

Psychology

N-400 RESPONSES TO LINGUISTIC ANOMALIES. Amy L. Adamson, Jon C. Yeargau, and Thomas P. Urbach, Dept. of Psychology, Washington and Lee University, Lexington, VA, 24450. This partial replication of a study carried out by Neville *et al.* (1991) uses event-related potentials (ERPs) to investigate different sentence processing classes. Two types of sentence stimuli were used, one containing a semantic anomaly and the other containing a phrase structure violation, each with their respective controls. Ten subjects read the sentences presented word-by-word at an SOA of 550 msec. As in the original study, a negative peak (N400) was found focused around 400 msec. following the onset of the semantically anomalous word in the first condition. Neville *et al.* reported that phrase structure violations elicited a left frontal negativity (LFN) at a latency of approximately 400 msec, followed by a large positive deflection between 500-700 msec. This late positivity was uninterpretable in their study because it coincided with the onset of the next word in the sentence. The LFN was not reliable in the present study but the late positivity was quite robust. Furthermore, since the positive deflection in the present study was significant between 450 and 550 msec post-onset, i.e., prior to the onset of the subsequent word, it can be attributed directly to the phrase structure violation.

SAFETY BELT USE VERSUS VEHICLE SPEED: A TEST OF RISK HOMEOSTASIS. Joanne M. Benedetto, John P. Jones, Tamara L. Jantz, & Thomas E. Trail. Dept. of Psychology, Va. Polytechnic Inst. and State Univ., Blacksburg, VA 24061. Risk homeostasis theory (Wilde, 1982) contends that an individual maintains a certain level of acceptable risk which influences behavior following the use of safety devices. For example, a person who buckles a safety belt (to comply with a belt use law) will feel safer and drive faster to maintain risk homeostasis. We tested this theory on a frequently traveled access road to a college campus with a speed limit of twenty-five miles per hour. This study assumed that drivers would manipulate safety belt use and vehicle speed to adjust their level of risk. The gender of the drivers was compared for differences, on the assumption that women who use their safety belts would drive faster than males who use their safety belts, based on the results of Preusser *et al.* (1991). Relevant results are discussed, as well as implications for future studies.

Employee Attitudes about the Performance Appraisal Process: Development of the Performance Appraisal Attitude Questionnaire. Andrea E. Berndt & Terry L. Dickinson, Old Dominion University, Norfolk, VA 23529.

Employees often place great significance on the performance appraisal process and its results. This emphasis by employees reflects intense feelings and attitudes about the performance appraisal process. Factors believed to influence employee attitudes include characteristics of the performance appraisal system, the organization, and individual differences. The current research produced and evaluated a questionnaire composed of 16 subscales representing the factors believed to measure performance appraisal attitudes. Data were collected from 100 participants (47 males, 53 females) representing a wide variety of organizations and occupations. Results from a principal components factor analysis indicated that 12 of the 16 subscales extracted single factors. Two factors were extracted from the Anxiety subscale, one measuring components of employee anxiety and the other, employees' need for achievement about the performance appraisal process. The subscale, Performance Review, also extracted two factors - one that measured the adequacy of the performance review meeting, and another that measured the supervisor's contribution at the performance review. The remaining two subscales extracted more than two factors and will require revisions due to their complexity. Overall, the questionnaire appeared to measure many of the factors that influence employee attitudes about the performance appraisal process. Future research is intended with a larger sample for validation purposes and a total-item factor analysis.

SENSATION SEEKING AND DURABLE RELATIONSHIPS: A STUDY OF MARRIAGE ENCOUNTER COUPLES. Marian Bradshaw, Becky Bacheller, Stuart Snell and James O'Brien, Social Sciences, Tidewater Cmnty. Col., Va. Beach, Va. 23456. A few studies indicate satisfactory marriages are associated with congruent sensation seeking between spouses as measured by Total Sensation Seeking Score (SSS) and each of its 4 subscales: Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Boredom Susceptibility (BS), and Disinhibition (DIS). To see whether such congruency characterizes older couples with longer marriages and evidence of working on their relationship; 50 Marriage Encounter (ME) couples living in Va. Beach, VA. were randomly selected to receive a mailed personal data form and Zuckerman's Sensation Seeking Scale U (Revised); 12 couples responded. Q-sort results for marital satisfaction/dissatisfaction showed 19 of 24 subjects satisfied, 0 dissatisfied, and 5 not reliably classifiable. However, no significant correlations were found between matched spouse's scores on SSS, or 3 subscales, contrary to the literature for younger couples with shorter marriages. DIS score results show ME spouses are not only highly congruent but also score extremely low for their age groups. Perhaps, longer marriages are characterized by more acceptance of differences because of higher realistic spousal trust.

