

# Undergraduate Honors Projects – 2011-2012

## **Leah Child**

Naive Viewers' Implicit and Explicit Segmentation Judgments of American Sign Language

**Advisors:** Dare Baldwin, PhD and Jessica Kosie, BS

One of the most daunting challenges of learning a new language is often accessibility of the segmental structure, since most languages do not contain pauses or signals at word boundaries. American sign language is unique in that it allows the learner to process it in a visual form opening the way for them to use their action processing abilities to segment the language they see as they would action. Sixty college students were asked to segment ASL monologues using explicit segmentation and dwell time methodologies, and their segmentation decisions were compared to a native ASL user's segmentation decisions. This research could have interesting potential impact on the way we approach language learning, as well as indicating possible useful applications for those with communicative barriers. This knowledge also has the potential to be of benefit to those working on software for translating ASL.

## **Camille Cioffi**

Infant Orienting Predicts Executive Control at 5 Years of Age: A Moderating Role for Early Forms of Adversity

**Advisors:** Jeff Measelle, PhD and Jennifer Ablow, PhD

Self-regulation develops across the first years of life through repeated social interaction. One crucial aspect of early regulation is seen in how the infant deploys or orients her attention when distressed. Infants as young as five months of age engage in a variety of attention related behaviors that serve to regulate distress, including distracting themselves (object engagement), orienting toward the parent (social monitor), or avoidance behaviors (look away) when a parent is non-responsive. The overarching aim of the current study was to examine how individual differences in infants' attentional deployment when challenged interpersonally would predict more advanced forms of executive functioning later in childhood. Additionally, the current study examined how association between early attentional deployment and later executive functioning might vary as a function of early adversity. Infants' orienting behaviors were coded when they were five months old during the challenge phase of the Still Face Procedure (SFP). Executive control was assessed when children were five years of age using a composite measure of working memory, inhibitory control, visual attention, and planning capabilities. Indicators of early adversity included attachment classification, socioeconomic status (SES) and maternal depression. In a sample of 64 mother-infant dyads, multiple regression analyses indicated that infants who attended more to their mothers when distressed (social monitoring) exhibited significantly higher levels of executive functioning when they were five years old. However, the relation between infants' orienting behavior and later executive control was moderated by SES such that infants from lower socioeconomic backgrounds who looked away from their mothers scored low on executive control.

## **Melissa Dollar**

Autistic Tendencies and Visual Processing: A Local Bias versus a Global Deficit

**Advisors:** Paul Dassonville, PhD and Sara Hodges, PhD

Past research suggests that individuals with autism spectrum disorders (ASD) exhibit an enhanced local-oriented processing bias, but have an attenuated tendency to use global contextual cues. In addition, the autistic trait of systemizing has recently been found to predict sensitivity to global contextual cues, where high systemizing tendencies are associated with a decreased tendency to process misleading global context (e.g., visual illusions). It is currently unclear, however, whether individuals with heightened systemizing drives, such as those with autism, display the same decreased tendency to process context when it provides information beneficial to performance. The current study examined the extent to which systemizing tendencies were predictive of whether individuals could use beneficial global-contextual information in two perceptual tasks. In one task, we found a significant benefit from the presence of an upright frame (compared to no frame) when participants judged the orientation of a central rod. However, there was no correlation between systemizing or autism quotient scores and the extent to which participants benefited from the global context of the frame. The presence of an upright frame provided similar performance benefits when participants were asked to make saccades as close to vertical as possible, but again the size of the benefit was uncorrelated with systemizing quotient scores. These results suggest that individuals with heightened systemizing drives, such as those with autism, can still make use of global context when it is beneficial to performance.

### **Alex Fortune**

Exploring Associations Among Homophobic Attitudes, Trauma Exposure, Gender, and Sexual Orientation

**Advisors:** Laura Kaehler, MS and Jennifer Freyd, PhD

The associations among gender, sexual orientation, homophobia, and trauma history were explored in this study. A total of 537 undergraduate students (63.7% female, 76.7% Caucasian,  $M_{age} = 19.5$ ) completed an online survey that included versions of the Homophobia Scale (Wright, Adams, Bernat, 1999), which assessed parental, self, and friend homophobia, and the Brief Betrayal Trauma Survey (BBTS; Goldberg & Freyd, 2004), a self-report measure of trauma history. Results indicated that both personal homophobic attitudes and those of participants' friends were higher for men, but that only personal homophobic attitudes were higher for heterosexuals. A linear relationship between trauma history and homophobic attitudes was found, showing that people who experienced traumas high in betrayal were less homophobic. Non-heterosexual people ( $n=35$ ) were more likely to experience medium or high betrayal traumas (interpersonal traumas), whereas heterosexual people ( $n=502$ ) were more likely to experience low betrayal traumas (non-interpersonal traumas) or no trauma at all. Implications of the increased negative effects for traumas high in betrayal and manifestations of homophobia in society are discussed.

