MITOCHONDRIAL DNA VARIATION IN THE EASTERN FOX SQUIRREL (*SCIURUS NIGER*). N. D. Moncrief, VA Museum of Natural History, 21 Starling Ave., Martinsville Virginia 24112 & R. A. Van Den Bussche, Department of Zoology, Oklahoma State University, Stillwater OK 74078. The eastern fox squirrel (*Sciurus niger*) occurs naturally over most of eastern North America. This species displays striking patterns of geographic variation in size and coat color. These patterns of morphologic variation are consistent with a hypothesis of southward range contraction and isolation in two refugia (in Texas and Florida) during the Last Glacial Maximum, followed by northward range expansion after the glaciers receded. Similar hypotheses have been proposed to explain the patterns in phylogeographic structure exhibited by many plants and animals in eastern North America. As part of a more comprehensive study of geographic variation in *Sciurus niger*, we analyzed a 402 bp segment of the cytochrome b (cyt b) mtDNA gene in populations throughout the species' range. Despite the broad geographic sampling in our study, there was no phylogeographic structure in our data. Unique haplotypes differed from high-frequency haplotypes by only one or two base pairs, producing a star-like phylogeny of haplotypes. Bootstrap analysis of neighbor-joining trees revealed a lack of phylogenetic structure among haplotypes. Variation within populations and within the species as a whole was characterized by high haplotype diversity and low nucleotide diversity. Taken together, our data indicate that the eastern fox squirrel underwent a rapid range expansion and rapid morphological divergence within the past 20,000 years.

Psychology

INTERHEMISPHERIC COLLABORATION: EFFECTS OF STIMULUS FORMAT AND TASK PROCESSING SIMILARITY. Urvi J. Patel, Dept. of Psych., Christopher Newport Univ., Newport News VA 23606. Observers were presented with a five stimuli array; two items above the point of fixation (one to each visual field), one item below the point of fixation (to one visual field), and two items directly above the other at the point of fixation (to both visual fields). During each experiment, observers engaged in three conditions: (1) responded to whether the bottom stimulus matched either of the top two stimuli (single primary task), (2) responded to whether the two center stimuli matched (single secondary task), and (3) responded to the primary stimuli OR to the secondary stimuli as prompted by a post-stimulus cue (dual task). While all letter stimuli were presented for Experiment 1, Experiment 2 displayed letter primary stimuli and picture secondary stimuli. Performance on the single and dual primary trials was of principal interest. The critical comparison involved trials on which the two matching stimuli projected to the same visual field (within-hemisphere trials) versus trials on which the two matching stimuli projected to opposite visual fields (across-hemisphere trials). While no difference between trials was found when the dual task involved stimuli of different format, an across hemisphere advantage was found when the dual task involved stimuli of the same format. Processing similarity of stimulus format may determine whether the benefits to spreading the processing load between the two hemispheres outweigh the costs.

ARE DIFFERENT PEOPLE SUSCEPTIBLE TO DIFFERENT DISTRACTIONS? THE RELATIONSHIP BETWEEN LEARNING STYLES AND PERFORMANCE UNDER DISTRACTING TASK CONDITIONS. Rachel R. Phillips & Poornima Madhavan, Dept. of Psych, Old Dominion University, Norfolk VA 23529. In order to examine the relationship between learning styles and performance for a complex visual search task under distracted and undistracted conditions, eighty participants completed two complex visual search tasks, one with distraction and one without (the conditions were counter-balanced). Distractions were presented either auditorially or visually, and were either verbal or spatial in nature. This was a 2 (perceptual modality: auditory vs. visual) x 2 (processing code: verbal vs. spatial) x 2 (distraction: distracted vs. undistracted) mixed design. Results for hit rates revealed that participants scoring high in the verbal dimension performed differently than those scoring high in the visual dimension depending on distraction and condition. Hit rates for those classified as sensors varied differently when distracted versus undistracted than those classified as intuitors which also varied as a result of gender. Results for false alarm rates revealed that those in the sensing dimension performed better when distracted but those in the intuiting dimension performed worse. Analyses for false alarms also revealed that males and females performed differently when distracted versus undistracted and that this varied by condition. Finally, in addition to the overall sensing and intuiting dimension differences for false alarms, this also varied with gender and distracted condition. These findings have implications for the development of training programs, computer automation, and contribute to the overall understanding of the influence of individual processing preferences on performance.

