

# Undergraduate Honors Projects – 2009-2010

## Whitney Boyer

Maternal Brain Response to Own Infant Cry Relative to Delivery Type and Depression

**Advisors:** Dr. Jennifer Ablow and Dr. Heidemarie Laurent

The way a mother responds to her infant is vital for the development of a healthy child-caregiver attachment. Specific delivery types have been linked to important neurohormonal activity that can interfere with a parent's acquisition of thoughts and behaviors facilitating healthy parenting (Swain et al., 2008). James Swain and colleagues (2008) discovered mothers who deliver vaginally (VD), compared to those who deliver by cesarean section (CSD), have heightened levels of maternal brain response to own infant cry in the anterior cingulate, insula and hypothalamus — areas of the brain associated with emotional response and hormone release. Additionally, mothers with depression are more likely to experience difficulty in making these connections and responding to their own infant's needs. To further understand the effect of delivery within depressed mothers we examined patterns of maternal brain activation to their infant's cry in two case comparison depressed mothers — one with a VD and one with an unplanned CSD — collected as part of a larger longitudinal study that assessed depressed, low SES mothers and their infants. We predicted lower activity in the CSD, compared to the VD mother, in the hypothalamus, midbrain, limbic system, and paralimbic system — areas of the brain associated with maternal parenting behavior in animals (Kendrick, 2000). Data from functional magnetic resonance imaging (fMRI) was used to measure each mother's response to her own infant's cry compared to a control sound. Counter to hypotheses, the VD mother did not reveal significant activation in the brain in response to her own infant greater than control sound. The CSD mother revealed significant ( $p < .05$ ) clusters of own cry greater than control sound activation in the parahippocampal gyri, posterior cingulate, and precuneus cortex, areas of the brain relevant to memory encoding, episodic memory and reflections on the self. This pattern of activation may indicate the elicitation of memories of her child and reflections on the caregiver-infant relationship.

## Jason Dooley

Allocation of Attentional Resources When Presented With a Dual Task

**Advisors:** Dr. Dare Baldwin and Dr. Jeff Loucks

This study looks at two different types of action, featural and configural. To test how participants allocate attention, we used a dual-task design. This made it possible to investigate whether the detection of featural changes requires more attentional resources than the detection of configural changes. Participants watched two videos, the first of which depicted an actor doing an everyday action. The second video depicted the same basic action but with a change in the featural information of the action or a change in the configural information of the action. Half of the participants completed a subsequent task for which they paid attention to four rectangles changing around the video on the computer screen. We found that when presented with a dual-task, participants' detection of featural changes did not decrease more significantly than configural changes,  $F(1,38) = 4.608$ ,  $p = .05$ . These results may suggest that adults are more practiced at perceiving featural information.

## Brittany Dungan

## Category Learning and Visual Working Memory Capacity

**Advisors:** Dr. Ed Vogel and Andrew McCullough

Category learning is an important cognitive ability, yet no extensive study exists of individual differences in category learning. Here I extended the Posner, Goldsmith, and Welton (1967) dot pattern, distorted prototype task to multiple category set sizes, and set sizes of dots, and examined the correlation between visual working memory capacity and category learning. I then examined the relationship between working memory capacity and categorization in a second experiment, where subjects were asked to classify exemplars from two categories and then to perform a category change detection task. Subjects were presented with an exemplar from one category and then a new exemplar from either the same or a different category. Change detection accuracy tested greater for learned than for new categories. Visual working memory capacity in all experiments was estimated using a color change detection task (Luck & Vogel, 1997). Working memory capacity was negatively correlated with categorization accuracy, in set size two and four, and with change detection accuracy.

## Sarah Eckstein

### Severe Delinquency and Late Entry into Foster Care: An Ecological Perspective

**Advisors:** Dr. Philip Fisher and Dr. Pamela Birrell

Previous literature identifies associations between delinquency and increased frequency and severity of maltreatment, insecure attachment, deviant peer unions, foster care placement instability, school failure, and, most pertinently, late placement in foster care. The present study hypothesizes that entering foster care at an earlier age is linked with decreased severity of delinquency in a sample of 117 preschool aged foster children due to less frequent and severe maltreatment and less frequent residential and school transitions. Variables were measured by the Parent-Reported Child Behavior Checklist for delinquency and the local child welfare records were coded to provide the children's detailed maltreatment histories. Support for our hypothesis that late placement is associated with severe delinquency emerged from an ANOVA revealing that children who scored highly on severity of delinquency in any point during the 2.5 year study entered foster care significantly later than children who never displayed such severe delinquent behaviors. Further analysis failed to support our hypothesis however, given that a correlation between age of first placement in foster care and average severity of delinquency was insignificant ( $r=.021$ ). An ANOVA measuring delinquency difference between groups based on age of first placement in foster care revealed minimal differences between groups. Analysis of maltreatment incidence supports our hypothesis that maltreatment is associated with severe delinquency. We paradoxically found that children who entered foster care earlier experienced a higher average number of residential transitions. Given the limiting effects of our minimal variability of ages of first placement in foster care and the narrow age range of our subjects, we urge future researchers to select a sample with a wide range of ages of first placement in foster care so that greater insight to the full picture of the foster care experience can be assessed. Overall, findings warrant further exploration of this topic and all of the complex variables which require a closer look.