### **Sarah J. Harsey**

It Happens, Just Not to Me: Self-Reports of Trauma versus Reporting Trauma of Others

**Advisors:** Melissa Platt, MS and Jennifer Freyd, PhD

Prevalence rates of trauma within the general population are high, and incidences of trauma, especially childhood abuse and adult sexual abuse, are underreported. Betrayal Trauma Theory (BTT) asserts that certain traumas with high social betrayal can remain outside of the victim's conscious awareness due to a need to maintain a vital relationship with the perpetrator. The current study examined this phenomenon of "betrayal blindness" by comparing self-disclosure and friend or sibling disclosure rates for both high and low-betrayal traumas. Using data from a sample of 394 university undergraduates, we discovered that participants were more likely to report a sibling's or friend's trauma than their own. However, contrary to what we predicted, we did not find a discrepancy in reporting rates for high and low-betrayal traumas; this may be partially explained by wording ambiguity in the way we presented BBTS items for reporting on a friend or sibling. Overall our findings indicate that individuals are

more hesitant to disclose their own traumas than the traumatic experiences of a sibling or friend, thereby providing further evidence that a “culture of silence” continues to surround discussion of one’s own traumas.

### **Chihoko Hayashi**

Competition, Inhibition, and Voluntary Task Control

**Advisors:** Atsushi Kikumoto, BS and Ulrich Mayr, PhD

In competitive situations, it usually pays off to be unpredictable because it helps outwit opponents. However, people tend to be predictable. Using the voluntary task-switching paradigm where participants are asked to randomize task choices, Arrington and Logan (2004) showed that people often repeat the same task. In contrast, those participants who manage to resist the so-called perseveration may do so by inhibiting the just-executed task, resulting in slowing response times when they do not switch task (Mayr & Bell, 2006). Given that randomness is beneficial in competition we examined participants’ use of inhibition in a voluntary switching experiment framed as a competitive situation in which the presence of an opponent and the competition could make people more random. In the present study, participants competed against a real opponent, where participants played the part of a ‘Fox’ who was rewarded for each trial on which they chose the same task as their opponent, the ‘Rabbit’, while participants who played the ‘Rabbit’ were rewarded whenever they chose a different task from the ‘Fox’. We also included a control condition with random feedback after each trial to eliminate confounds between task choice and feedback. Competition increased switch rate close to 50%, which indicated more random performance. Moreover, response times also increased, which could imply that participants used inhibition to overcome perseveration. This study suggests that competitive situations affect executive control and alter predictability.

### **Daniel Klee**

Does Spatial Attention Influence the Severity of Visual Crowding?

**Advisors:** Ed Awh, PhD and Edward Ester, PhD

The identification of a target in peripheral vision is severely impaired in the presence of nearby distracting information. This phenomenon is referred to as visual crowding, and it constrains important visual processes, such as object recognition and reading. Although a popular model of crowding attributes perceptual degradation to the compulsory averaging of target and distractor feature values, recent work by Ester, Klee, & Awh (in prep.) suggests that crowding is the result of feature mislocalization and a subsequent “swapping” of target and distractor feature information. Decades of research have shown that when an observer directs attention to the location of a stimulus, perceptual processing of that item is enhanced. Here, we examined the consequences of spatial attention on visual crowding. Our findings show that spatial attention attenuates crowding effects by reducing confusions between target and distractor values. The critical spacing distance for crowding — defined by the largest distance between targets and distractors where crowding is observed — was unaffected by spatial attention. These findings shed light on the basic mechanisms by which visual attention can ameliorate the harmful effects of nearby distractor stimuli.

