmed more frequent and longer fixations to prioritized locations post-cue, supporting the idea of spatial rehearsal in memory maintenance.

02 Does selection history impact optimal encoding strategies in visual working memory?

◦ Kiersten E. Gentry, C. Jackson Van Meter IV, Dr. Andrew Clement — Millsaps College

Previous research has shown that strategy usage affects VWM and attention. Here, we attempted to study how history-driven encoding affected optimal visual encoding strategies and whether participants were aware of these strategies. Using a change detection task with a biased and control group and arrays of differently-colored stimuli, we asked participants to identify one of two changed stimuli. The biased group was more accurate and optimal compared to the control group. Aware participants were more optimal with no difference in awareness between the biased and control groups. These findings indicate that selection history impacts optimal encoding strategies in VWM.

03 A Visual testing effect for novel abstract objects depending on how memory is cued

◦ Jennifer Gove, David E. Huber, Rosemary A. Cowell — University of Colorado Boulder

Some theories of the learning benefits of retrieval practice – aka the testing effect (TE) claim it occurs only for semantic or high-level, hippocampally dependent information. One domain-general competitor theory instead explains the TE based on intra-item learning; it predicts a TE for visual material, which is greatest when retrieval happens by visual pattern completion, as when an object is partially occluded but nonetheless recognized. Across multiple experiments, we report a robust visual TE for abstract (non-semantic) visual objects, but only if retrieval is cued with an occluded view; not when cued in a manner that does not induce pattern completion.

04 Trait versus state mental imagery: Characterizing the subjective nature of misremembering

◦ Kennedy Nikko King, Himanshu Chaudhary, Dr. Ayanna Thomas, Dr. Elizabeth Race — Tufts University and Drexel University

Exposure to misleading information after a witnessed event leads to memory distortion for that event (misinformation effect). Prior research has demonstrated that the misinformation effect involves faulty reconstructive processes during memory retrieval whereby misleading information is remembered as part of an original event. People vary in the level of vividness they attribute to their mental imagery. Those with higher imagery vividness perform better in various memory contexts. Experiment 1 investigated whether trait-level visual mental imagery ability can prevent memory errors from misinformation. Experiment 2 examined whether vivid recollection on a trial-by-trial basis characterizes misremembering. One hundred participants viewed a silent crime video and then listened to a misleading audio narrative. Afterward, they took a forced-choice memory test and completed the Vividness of Visual Imagery Questionnaire. High-imagery did not outperform low-imagery with misinformation; however, imagery vividness correlated with overall accuracy. Moreover, vivid recollection characterized both accurate retrieval and memory distortions, suggesting vivid remembering may support misinformation endorsement.



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Memory

05 Exploring the boundaries of attribute amnesia: Can an intervening task modify how much is forgotten?

◦ Kellen Hendrix, Bill DuVall, Nelson Cowan — University of Missouri, Southwest Baptist University
Attribute amnesia (AA) occurs when participants repeatedly report stimuli's features (e.g., by reporting letters' locations) but, on a surprise trial, they cannot report the key attribute of the stimulus (e.g., the identity of the letter). The current study explored AA's limits by introducing a surprise-second condition receiving the surprise question after the expected question. Location and identity varied roles as the presurprise and surprise questions across three experiments. We found AA for location when probed after the expected question but greater AA for identity regardless of question order. Findings reveal a Zeigarnik-style effect on spatial memory driven by question order.

06 The benefits of drawing and describing for visual memory binding

◦ Anna C. McCarter, Jeffrey J. Starns — Harvard University & University of Massachusetts Amherst
What strategies are optimal for learning visual materials? In this experiment, young adult and older adult participants learned images through either drawing a copy, writing a description, tracing, or viewing. Subsequently, participants had a recognition test and a feature binding test. For the younger adults, drawing and describing were the best strategies for recognition and binding. For the older adults, drawing and describing were the best strategies for recognition, while studying and describing were best for binding. Overall, this suggests that the optimal learning strategy depends on the test format and learner population, with both drawing and describing showing benefits.

