May 7-9, 2023
Grand Rapids, MI
Grand Valley State University
Loosemore Auditorium of DeVos Center (DEV-122E)

Meeting Overview

Sunday, May 7, 2023
5:00 PM - 7:00 PM Midwest Cognitive Science Conference Reception DEV 107C - University Club

5- 7pm Arrival, *coffee, tea, snacks, cash bar*

Monday, May 8, 2023
8:00 AM - 5:00 PM Midwest Cognitive Science Conference DEV 122E - Loosemore Auditorium

8:00-8:25 Arrival, *coffee, tea, snacks*

8:25 – 8:30 Opening Remarks

8:30 – 9:45 SESSION I

8:30 Pragmatics of Conversations in Families with a Toddler with Hearing Loss
Mark VanDam, Caitlin McCaslin, Aleah S. Brock, Sandie M. Bass-Ringdahl, David Jenson, Lauren Thompson, Paul De Palma, and Elizabeth Wilson-Fowler

8:55 Rethinking the Prediction-as-chronometer Method Through Disentangling Argument Role Computations in Active and Passive Sentences: A Pilot Study
Shuchen Wen and Jonathan Brennan

9:20 Exploration Benefits Student Learning Outcomes for Engineering Students Learning Graphical Drawing
Ryan J. Patrick, Campbell R. Bego, Angela Thompson, Raymond Chastain, Jeffery Hieb, Linda Fuselier and Marci S. DeCaro

10:15 – 11:30 SESSION II

10:15 Man vs. Machine: What ChatGPT Reveals about Human Memory, Emotion, and Creativity in the Serial Reproduction of Stories
Ege Otenen, Devin Robert Wright, Yiyan Tan, John Kruschke, Ying Li and Fritz Breithaupt

10:40 Absolute Pitch Judgments of Familiar Melodies Generalize across Timbre and Octave
Stephen Van Hedger, Noah Bongiovanni, Shannon Heald and Howard Nusbaum

11:05 Can the Wrong Horse Win: The Ability of Race Models to Predict Fast or Slow Errors
James T. Townsend & Yanjun Liu

11:30-1:00 **Lunch and Posters**
DEV 105E- Hager-Lubbers Exhibition Hall

1:00-2:00 **Keynote: "Molecules, Minds, and Machines"**
Kevin Gluck
Senior Research Scientist at the Institute for Human and Machine Cognition

2:15 – 3:30 SESSION III

2:15 Using Process-Tracing Data to Inform and Validate Computational Models of Decision Making
Joseph Johnson, Lauren Davidson, Elizabeth Pettit, Kat Pikus and Sarah Lett

2:40 Revisiting Hicks Law: Integrating Choice Behavior and Concept Learnability
Ronaldo Vigo, Charles A. Doan, Jay Wimsatt, and Cody B. Ross

3:05 The Effects of Sensitivity to Reward, Punishment, and Cognitive Effort Cost in Categorization System-Switching
Li Xin Lim, Jasmine Johnson, Nishka Awasthi and Sébastien Hélie

3:45 – 4:35 SESSION IV

3:45 Does Working Memory Performance Correlate with Decision-Making during Social Bargaining? An ERP Study
Illia Kuznietsov, Lesya Ukrainka Volyn and Sébastien Hélie

4:10 Quantifying the Digital Phenotype of Loneliness on Twitter
Ege Otenen, Ozgur Can Seckin, Danny Valdez and Johan Bollen

6:00 pm – **Banquet dinner.** The details will be shared at the conference.

Tuesday, May 9, 2023
8:00 AM - 1:00 PM Midwest Cognitive Science Conference DEV 122E- Loosemore Auditorium

8:30 – 9: 00 Arrival, *coffee, tea, snacks*

9:00 – 10:15 SESSION V

9:00 Events Organize Memory for Autobiographical Experience
Christopher A. Kurby & Logan T. Bezy

9:25 Relating Perception and Memory for a Novel Set of Reconfigurable Auditory Stimuli: A Noisy Exemplar Approach
Nathan Gillespie & Gregory Cox

9:50 Modular Serial-Parallel Network (MSPN): A Unified Model for Hierarchical Cognitive and Perceptual Processes
Mario Fific

10:45 – 12:00 – SESSION VI

10:45 Examining Knowledge and Confidence Calibrations after Introductory Text Experiences
Mandy Withall, Michael C. Mensink and David N. Rapp

11:10 Short- and Long-Term Consequences of Exposures to Inaccuracies
Josie Holohan, Tiffany Lou and David Rapp

11:35 Mechanisms and Implications of Retest Effects in Ravens Advanced Progressive Matrices
Erin Neaton, Zach Hambrick and Erik Altmann

12:05 – 12:55 SESSION VII

12:05 The Benefits of Mixing it Up - Variable Materials Influence Children's Pattern Practice
Tongyao Zhang & Emily R. Fyfe

12:30 How Accurately do Mothers Judge their Child's Object Knowledge?
Jason Scofield and Catanya Stager

Conference ends

Midwest Cognitive Science 2023 Meeting Information

About Midwest Cognitive Science

The Midwest Cognitive Science Conference is a dynamic and inclusive annual gathering of interdisciplinary researchers with a shared passion for understanding the intricate workings of the human mind. We explore all aspects of cognition, including perception, language, psycholinguistics, learning, memory, attention, decision-making, and mathematical and computational modeling. Our conference provides a unique opportunity for researchers from diverse fields to come together, exchange ideas, and engage in fruitful discussions. We foster a collaborative and interdisciplinary environment where experts can share the latest research, challenge assumptions, and spark new insights.

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Abstracts

KEYNOTE

Molecules, Minds, and Machines

Kevin Gluck

Senior Research Scientist at the Institute for Human and Machine Cognition

As with many aspects of the human experience, science and technology proceed in do-improve-excel spirals. First, we ask if something can be done, then we ask how much we can improve on doing it, and for those who pull ahead of the pack we see the emergence of excellence. The creative capacity of individual and joint goal setting continuously moves the bar, as bigger, better, faster, more wins the day. In this presentation I will offer historical, contemporary, and anticipatory thoughts on the computational cognitive sciences through the lens of do-improve-excel.

Session I

Pragmatics of Conversations in Families with a Toddler with Hearing Loss

Mark VanDam[1,2], Caitlin McCaslin[2], Aleah S. Brock[3], Sandie M. Bass-Ringdahl[4], David Jenson[1], Lauren Thompson[1], Paul De Palma[5], and Elizabeth Wilson-Fowler[6]

[1] Speech & Hearing Sciences, Elson F. Floyd College of Medicine, Washington State University

[2] Hearing Oral Program of Excellence (HOPE) of Spokane

[3] Counseling, Higher Education, & Speech-Language Pathology, University of West Georgia

[4] Communication Sciences and Special Education, University of Georgia

[5] Computer Science, School Engineering and Applied Science, Gonzaga

[6] Communication Sciences & Disorders, Eastern Washington University

One aspect of pragmatics is who initiates a conversation. Children who initiate conversations pick the topic, appear more confident, are assumed to be more accurate, and elicit more responses, thus shaping their own developmental environments. In families, typically-developing children have been shown to initiate conversations more than mothers and mothers more than fathers. Girls initiate conversations to create alliances and cement friendships while boys do so to assert control. Importantly, underlying motives are difficult to assess, effects are not consistently attested, and cultural socio-pragmatic influences are at play. There is evidence that children with hearing loss differ in their pragmatics from typically developing peers, but conversational dynamics are less-well studied. Here we examine pragmatics through conversation initiation rate in toddlers with hearing loss. Using automatic speech processing analyses, we examined 150k hours of in situ family audio recordings to compare conversation initiation rate of interlocutors within families with a hearing-impaired or with a typically-developing toddler. Children initiated about twice as many conversations as their mothers, and mothers initiated about twice as many as fathers. Boys and girls initiated about 50% more conversations with their mothers than with their fathers. None of the statistical relationships were sensitive to the child's hearing status, and boys and girls initiated conversations at comparable rates. These findings suggest that higher-order pragmatic conversational strategies in hearing-impaired and typically-developing toddlers are comparable, but there are significant differences in who initiates conversations within family communicative dynamics.

