

Undergraduate Honors Projects – 2013-2014

Cassandra Brandes

Mind-Body Dualism and Mental Illness Stigma

Advisors: Azim Shariff, PhD and Zhen Cheng, MS

Implicit theories and biases continue to be large obstacles in the attainment of adequate mental health services for those with mental illness. Mind-body dualism is a theoretical construct which claims the independence of the mind from the body and which may influence some of these biases. We hypothesized that dualistic views may lead people to hold greater stigma toward those with mental illness, as well as greater internalized stigma and differential treatment behaviors for those with mental illness, themselves. Study 1 measured the relationship between mind-body dualism and stigma variables and found that dualism was positively associated with blame. A second study primed participants with either dualistic or physicalistic theories but found no effect on stigma. The correlational findings from Study 1 were also not replicated. Study 3 targeted participants with a reported diagnosis of mental illness, and found no consistent relationship between mind-body theories and self-stigma or treatment behaviors. Interpreting from null findings must be done with caution; nevertheless these results show no reliable or homogenous relationship between this theory of mind-body dualism and mental health service selection or stigma.

Brynna Cooper

Electrophysiological Correlates of Mood-Cognition Interaction in Self-Evaluative Decisions

Advisors: Don Tucker, PhD and Allison Waters, MS

We investigated the neural correlates of self-referential cognition. Previous research in this area has been largely accomplished using metabolic measures of brain activity. Building on this literature, we explored brain activity using dense array electroencephalography (dEEG) to achieve a temporal resolution more apt to capture the time scale of cognitive events. Forty undergraduates read desirable and undesirable trait-descriptive words and evaluated whether each word was self-descriptive. In a separate condition, participants evaluated the president of the United States using the same trait-descriptive words. Consistent with previous research, we observed a positivity-bias in self-appraisal behavior. This positivity bias was not contained to self-appraisal; instead it was equally present in the other-referential condition. Additionally, the amplitude of the P300 event-related potential was enhanced during self-reference in contrast to the amplitude of the P300 during other-reference; it was also enhanced following desirable words relative to undesirable words. We then conducted an exploratory, correlation analysis to better understand the relationship between appraisal bias and individual differences in trait affect. Findings are consistent with a two-dimensional model of mood constraint on evaluative decisions.

Jackie Cowell

More Than Just Words: EMOTAIX-Tropes Examines Linguistic Predictors of Mental Health

Advisor: Jennifer Ablow, PhD

Given the fundamental role that language plays in our lives, it is apparent that the words people use reveal information about the ways in which they experience and interact with those around them. Examining the language use of at-risk first-time mothers is especially pertinent, as risk factors such as maternal depression and anxiety lead to adverse child outcomes including delayed emotional development, behavioral problems and lower IQ. To broaden our understanding of how language is used in emotion processing with regards to mental health, we used EMOTAIX-Tropes, a text-analysis software program aimed at assessing the emotional lexicon, to examine 105 first-time mothers' use of emotion language (i.e. words denoting worry, happiness, anger). The women were interviewed using the Adult Attachment Interview (AAI) and were recorded and transcribed verbatim, then analyzed via EMOTAIX-Tropes, which divides and classifies emotion terms into semantic categories according to valence (positive or negative). Additionally, participants filled out questionnaires to assess levels of depression (CESD; Radloff, 1977), anxiety (BAI; Beck, Brown, Epstein & Steer, 1998), trauma history (TSC; Elliot & Briere, 1992), alexithymia (TAS; Bagby, Parker & Taylor, 1994), and verbal intelligence (Shibley, 1940). We hypothesized that participants' emotion language would correlate with self-reported measures of distress, such that those with greater symptomatology would use more negative affect terms. Preliminary results revealed that self-reported distress levels are positively correlated with the use of words expressing hatred and aggression. Further analyses will examine the relationship between measures of distress and the remaining emotion word categories.