### **Bethany Lassetter**

Judging the Credibility of Others in Light of Lies and Forgetfulness

**Advisors:** Sara Hodges, PhD and Elliot Berkman, PhD

The present investigation employs two studies to examine how individuals assess the credibility of providers of false information. We hypothesized in both studies that strategic liars who provided false information would receive significantly higher credibility scores than mixed-up individuals who also provided false information. A total of 332 university students (63% female) participated in Study 1 by reading a brief vignette and answering questions about the credibility of a reference provider. Contrary to our hypothesis, results demonstrated that strategic liars were actually rated as significantly less credible than mixed-up individuals. Study 2 utilized 897 student participants (68% female) who again read a brief vignette and answered questions about four target individuals' credibility, either in a courtroom or non-courtroom setting. Once again, results showed that strategic liars were rated as significantly less credible than mixed-up individuals; however, the strength of this pattern varied depending on target and context. Results thus deviated considerably from projected hypotheses and previous research, but supported the idea that credibility assessments depend on the type of misinformation and the setting in which this information is provided.

### **Jennifer Lewis**

Mapping the Human Visual Cortex: Exploring Early Components of the Visual Evoked Potential with Dense-Array EEG

**Advisors:** Phan Luu, PhD, Don Tucker, PhD, and Allen Malony, PhD

With the advancement in technology of dense-array EEG (dEEG), improving the spatial resolution on noninvasive electrophysiology is becoming more realistic. This study aims to replicate the current evoked related potential (ERP) literature and characterize the early components of the visual evoked potential (VEP), while also comparing the cortical surface activity generated in source space with the spatial resolution of the hemodynamic response in similar studies in the functional magnetic resonance imaging (fMRI) literature. EEG was collected from 10 participants as they viewed a series of checkerboard stimuli presented in 5 quadrants. Locations and characterization of the early C1, P1, and N1 components were examined through multichannel scalp recordings, retinotopic mapping, and linear inverse solution techniques. Individual subject data shows the C1 is generated in the primary visual cortex; early P1 is generated in extrastriate cortex areas of V2; and the N1 is generated in more lateralized areas of visual cortex.

### **Sara Loitz**

Implicit and Explicit Attitudes in Self-Other Hypocrisy Judgments

**Advisors:** Sara Hodges, PhD and Brian Clark, MA

How do people react to evidence that they harbor inconsistent attitudes or beliefs? University student participants (n=82) filled out a series of questionnaires designed to measure explicit attitudes and took a reaction-time implicit associations test to determine their implicit attitudes toward homosexuality. Afterward, participants were presented with fabricated results of the implicit and explicit measures. Half of the participants were shown evidence that they harbored morally inconsistent attitudes toward homosexuality ("self" condition), whereas the other half were shown evidence that another (fictitious) student harbored hypocritical attitudes ("other" condition). At the end, participants were solicited to sign a petition in support of gay marriage. As predicted, people in the self condition reported more negative affect than did those in the other condition, suggesting possible feelings of cognitive dissonance. However, people in the self condition were not more likely than those in the other condition to sign a petition in support of gay marriage as a means of reducing those feelings of dissonance. In addition, we found that those in the self condition were 7.6 times more likely to describe the attitude results as inconsistent than those in the other condition.

## **Rianna Lowrance**

The Effects of Religious Primes on Political Voting

**Advisor:** Azim Shariff, PhD

This study looks at the significance of religion in politics; specifically investigating whether religious primes affect an individual's support for a democratic or republican political speech. The participants were given a political speech that was either democratic or republican and religious or non-religious. They were then asked to rate their support for the hypothetical political candidate. Although the religious primes did not produce a significant effect in terms of political preference, it was found that there was significant interaction between the religious and control passages and the religious and non-religious participants, such that those individuals who were religious tended to support the religious passages more, and those participants who were not religious supported the religious passages less. In addition, it appears that republicans may have a more diverse circle of friends than democrats. Discussion focuses on implications for these findings and questions for future research.