Rethinking the Prediction-as-chronometer Method Through Disentangling Argument Role Computations In Active and Passive Sentences: A Pilot Study

Shuchen Wen[1] and Jonathan Brennan[2]

[1]Weinberg Institute of Cognitive Science, University of Michigan

[2]Linguistics Department, University of Michigan

Predictive processing is an integral part of online sentence comprehension. Previous work has shown that language comprehension involves some level of prediction, but relatively little is known about how different contextual information contributes to predictive processing. Recent findings suggest that not all types of contextual information impact online prediction equally, and that time is a key factor governing how diverse contextual information contributes to predictions (Slow Prediction Hypothesis). This has led to the development of the prediction-as-chronometer EEG experiment framework, which uses the speed of prediction updates as a chronometer to determine the time course of linguistic computations. The speed of prediction updates is indexed by a neural indicator - the N400 component in Event-related Potentials (ERPs). The present study used the prediction-as-chronometer approach to investigate how long it takes for information about argument roles to impact online verb prediction in active and passive sentences in Mandarin. We used Ba (active SOV) and Bei (passive OSV) structures, which provide clear syntactic cues for argument role assignment before the verb appears. Our findings provide preliminary support for the "Slow Prediction" hypothesis, which suggests that argument role information can impact online verb prediction at a delayed Stimulus-Onset Synchrony (SOA). However, we also encountered some challenges with this approach and proposed a new method to analyze N400 differences at different SOAs. Our experiment highlights the potential and limitations of the prediction-as-chronometer method for studying sentence processing.

Exploration Benefits Student Learning Outcomes for Engineering Students Learning Graphical Drawing

Ryan J. Patrick, Campbell R. Bego, Angela Thompson, Raymond Chastain, Jeffery Hieb, Linda Fuselier and Marci S. DeCaro

University of Louisville

In learning and instructional settings, solving a novel problem before instruction (exploratory learning) has been shown to improve learners' conceptual knowledge through productive failure. During exploration, individuals become more aware of knowledge gaps that can be filled in or corrected with subsequent instruction. They also test hypotheses, allowing them to activate and connect their prior knowledge with new knowledge, creating more integrated schemas in long-term memory. They additionally explore the problem space more deeply. However, few studies have tested productive failure in undergraduate STEM courses. The current study investigated whether these learning benefits occur in large introductory engineering courses. Participants (N=435) were students enrolled across six sections of the first-year engineering courses, who were randomly assigned to condition according to the section in which they were enrolled. In the more traditional instruct-first condition, students received instruction on engineering graphics, followed by a graphical drawing activity. In the explore-first condition, students completed the graphical drawing activity first, followed by instruction. Following the learning activities, all students completed an assessment including three drawing problems of various difficulty to assess procedural and conceptual knowledge. To account for non-random differences in sections, final course average was included as a covariate. Students in the explore-first condition scored significantly higher than the instruct-first condition at graphical drawing on the assessment; $F(1,432)=8.02$, $p=.005$. This finding suggests that exploratory learning benefits student learning outcomes for engineering students learning graphical drawing, extending this research to new undergraduate course topics.

Session II

Man vs. Machine: What ChatGPT Reveals about Human Memory, Emotion, and Creativity in the Serial Reproduction of Stories

Ege Otenen[1], Devin Robert Wright[1], Yiyan Tan[2], John Kruschke[3], Ying Li[4] and Fritz Breithaupt[5]

[1]Center for Complex Networks and Systems Research - Luddy School of Informatics, Computing, and Science & Cognitive Science Program, Indiana University - Bloomington
[2]Program of Cognitive Science & Psychology and Brain Science Department, Indiana University - Bloomington
[3]Psychology and Brain Science Department, Indiana University-Bloomington
[4]CAS Key Laboratory of Behavioral Science, Institute of Psychology, Chinese Academy of Sciences
[5]Cognitive Science and Department of Germanic Studies, Indiana University-Bloomington

The launch of ChatGPT has garnered significant global interest. While ChatGPT can generate human-like responses and engage in coherent discourse, the question of how it differs from and what it can reveal about human cognition remains. To shed light on this, we conducted a serial reproduction experiment, in which 116 stories of varying emotional valence were passed down and retold by recipients for three generations. We subsequently performed the same experiment in which ChatGPT provided all retellings for the same original stories. Another group of participants then rated all retellings by various metrics such as strength of affect or their ability to picture the story. Our analysis went beyond examining the overall trend in word usage of ChatGPT in comparison to human retellers. We examined the preservation of affects, concepts, and words by considering the role of age of acquisition and the creative contributions of words. We additionally explored the differences in grammatical patterns between human and ChatGPT retellings. Among our findings are insights which illustrate creativity and parsimony of human vocabulary when compared to ChatGPT. We also found key differences in the factors which influence word preservation (e.g., age of acquisition, emotion). Our findings highlight distinctive patterns in human and ChatGPT retellings and will be discussed within the context of cognition and narrative processing.

Absolute Pitch Judgments of Familiar Melodies Generalize across Timbre and Octave

Stephen Van Hedger[1], Noah Bongiovanni[2], Shannon Heald[3] and Howard Nusbaum[3]

[1] Huron University College at Western: London, ON, Canada
[2] University of Notre Dame: Notre Dame, IN, USA
[3] University of Chicago: Chicago, IL, USA

Most listeners can determine when a familiar recording of music has been shifted in musical key by as little as one semitone (e.g., from B to C major). These findings appear to suggest that absolute pitch memory is widespread in the general population. However, the use of familiar recordings makes it unclear whether these findings genuinely reflect absolute melody-key associations for at least two reasons. First, listeners may be able to use spectral cues from the familiar instrumentation of the recordings to determine when a familiar recording has been shifted in pitch. Second, listeners may be able to rely solely on pitch height cues (e.g., relying on a feeling that an incorrect recording sounds too high or too low). Neither of these strategies would require an understanding of pitch chroma or musical key. The present experiments thus assessed whether listeners could make accurate absolute melody-key judgments when listening to novel versions of these melodies, differing from the iconic recording in timbre (Experiment 1) or timbre and octave (Experiment 2). Listeners in both experiments were able to select the correct-key version of the familiar melody at rates that were well above chance. These results fit within a growing body of research supporting the idea that most listeners, regardless of formal musical training, have robust representations of absolute pitch - based on pitch chroma - that generalize to novel listening situations. Implications for theories of auditory pitch memory are discussed.