EMERGENT LEADERSHIP AND TEAM PERFORMANCE AS A FUNCTION OF TASK DIFFICULTY IN A DISTRIBUTED COMPUTER GAME-BASED ARCHITECTURE. Alexandra B. Proaps & James P. Bliss, Dept. of Psychology, Old Dominion University, Norfolk, VA, 23529. Specialized military field training can be expensive, time-consuming and dangerous. The use of computer game-based architectures may help provide a safe, controlled environment in which geographically dispersed military units (i.e., distributed) can develop decision-making and leadership skills while rehearsing a specific task, such as building clearing, area reconnaissance, or navigation. Leaders of distributed teams need to know how to perform to overcome the challenges involved in these virtual environment contexts. Current research shows there are implications of task difficulty on how distributed team members emerge as leaders within virtual environments. The purpose of the proposed study was to investigate the possible relationship between task difficulty with team task performance and emergent leadership during a team search task using a modified version of the popular video game, Half Life 2™. The experimenters determined that task difficulty decreased the speed with which the task was completed and that the gender composition of the dyad had an effect on accuracy and speed. The experimenters also found dyad members rated each other as sharing the overall contribution to the task. Dyad members did rate one member of the team as the overall leader, but their rating of leadership did not change based on task difficulty.

AN INVESTIGATION OF TRAINING INCENTIVES IN IMPORVING PERFORMANCE ON COMPLEX TASKS. Patricia C. Brennan & Poornima Madhavan, Dept. of Psyc., Old Dominion Univ., Norfolk VA 23507. Incentives not only serve as extrinsic motivation for a particular task, but also manipulate people to behave a certain way. We are interested in studying how framed incentive structures may have training implications in a visual search task such as airline luggage screening. The framed incentive structures are a representation of choices in either a positive (rewards) or negative frame (punishment) in which points are given or taken away to influence detection behavior in finding weapons across two phases – training (familiar targets) and transfer (novel targets). We are only interested in performance during transfer due to the real world implications. Participants are presented with the context of being an airport luggage screener with points for hits, misses, false alarms and correct rejections, which serve as incentive structures. The goal is to improve the design of training programs for operators in applied visual search tasks, particularly airport luggage screening. We found that providing incentives does enhance performance in maximizing hits, in which the hit-sensitive and miss-sensitive outperformed the equal-costs and no-incentives groups. However, the control group outperformed all other groups in transfer because they were able to self-train thus conjure up their own representation of a weapon. In all the control group had the highest rate of hits, highest overall confidence, lowest rate of false alarms and fastest response times.

EXAMINING THE HINDSIGHT BIAS EFFECT DURING JUDGMENTS OF TRUST. Martin D. Smith-Rodden & Ivan K. Ash, Dept. of Psychology, Old Dominion University, Norfolk, VA. 23529. The Hindsight Bias Effect (HSE) describes people's tendency to overestimate their own ability to predict an event once an event's outcome is known. HSE has been shown to be a ubiquitous, reliable, and potentially harmful retrospective judgment bias. The purpose of this research was to examine participants' evaluations of trust outcomes, to determine how judgments of trust might be susceptible to hindsight biases, in two experiments. Subjects were exposed to fictional vignettes about interpersonal trust: one about a small money loan (N=120), and in the second experiment, one depicting a small business hiring decision (N=122). To manipulate subject's surprise at outcome, stories were controlled for congruency (i.e. degree of trustworthiness of target, versus the outcome, in which the target either upholds trust or defects). Subjects were polled for their opinions on the target's trustworthiness just prior to learning the outcome, and again for their recollections of that opinion in a post-test administered exactly one week later. Results were analyzed in a 2 (pretest/post-test) X 2 (Target is trustworthy/Target is non-trustworthy) X2 (Trust upheld/ Defection) mixed design. Increased hindsight bias was observed on unexpected outcomes and no/reverse hindsight bias on expected outcomes in a significant interaction predicted by the Sense-making model of hindsight bias. However, in Experiment 1 we did not observe hindsight bias in the condition where the story's target unexpectedly failed to uphold trust. This may be because participants interpreted the failure to pay back a loan as a "non-event," as previous research has shown abated hindsight bias effects for these types of "non-event" outcomes.