## **Christabelle Moore**

Thinking about Best Friends: Neural Correlates of Trait Evaluations Across Development

**Advisors:** Junaid Merchant, BA and Jennifer H. Pfeifer, PhD

This study aimed to investigate the developmental trajectory of neural correlates underlying trait evaluations of a close other (i.e., same-gendered best friend). Twenty-four Chinese participants (12 adults, 12 children) underwent functional magnetic resonance imaging (fMRI) while making trait evaluations in the social and academic domains. Participants reported whether these traits described their best friends or not, and as a control condition also evaluated the valence of these traits. The results demonstrated a three-way interaction between age group, evaluation type (best friend or valence), and domain (social or academic). Post-hoc analyses demonstrated that, in children compared to adults, activation was great in right posterior superior temporal sulcus (pSTS), such that children utilized this area significantly more when thinking about their best friend in the social domain compared to the academic domain. Meanwhile, in adults compared to children, activation was greater in right inferior frontal gyrus (IFG), such that adults utilized this area significantly more when thinking about the valence of a phrase in the social domain compared to the academic domain. In previous studies, the pSTS is associated with person perception and social information processing, while the IFG is reliably involved in inhibition. These results help to identify the trajectory and underlying neural correlates of social cognitive development using neuroscience methods. Undoubtedly the emerging field of developmental social neuroscience is shedding light on the underlying neural mechanisms of social behavior as they change over time.

## **Trevor Moore**

Perceived Judicial Fairness of Court Appointed Expert Witness Testimony vs. Exclusively Adversarial Expert Witness Testimony

**Advisor:** Robert Mauro, PhD

Studies conducted in the field of psychology and law research have shown varying and inconsistent results of the public's overall perceived judicial fairness in the differing realms of the justice system. This study aimed to address

the question: *What is the public's opinion on the judicial fairness of judges' decisions when there is use of court appointed expert witness testimony in addition to adversarial expert witness testimony vs. exclusively adversarial expert witness testimony?* Based on previous research, the expectation is that there will be no change in the public's perceived judicial fairness when there is court appointed expert witness testimony in addition to adversarial expert witness testimony, when compared with exclusively adversarial expert witness testimony. Early research suggests that judges' decisions have great influences on juries, mainly the acceptance of evidential materials to be factual, and do so without question because it legitimately made it past a judge, leading to what is known as the "Gatekeeper" effect. Participants will be University of Oregon human subject pool candidates. The aim is to have 150 participants, 75 male and 75 female. Questionnaires will be used to indicate pre-existing biases and attitudes toward the justice system, then following each of the four sample stories, participants will fill out another questionnaire per story, and finally, a post attitude questionnaire (6 questionnaires total). Following data collection, the data will be analyzed.

### **Kyle Morgan**

Mapping the Human Primary Somatosensory Cortex Using Dense-Array EEG: An Analysis of the Somatosensory Evoked Potential

**Advisors:** Phan Luu, PhD, Don Tucker, PhD, and Allen Malony, PhD

In principle, dense-array EEG (dEEG) technology has the ability to localize cortical brain activity with adequate spatial resolution such that anatomically and functionally distinct regions can be studied. The present study employs dEEG to map activity of the primary somatosensory cortex (SI), which is functionally and anatomically defined. EEG recordings were acquired from 10 participants as their thumbs were stimulated by a custom-made piezoelectric stimulator. Early components of the somatosensory evoked potential (SEP), which reflect activity from SI, were evaluated in individual participants to assess topographic distribution at the scalp. In a subset of participants, we build high-resolution electric head models that describe how current propagates from the cortex to the scalp surface, where the SEP is measured, and we use this model to localize the early SEP components. We report on the localization accuracy relative to the expected location (SI).

### **Michael Naylor**

Tell Me What You See: Effects of Captured Attention and Ability to Encode Information

**Advisors:** Edward Ester, PhD and Ed Awh, PhD

What can capture one's attention in the visual field is an important field of research due to the negative implications when one does not pay attention to certain cues. Past investigations have yet to answer whether or not your attention can be captured by multiple things at the same time. What are the limits? Does this change whether or not the individual is actively attending to a cued location or not? In our study, participants were gauged on their ability to encode stimuli presented in an array of distractors while their attention was captured by visual cues. There was no significant difference in the subjects' ability to encode when the stimuli was presented within a cued location, suggesting that attention was captured regardless of whether or not the participant was actively attending to the cued location or not. However, there was a significant decrease in encoding when the stimulus was presented outside of a cued location. This suggests there is a discrete limit in number of objects attention can be captured by, which is the same regardless of whether or not the participant was actively attending to the cued location or not.