STRATEGY SELECTION BY RATS LEARNING A PLACE AND CUE TASK. Damani N. Bryant, Christine M. Grandinetti*, Charles B. Ireland*, Amanda E. Keegan*, and Leonard E. Jarrard, Dept. of Psychology., Washington and Lee University., Lexington, Va. 24450.

Rats were trained on a 8 arm radial maze that simultaneously tested for the utilization of place and cue strategies. Determination of strategy selection was based on an analysis of the patterns of arm selection. Previous research suggests that rats prefer, when given the option, to utilize spatial information as opposed to cue information. The results of the current study do not support these findings. These results will be discussed as they relate to previous research.

USING SOCIAL PROMPTS TO INCREASE STAIR SAFETY IN A UNIVERSITY SETTING. Curt M. Buermeyer, Lynn C. Previ, Keith Pitzer, Helene D. Woolfolke, & E. Scott Geller. Dept. of Psychology, Va. Polytechnic Inst. and State Univ., Blacksburg, VA 24061. Of the countless accidental injuries which occur each year, a considerable amount are due to falls. Many of these falls occur on stairs. Because research on this topic is vacant, yet important regarding preventative health issues, this study was designed to discover and expose frequencies of various stair behaviors, and to develop effective interventions to increase safety on stairs. Baseline data on was collected on stair behaviors and subject characteristics, including hand rail use, speed of ascent or descent, gender, skipping of steps, shoe type, direction of travel, and availability of hands while on the stairs. An intervention was then implemented to increase hand rail use. The intervention consisted of a research assistant (either male or female) holding a visual prompt which read "Please be safe and hold the handrail". The sign was directed at stair-users ascending or descending on the stairs until data on 25 subjects had been collected in each direction by a research assistant. Results are discussed, as well as relevant implications for future stair safety research.

DEVELOPMENTAL AND INTERFERENCE EFFECTS ON SPATIAL MEMORY. Charles H. Campbell, Jr., Doug Kaufmann*, David G. Elmes, and Joseph B. Thompson*, Dept. of Psychology, Washington and Lee Univ., Lexington, VA 24450. In the present study, developmental and retroactive interference effects on spatial memory were studied through the use of the SNITCH computer program, which presents the subject an array of either icons or words which is to be studied. The subject is asked to recognize and relocate one item which was removed from the array. In all studies performed, the recognition and relocation for pictures was better than for words, which agrees with earlier studies on spatial memory. Developmental effects were found, as college students were able to recognize and relocate the icons and words better than 5th graders. Earlier studies had not found developmental effects for the relocation of words. The present study was unable to support earlier work done in this lab, which found that interference effects are greater the more similar the target task is to the interference task. Although there was less interference when the target and interference tasks were dissimilar, the results were not statistically significant.

DECISION-MAKING IN HIERARCHICAL TEAMS: THE EFFECTS OF COGNITIVE FRAMING AND PERCEIVED CONTROL ON THE RISK-TAKING OF SUBORDINATES. Fleta K. Collier & Debra A. Major, Dept. of Psyc., Old Dominion Univ., Norfolk, Va. 23529. A computer simulation, TIDE 2, was used to test the effects of gain v. loss frames and perceived control on the risk taking of subordinate team members engaged in a naval command and control simulation. Male and female undergraduate management students (N=104) formed 26 teams of three subordinates and one leader. As predicted, subordinates' perceived control was significantly less than that of team leaders. However contrary to expectations, subordinates advocated significantly greater risk taking than team leaders. Frame and perceived control had main effects on subordinate risk taking. Subordinates working under loss frames were more likely to take risks than those working under gain frames. Subordinates were more likely to take risks when they perceived greater control.