Can the Wrong Horse Win: The ability of Race Models to Predict Fast or Slow Errors

James T. Townsend & Yanjun Liu

Indiana University

This report continues our probe of the fundamental properties of elementary psychological processes. In the present instance, we first distinguish between descriptive and state–space based parallel race models. Then we show, engaging previous results on stochastic dominance in Theorem 1, that descriptive race models can be designed that predict either faster 'right' channels or faster 'wrong' channels. Moving to state–space based models and in particular, to inhomogeneous Poisson counter models, we use Theorem 1 to prove Theorem 2 which offers sufficient conditions for such models to elicit faster 'rights' than 'wrongs'. Then, constraining ourselves to models possessing proportional processing rates, we revisit an important finding by Smith and Van Zandt (2000) to the effect that in such models, mean processing times conditional on 'right' decisions are faster than those conditional on 'wrong' decisions. Theorem 3 expands that property to the much stronger level of ordered conditional distribution functions. The penultimate section constructs an example of an inhomogeneous Poisson race model that predicts faster 'wrongs' for fast processing times but faster 'rights' for slower processing times. We leave as an open problem the question of whether there exist inhomogeneous Poisson race models where 'wrongs' are stochastically faster than 'rights' for all durations of processing such models, mean processing times conditional on right decisions are faster than those conditional on wrong decisions. Theorem 3 expands that property to the much stronger level of ordered conditional distribution functions. The penultimate section constructs an example of an inhomogeneous Poisson race model that predicts faster wrongs for fast processing times but faster rights for slower processing times. We leave as an open problem the question of whether there exist inhomogeneous Poisson race models where wrongs are stochastically faster than rights for all durations of processing.

Session III

Using Process Tracing Data to Inform and Validate Computational Models of Decision Making

Joseph Johnson, Lauren Davidson, Elizabeth Pettit, Kat Pikus and Sarah Lett

Miami University

The current work extends the conceptual and empirical means by which we can better understand information search and how it affects development of a chosen option over the course of a decision. Specifically, we jointly employ three recent and individually successful innovations in choice research. First, we provide a computational framework that represents choices as the product of dynamic preference updating resulting from the evaluation of selectively-attended information. Second, such models typically make simplifying assumptions about attentional shifts, but instead we use eye-tracking to empirically monitor which information is accessed and evaluated to drive model predictions for changes in preference over time. Third, we incorporate mouse-tracking of the response dynamics as a measure of momentary preference that we can then use to validate these model predictions. We apply this approach to a variety of choices among different snack foods that vary on several dimensions. Participants made both inferential and preferential incentivized choices among pairs of stimuli, choices between 50/50 gambles involving probabilistic outcomes (one of two snack foods), and choices among pairs of snack foods described by multiattribute profiles. We show the impact of choice difficulty (i.e., similarity between choice options) on choice processes and final outcomes, and compare results across the different task types. We also interpret model parameters associated with the rate of evidence accumulation and the choice threshold across these conditions, and show how hard wiring attention processes in models with empirical data can successfully describe and predict behavior across a range of choice tasks.

Revisiting Hicks Law: Integrating Choice Behavior and Concept Learnability

Ronaldo Vigo[1], Charles A. Doan[2], Jay Wimsatt[1], and Cody B. Ross[1]

[1] Ohio University
[2]Marietta College

We tested the two variants of Hicks law based on Shannon entropy (i.e., one for equiprobable and one for non-equiprobable choices) and report to what extent each version is not able to account for choice reaction times with respect to structured choice sets (SCSs). To do this, we applied both variants to data from a choice experiment involving 56 SCSs. Considering these results, we discuss theoretical impediments identified by Luce (2003), Vigo (2011, 2012, 2015), and Vigo et al. (2022) with respect to Shannon information in psychological research to point at the futility of similar approaches. We conclude by showing how the invariance-based choice reaction time law (Vigo, 2014, 2015) overcomes these impediments by offering an alternative account of choice behavior based on both the detected invariance patterns that emerge from the perceived relationships between the object stimuli of SCSs and the cardinality of the sets. Such characterization from Generalized Invariance Structure Theory potentially offers a sound, rigorous, and effective pathway for integrating concept learning difficulty and choice behavior.

The Effects of Sensitivity to Reward, Punishment, and Cognitive Effort Cost in Categorization System-Switching

Li Xin Lim[1], Jasmine Johnson[2], Nishka Awasthi[1] and Sébastien Hélie[1]

[1]Purdue University
[2]Butler University

Categorization is an essential aspect of decision-making in daily life, and research has focused on the multiple-systems theory of category learning to understand how psychological and biological systems contribute to learning. While previous studies have shown the ability to switch between categorization systems, it is difficult for individuals to switch between distinctive categorization learning systems on a trial-by-trial basis. Therefore, the current study aims to identify the individual characteristics that allowed some participants to execute frequent system-switching in category learning. During the experiment, some categorization tasks were presented with cues indicating the task type, while others were not. The study involved two types of categorization tasks: the rule-based task and the information-integration task. According to COVIS, the optimal system in the rule-based task is the hypothesis-testing, while the procedural system produces optimal performance in the information-integration task. The present study compared individual differences in the ability to switch categorization system depending on the categorization task type with the sensitivity to reward, punishment, and cognitive effort cost. The results show that individuals who learn to use the optimal categorization system in the training phase have a lower cognitive effort cost in accomplishing a more demanding task. Additionally, individuals who could switch between optimal systems from trial-to-trial when the task type was not indicated beforehand exhibited higher sensitivity to punishment than reward. These results provide insights into the individual characteristics that enable system-switching in category learning and can aid in designing effective training and learning programs.

Session IV

Does Working Memory Performance Correlate with Decision-Making during Social Bargaining? An ERP study

Illia Kuznietsov[1,2], Lesya Ukrainka Volyn[1,2] and Sébastien Hélie[2]

[1]National University, Lutsk, Ukraine;
[2]Purdue University, West Lafayette, IN, USA

The effects of working memory (WM) performance remain understudied in social decision-making . The mechanisms of WM are anatomically and functionally related to the mechanisms of behavior inhibition. From an evolutionary point of view, an increase of computational demands for social decision-making correlated with the increase of the complexity in

human society. As a result, we propose that WM performance should correlate with the level of altruism. Specifically, subjects prone to altruistic behavior should show larger WM capacity. To test this hypothesis, we recorded the evoked electrical activity of the brain in 70 subjects (33 female) aged 18-22 years under the following experimental conditions: Dictator Game, Ultimatum Game, the 2-Back WM task, and the Sternberg WM test. The results show that, contrary to the working hypothesis, subjects who showed more altruistic behavior had a higher feedback-related negativity amplitude. In addition, the P3 amplitude was also higher in the group of altruistic subjects in the Sternberg test. On the other hand, the amplitude of the N2-P3 complex in the 2-Back task was higher in individualistic subjects. Behavioral results in WM tests showed that subjects with individualistic behavior have higher WM performance in both the 2-Back task and the Sternberg test. Thus, overall, subjects with individualistic behavior showed higher WM performance.