## Hale Forster

### Did You Bring It? The Effect of Ambiguous Stimulus Presentation on the Processing of Informational Prompts in Behavioral Interventions

**Advisors:** Ezra Markowitz and Dr. Sara Hodges

This study investigated the effectiveness of a two-step informational prompt strategy to increase reusable mug use in coffee shops. Based on previous work by Hansmann and Scholz (2003), it was proposed that pairing an ambiguous prompt with a disambiguating informational prompt could result in behavior change, even for behaviors where traditional informational prompts prove ineffective. The simultaneously paired prompts resulted in a 9% increase in the likelihood of an individual bringing a mug, compared to a single informational prompt, which did not result in any significant behavior change. In the sequential condition, while the ambiguous prompt alone did not increase the probability of mug use, the probability of mug use increased by 16% when the informational prompt was added. Possible psychological mechanisms, the benefits of logistic regression for modeling person-level effects, and implications for further research are considered.

## **Laura Gramcko**

Defining Trauma from a College Student's Perspective

**Advisors:** Laura Kaehler and Dr. Jennifer Freyd

The current professional definition of psychological trauma is in flux, with much debate and disagreement between professionals over how to define this construct. The current study looks at how college students define trauma, in order to build a preliminary understanding of its colloquial definition, while also examining betrayal trauma's affect of individuals' definition. The 278 participants rated events for their degree of trauma and they rated what emotions were associated with each event. In addition, participants also provided betrayal trauma histories. Results indicate that betrayal trauma history affects individuals' perception of trauma. Betrayal trauma history also affects individuals' perception of betrayal in a hypothetical situation. The emotions of fear and helplessness are associated with traumatic events, in agreement with the *DSM-IV-TR*'s definition of trauma. Perception of betrayal, however, was not related to events participants considered traumatic. Trauma history's effect on individual definitions of trauma has important implications for the definition of trauma, in that perhaps a definition is so controversial because individual experience changes opinion. Future research on hypothetical events and trauma classification is needed to gain a full understanding of a colloquial definition of trauma, and this understanding can subsequently have practical effects on the professional definition of trauma.

## **Killian Kleffner-Canucci**

The Relationship Between Speech and Action During Serial Task Control

**Advisor:** Dr. Ulrich Mayr

Mayr (2009) found substantial response-time (RT) costs associated with lag-2 repetitions within a repeating sequence of tasks, even when given relatively long time intervals between responses (~1000ms). To understand the lag-2 RT costs the temporal relationship between speech and action was focused on to find a) participant's natural timing of speech in relation to action and b) if changing that timing improves performance. In the first condition where participants spoke the relevant task in an unconstrained manner, the speech was completely aligned with their responses. The unconstrained speaking condition did not show a difference in RT pattern from participants who did not speak at all. In the second condition where participants had to speak the current task aloud before the stimulus appeared, the expected RT cost pattern completely disappeared. Moreover, participant's overall RT's were reduced. While other research indicated that speech is important in implementing action, this study showed that it is particularly speaking in advance of action that will enhance performance (Bryck & Mary, 2005; Kray, 2009).

## **Emily Walden**

### Betrayal Trauma Subtype Differences in Childhood Best Friendship Quality

**Advisors:** Dr. Lou Moses and Mary Ann Winter-Messiers

Research on betrayal trauma subtype differences and negative outcomes is necessary in developing preventions and interventions. I examined the relationship of childhood betrayal trauma history and best friendship quality and hypothesized that BT would predict lower friendship quality. I also hypothesized that there would be friendship quality differences among betrayal trauma subtypes and that friendship quality would differ for men and women. Participants consisted of 182 women, 78 men, and 5 participants who gave no response of gender (N = 265). Participants reported online on childhood experiences of BT through the Brief Betrayal Trauma Survey (Goldberg & Freyd, 2006) and childhood best friendship quality through the Friendship Quality Questionnaire (Parker & Asher, 1993). I found that as physical abuse experiences increased in frequency, best friendship quality scores decreased. I also examined subtype differences in friendship quality. In addition, I also found that women had higher friendship quality scores than men.

## **Adrian Yupanqui**

### Emotion Regulation and Interpersonal Perception: How Emotion Regulation Affects How People Are Seen By Others

**Advisor:** Dr. Sanjay Srivastava

Emotion regulation allows people to use strategies that alter emotional experiences and expressive behavior. Prior research has looked into the effects of emotion regulation strategies on social interactions, showing that different strategies have different consequences for closeness and social support. The present study looked at the role of interpersonal perception in explaining these effects. Specifically, it examined how emotion regulation strategies affect the way the regulator perceives the personalities of other people during a social interaction. Participants were put into small groups for a facilitated social interaction. After the interaction, we assessed the participants' perceptions of one another's personalities. Expressive suppression, an emotion regulation strategy in which people try not to show the emotions that they are feeling, predicted others' perceptions of the suppressor. Specifically, we found that people who suppress their emotions are seen as less extraverted, less agreeable, and more neurotic. These perceptions may help explain why suppressors often receive less social support from others.