07 Transsaccadic memory: Distinguishing between integration and overwriting mechanisms

◦ Zexuan Niu, Andrew Hollingworth — University of Iowa
In the literature on transsaccadic memory, there are two hypotheses of the role of pre- and post-saccadic information in object perception: the integration model, in which information across saccades is integrated, and the overwriting model, where post-saccadic input probabilistically overwrites pre-saccadic content. Using a saccade-contingent color change paradigm, we investigated how post-saccadic input affects the retention of pre-saccadic information. Modeling of continuous report data favored integration for similar pre- and post-saccadic colors, whereas more distinct colors supported overwriting. These findings suggest that humans may dynamically shift between integration and overwriting mechanisms depending on the similarity of visual input across saccades.

08 Do item-context associations distort memory for the details of the context?: An investigation via drawings

◦ Ryan E. O'Donnell, Alexa Tompary — Drexel University
Theories of item-context memory binding state that context memory dynamically updates according to its bound associates. However, theories focus on how context updating facilitates recall of items studied close in space or time. We investigated whether details of the context also change based on its bound associates. Participants placed to-be-remembered items into birds-eye-view scenes, then drew the scenes from memory. Pilot data (N=10) found that scene sections with more associates were drawn with greater detail, while sections with no associates were occasionally missing from drawings. Results suggest one's memory for the details of a spatial context can be strengthened and/or distorted by its bound associates.



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Memory

09 The cost of retrieval task uncertainty in working memory

◦ Jenna N. Pablo, Lena L. Kemmelmeier, Marian E. Berryhill — University of Nevada, Reno

The working memory (WM) retrieval phase can be accomplished using recognition or recall. A minority of WM studies make retrieval demands uncertain, making this area underexplored. We asked: How does unpredictability in retrieval demand affect WM performance? Across two experiments we observed that recall performance worsened when recall and recognition were intermingled compared to when recall was predictable. This effect was not due to fatigue, motivation, or strategy. Ongoing experiments evaluate metacognitive monitoring or diminished cognitive effort, using confidence ratings, feedback, Hurst exponent measures, and EEG decoding to understand the sacrifice of recall precision under unpredictable retrieval demands.

10 Spatial memory among collegiate athletes and non-athletes

◦ Sarah Sikder, Alexa Tompary — Drexel University

Spatial memory supports the encoding and recall of object locations, essential for performance in physical and digital environments. This study examined how spatial memory may differ across distinct types of athletic experiences, given that athletes frequently engage in sophisticated spatial skills under fast-paced, cognitively demanding conditions. Using the Corsi Block Tapping Test, we examined spatial memory across collegiate athletes, non-athletes, and video game players. Preliminary results suggest athletes tended to perform better than non-athletes. Individual sport athletes outperformed team sport athletes and non-athletes, suggesting sport-specific nuanced relationships between experience type and visual-spatial memory.

11 The effects of divided attention on memory accuracy: A comparison of responsive and non-responsive distraction

◦ Ashley C. Steinkrauss, Scott D. Slotnick — Boston College

This study examined how divided attention (DA) affects item and context memory. Participants encoded face-scene pairs under four DA conditions: baseline, non-responsive distraction (babble), responsive distraction (tone response), and combined distraction. Context memory suffered under responsive DA but was relatively preserved under non-responsive DA, indicating that task demand modulates contextual encoding. Contrary to predictions, combined DA did not further impair performance. Item memory was unaffected across conditions. These findings suggest that context memory is more sensitive to attentional demands than item memory, emphasizing the importance of distraction type and memory type in understanding multitasking effects on memory.

12 Integrating and segregating perceptual history: The effect of competing priors on visual judgments

◦ Bugay Yildirim, Aysecan Boduroglu — Koç University

The current study shows that working memory representations are adaptively distorted, integrating or segregating current input and perceptual history of different timescales according to the history's statistical predictability and the uncertainty of the representation. We found short- and long-term history biases influencing orientation estimates of targets presented in an attentional blink task. Critically, the direction (attraction/repulsion) of these biases adapted to stimulus statistics, reflecting whether priors would optimize or impair target estimates. We also found that the attractive bias was stronger when target representations were highly uncertain due to reduced attentional resources.





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POSTER SESSION | 10:30AM - 12PM

Attention

13 Cognitive control intensifies the effect of attention on emotion

◦ Rebeka C. Almasi, Myeong-Ho Sohn — The George Washington University

The present research investigated whether attentional scope (global vs local) affects emotional valence perception using Navon hierarchical stimuli. Participants responded to congruent and incongruent Navon stimuli directly before categorizing the valence of emotional faces. Trials were grouped into "global blocks" and "local blocks". Following congruent Navon stimuli, which require less cognitive effort than their incongruent counterparts, the effect of attentional scope on emotional valence was not significant, but following incongruent stimuli, a local (rather than global) attentional scope significantly widened the positivity bias through penalizing negative emotion recognition.