Quantifying the Digital Phenotype of Loneliness on Twitter

Ege Otenen[1], Ozgur Can Seckin[1], Danny Valdez[2] and Johan Bollen[3]

[1]Luddy School of Informatics, Computing, and Science & Cognitive Science, Indiana University-Bloomington

[2]School of Public Health Department, Indiana University-Bloomington

[3]School of Informatics, Computing, and Science & Cognitive Science, Indiana University-Bloomington

Social media is largely used as a tool to promote social connection among people and groups; yet that does not imply social media users are not lonely. Here we explore whether we can detect loneliness in individuals from their language and social indicators on Twitter. We define a sample of self-declared lonely Twitter users and compare their language to a matching random control sample. For each user we create a text embedding for the content of their online posts, excluding terms and expressions related to loneliness. Using a principal component analysis of the resulting embeddings we position each user in a two-dimensional space spanned by the first two components. Lonely individuals are spatially separated from the control sample, indicating that lonely individuals exhibit distinct language patterns related to the expression of internalizing thoughts focused on the self, e.g., I should and but I. Indicators of online social relations, such as the number of online friends, favorites, mentions, indicate that lonely individuals have fewer social relations, while a sentiment analysis indicates that their posts have lower valence. Our results provide insights into the lexical, social, and affective markers that characterize loneliness online, providing a starting point for the development of diagnostics and prevention.

TUESDAY SESSION V

Events Organize Memory for Autobiographical Experience

Christopher A. Kurby & Logan T. Bezy

Grand Valley State University

People spontaneously segment their subjective perceptual experiences into discrete events, such as segmenting a trip to the zoo as entering, visiting exhibits, and exiting. How we segment our experiences may be important for how we remember them. Here we tested whether memory for one's autobiographical experience is organized by events. We tested this by giving participants a tour of six different buildings, then assessing memory with picture cues. We varied whether adjacent trials probed the same event (building) or different events (building). We found evidence for event-based organization: Retrieval of location and event information was better when assessing the same event as the previous trial than when switching to a new event. We also found that picture cues from the beginning of events served as better cues for recall of the tour than pictures from the middle of events. These findings suggest that memory for everyday autobiographical experience is organized by the perception of boundaries between events.

Relating Perception and Memory for a Novel Set of Reconfigurable Auditory Stimuli: A Noisy Exemplar Approach

Nathan Gillespie & Gregory Cox

University at Albany, SUNY

While many real-life events are complex and temporally extended, most memory research employs discrete, static stimuli. We begin to bridge this gap by developing a set of novel auditory stimuli constructed by adjusting the distribution of power across upper frequency bands. Participants rated similarity between pairs of sounds and engaged in a recognition memory task in which two sounds were played followed by a probe. Recognition false alarms increased with subjective similarity between the probe and the first memory item but not the second, suggesting that the most recent sound was represented in a form that is less susceptible to incidental similarity. We also observed a list homogeneity effect: hits and false alarms decreased with similarity between studied sounds. We discuss ways to combine these stimuli sequentially or simultaneously to create artificial events that mimic the complexity of more naturalistic ones.

Modular Serial-Parallel Network (MSPN): A Unified Model for Hierarchical Cognitive and Perceptual Processes

Mario Fific

Grand Valley State University

We present the Modular Serial-Parallel Network (MSPN) model, a comprehensive and unified theoretical framework for cognitive and perceptual processes across various behavioral domains. MSPN has the potential to generalize to cognitive neuroscience modeling and offers a detailed mechanistic analysis of the mental processes involved. In the back end, MSPN synthesizes several perceptual and cognitive approaches, including memory representations, signal detection theory, rule-based decision-making, mental architectures, random walks, and process interactivity. It provides a computational modeling account of four stages in face perception and can account for both choice probabilities and response-time predictions. The MSPN model has been applied to two domains to explore the hierarchical nature of mental representations. Firstly, in face perception, MSPN proposes a hierarchical organization of visual processing with low-level features processed first, followed by higher-level features. This is consistent with the two dominant approaches in facial perception: holistic and analytic facial encoding, and it is consistent with the idea that mental representations of faces are organized hierarchically. Secondly, in decision-making involving preferential gamble choices, MSPN proposes a similar hierarchical organization of processing, with low-level object attributes processed first, followed by higher-level integration of these properties, consistent with the so-called Heuristic- and Utility-based approaches to decision making.
Using the joint analysis of choice response time distributions, we compared several candidate stochastic models. The MSPN has shown impressive abilities in fitting choice response time distributions over other models in tested tasks, implying that MSPN can be used as a tool for further development and refinement of theoretical constructs. The analysis of the model's parameter values provides insights into distinct properties of perceptual and cognitive processes.

SESSION VI:

Examining Knowledge and Confidence Calibrations after Introductory Text Experiences

Mandy Withall[1], Michael C. Mensink[1] and David N. Rapp[2]

[1]Psychology Department at Northwestern University

[2]Psychology Department at Northwestern University

Introductory-level explanatory texts are a standard resource for helping people begin to form understandings of unfamiliar topics. But can these texts also lead readers to misestimate what they understand? Previous work indicates that when people do not know much about a topic, their confidence judgments with respect to what they think they know can be quite different from what they actually know, a phenomenon referred to as miscalibration. This led us to ask whether exposure to a brief information on a complex topic, such as from an introductory-level text, could lead people to misestimate how much they understand. Across three experiments we examined whether peoples confidence in what they know about the complex topic of natural selection changes after reading an introductory-level text about it. We compared these confidence judgments to actual performance as measured using the Conceptual Assessment of Natural Selection test. We also explored whether warnings, pretests, and pretest feedback could support calibration by reducing confidence, increasing knowledge, or a combination of the two. Results showed that confidence increased after reading the introductory text, and the observed increases were in line with actual knowledge acquisition. Warnings about topic complexity did not affect confidence judgments, potentially because people were able to estimate what they learned. Taking a pretest on the topic further supported calibration by increasing knowledge gains rather than influencing confidence. This project serves as a preliminary investigation into factors that can influence, or fail to influence, peoples estimates about what they know after reading brief introductory texts.

Short- and Long-term Consequences of Exposures to Inaccuracies

Josie Holohan, Tiffany Lou and David Rapp

Northwestern University

Studies show that people often reproduce inaccuracies after recent exposures. The current project examines whether this pattern also emerges after a longer delay. Participants read inaccurate, accurate, and unrelated statements. Either immediately after or two months later, they completed open-ended questions that could be answered using content from the statements they previously read. Participants tested immediately reproduced inaccuracies they read as answers to related questions more so than they spontaneously produced those inaccuracies as answers after reading accurate or unrelated statements. In contrast, after the two-month delay, participants showed little influence of previously read inaccuracies on their responses. These results indicate that the effects of inaccurate exposures may attenuate over time, perhaps because the falsehoods are not encoded sufficiently or at all into long-term memory. We are currently collecting data for a follow-up study to interrogate this issue. In this experiment, participants read inaccurate or accurate statements, and subsequently judged whether ideas related to the statement contents were true or false immediately after reading or two months later. This second experiment uses a judgment task rather than the previous open-ended task, leveraging the notion that people often show better memory performance on recognition than recall tasks. If previously read information exhibits even modest encoding into long-term memory, we would expect to see recognition effects after the two-month delay. However, if brief exposure to statements did not involve long-term encoding, as suggested by the first experiment, participants should show an influence of inaccurate exposures in the immediate but not two-month condition.

Mechanisms and Implications of Retest Effects in Ravens Advanced Progressive Matrices

Erin Neaton, Zach Hambrick and Erik Altmann

Michigan State University

Retest effects are common in higher order cognitive tasks, reflecting the effects of practice. One such task is Ravens Advanced Progressive Matrices (Ravens), the gold standard for tests of fluid intelligence. The study presented here examines two questions concerning retest effects in Ravens: whether the underlying mechanisms include item memory, strategy learning, or both, and whether learning on Ravens affects its validity as a predictive test. We conducted a two-session, remotely administered study in which participants performed either identical Ravens forms in each session, alternate Ravens forms in each session, or a control task in Session 1 and Ravens in Session 2. Ravens form was fully counterbalanced. At the end of Session 2, participants completed tests of fluid intelligence. Results suggest strategy learning, not item memory, is responsible for retest effects. Additionally, correlations between Ravens and the criterion tasks increased between sessions. The experimental results suggest strategy learning may be responsible for this increase, although transient error due to intraindividual variability across sessions may also play a role.