Lucas Cylke

To Use or Not to Use: Stereotypes and their Effect on Empathic Accuracy

Advisors: Sara Hodges, PhD and Karyn Lewis, MS

Stereotypes have long been seen as something that people need to overcome and transcend. This study explores the ideas that stereotypes may be useful heuristics that help people make sense of the world; especially in social perception and empathic inference. We hypothesized that the act of not using one's stereotypes when making empathic inferences would greatly compromise one's empathic accuracy. In this study, perceivers ($N = 79$) were told to use or not use their currently held stereotypes when inferring the thoughts and feelings of targets talking about having divorced parents. The participants that were told to not use their stereotypes when making inferences had significantly lower empathic accuracy scores than those who were told to use them and a control. Though stereotypes may be seen as something that needs to be rid of, this study suggests otherwise. Stereotypes, when accurate, should not be ignored as they may lead to better empathic accuracy and more broadly better social perceptions.

Tad Falk

Personality Impressions on Twitter

Advisors: Sanjay Srivastava, PhD and Nicole Lawless

This study examined the extent to which participants agreed about Twitter users' personalities based only on the Twitter user's profile or their social network. Participants ($N=630$) evaluated a random selection of Twitter users' profiles, a set of the user's followers, or a set of the user's friends. Multilevel modeling techniques were used to separate perceiver and target variance in order to estimate trait level agreement. When viewing a Twitter user's profile, participants agreed most about the degree to which users' were thorough and agreed least about the degree to which users' were assertive. When viewing a Twitter user's set of followers, participants agreed most about the users' socioeconomic status and least about the degree to which users were relaxed. When viewing a Twitter user's set of friends, participants agreed most about the degree to which users' needed to be the center of attention and least about having artistic interests. The findings of this study support existing literature regarding the ability of

perceivers to make consistent judgments of strangers based on limited amounts of information present on social media websites. Not only did observers agree on a Twitter user's personality characteristics when they saw the same type of information (either the user's profile, followers, or friends), they also agreed when they saw different types of information about the user. This study extends previous literature to Twitter, a microblogging social media platform and one of the most popular social media websites in the world.

Marina P. Gross

Accessing Long-Term Memory – What Pupil Dilation Can Tell Us About Learning And Memory

Advisor: Nash Unsworth, PhD

This study investigates the role of pupil dilation in memory formation and retrieval through a delayed free recall task. Previous studies have shown the validity of pupil dilation as a proxy for attention and effort. For the first time, our study used pupillometry to investigate encoding and search processes in long-term memory as well as the *primacy effect* – a phenomenon that describes superior recall of the first item on a list. Participants ($N = 66$) learned 7 lists of 10 words each for later recall. Using eye tracking, we analyzed pupil size during list learning as well as item retrieval. Results reveal a close relationship between pupil dilation and both encoding and search processes. During encoding, attention, as indicated by pupil size, peaked at the first item only to decrease over the course of each trial. These findings are consistent with primacy-gradient models. Additionally, we provide new evidence on the *primacy effect*. During encoding, pupil dilation during the first item was not only much larger but also followed a different pattern than that of any other item. Our data suggest that besides rehearsal, increased attention to the first item on the list might play a role in its superior recall. Lastly, our data reveal that intense search processes at recall onset are mirrored in peak pupil dilations. At the beginning of the recall period, the pupil dilates sharply before participants begin recalling items. Additionally, when pupil was large, participants recalled words rapidly and to a higher degree. Overall, this study demonstrates how encoding and long-term memory search processes are reflected in pupil dilation. We propose future research into attention levels during encoding to understand subsequent recall performance.