14 Disentangling active and passive sustained attention: Evidence from temporal patterns in pupillometry

◦ Mayte Alonso Carrillo, Giovanna C. Del Sordo, Megan H. Papesch, Michael C. Hout — New Mexico State University

The potential distinction between vigilance and sustained attention (SA) has yet to be addressed in the cognitive literature. This study investigated whether active and passive/vigilant forms of SA can be dissociated. Pupil dilation was compared across Active and Passive Multiple Object Tracking tasks, each designed to target a different SA form. The findings support a dissociation between active and passive SA, with the former characterized by continuous engagement and the latter by delayed, stimulus-driven engagement. Clarifying this distinction challenges the notion of SA as a unitary construct and advances our understanding of its cognitive and neurophysiological components.

15 Pushing the envelope: Active viewing drives boundary extension

◦ Hong B. Nguyen, Benjamin van Buren — The New School

Past work has found that sensorimotor predictions made during active (vs. passive) viewing facilitate the encoding of information, enhancing memory for what we saw. Might active viewing also bias us to falsely remember details that we never saw? 200 active viewers moved a small aperture to view scene images. 200 passive viewers watched replays of these viewing trajectories. Active viewers' recognition memory was strongly biased toward 'zoomed-out' decoy views showing details beyond the boundary of what was actually visible; passive viewers showed the opposite bias. We conclude that active visual exploration engenders sensorimotor predictions, which drive boundary extension in memory.

16 Saccadic timing in visual search is mediated by individual differences in covert visual processing and inhibition

◦ Ryan V. Ringer, Bradley Stewart, Zachariah Weir, Chloe Alvarado, Carly J. Leonard — University of Colorado Denver

Saccadic behavior is dependent upon information accumulation, followed by a saccadic decision. This study investigated mechanisms underlying individual differences in saccadic timing. Participants' first saccade latencies during visual search were compared with performance in the UFOV task to measure attentional breadth, and the stop-saccade task to measure oculomotor inhibition (SSRT). The results indicate that individual differences in first saccade latency were dependent on a complex interaction between target eccentricity (visual search), UFOV accuracy, and SSRT, such that participants with poor UFOV accuracy and weak inhibitory control were more likely to wait longer before initiating their first saccade during visual search.



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Attention

17 Attentional guidance or decision-making? Effects of learning on eye movements during visual search for real-world objects

◦ Olivia Caputo, Doug Addleman — Gonzaga University

The ability to adjust the specificity of visual search helps people successfully locate real-world items. In two eye-tracking experiments, participants learned to find frequent targets faster than other items, the effects of which persisted through testing phases. When participants were trained with multiple images, learning generalized to other images from the same category, but remained image-specific for participants trained on just one. Despite effects of learning on response times, we found little clear evidence in eye-tracking indices to attribute effects specifically to either early attentional guidance or decision-making, raising important questions for future research about the mechanisms supporting these effects.

18 See it to believe it: The role of feedback in low-prevalence search

◦ Vincent D. Caruso, Gavin Fox, Nancy B. Carlisle, Patrick H. Cox — Lehigh University

Many critical real-world searches involve low target prevalence (e.g., radiology or airport security screening). In low-prevalence searches, target misses become more frequent and false alarms become less frequent, indicating a higher criterion for labelling something a target. The present meta-analysis replicates previous findings and further examines the role of trial-by-trial accuracy feedback in modulating low-prevalence effects. Specifically, we demonstrate support for the hypothesis that feedback leads to more confidence in the true prevalence rate, leading to larger criterion shifts in the low-prevalence conditions.

19 Task-irrelevant physical salience delays target processing inside and outside of the attentional blink

◦ Carly Chak, Kaylene Truong, Trisha Dharmapuri, Barry Giesbrecht — University of California, Santa Barbara

Physical salience and selection history are two specific attributes that often capture attention. It is unclear how physical salience and selection history impact attention in the temporal domain. In an RSVP task, we measured the delay in processing (P3) a second target in trials with a neutral distractor compared to trials with a distractor associated with either selection history or physical salience. There was a significant delay present in both short and long lags when the distractor was physically salient. This finding suggests that task-irrelevant physical salience may extend the temporal limits of attention.