SESSION VII

How Accurately do Mothers Judge their Child's Object Knowledge?

Jason Scofield & Catanya Stager

University of Alabama

A child's vocabulary size is associated with their future academic and behavioral success (Morgan et al., 2015). While many things affect a childs vocabulary size, the language environment that surrounds the child is among the most important. Parents are an integral part of this environment, and a parent who is knowledgeable about the words their child does or does not know might be more likely to introduce new words to the child. In the current study, we asked how well mothers are attuned to their child's knowledge of object words and functions. Nineteen mother-child dyads participated in the study. Most children were 4 years old. Mothers and children were tested separately. During testing, participants were presented with unfamiliar objects, one at a time, and asked a series of questions assessing their own familiarity with the objects name and function. Mothers were also asked to assess their childs familiarity with the objects name and function. Overall, we found that mothers were often an accurate judge of their childs object knowledge. For labels, mothers were accurate on roughly 70% of trials. However, when mothers were incorrect, they almost exclusively made overestimation errors (i.e., saying their child knew an object label that they did not). Similarly, for functions, mothers were accurate on roughly 70% of trials and again made almost exclusively overestimation errors when they were not. Overestimation errors are potentially costly because they may lower the chances that the parent uses an unknown word thereby limiting the child's opportunity to learn that word.

The Benefits of Mixing it Up - Variable Materials Influence Children's Pattern Practice

Tongyao Zhang & Emily R. Fyfe

Indiana University, Bloomington

Concrete materials (e.g., pictures, objects) are believed to be helpful with learning, but not in all circumstances. Variability in the materials (i.e., using different materials from time to time vs. using the same materials over and over) could be an important factor. We compared how variability in concrete images influenced childrens learning about repeating patterns (e.g., ABB-ABB-ABB). Eighty-seven children aged 4 to 6 from the United States (75% White, 44% female) completed an experiment via Zoom in which they received brief pattern training. Children were randomly assigned into low, medium, and

high variability training conditions. Patterns in higher variability conditions change in shape, size, and color from time to time, while lower conditions keep with the uniform set of objects. Children in the low variability condition performed better at the beginning of training (first block, Low condition, M = 2.90, SE = 0.09, High condition, M = 2.64, SE = 0.09, p = .050), but this trend ultimately reversed. Children in the high variability condition performed best by the end of training and on the posttest (last block, Low condition, M = 1.93, SE = 0.13, High condition, M = 2.43, SE = 0.13, p = .008). The Block*Condition interaction is significant, F (3.6, 143.9) = 4.79, p = .002, ·p2 = .11. Using variable materials may introduce heavier cognitive load in the beginning, but it allows children to extract common structures across instances.

POSTERS

1

Using Generalized Invariance Structure Theory to Account for Sequence Effects in Unsupervised Learning of Exclusive-or Relations

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Recent evidence provided by the authors reveals that multidimensional unsupervised learning is demonstratable (e.g., 2-dimensional, and 3-dimensional learning) when the categorization task and stimuli are simplified when compared to previous empirical investigations (Ashby, Queller, & Berretty, 1999; Colreavy & Lewandowski, 2008). We replicate and extend upon these results by investigating how varying the order in which the exemplars are presented in the learning phase (exemplar sequence) affects learning of a two-dimensional exclusive-or logical relation (Mathy & Feldman, 2009). In addition, we extend on the previous results by connecting traditional unsupervised learning metrics (proportion of correct selections, reaction times) with eye-tracking metrics (Rehder & Hoffman, 2005). Consistent with prior supervised studies, we observed facilitation in exclusive-or learning with clustered exemplar sequences and this learning was evident across each of our dependent variables (exclusive-or accuracy, reaction times, proportion dwell time, number of fixations). Finally, we demonstrate how the facilitation in exclusive-or learning with clustered exemplar sequences naturally emerges within the theoretical and modeling framework underlying Generalized Invariance Structure Theory (Vigo, 2013, 2015).

2

How Perspective Influences the Overspecification of Size: A Replication of Yoon, Koh, and Brown-Schmidt (2012)

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When making reference during communication, speakers often overspecify, i.e., they say more words than necessary. For example, in the context of a single car, a speaker might refer to the car as yellow car, even though yellow in this context is unnecessary. In this study, we attempted to replicate speakers overspecification tendencies during an experiment conducted by Yoon et al. (2012). In their study, participants were asked to refer to target objects (e.g., a car) in a display that sometimes included a size-competitor (e.g., a bigger car). Importantly, the presence of size-competitors was not always available to both interlocutors, meaning the competitor only existed in the speakers privileged ground. Thus, competitors appeared either in privileged ground, common ground, or not at all. Furthermore, Yoon et al. included a between-subject manipulation in which some speakers were asked to make requests (e.g., move the car) while others simply informed their partners (e.g., the experimenter is about to move the car). Their results showed that participants included size-modifiers when common ground competitors were present more than privileged ground competitors (and no competitors). Critically, when competitors were in privileged ground, speakers included size more when informing than when requesting. Despite several methodological changes, we replicated these patterns overall, finding that participants overspecified less in the privileged ground condition when requesting (21.1% of trials) than when informing (30.3%). These findings confirm that speakers engage in perspective-taking more when they have a stake in the communicative goal.

3

What is Learned During Incidental Exposure to Categories?

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Categories simplify and help us interact with our environment. Most research on category learning has explicitly taught categories and found that adults selectively attend to the smallest number of features that determine category membership. However, much exposure to real-world categories occurs incidentally, without an explicit intention to learn. Moreover, categories are typically associated with clusters of features that occur together; for example, trees tend to have a trunk, branches, and leaves. Recent evidence suggests that incidental exposure improves subsequent category learning from explicit teaching. One explanation for this may be that attention is drawn to features that cluster together and are thus relevant to category membership. To test whether incidental exposure optimizes attention to relevant features, we tasked participants with learning to categorize unfamiliar creatures. Category membership depended on the appearance of a cluster of relevant features. Critically, before this task, participants were exposed to the creatures during a simple game in either an Incidental condition, in which they saw creatures belonging to two categories, or a Baseline condition, in which they saw randomized creatures. Eye tracking was used to examine attention to irrelevant versus relevant features. Results suggest that participants in the Incidental condition began attending to relevant features during the exposure phase. Moreover, those who continued paying attention to these features excelled at category learning. In contrast, Baseline participants gradually refocused their attention to relevant features after being explicitly taught categories. This study provides evidence that incidental exposure optimizes attention to features that are relevant to category membership.