Amanda R. Hammons

You LANG them!: Re-evaluating Recasts as Negative Evidence

Advisors: Dare Baldwin, PhD and Rose Maier, MS

Marcus (1993) argues that recasts (feedback on children's speech errors provided via a corrected version of the utterance) are of little value for language acquisition: although parents recast children's errors, they also recast well-formed utterances. Perhaps, however, parents provide pedagogical cues that distinguish recasts with corrective versus non-corrective intent. If so, children might be especially receptive to recasts accompanied by corrective intent, and update their linguistic constructions accordingly. To test this, 5- and 6-year-old children are introduced to two novel verbs in present tense forms. Both verbs take irregular past tense forms, modeled after real irregular verbs in English (e.g. *ling/lang* modeled after *ring/rang*), so children's initial attempts to use the past tense are typically overgeneralizations (e.g. *linged*). The experimenter recasts these errors in two conditions: In the informative condition, pedagogical cues signaling corrective intent accompany recasts. In the uninformative condition, recasts are linguistically identical but lack pedagogical cues to corrective intent. It was predicted that if these cues help children disambiguate corrective versus non-corrective recasts, children in the informative condition should show greater preference for the correct (irregular) past tense form over the incorrect (overgeneralized) form. In this preliminary sample there was no significant effect of condition, $t(16) = -.89$, $p < .05$. This work contributes to our growing understanding of the role social information in the analysis of linguistic input.

Rebecca Kenny

Perceptual Bias: Contextual Effects and the Systemizing Factors of Autism

Advisors: Paul Dassonville, PhD and Scott Reed, MA

Autistic tendencies in the general population have previously been found to predict a global-to-local shift in perceptual processing. Specifically, a two-factor structure to the systemizing trait of autism has been recently found to predict this shift, with an *analytical-tendencies* factor associated with weakened use of global contextual cues, and an *insistence-on-sameness* factor associated with heightened use of local information. In the current study, we measured autistic tendencies in the general population and examined the extent to which the two systemizing factors were also predictive of low-level contextual interactions in early visual processing. Specifically, we used a flanker task to measure attractive and repulsive contextual effects on orientation perception, which are thought to be driven by contextual interactions at the single-unit level in primary visual cortex. It was found that higher autistic tendencies related to insistence-on-sameness were associated with greater contextual interactions with lateral flankers, while higher autistic tendencies associated with analytical-tendencies were associated with reduced contextual interactions with collinear flankers. These relationships were found only with these specific subcomponents of systemizing and were not related to overall autistic or systemizing tendencies. These findings suggest that distinct forms of systemizing differentially predict the magnitude of low-level contextual interactions, though future research should examine the extent to which the relationships also reflect differences in neurophysiological functioning.

Heidi Martinez

Beyond Depression: Mothers with Comorbidity Differ in Neural Response to Infants' Cry

Advisors: Heidemarie Laurent, PhD and Rosemary Bernstein, MS

Past research has illuminated how the functioning of the subcortical and prefrontal regions of the brain is affected by a major depressive disorder and in turn affects the maternal response to infant stimuli. The current study explores how comorbid anxiety disorders impact specific patterns of maternal response. We hypothesized a difference in neural response to infant cries in mothers who are comorbidly diagnosed in comparison with mothers who suffer from depression without anxiety and in comparison to mothers with no diagnosis. This hypothesis was tested in a group of 22 high risk mothers exposed to their own infant's cry sound during functional neuroimaging. Group comparisons of neural response to own infant cry (vs. a control sound) were examined. Fixed effects analysis revealed greater activation in several areas, including those associated with speech-related auditory processing and empathy, for those mothers with depression and anxiety as compared to mothers with depression and no anxiety disorder. Areas of emotion regulation and motivation showed greater activation for mothers in the control group. Implications of these neural responses for associated behavioral responses are discussed.

Jessica Montgomery

Moralization of Smoking in Germany and the US

Advisors: Sara Hodges, PhD and Brian Clark, MA

Cigarette smoking has become more moralized over the last half century.

Moralization is the process by which moral value is attached to objects and activities that were previously morally irrelevant. Moralization of behaviors such as smoking is an individual-level (e.g., reflected in an individual's attitudes towards smoking) as well as a cultural-level (e.g., reflected in anti-smoking policies) phenomenon. We studied moralization of smoking in two cultural contexts (Eugene, OR, USA and Tübingen, Germany). Participants were asked by research assistants on and around university campuses to complete a questionnaire in their native language while the research assistant waited. The questionnaire included questions about moralization of cigarette smoking and related constructs, beliefs about smokers' volitional control over smoking, prejudice against smokers, and support for antismoking policy. These constructs were used in order to measure the attitudes that lead to relevant real-world outcomes such as differential treatment of cigarette smokers. We found that American non-smokers' attitudes about smoking were marginally more moralistic than were those of German non-smokers and that American smokers' attitudes about smoking and smokers were significantly more moralistic than were those of German smokers.