ALCOHOL AND INJURY: DEFINING THE ALCOHOL PROBLEM ON COLLEGE CAMPUSES. Diane A. Kokorelis & Bryan E. Porter, Dept. of Psychology, Old Dominion University, Norfolk VA 23529. Unintentional injuries, particularly motor vehicle crashes, are the leading cause of death among 1-44 year olds. A particularly large portion of these crashes are caused by young males under the influence of alcohol. This study looks to gather and examine the knowledge and attitudes concerning alcohol and drinking and driving among students at a southeastern Virginia university in order to create an appropriate intervention on campus. Data were collected from 310 psychology undergraduates, 199 being female and approximately 55.2% being Caucasian. Multiple correlations and one regression were conducted to assess the relationship between alcohol consumption and the threat and efficacy components of the Risk Behavior Diagnosis Scale concerning the consumption of alcohol as well as drinking and driving. Results indicate that while students' levels of drinking correlate with levels of threat, the same does not hold true for their levels of efficacy. Further, CDC-classified binge drinkers feel as though their behavior does not pose a serious threat, nor do they think they can alter their drinking behaviors. The results also suggest that the more students drink, the more likely they are to drink and drive. Finally, there was no significance found between each gender's uses of a designated driver.

A THEORETICAL MODEL FOR RELIGION'S ROLE ON DOMINANCE DIFFERENCES IN GENDER. Julia R. Quigley, Dept. of Psychology, Christopher Newport University, Newport News, VA 23606. This study presents a theoretical model to explain the potential relationship between religion, gender schemas, and dominance. Social learning theories and research show that religion creates gender schemas with associated dominance differences in the sexes. The prescribed dominance patterns in the sexes could lead to unintended consequences, such as pay scale differences, anorexia, and poor academic performance.

STUCK IN THE MIDDLE WITH YOU: THE EFFECT OF BIRTH ORDER ON CREATIVITY. Laura Boettcher & Gayle Dow, Psychology. Department, Christopher Newport University, Newport News, VA 23606. Birth order has been found to play an important role in how participants perform on creativity measures. The purpose of this study was to investigate the impact of birth order (youngest, middle, and oldest) on verbal measures of creativity. Forty-one undergraduates from a liberal arts university completed a creativity assessment, specifically the Remote Associates Test (RAT), and a measure of demographics, including birth order. There was a significant main effect of birth order on creativity (middle-born out performed youngest-born).

CREATIVITY AND COGNITIVE FLEXIBILITY. Julie F. Erath & Urvi J. Patel, Dept. of Psych., Christopher Newport Univ., Newport News VA 23606. A number of studies have reported a positive relationship between creativity and cognitive flexibility. Creativity may be defined as the ability to use diverse manners of thought to generate novel and dynamic ideas and solutions. Consistent with such a mode of processing, cognitive flexibility is the ability to restructure knowledge in a manner that allows ease in task shifting. The present study was designed to investigate how this relationship may be influenced by verbal ability (i.e., vocabulary knowledge and the

ability to reason by way of such knowledge). Four verbal measures were administered to 47 undergraduate students to evaluate how the following constructs interrelate: creativity (Remote Associates Test), cognitive flexibility (self-report Cognitive Flexibility Scale), and verbal ability (Shipley Vocabulary Test and Homographs Task). Correlation analyses revealed a significant positive relationship between select measures of interest. Specifically, verbal knowledge and reasoning may influence one's ability to generate novel solutions which, in turn, may be associated with adaptability to different tasks. These results are consistent with the findings of previous studies and make a unique contribution to the literature by suggesting that verbal ability may facilitate the relationship between cognitive flexibility and creativity.

AN INVESTIGATION OF EATING PATTERNS AND WOMEN'S BODY OBJECTIFICATION. Whitney N. Kailos, Dept. of Psychology, Christopher Newport University, Newport News, VA 23606. The current study investigates the relation between college women's eating patterns and behaviors in retrospect to certain influential factors such as body objectification. Through the social comparison theory women may either objectify or subjectify their bodies leading to abnormal eating behaviors. College women presumably concern themselves with weight, body scrutiny, and social status which may encourage food restriction and eating disorders. This study used published literature to further examine women in a college setting to determine the reasons behind their eating behaviors.