4

The Effect of Concurrent Experiences of English on the Learning of Artificial Phonotactic Rules

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Adults can rapidly learn new first-order phonotactic constraints like /f/ only occurs at the beginning of syllables, by producing strings of nonsense syllables such as "hes feng neg kem". The learning is measured by observing their speech errors, e.g., whether /f/s then always slip to syllable onset position. Context dependent constraints such as /f/ occurs at the beginning of syllables if the vowel is /æ/, but occurs at the end of syllables if the vowel is /1/ can be learned as well, but errors only follow these constraints after a period of sleep. It has been suggested that the knowledge of newly-learned second-order constraints is isolated from English knowledge in a separate "mini-grammar" and that the creation of the mini-grammar requires a period of sleep. The present study investigates the mini-grammar notion in the learning of first-order constraints, which are learned quickly in a single session. Study 1 was one-session where we interleaved trials in which participants produced strings of nonsense syllables with trials of English sentences. In study 2 participants had only nonsense trials in Day 1 and had both nonsense and English in Day 2. The English sentences and nonsense sequences either showed the same consonant-position constraints or the opposite constraints. Speech error data showed that the English sentences interfered with the learning of the first-order constraints in Day 1 but not in Day 2. We consider the hypothesis that the formation of mini-grammars require consolidation and that learning of first-order constraints is not isolated into a mini-grammar.

5

Preference Choice Modeling of Snack Foods in College Students

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Miami University

A healthy diet is an important part of living, so understanding how healthy choices are made is of pivotal. There are many important food attributes and food choices that face decision makers. We investigated college students preferences for 16 common snack foods with a variety of attributes including health as well as taste, convenience, familiarity, and satiation. We looked at choices among pairs of single options, as well as between two 50/50 grab bag gambles composed of two snacks each. Decision-making has historically been focused on the result of the choice or preference. In our study, we included process tracing methods such as mouse movement, eye fixation location, and self-reported assessments of snack foods and their attributes, in addition to the final choice. We present results illustrating attention, valuation, and weighting of options and attributes during snack food choice; the effects of similarity on choices, attention, and response conflict; distinctions between pairwise choices among individual options and those with probabilistic outcomes; and the effect of variability among outcomes (or risk-aversion) in the latter. Our results both validate the assumptions of process-tracing methods and extend our understanding of the cognitive processes underlying decision making. These results can be used to predict the outcomes of individual decision makers when faced with familiar snack choices, by informing both utility-based and computational models of decision making. Ideally, this understanding could potentially target interventions to increase healthy eating habits, and our methodological approach can be applied to many broad choice domains.

6

Disentangling Speed-Accuracy Trade-Offs and Choking Under Pressure in an Online Paradigm

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In many real-world situations, tasks must be completed quickly but accurately often under time pressure and the scrutiny of others. Such situations can lead to a speed-accuracy trade-off (SAT), which is the tendency for the speed of completing a task to covary inversely with accuracy. Beyond SATs, performing under time-limited and results-driven constraints may lead to choking under pressure, which occurs when an increase in perceived pressure causes performance to be much worse than would be expected in the absence of that pressure. This project aims to disentangle SATs and choking under pressure in an online, self-administered (OSA) research platform that mimics the pressure of real-world situations such as high-stakes academic tests. Novice participants were trained in a modular arithmetic (MA) task. Pressure was manipulated by a combination of a countdown timer and a screen recording ruse. These manipulations successfully induced performance decrements, based on changes in the speed and accuracy of solving the MA problems from baseline to pressure trials. Individual trials were classified according to whether participants successfully resisted the pressure manipulations (i.e., faster than baseline and correct answer) or unequivocally failed (i.e., slower than baseline and incorrect answer). On average, participants succeeded in 70.3% of the trials and failed in 3.3% of the trials, with a range from 0% to 22.9% for the latter. This study establishes pressure manipulations that influence cognitive performance, offers a way to scrutinize the impact of those manipulations, and demonstrates the viability of an OSA platform for future work.

7

Genuinely No-signal vs Target Absent in Systems Factorial Technology Capacity Coefficient Estimates: A Comparison

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Ideally, the capacity of a single channel in a multichannel system should be unaffected by task type (e.g, logical AND vs OR tasks). However, Howard et al. (2021) reviewed studies in which capacity estimates for AND tasks differ greatly from OR tasks. In the classic definition of capacity, the absence of a component is not explicitly considered. They suggest a need to incorporate processing time random variables from the no-signal channels into the capacity formulation. We recently collected data from the standard double factorial paradigm that allows us to evaluate the utility of this modification. In one experiment, observers detected the presence or absence of components in Navon-like stimuli (i.e., global shape is composed of local shapes) for both the OR and the AND task instructions. Absence of a target feature was the presence of a neutral distractor. Hence, the no-signal channel actually contained shape information. In contrast, a second experiment used complex Gabor patches composed of two sinewave gratings in the same tasks. Hence, the absence of one grating does imply nothing is present on that channel. We show that modifying the classical capacity coefficient to account for empty channels is more effective for Gabor patches when compared to the Navon stimulus example.

8

Cognitive Effort & the Context of Decision-Making

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Purdue University

Cognitive effort-based decision-making research aims at better understanding how people choose to focus their mental capabilities on a given action. Critically, when studying cognitive effort, performance reflects both whether someone is able to perform a task as well as whether they are also willing to perform that task. However, past literature often overlooked this distinction and instead used a person's capability to answer to measure their willingness to perform and/or motivation towards a given task. Over four experiments, this study investigated how people choose between different demand levels across different cognitive tasks. Experiments 1-3 used an adaptive algorithm to tailor two choices to each participant, attempting to control for a possible confound of capability that could be influencing people to prefer a low-demanding option. Experiment 4 further looks at how the options themselves can lead someone to make more high-demand selection. This study also introduced a theory-based method for categorizing people's tendency to prefer a high or low demanding task. The results suggest that effort-based decisions can be highly influenced by capability, task type, and options that are offered. That is, contrary to prevalent research, this study suggests that people do not generally prefer low-demanding options and can even be persuaded to prefer a high-demanding one under the right circumstances.

9

Beliefs Influence Argumentative Writing

[1]Liam Hart, [2]Greg Russell, [1]Michael Wolfe and [1]Todd Williams

[1]Grand Valley State University

[2]Central Michigan University

Individual differences in argument schema are a primary determinant of which basic components of argumentation are included in written arguments, but there has been little investigation into other factors at play. The present experiment investigated the influence of beliefs on the generation of written argument. Believers and disbelievers in gun control effectiveness read a one-sided text that was either consistent or inconsistent with their beliefs, then wrote a 250-word argumentative essay explaining their beliefs. Essays were coded for the presence or absence of a claim, number of reasons supporting the claim, and the presence of a and the presence or absence of a claim, counterargument, text content, policy claim, statement about belief change, and evaluative statement about the text. Supplementary subjects rated essays for position on the issue, consideration of both sides, type of support for claim, emotionality, and clarity. Belief-consistent subjects wrote essays that were one-sided but contained higher quality arguments than belief-inconsistent subjects' essays. Additionally, several of these essay characteristics differed depending on the degree of belief change in response to reading the text. This study provides evidence that beliefs influence the inclusion of certain basic elements of argumentation in argumentative essays, and that the inclusion of these elements changes dynamically as beliefs change.