Beth Ngan

It's Too Loud in Here: Effects of White Noise on Attention

Advisor: Nash Unsworth

Stochastic resonance refers to the effect of how noise strengthens a signal that enhances the potential of a subject to increase cognitive performance. Stochastic resonance works whereby external noise, specifically white auditory noise enhances internal neural signals often too weak to be detected by a sensor. This study examines this model and its effect on attentional abilities. The experiment was run on university students, paying particular attention to the variance in results, in response to a range of decibel levels in white noise. Results showed that variance in response times were significantly lower, and accuracy was significantly higher at a 60-80db range, hence displaying that perhaps white noise at that level does enhance attention.

Katelyn Occhipinti

Motivation and Executive Control: Using Eye Movements to Investigate Reward-Related Modulation during Task-Switching

Advisors: Ulrich Mayr, PhD and Jason Hubbard, MS

Recent studies have demonstrated the positive effect of motivation on executive functioning (Locke & Braver, 2008; Savine & Braver, 2010). However, the cognitive mechanisms responsible for observed improvements in performance are not fully understood. The current study investigated the effect of performance-contingent rewards (monetary incentives) on response time and attention by tracking participants' eye movements during a cued task-switching experiment. Twenty-nine participants (16 female, 14 male) aged 18-31 ($M=20.4$, $SD=3.14$) performed two different tasks in which three objects (one target, one distractor, and one neutral object) were presented on a computer screen. Subjects were instructed to respond using corresponding keys that changed depending on the currently relevant task. Results of behavioral measures indicate that reward significantly reduced switch-costs and error rates. Preliminary results of eye-movement trajectories reveal improved performance on rewarded trials. Notably, improvements are exclusively observed during response selection, rather than the attentional selection phase. These results suggest that executive control improvements associated with reward are due to processes specifically involved with response selection.

Matt Pepitone

Self-Evaluation of Trait Adjectives: An EEG and Behavioral Analysis

Advisors: Don Tucker, PhD and Allison Waters, MS

While previous studies looking at neural substrates of self-evaluative cognition have focused on fMRI and PET experimental procedures, EEG experiments in this realm are newer and less understood. This study looks to investigate event-related potentials related to self-evaluation and semantic processing while attempting to replicate previous findings regarding how positive and negative affect differentially predict endorsement patterns of good and bad words, respectively. EEG was recorded from 43 nonclinical participants as they rated whether trait adjectives were like them or not, in addition to a semantic-processing control condition where they evaluated the word's meaning. Preliminary ERP results show differences in responses to good and bad words around the P300, while responses to good words in the self-evaluative condition show a larger late positivity potential. Behavioral results indicate that only positive affect predicts endorsement patterns for responses to good and bad words, an interesting finding that will need replication in order to be verified.

Lisa Shimomaeda

Words in Action: An Exploratory Study of the VGT Paradigm in dEEG

Advisors: Don Tucker, PhD and Catherine Poulsen, PhD

Past research has provided evidence to support the use of non-invasive imaging and brain activity measurement techniques such as functional magnetic resonance imaging (fMRI), positron emission tomography (PET), and magnetoencephalography (MEG) in pre-surgical planning for epileptic patients. The current study explores the possibility of using dense-array electroencephalography (dEEG) for the pre-surgical mapping of brain areas necessary for language functioning in epileptics. We hypothesize that we will find differences in P300 component across the visual VGT task and naming task and that we will find left lateralized effects for language. Thirteen participants took part in auditory and visual versions of the verb generation task (VGT) and a naming task. During both VGT tasks, participants made overt responses of action words in response to concrete nouns. During the naming task they overtly stated the name of the object they had seen. Data is still being collected and analysis is ongoing.