20 Proactive suppression of salient distractors persists under feature variability and cognitive load

◦ Sieun Choi, Yang Seok Cho — Korea University

This study investigated whether distractor color variability modulates suppression in feature-based visual search. In two experiments, participants searched for a target defined by shape, while ignoring a salient color singleton that appeared with high probability (80%), either with a fixed or varied color. Across both experiments, participants responded faster when distractors were present, indicating effective suppression. However, observed congruency effects between the target and color singleton suggested partial distractor processing. Importantly, color variability did not significantly impact suppression or congruency effects. These findings support second-order suppression driven by higher-order expectations rather than the predictability of specific distractor features.



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21 From providing to predicting: Expanding the information-driven attentional capture hypothesis

◦ Alenka Doyle, Emily Gonzales, Michael A. Grubb — Trinity College-Hartford

Attention is reflexively captured by non-salient, task-irrelevant objects that have a history of reliably predicting reward acquisition. Recently, we showed that attention is also grabbed by objects with a history of providing useful information. But what if, rather than providing information instantly, these objects had predicted the upcoming receipt of information? We developed a novel training phase protocol using two tasks per trial to associate visual objects with predicting information gain. In a series of online pilot studies, we fine-tuned our methodological approach in training participants to learn associations between objects and information prediction.

22 Neurotype modulates search performance, not statistical learning

◦ Riley Dunkelberger, Carmen Ovalle, Dr. Arryn Robbins — University of Richmond

Categorical cuing refers to the ability to learn and use consistent associations between features (e.g., color) and object categories to guide visual search. This study examined categorical cuing in autistic and neurotypical individuals. In Experiment 1, participants searched for objects with consistent color-category pairings; those with ASD showed faster search but similar cuing effects as neurotypicals. In Experiment 2, targets appeared within real-world scenes. Categorical cuing persisted, but ASD participants were slower, suggesting difficulty integrating scene context. Results suggest that while feature learning does not differ between groups, increased contextual complexity may impact processes of attention during search.

23 Identifying the behavioral consequences and neural mechanisms of learned attentional flexibility in older adults

◦ Verity A. Elliott, Anthony W. Sali — Wake Forest University

Attentional flexibility and sustained attention fluctuate with age and may show distinct aging-related patterns. Older adults (65–75 years) completed a spatially cued gradual continuous performance task during fMRI, responding to targets while shifting or maintaining attention across spatial streams. The response time cost of shifting decreased as shift probability increased. A region of interest analysis based on a similar study of younger adults revealed that activity in the left inferior frontal, left middle frontal, and right angular gyri increased following unexpected cues. These findings suggest older adults flexibly adapt attention using mechanisms shared with younger adults.

24 Under multifocal selection, global information may be available for location, but not for features

◦ Ouxun Jiang, Sophie Shin, Steven L. Franconeri — Northwestern University

Outside of a single local visual focus, information about object features degrades, even for statistical summaries. But some work also shows that under the multifocal attention demanded by tracking tasks, location information can survive for objects outside of those foci, in the form of statistical summaries. Across these studies, is that survival driven by multifocal being less 'focal' and more 'global', or by feature information being weaker than location? We found that participants were at chance at noticing average feature (size) changes in distractor objects during a tracking task, suggesting that tracking relies on more of a focal selection.



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25 When active meets passive: Attentional guidance from mixed-state representations in WM

○ Juyeon Joe, Min-Shik Kim — Yonsei University

Recent research suggests that working memory (WM) consists of multiple functional states, with only active representations guiding attention. We investigated how attentional guidance is affected when a search object combines features from active and passive WM states. Participants encoded two colored shapes, with one designated active via a retro-cue. During a search task, response times were slower when distractors matched both active features or a combination of active and passive features, compared to baseline. This suggests that attentional guidance arises when an object includes an active feature and the remaining feature is held in WM, even in a passive state.

26 Bind 2, get 1 free?: Will the visual system encode a third feature even when it's irrelevant?

○ Moussa Kousa, Brad Wyble — The Pennsylvania State University

Attribute amnesia (AA) challenges the notion that attending to an attribute ensures its retention in memory. AA occurs when participants fail to recall recently attended attributes, likely due to cognitive efficiency mechanisms discarding unreported features. We modified the standard AA paradigm by requiring participants to report two attributes of the target, hypothesizing that this would encourage integration of features into a single object token, and improve accuracy for a third feature. However, AA persisted with this change, except notably when color was the reported attribute, indicating color's unique resistance to AA in our stimulus set.