ROLE OF HIPPOCAMPUS IN CONCURRENT ODOR DISCRIMINATION. Jay E. Cross, Amy M. James, Heather, E. Schader, Tim E. Thompson, and Leonard E. Jarrard, Dept. of Psychol., Washington & Lee Univ., Lexington, VA. 24450.

The performances of normal rats and that of rats with lesions to either the hippocampus or entorhinal cortex were tested on an olfactory concurrent discrimination task. The task involved choosing the correct (rewarded) odor out of the 2 presented in a Y-shaped maze. A total of 4 odor pairs existed. All of the odorants remained in the same paired groups throughout the experiment and the rewarded odorants were never changed. No significant differences were found between the abilities of the 3 separate sets of rats. However, the mean scores throughout the experiment were relatively low for each group which suggests that the rats were unable to learn the discriminations from the beginning. For this reason, more thorough tests of this type should be performed before any theories relating to hippocampus' role in olfactory discrimination can be solidified.

ANALYSIS OF EVENT-RELATED POTENTIALS TO TASK-IRRELEVANT AUDITORY STIMULI DURING MONITORING TASKS. Stephen G. Cunningham, Fred G. Freeman, Mark Scerbo, Dept. of Psych., Old Dominion Univ., Norfolk, Va. 23529, & Debbie S. Bartolome, Lockheed Engineering & Sciences Co. Ten subjects participated in two vigilance tasks of different levels of mental difficulty, while event-related potentials (ERPs) were recorded in response to task-irrelevant auditory tones during each task. A repeated measures ANOVA indicated no difference between the ERP components produced by the unattended tones during the cognitive task and the perceptual task. It was demonstrated, however, that a signal's relevance to a task is required to elicit observable changes in the ERP waveform, specifically the P300 component. Further, it was demonstrated that lower stimulus presentation rates markedly enhanced the amplitude of the N1-P2 component in each task. The findings also suggest that the presentation rate of the stimulus seems to affect the ERP waveform more dramatically than the stimulus intensity. Additional research employing current brain mapping technology is needed to better understand the relationship between ERP components and attentional states.

BEVERAGE SELECTION AND ITS RELATIONSHIP TO SUBSEQUENT INTOXICATION AT A UNIVERSITY PARTY. Jeannette C. Davis, Kim A. Jaxthimer, D. Steve Roberts, Kent E. Glindemann, Dept. of Psychology, Va. Polytechnic Inst. and State Univ., Blacksburg, VA 24061. A question of interest in the field of alcohol research is whether the type and brand of alcoholic beverage that an individual consumes will influence his or her subsequent level of intoxication. It is hypothesized that they do, and that the resulting relationship is moderated by various personal and environmental antecedents and contingencies. Subjects age 21 and above were recruited voluntarily from a pool of fraternity brothers and guests at a party of the national fraternity. Upon entrance to the party, prospective subjects' Blood Alcohol Concentration (BAC) were assessed using an Alco-Sensor III breathalyzer. Subjects were brought two at a time into an experimental room, where they proceeded to complete a questionnaire regarding their beverage selection. The questionnaire covered areas of selection, amount of consumption, intentions, and estimates of their BAC. Upon completion of the questionnaire subjects' BACs were again assessed by means of a breathalyzer. Relevant results are discussed, as well as implications for future studies.

A CULTURE-FREE LEARNING TASK? Kathy L. Ferrell, Allison K. Hyko, and David G. Elmes, Dept. of Psychology, Washington and Lee University, Lexington, VA 24450. These experiments examined differences between procedural and declarative memory. The first study used semaphore figures as a culture-free learning task. Subjects were shown lists of clock times and corresponding semaphore figures and asked to recall the times and draw the figures. Recall of clock times was considered representative of declarative knowledge, and the drawing of the semaphore figures was considered representative of procedural knowledge. More clock times were recalled than the number of figures drawn, indicating that declarative knowledge is easier to remember. A follow-up experiment investigated instructional manipulation and culture-free learning. Subjects were shown times and told to visualize them on a clock face, and then recalled them or drew them on a clock face. There was not a significant difference between recall and drawing. Across the two experiments, there was a significant difference between the drawing of the times on the clock and the drawing of the semaphore figures. The claim of a culture-free learning task in this experiment is not supported.