## **Lucas Ott**

The Impact of Physiology, Emotion, and Individual Differences on Social Judgment

**Advisors:** Arielle Morganstern, MS and Robert, Mauro, PhD

The current research investigates trait personality and state experiences of authentic pride and hubristic pride (Tracy & Robins, 2007) and anger with physiological measures, subjective feeling states, and social judgments. The physiological measure used was respiratory sinus arrhythmia (RSA), which is an index of emotion regulation (Butler et al., 2006; Oveis et al., 2009). Employing an experimental between subjects design, hubristic pride, authentic pride, and anger were successfully induced and participants subsequently completed measures of social dominance orientation (SDO; Malle, Stallworth, Sidanius & Pratto, 1994) and empathy. Results indicated an interaction in which increasing levels of trait anger and trait hubristic pride coincided with decreasing RSA levels as measured during a baseline paced breathing task, which postulates less emotion regulation among those high in trait anger and hubristic pride. In addition, individuals who were high in trait anger had significantly lower levels of RSA across conditions than those low in trait anger. The anger condition was the only condition where trait anger significantly predicted RSA in the aforementioned pattern. Furthermore, subjects high in trait anger randomized to the anger condition endorsed social inequality considerably more than those low in trait anger. Individuals with high trait anger levels randomized to the hubristic pride condition reported lower levels of empathy relative to their low trait anger counterparts. These findings suggest that individual differences impact physiology and subsequent judgments induced from incidental emotions.

## **Matthew Parker**

Differential Effects of Stress on Working Memory

**Advisors:** Nash Unsworth, PhD and Brittany McMillan, BS

This study examined the relationships between stress, working memory capacity (WMC), fluid intelligence, and attention control. Research participants completed a number of tasks designed to measure WMC, general fluid intelligence, attention control, and stress. Stress was measured and three factors of stress (engagement, distress, and worry) were analyzed in relation to the other factors. Correlations were run and distress was significantly correlated with an improvement in performance on task designed to test WMC, fluid intelligence, and attention control. Worry decreased performance on measures of fluid intelligence, and engagement improved performance on WMC and attention based tasks. Additionally, all three factors of stress engagement, distress, and worry were correlated with changes in task performance differentially suggesting that different types of stress differentially effect memory and attention, sometimes positively and sometimes negatively.

## **Jennifer Paternostro**

A Look at the Development of Action Segmentation in Children and Adults

**Advisors:** Dare Baldwin, PhD and Kara Sage, MEd, MS

In order to process and understand events as they unfold, adults break down events into smaller parts. For example, the process of making a sandwich would include big, medium, and small events. A big event would be completing making the sandwich, a medium event would be finishing putting the condiments onto the sandwich, and a small event would be placing one slice of turkey onto the bread. Adults are readily able to predict the next step in a sequence of actions, such as predicting that the cheese will go on top of the meat in the sandwich example. The

present research investigates developmental differences in how humans predict action. We hypothesize that when adults are processing an action sequence, they tend to look longer at the end of that sequence as they actively make predictions about the next step. Children, however, may be slower to predict what will happen next and therefore will have longer looking times at the beginning of each additional sequence. Specifically, this study explores the differences in action segmentation between 3-year old children, 5-year old children, and adults. Participants advanced through a self-paced slideshow of an actor making an ice cream sundae while the computer recorded their looking times to each individual slide. Our findings point to the differences in how children and adults segment and predict action.

## **Justin Pomerence**

Expression of Emotion During Recall of Military Service

**Advisors:** William Schumacher, MS and Holly Arrow, PhD

To investigate emotional resilience in war, 250 interviews were chosen from the Veterans' History Project, 50 each from World War II Pacific and European theaters, Korea, Vietnam, and the Iraq/Afghanistan wars. Each interview was divided into sections that discussed experiences before, during, and after deployment to a combat zone, and analyzed by the Linguistic Inquiry and Word Count software (LIWC; Pennebaker, Francis, & Booth, 2001) to measure levels of positive and negative emotion. Previous literature suggests that soldiers with higher levels of negative post-deployment emotion tend to be more susceptible to poor psychological outcomes, such as post-traumatic stress disorder. As hypothesized, Vietnam and Iraq/Afghanistan veterans scored significantly higher for post-deployment negative emotion scores than veterans of the earlier wars. As expected, negative emotion increased over the pre-deployment baseline when recounting experiences during deployment for all wars. For WWII and Korean War veterans, negative emotion dropped again for post-deployment experience, to levels comparable to the baseline. For veterans of Vietnam and Iraq/Afghanistan, however, post-deployment experiences had the same high level of negative emotion as combat experience, with no evidence of recovery.