27 Multitasking training: The effects of adaptive and variable difficulty on learning and long-term retention

○ Siong Peng Kwek, Yi Xuan Yan, Jane Lee, En-Lin Leong, Yun Da Chua, Alvin Wong, Takashi Obana, Jing Wen Chai — National University of Singapore

Multitasking is often inevitable, but how best to train it remains unclear. Applying learning theories, we tested whether variable difficulty would improve training gains and retention in an online version of the Multi-Attribute Task Battery (MATB). Across two studies (N=148 and N=110), participants underwent different training regimens including fixed (baseline), adaptive, or random difficulty. All groups showed significant improvements, but variable difficulty tended to produce larger initial gains and greater long-term retention. These results demonstrate the effectiveness of the online MATB as a scalable training tool and suggest that training variability enhances both learning and retention of complex cognitive skills.

28 Effect of cognitive workload on performance awareness

○ Zoe Loh, Spencer C. Castro — University of California, Merced

As task demands increase, fewer limited cognitive resources remain for not only executing the task but monitoring one's own performance. This study investigates the point at which performance and self-assessment begin to diverge under increasing cognitive workload. Participants completed a visual tracking task in which they monitored target dots moving among distractors on a screen. Task difficulty was manipulated by varying the number of targets. During each trial, participants were prompted to estimate their performance and perceived cognitive workload prior to receiving feedback. Preliminary results indicated that difficulty impacted both self-assessed performance and actual performance.



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29 Distractor avoidance is independent of search seriality

◦ Xiaojin Ma, Richard A. Abrams — University of Missouri

In visual search, observers can often ignore salient but irrelevant distractors. Competing accounts attribute this to either feature-based suppression or narrowly focused attention during serial search. To test these explanations, in three experiments, we manipulated search seriality by varying the similarity among search elements, the stimulus pattern complexity, and the conjunctive features that defined the target. Distractor avoidance was measured via manual responses and probe reports, both showing no effect of search seriality. This challenges the search mode account and supports the feature-based suppression account.

30 The influence of emotion on object-based attention using reward

◦ Sanweda Mahagabin, Sarah Shomstein — George Washington University

Object-based attention (OBA) enhances the perceptual processing of features within an attended object. While prior research suggests that reward influences OBA, the role of emotional valence associated with reward and punishment remains unclear. Using a modified Egly rectangle paradigm, we tested how emotionally valenced feedback modulates OBA. Data showed preserved space-based effects constant across valence, yet the object-based effect was modulated, exhibiting stronger effects in punishment trials. This suggests that negative feedback may intensify or disrupt object-based processing. These findings highlight the dynamic influence of motivationally driven emotion on visual attention.

31 Workload and trust in collaborative human-AI (WATCH): A multimodal framework to understand trust and workload in human-AI collaboration

◦ Jordan Elizabeth Martinez, Anthony J. Ries, Anna M. Madison — U.S. Air Force Academy

Human-AI collaboration is rapidly expanding across domains, yet how people trust and interact with AI remains a critical research question. A multi-modal framework offers a promising approach to predicting trust and workload by integrating subjective, behavioral, and physiological measures such as eye tracking. We combined this multi-modal approach by having a human play a computer-based serious game with and without an AI partner to examine how trust and workload fluctuate in human-AI collaboration. Here, we explore differences in attention across conditions using eye movements, which can reflect dynamic human responses to utilization of AI.

32 An evaluation of the stability of the expectancy effect in visual search

◦ Natalie A. Paquette, Joseph Schmidt — University of Central Florida

Participants search behavior shifts towards the expected search difficulty, despite incorrect expectations (Paquette & Schmidt, 2025). This pilot data examined the consistency of the expectancy effects across easier-than-expected (ETE) and harder-than-expected (HTE) searches, differing in visual and semantic features. When the search was ETE, expectancy effects in guidance were positively correlated but tended negative in HTE and target and distractor dwell times were trending positively correlated. Early results suggest consistency in participants' expectancy effects but with results varying by stimulus features, suggesting possible stable individual differences.