ASSOCIATION STUDY BETWEEN GABA RECEPTOR GENES AND ANXIETY DISORDERS. Xuan T. Pham & John M. Hettema, Dept. of Psychiatry. Virginia Commonwealth Univ., Richmond VA 23220. Human anxiety disorders are complex diseases with relatively unknown etiology. Dysfunction of the GABA system has been implicated in many neuropsychiatric disorders, including anxiety and depression. In this investigation, we explored four GABA receptor genes for their possible associations with genetic risk for anxiety disorders. Using multivariate structural equation modeling, we selected twin subjects scoring at the extremes of a latent genetic risk factor shared by neuroticism, several anxiety disorders, and major depression from a large population-based twin sample. Our study sample consisted of 589 cases and 539 controls (n=1128), which we subjected to a two-stage association study. In stage 1, all genetic markers were screened, the positive results of which were tested for replication in stage 2. We genotyped altogether 26 single nucleotide polymorphisms (SNPs) from the four GABA receptor genes (*GABRA2, GABRG2, GABRA6,* or *GABRA3)*. Of the 26 SNPs genotyped in stage 1, we identified 2 markers in the *GABRA3* gene that met the threshold ($p \leq .1$) to be tested in stage 2. These two markers, along with an additional two, failed to replicate in stage 2. Haplotype associations for this gene showed no significance across all haplotype combinations. Our findings did not show sex-specific associations for any of the markers on *GABRA3*. Our 2-stage association design did not reveal association for in anxiety disorders. The full extent to which polymorphisms in the GABA system may affect the genetic predisposition for anxiety disorders still remains to be elucidated.

TRAIN YOUR BRAIN TO BEHAVE: CLINICAL APPLICATIONS OF NEUROFEEDBACK. Kathryn. N. Hoey, Dept. of Psychology, Christopher Newport University, Newport News, VA 23606. Neurofeedback (NF) is an operant-conditioning system, known as neuroregulation, which teaches individuals how to control or change their own brain activity. When an individual is diagnosed with a disorder that can be treated via neurofeedback, that patient can then seek out a clinical psychologist or other practicing therapist for neurofeedback treatment. The therapist will begin the treatment with a comprehensive qualitative EEG (qEEG) to gather the data necessary in order to devise a treatment program for that particular patient. Disorders that can be treated using neurofeedback include but are not limited to ADHD, cerebral palsy, migraines, and epilepsy. Each disorder is treated with specific neurofeedback protocols that target specific areas of the brain in order to achieve a specific change in brain functioning.

Statistics

SUPPORT VECTOR MACHINES WITH THE RAMP LOSS AND THE HARD MARGIN LOSS. J.P. Brooks, Dept. of Stat. Sci. and O.R., Virginia Commonwealth University, Richmond, VA 23284. The support vector machine (SVM) is a well-established method for classification based on an approach that emphasizes minimizing misclassification error while maximizing the distance between sets of correctly classified observations. In training models, SVM uses a measure of error that is based on the Euclidean distance of observations from the separating surface. In the interest of increasing the robustness of SVM, we present two new integer programming formulations that incorporate the ramp loss and the hard margin loss, respectively. These formulations are able to accommodate nonlinear kernel functions that have made traditional SVM popular. The consistency of SVM with these loss functions is established. Analysis of simulated and real-world data sets indicates that Ramp Loss SVM is preferred over both Hard Margin Loss SVM and the traditional Hinge Loss SVM in the presence of outliers when a low-rank kernel function is employed.

EVALUATING STATISTICAL SIGNIFICANCE IN SUPERSATURATED DESIGNS. David J. Edwards, Dept. of Statistical Sciences and Operations Research, Virginia Commonwealth University, Richmond, VA 23284 & Robert W. Mee, Dept. of Statistics, Operations, and Management Science, Univ. of Tennessee, Knoxville, TN 37996. Two-level supersaturated designs (SSDs) are designs that examine more than n-1 factors in n runs. Although literature involving the construction of SSDs is plentiful, less has been written about analysis of data from these designs. Perhaps this is due in large part to the dearth of actual applications. Whether using forward selection or all-subsets regression, it is easy to select models from SSDs that explain a very large percentage of the total variation. Hence, naïve p-values can persuade the user that included factors are indeed active. We propose the use of a global model randomization test in conjunction with all-subsets to more appropriately select candidate models of interest. For settings where the number of factors is too large for repeated use of all-subsets to be applied repeatedly, we propose a short-cut