10

Abstract and Concrete Word-Learning from Context in Children

Allison Granger, Layla Unger and Vladimir Sloutsky

The Ohio State University

Some words refer to concrete items and can easily be perceived by our senses, like barn or ocean, whereas others refer to abstract items and cannot be perceived, like truth or reason. There is a body of prior work providing evidence for a profound concreteness effect, in which concrete words are learned earlier in development and remembered better than abstract ones. One possible explanation for this effect is that concrete words can be processed through two systems, one for sensory imagery and one for linguistic information, whereas abstract words are only processed by the linguistic system because they lack sensory referents. Alternatively, concrete words might be learned earlier because children are better able to understand words with concrete meanings. The purpose of the current study is to provide a novel test of why concrete words have a learning advantage over abstract words. Specifically, we leveled the playing field for learning abstract and concrete words so that the only information available for word learning was linguistic contextual information. 7-9 year old children were tasked with learning the meaning of nonsense words, which represented target abstract and concrete nouns, from context, such as in the sentence, The boy always lies and never tells the girk. The children were then evaluated on their knowledge of the novel word in two different measures. Results show that children show comparable abstract and concrete word-learning, indicating that the sensory referents associated with concrete words play a role in the concrete word-learning advantage.

11

Exploring The Aesthetics of Acoustical Concept Structures

Cody B. Ross, Ronaldo Vigo, Raghvendra Yadav and Abigail Bartlett

Ohio University

With a few notable exceptions, such as Vigo et al. (2018), who investigated the learnability of acoustical structures generated from two binary dimensions, most research on concept learning and categorization has focused on visual stimuli. In this study we examine the relationship between acoustical concept structure and pleasantness judgments for the first time with the aim of gaining insight into the relationship between concept learnability and subjective notions of beauty. Our preliminary results suggest a pleasantness ordering among category structures consisting of three acoustical binary dimensions with four category members in the form of tones. The potential significance of this ordering is then discussed from an evolutionary psychological perspective.

12

Assessing the Impact of Concept Structure on Relational Similarity Judgments

Abigail Bartlett, Ronaldo Vigo, Raghvendra Yadav and Cody B. Ross

Ohio University

Similarity assessment lies at the root of many computational models of categorization and concept learning. While some models of similarity have focused on similarity at the object level, others have attempted to account for people's ability to assess similarity between object relationships. To extend previous work in this area, in this study we explore people's relational similarity judgments as a function of concept structure. Participants in our experiment were presented with pairs of concept structures consisting of three binary dimensions and four positive examples. They were then asked to rate their relational similarity. We report our preliminary findings, including evidence suggesting that people's reaction times increase as the complexity of the concept structures increases but only up to a point.

13

Generalizing across Tonal Context, Timbre, and Octave in Rapid Absolute Pitch Training

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[2]Dartment of Psychology, University of Chicago

[3]Department of Psychology, Huron University College at Western, London, ON

[4]Western Institute for Neuroscience, Western University, London, ON

Absolute pitch (AP) is the rare ability to name any musical note without the use of a reference note. Given that genuine AP representations are based on the identification of isolated notes by their tone chroma, they are considered to be invariant to (1) surrounding tonal context, (2) changes in instrumental timbre, and (3) changes in octave register. However, there is considerable variability in the literature in terms of how AP is trained and tested along these dimensions, making recent claims about AP learning difficult to assess. Here, we examined the effect of tonal context on participant success with a single-note identification training paradigm, including how learning generalized to an untested instrument and octave. We found that participants were able to rapidly learn to distinguish C from other notes, with and without feedback and regardless of the tonal context in which C was presented. Participants were also able to partly generalize this skill to an untrained instrument. However, participants displayed the weakest generalization in recognizing C in a higher octave. The results indicate that participants were likely attending to pitch height in addition to pitch chroma a conjecture that was supported by analyzing the pattern of response errors. These findings highlight the complex nature of note representation in AP, which requires note identification across contexts, going beyond the simple storage of a note fundamental. The importance of standardizing testing that spans both timbre and octave in assessing AP and further implications on past literature and future work are discussed.

14

Listening to Catchy Music Negatively Affects Verbal but not Spatial Working Memory

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Listening to music has a consistently deleterious effect on verbal memory tasks, but not spatial memory tasks. Such results suggest that musical processing occupies space in verbal working memory (WM), or in what corresponds to the so-called phonological loop in Baddeley's (1986) WM model. However, this prior work does not convincingly rule out the possibility that music's effect on WM has a more domain-general nature. Specifically, prior studies have either failed to administer true complex WM span tests, or to test the possibility that catchy music might also occupy more domain-general aspects of WM (e.g., executive attentional control). The present research helps to address those gaps in the literature. In an initial experiment, participants performed tasks that measured simple verbal WM span using a Running Letter Span task, and complex spatial WM span using a non-verbal Symmetry Span task. Symmetry Span is a complex span task because it requires both maintenance and manipulation of information at the same time, thereby tapping into domain-general executive attention processes. During performance of both tasks, participants alternated between periods of listening to catchy songs and periods of silence. Results indicate that listening to catchy songs reduced accuracy in the verbal WM span task, but did not affect performance on our measure of complex spatial WM. Hence, musical interference is most likely when performing tasks that require specifically verbal aspects of WM.

15

What does the Spontaneous Speech Synchronization Task Measure?

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Assaneo and colleagues recently developed a spontaneous speech synchronization (SSS) task that they claim distinguishes between individuals who, without conscious awareness, spontaneously synchronize their speech with a to-be-attended syllable stream and those who do not (Assaneo et al., 2019; Assaneo et al., 2020). The SSS task consists of a syllable perception task where participants whisper the syllable tah while monitoring a series of synthesized syllables. Some participants spontaneously synchronize their produced syllables with the timing of heard syllables, while others appear to produce syllables timings that are unaffected by the heard syllable rhythm. Degree of spontaneous synchronization for this task is calculated by computing the phase-locking value (PLV) between the amplitude envelopes of the produced and perceived syllable sequences. The present study assesses the central claim that spontaneous speech synchronization in the SSS task emerges unconsciously without listener intent to synchronize. Participants in the present study completed the SSS task twice as part of a larger study. Following the second administration of the SSS task, participants completed a modified Perceived Awareness of Research Hypothesis (PARH) survey. Consistent with Assaneo and colleagues, there was a bimodal distribution of PLV scores distinguishing good synchronizers from poor synchronizers. However, contrary to the claim that the SSS task measures unconscious synchronization, the majority of participants indicated that they tried to synchronize their produced speech with the heard speech. Moreover, PLV scores were substantially greater for participants who indicated they intended to synchronize compared to those who did not.

16

Understanding Public Opinion on COVID-19: Sentiment and Topic Analysis of Online Discourse

Pengliang Jacky He

University of Michigan

The COVID-19 pandemic significantly impacted global society, with social media platforms like Twitter becoming crucial for gauging public sentiment. This study investigates sentiment and topic analysis of COVID-19-related Twitter discourse from March 2020 to March 2023 using the Linguistic Inquiry and Word Count (LIWC) tool. The analysis focuses on sentiment changes and the prevalence of four main topics: health, work, technology, and politics. Data collection involved web-crawling techniques targeting COVID-19-related tweets. After preprocessing, a dataset comprising millions of tweets was analyzed using LIWC for sentiment and relatedness of the four topics. The results show no substantial growth in these topics within COVID-related Twitter conversations. Instead, the relatedness of topics decreased over the three-year period. Sentiment analysis revealed fluctuating emotions, with periods of heightened concern and anxiety followed by relative stability. The diminishing relatedness of the four topics suggests public discourse has shifted from an exclusive focus on COVID-19 to broader subjects, indicating societal adaptation and resilience. The findings provide valuable insights into the dynamic nature of public opinion and concerns during a prolonged global emergency, demonstrating the potential of LIWC as an effective tool for large-scale sentiment and topic analysis in the context of social media data.