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33 Eye tracking reveals the efficacy of object-based attention at filtering out disproportionately salient foveal distractors

◦ Lasyapriya Pidaparathi, Frank Tong — Vanderbilt University

Visual attention helps us prioritize task-relevant information in dynamic real-world settings. Here, we used eye movements to assess how effectively object-based attention filters out the complex motion of an overlapping distractor, across a range of distractor saliency levels. In our paradigm, subjects attended to one of two objects that moved pseudo-randomly while remaining largely overlapping, as they monitored for brief spatial distortions of the attended object. As evidenced by strong gaze-following of the attended target, we observed robust filtering of distractor motion, even when the stimulus contrast of the distractor exceeded that of the target by five-fold.

34 Characterizing eye movements during visual word search

◦ Grace C. Sinclair, Joseph Schmidt — University of Central Florida

We often search for particular words when navigating via signage; however, little work has characterized visual word search viewing behavior. Observers ($n=48$) searched for target words while eye-movements were assessed across two eccentricities, two hemifields, three word lengths, and two word frequency levels. The guidance of oculomotor spatial attention replicated well documented search effects, whereas target dwell-times replicated some well documented reading effects. This suggests that the guidance of spatial attention functions similarly to standard object search and it is only once the target is fixated that we observe reading related effects during word search.

35 Impact of statistical learning on emotion-induced blindness

◦ Yiwei Tang, Christian E. Waugh, Anthony W. Sali — Wake Forest University

Emotional images interfere with perception of subsequent targets, a phenomenon known as emotion-induced blindness (EIB). However, evidence regarding the recruitment of proactive control to limit this distraction is mixed. We manipulated the frequency of negative and neutral distractor images across short and long intervals to test whether the magnitude of EIB varied based on implicitly learned image expectations. While we found robust evidence of EIB, the magnitude did not significantly vary across temporal contexts, and we observed no carryover to a follow-up test of attentional flexibility. Our results suggest that individuals do not use temporal structure to reduce emotion-induced distraction.

36 Using the Apple Vision Pro as a portable research tool.

◦ Kamilla Volkova, Kaila Dowd, Michael A. Grubb — Trinity College, CT

The Apple Vision Pro (AVP) holds great potential for visual attention research. Here, we used the AVP's eye-tracking capabilities to ensure accurate peripheral presentation of stimuli in two protocols that require it. In Experiment 1, we measured crowding and replicated previous findings showing that spatial attention reduces the critical distance. In Experiment 2, we demonstrated classic horizontal-vertical anisotropies and vertical meridian asymmetries: participants were more accurate when targets appeared along the horizontal than the vertical meridian, and better in the lower than upper visual field. These findings validate AVP for immersive, portable attention experiments.



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37 Proxemics and perception: How interpersonal distance shapes group perception

◦ Luowei Yan, Clara Colombatto, Jelena Ristic — McGill University

Recent research has shown a perceptual preference for facing groups. Here we asked whether this advantage may be affected by the distance between group members, since interactions typically occur when people are at shorter distances ('personal') vs. further ones ('public'). In two experiments, participants searched for facing or non-facing dyads and triads, with group members at either personal or public distance. The facing advantage was larger for groups at personal distance, particularly for dyads. This effect was not present for inverted displays, ruling out lower-level factors. Vision is thus sensitive to social factors like group orientation, but also members' proxemics.

38 Ensemble representations hinder sustained attention and facilitate attention orienting

◦ Harun Yörük, Thomas S. Redick — Purdue University

Ensemble processing extracts the gist information from the visual environment in a rapid and automatic manner. In this research, we tested whether the centroid (average location) can bias attention in a sustained attention and an attention orienting task, by manipulating the consistency between the centroid of an ensemble set and a spatial cue in the attention tasks. Results showed that when an ensemble set has an inconsistent centroid with the attention cue, it can hinder sustained attention. On the other hand, when the centroid and attention cue are consistent, the centroid can facilitate attention orienting.

39 The relationship between effort avoidance and attentional control strategy

◦ Tianyu Zhang, Saachi Kuthe, Andrew B. Leber — The Ohio State University

People frequently engage in visual search tasks, but they often do so inefficiently. Why do people perform suboptimally? Previous research has suggested that people avoid the cognitive effort required to search optimally. Here, we design a novel paradigm to measure individuals' effort avoidance and investigate its relationship with their search strategy. Results showed that this avoidance metric was significantly correlated with visual search optimality, revealing that the more participants avoided the required cognitive effort, the less optimal their search strategies became. Overall, this study demonstrates how individuals' effort avoidance of specific cognitive components shapes their search behaviors.