## **Mora Reinka**

Stereotypes as an Attentional Deficit: Examining the P1 in the IAT

**Advisors:** Jennifer Pfeifer, PhD and Kristina Hiatt Racer, PhD

The Implicit Association Test (IAT) uses reaction times as a test of an individual's implicit biases in a multitude of fields such as gender, race, and age. More recently, researchers have proposed a number of different reasons why reaction times tend to be slower when participants categorize words that are at odds with currently societal stereotypes than when the words are in line with these views. To test these theories, event related potentials (ERPs) have been useful in examining the underlying components of stereotype processing. In an exploratory analysis of ERPs within the IAT, we found a difference in early attention processes (indexed by the P1 ERP component) when female participants (N=55) are categorizing stereotypically congruent and stereotypically incongruent stimuli during a gender and career IAT. Participants also completed a numeric Stroop task, allowing us to compare ERP congruency effects across tasks with more (IAT) versus less (Stroop) relevance to gender stereotypes. This study extends the limited body of research on the effects of stereotypes on brain functioning using electrophysiological measures.

## **Mirjam Staeb**

## The Angry Cookie: Adults' and Children's Attribution of Human-like Facial and Emotional Characteristics to Inanimate Objects

**Advisors:** Marjorie Taylor, PhD and Deniz Tahiroglu, MS

Anthropomorphism is the tendency to describe inanimate objects with human-like characteristics. In this study, we investigated individual differences in the perception of faces and emotional expressions in inanimate objects (e.g., a piece of toast with a pattern in the placement of raisins that made it look like a crying face). First, we investigated adults' tendency to recognize faces in inanimate objects (N=32). The participants were shown pictures of human faces expressing different emotions, objects with features that could be interpreted as resembling human faces, and objects without such features and were asked to describe what they saw in each picture. We hypothesized that the degree to which adults characterized the pictures with human-like attributes would correlate with their scores on the Individual Differences in Anthropomorphism Questionnaire. The results of the adults' study were used to develop a study with children in which they are shown a subset of the pictures and asked, "What do you see in this picture?" We were interested whether the ability to see faces in objects could be related to the children's theory of mind, pretend play abilities, and individual differences in other aspects of anthropomorphism. There were individual differences in the extent that adults described the pictures in anthropomorphic terms, but there was not a strong correlation found between the description of the anthropomorphic items and the questionnaire. The children's data are currently being collected.

## David Williamson

Surround Suppression is Modulated by a "Need for Sameness" Factor Within the Systemizing Trait of Autism

**Advisors:** Paul Dassonville, PhD and Scott Reed, MS

The systemizing trait of autism is currently regarded as a uni-dimensional measure of the tendency to analyze the world in a systematic manner (Wheelwright et al, 2006). Recent work has shown that individuals high on the systemizing quotient are less susceptible to a class of visual illusions known to affect an observer's egocentric reference frames (Walter et al, 2009). However, follow-up work (Reed & Dasonville, VSS 2012) using a principal components analysis has uncovered a two-factor structure to the Systemizing Quotient-Revised (SQ-R), with one factor (i.e., 'analytical tendencies') associated with decreased reliance on global-level visual context and the second (i.e., 'insistence on sameness') associated with an increased reliance on local-level visual information. We examined contextual processing using surround suppression, in which the perceived contrast of a central sine-wave grating is reduced when surrounded by a high contrast surround. Because the 'insistence on sameness' factor is associated with a local perceptual bias, we predicted that surround suppression performance would be significantly correlated with scores on this factor and unrelated to scores on the 'analytical tendencies' factor. Indeed, scores on the 'insistence on sameness' factor significantly correlated with surround suppression susceptibility performance, indicating that individuals high on this factor showed *increased* surround suppression. Scores on the 'analytical tendencies' factor were unrelated to surround suppression. These results further support the hypothesis that high scores on the 'insistence on sameness' factor subcomponent of the systemizing trait of autism is associated with a local visual processing bias.