17

Processing Fluency and Moral Judgment: Aesthetic Features Affect the Emotional Response to Violence but not its Perceived Morality

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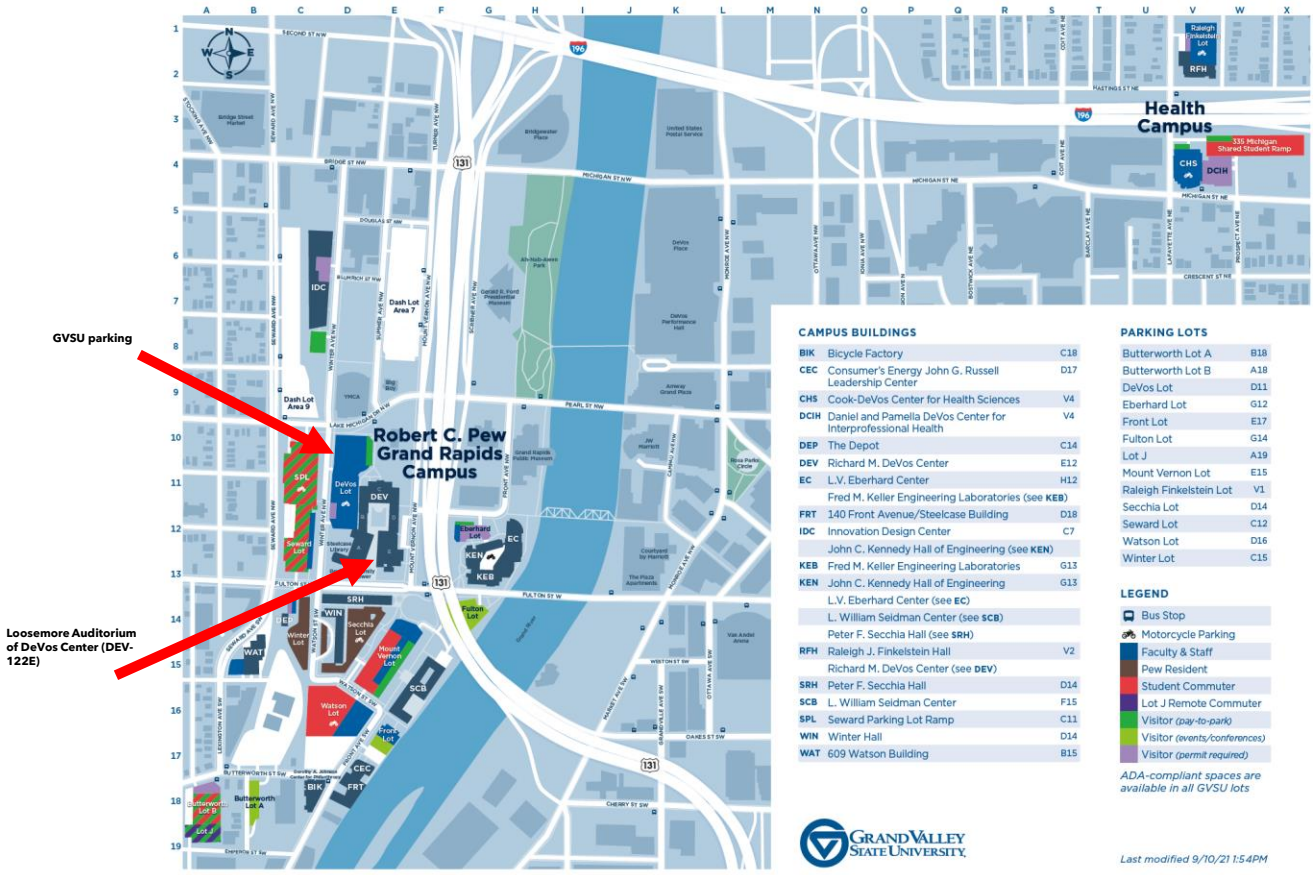
We investigate the link between aesthetic judgment and moral judgment and find a possible space of influence between them around processing fluency. Processing fluency refers to a metacognitive feeling of the ease with which information is processed. Higher processing fluency of stimuli has been linked to greater subjective enjoyment but also to greater perceived reliability, truthfulness, and potentially morality. In poetry, features of consistent rhyme, meter, and line length have been connected to greater processing fluency and higher aesthetic enjoyment. To test the connection between aesthetic processing fluency and morality, we constructed texts that depict different levels of violent actions. We altered these texts to create one group with aesthetic features that produce high processing fluency and one group with features that do not produce high processing fluency. Participants rated these texts for their beauty, melodiousness, morality, and how upsetting they were. As hypothesized, we find that texts with aesthetic features were perceived to be more melodious and beautiful, and that texts with greater violence were perceived to be less moral and more upsetting. However, we also find that the level of violence inversely affects perceived beauty but does not alter ratings of melodiousness. Similarly, we find that aesthetic features inversely affect how upsetting the texts are rated to be but not their perceived morality. Together, these results indicate that while violence and aesthetic textual features remain separate for more objective assessments of morality and melodiousness, they blend in more subjective responses to upsetting actions and beauty.

MAPS


GVSU parking
Loosemore Auditorium of DeVos Center (DEV-122E)
Robert C. Pew Grand Rapids Campus
Health Campus
Raleigh Finkelstein Lot
RFH
335 Michigan Shared Student Ramp
CHS
DCIH
IDC
Dash Lot Area 9
Dash Lot Area 7
DEV
DeVos Lot
SPL
Seward Lot
Eberhard Lot
EC
KEN
KEB
SRH
WIN
Secchia Lot
Winter Lot
Mount Vernon Lot
Fulton Lot
WAT
SCB
Watson Lot
Front Lot
CEC
FRT
BIK
Butterworth Lot A
Butterworth Lot B
Lot J
CAMPUS BUILDINGS
BIK Bicycle Factory C18
CEC Consumer's Energy John G. Russell Leadership Center D17
CHS Cook-DeVos Center for Health Sciences V4
DCIH Daniel and Pamella DeVos Center for Interprofessional Health V4
DEP The Depot C14
DEV Richard M. DeVos Center E12
EC L.V. Eberhard Center H12
Fred M. Keller Engineering Laboratories (see KEB)
FRT 140 Front Avenue/Steelcase Building D18
IDC Innovation Design Center C7
John C. Kennedy Hall of Engineering (see KEN)
KEB Fred M. Keller Engineering Laboratories G13
KEN John C. Kennedy Hall of Engineering G13
L.V. Eberhard Center (see EC)
L. William Seidman Center (see SCB)
Peter F. Secchia Hall (see SRH)
RFH Raleigh J. Finkelstein Hall V2
Richard M. DeVos Center (see DEV)
SRH Peter F. Secchia Hall D14
SCB L. William Seidman Center F15
SPL Seward Parking Lot Ramp C11
WIN Winter Hall D14
WAT 609 Watson Building B15
PARKING LOTS
Butterworth Lot A B18
Butterworth Lot B A18
DeVos Lot D11
Eberhard Lot G12
Front Lot E17
Fulton Lot G14
Lot J A19
Mount Vernon Lot E15
Raleigh Finkelstein Lot V1
Secchia Lot D14
Seward Lot C12
Watson Lot D16
Winter Lot C15
LEGEND
Bus Stop
Motorcycle Parking
Faculty & Staff
Pew Resident
Student Commuter
Lot J Remote Commuter
Visitor (pay-to-park)
Visitor (events/conferences)
Visitor (permit required)
ADA-compliant spaces are available in all GVSU lots
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