40 Machine psychophysics: Cognitive control in vision-language models

◦ Dezhi Luo, Maijunxian Wang, Bingyang Wang, Tianwei Zhao, Yijiang Li, Hokin Deng — University of Michigan

Cognitive control refers to the ability to flexibly coordinate thought and action in pursuit of internal goals. A standard method for assessing cognitive control involves conflict tasks that contrast congruent and incongruent trials, measuring the ability to prioritize relevant information while suppressing interference. We evaluate 108 vision-language models on three classic conflict tasks and their more demanding "squared" variants across 2,220 trials. Model performance corresponds closely to human behavior under resource constraints and reveals individual differences. These results indicate that some form of human-like executive function have emerged in current multi-modal foundational models.



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Object Perception

41 Immediate auditory feedback speeds visuomotor delay adaptation in video Games

◦ Xuyuan Duan, Colleen Macklin, Benjamin van Buren — The New School

When a video game exhibits lag between your keypress and an onscreen event, it is often ambiguous whether the delay occurred before your input was registered by the game, after, or a bit of both. To address this, we asked 300 online players to jump to collect coins in a modded DinoRun game, and introduced lag partway through. We found that providing immediate auditory feedback upon keypress aided players in implicitly 'debugging' where in the system lag was occurring — resulting in substantially faster adaptation to visuomotor delay, relative to a condition in which auditory feedback was synchronous with visual lag.

42 Face perception is resistant to redundancy masking

◦ Lillian R. Hauser, Timothy Sweeny — University of Denver

Through two experiments, we sought to understand the strength of redundancy masking (i.e., a perceptual phenomenon where the perceived number of identical items in a repeating pattern is reduced) against faces compared to geometric features. We found that faces are more resistant to redundancy masking than our other features. We did, however, find complexity in comparisons of upright versus inverted faces. These findings highlight the another way in which the brain prioritizes accurate facial perception.

43 Reinforcement learning enhances neural mechanisms that support conscious visual perception of rewarding stimuli

◦ Rebecca M. Lovasco, Casey E. Baldwin, Marty G. Woldorff, Kristina Krasich — Elon University

This study tested whether reinforcement learning influences conscious perception. EEG was recorded from eleven participants who completed block pairs consisting of a learning block and a perceptual discrimination block with perceptually masked target stimuli. The findings showed that two event-related potentials (ERPs) typically associated with conscious perception—the visual awareness negativity (VAN) and the late positivity (LP)—were significantly enhanced in the perceptual discrimination block when the previously learned rewarding target was shown. However, self-reported conscious perception did not differ. These findings suggest that reinforcement learning modulates neural mechanisms that support conscious perception without directly altering self-reported subjective experience.

44 Object representations in early visual cortex are modulated by visual versus semantic task context

◦ Kate Walsh, Rosemary A. Cowell — University of Colorado Boulder

Semantic information is intrinsically tied up with visual information: tigers and lions are conceptually related in part because they share (visual) features like fur and face shape. But where and how in the brain does semantic information emerge? Using a set of visual stimuli for which visual and semantic similarity ratings already exist, we scanned participants while they answered both visual and semantic questions about the objects. Representational Similarity Analyses (RSA) were used to assess where representational content better matched visual versus semantic judgments. Even in early visual cortex, object representations were shaped by task demands (i.e., visual versus semantic).





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Object Perception

45 I Resist, Therefore I Feel in Control: Within- and Between-Person Contributions of Effort and Resistance to Sense of Agency

- Rebecca Nicole Warren, Austin Wyman, Mary A. Peterson, Bradley S. Gibson — University of Notre Dame

Theories of perception typically focus on mechanisms that unfold inside an individual's mind in response to external stimuli or internal states. However, the research designs and analyses used to evaluate these "within-person" (WP) theories typically conflate WP and "between-person" (BP) effects. Here we used multi-stable Necker cubes to disaggregate WP and BP effects associated with measures of internal (willed effort) and external (the cube's physical properties) factors. As expected, we found that internal and external factors had opposite effects on participants' sense of agency when the instructed orientation was held, and both BP and WP effects were observed.