Ally Simone

Creative Coping

Advisors: Marjorie Taylor, PhD & Candice Mottweiler, MS

Creative ability is most frequently measured with divergent thinking tasks based on the manipulation of physical objects. While useful, this type of method does not capture the complexity or range of creative behavior. The purpose of this study was to develop new tasks that measure creative ability in the social domain and that involve the creation of a product rather than divergent thinking. We were also interested in testing the extent that creativity on our tasks was related to children's ability to cope in real world situations. Seventy-seven children between the ages of 8 and 12 completed divergent thinking and product creation tasks focused on social or non-social content. Performance on the tasks with social content was not related to performance on the tasks with non-social content, indicating that social creativity is a distinct domain. However, creativity was not related to our measure of coping strategies.

Nikkie Snow

The Effects of Causal Explanations and Attributions on Reactions to Children with Mental Health Problems

Advisors: Phil Fisher, PhD and Zhen Cheng, MS

Along with the various challenges that can accompany mental illness, stigma towards mental illness further decreases one's quality of life. Stigma directed towards children with mental health problems may have especially adverse consequences due to the importance of positive relationships in healthy development. Research has demonstrated that our beliefs about the cause of an individual's psychopathology are important because they can often predict the amount of stigma one will project towards adults with mental illness, however little research has examined the stigmatization of childhood psychopathology. This study investigated the relationship between stigma and mental illness in children through administering a task that required participants to read pseudo articles that provided different causal explanations for psychopathology in children, a vignette of a child diagnosed with a mental health problem, and then complete a questionnaire that measured their emotional and behavioral reactions to the child.

Adam Tratner

Count to ten, and then? – Psychophysiological Effects of Time on Aggression in Web Video Social Interactions

Advisors: Pranjal Mehta, PhD and Erik Knight, MS

Thomas Paine, the late 18th century English-American political theorist was quoted as saying that “the greatest remedy to anger is delay.” Similar to this adage, strategies such as waiting or “counting to ten” before reacting to a negative situation is a common solution prescribed by our culture to aid in reducing further aggression. However, few scientific models have set out to test the veracity of such folk wisdom and examine the effect that time has on aggression in subsequent social interactions. To address the question of how the passage of time alters our aggressive responses to negative social situations, the present study will investigate the relationship between time and aggression, and further explore whether social, affective, and physiological processes mediate one's aggressive output. While their heart rate physiology was being measured with biopac sensors, participants filled out online questionnaires, partook in a pre-recorded, fictitious online web-video social interaction with another student, and then were instructed to participate in a decision-making paradigm (the ultimatum game) with the same student after either a short or prolonged period of time following the initial interaction. We hypothesize that if there is less time between the first and second interactions, participants will be more likely to display aggression towards the fictitious student during the decision making paradigm. Results and findings are forthcoming.

Lauren Williams

Plasticity-Based Brain Training and Aging: A Meta-Analytic Review

Advisor: Ulrich Mayr, PhD

Cognitive decline is an unfortunate hallmark of aging. Deficits can interfere with daily activities and often come at the cost of living independently. In recent years, “brain training” programs and games have become a popular option for older adults who are looking to sharpen their cognitive skills. However, despite their commercial success, it is not clear to what degree these programs produce generalized effects beyond improvement on the trained skills. To

determine the size of generalized training effects, we conducted a meta-analysis of existing training studies that used plasticity-focused practice regimes. Studies were included if they sampled adults aged 50 and older, participants had no cognitive impairment, and they had a control group. This led to a final sample of 32 studies. Preliminary results suggest a small-to-moderate overall effect size. In addition, we found that the effect size declined along the near-to-far transfer continuum as assessments become more dissimilar to training type, and with the sample size of the study. Particularly surprising is the fact that the effect size is negatively correlated with duration of the practice regimen. For far-transfer outcome measures with large sample sizes and long durations of practice, the effect size approaches zero. These results raise doubts about the promise that plasticity-related training regimes effectively counter the broad effects of cognitive aging.