Other

46 Many FACETS, one emotion: Reporting the valence and labeling of emotional faces

- Graci P. King, Melena R. Gonzalez, Amanda L. Martinez, Amy Bohmann, Dawn R. Weatherford — Texas A&M University-San Antonio

Common facial expressions correspond with universal emotions across cultures. Therefore, facial emotional expression (FEE) and recognition (FER) remain popular research topics. Nevertheless, many available face databases tend to represent limited emotional expression across identities. However, FACETS (Faces Across Camera, Emotions, Time, & Settings) provides a more comprehensive option including happiness, sadness, fear, anger, surprise and neutral. To generate standardized norms across 265 identities, N=795 participants will view 40 emotional facial images while providing an emotional label and rate valence and genuineness. We will report descriptive statistics for each image to support investigations of facial perception, attention, and memory.

47 Time perception and embodiment: Agency, body ownership, and self-location affect interval timing during a virtual walk

- Tristen B. Roussel, Eve A. Isham — University of Arizona

Embodiment (the sense of being in or controlling a body) shapes perceptual experiences, including time perception. We investigated how embodiment affects interval timing during a virtual walk (N = 30), manipulating three attributes: sense of agency (movement control), body ownership (sensorimotor synchrony), and self-location perspective (first- vs. third-person view). First-person perspective led to longer duration estimates. We also found an interaction between agency and synchrony. Under high synchrony, high-agency walk felt shorter than in low-agency conditions. Under low synchrony, the pattern reversed. Results are interpreted through intentional binding and the attentional gate model.

48 Not just the mask: Medical, cultural, and fashion occlusion impair emotion recognition and empathy

- Sarah D. McCrackin, Sophie Naasz, Jelena Ristic — Marshall University

While it is known that face occlusion impairs social communication, it remains unknown if the type of face occlusion matters. Sixty-two North American women rated their empathy and identified the emotion displayed by female Caucasian and Middle Eastern faces wearing a surgical mask and cap, a niqab, or a hat and scarf. Reduced emotion recognition and empathy ratings did not differ between occluded faces. Responses were overall lower for Middle Eastern faces, although this effect was reduced when those faces were occluded. Thus, while different face occlusion types lead to similar social impairments, face occlusion appears to reduce in-group bias.

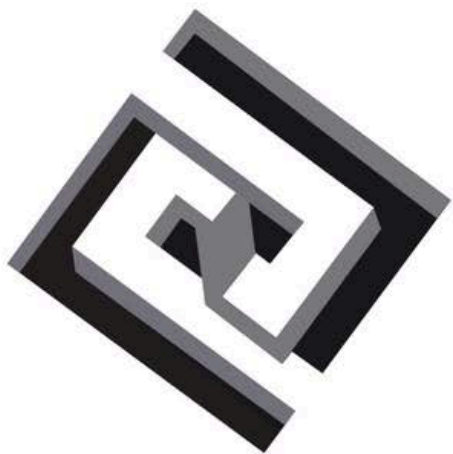




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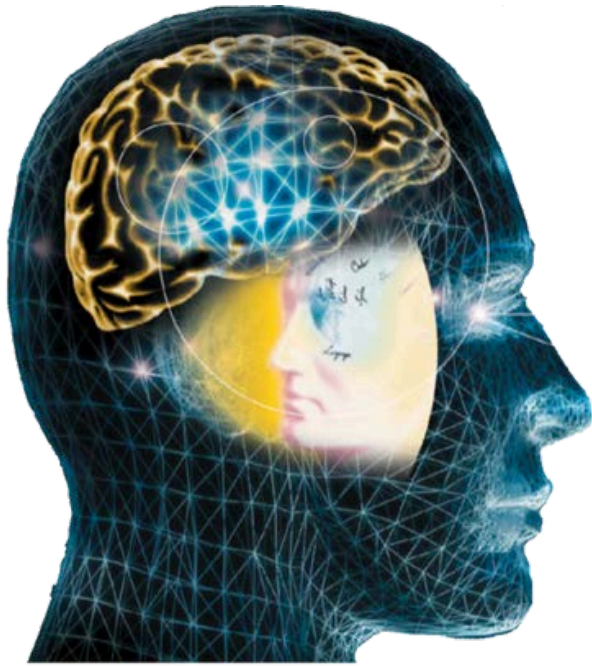
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