REACTIONS TO THERAPEUTIC TOUCH. Nichol T. Fisher and Valerian Derlega, Dept. of Psychology, Old Dominion University, Norfolk, VA 23529. Adult reactions to therapeutic touch were examined. Eighteen male students and 46 female students were divided into four subject groups. Each subject group observed a photograph of a nurse touching a male patient, a nurse touching a female patient, a nurse standing at the bedside of a male patient, or a nurse standing at the bedside of a female patient. Responses to the photographs were obtained with the use of a questionnaire. Results indicated that females observed being touched were perceived to be more anxious and uncomfortable than males observed being touched. Touch was perceived to have a significant effect on the anxiety of a patient.

THE RELATIONSHIP BETWEEN PSYCHOLOGICAL ANDROGyny AND PERFORMANCE ON PIAGETIAN SPATIAL TASKS IN COLLEGE WOMEN. Kimberly Lynn Gladysz, Dept. of Psychology, Washington and Lee Univ., Lexington, Va. 24450. Past research has shown that males typically perform better than females on Piagetian spatial tasks. Other studies indicate that when a task is labelled "masculine" or "feminine", subjects tend to perform better in the "sex-appropriate" condition. This study presented the Piagetian spatial tasks in the traditional fashion as well as in a feminine typed condition. Sex-role identity rather than gender was examined in relation to spatial skills. Ninety college women completed the Bem Sex Role Inventory; it was hypothesized that the androgenous typed females would perform equally well in both the masculine and the feminine typed conditions. The rules of horizontality and verticality were explicitly stated upon completion of the first set of tasks to determine whether those subjects who had failed, would then learn and apply the information in subsequent tasks. Results suggest that androgenous individuals were better able to apply the given rules in subsequent tasks.

GENDER DIFFERENCES AND THE EFFECTS OF OVERALL AND SITUATIONAL SELF-ESTEEM ON HELP-SEEKING BEHAVIOR. Jennifer S. Hoffman and Barbara Winstead, Dept of Psychology, Old Dominion Univ., Norfolk, VA 23529. The relationship between overall and situational self-esteem and help-seeking is investigated with regard to gender differences. One hundred and six (36 males and 70 females) undergraduate students, ages 17 - 47, volunteered as subjects. To obtain measures of overall and situational self-esteem and help-seeking, subjects completed Rosenberg's (1965) Self-Esteem Scale, Shrauger's (1990) Personal Evaluation Inventory, and the SEEK questionnaire (Conn & Peterson, 1989). Self-esteem is measured as an overall concept and as a situational concept. The results indicate partial support for the cognitive consistency theory for situational self-esteem, but support for the vulnerability theory for overall self-esteem was not established. No significant gender differences were demonstrated.

ON THE INVOLVEMENT OF THE CAUDATE NUCLEUS IN A COMPLEX PLACE AND CUE RADIAL MAZE TASK Allison K. Hyko, Jennifer Peszka*, Stephen Davenport*, and Leonard E. Jarrard, Dept. of Psychology, Washington and Lee University, Lexington, VA 24450. This experiment examined the effect of caudate nucleus lesions on the acquisition of a complex place and cue radial maze task. The purpose of this study was to provide further evidence that supports the hypothesis of dual memory systems in the brain. It has been suggested that the hippocampus and the caudate nucleus regulate different types of memory processes. Previous research on a similar task showed that animals with lesions of the hippocampus were impaired on the place and not the cue task. It was hypothesized that the animals with lesions of the caudate nucleus would be impaired on the cue and not the place task. This finding would provide another double-dissociation of the functions of the hippocampus and the caudate nucleus in memory. However, the results did not indicate that the animals with caudate nucleus lesions were selectively impaired on the cue task. The caudate nucleus lesioned animals were instead impaired on the general acquisition of the radial maze task.

THE EFFECTS OF SELF-EFFICACY AND SITUATION OUTCOME ON PERCEPTION OF OTHERS. Heidi E. Jacobsen, Rita E. Frank*, Donald G. Wolfgang*, and Althia V. Woodson-Robinson*, Dept. of Psych., Va. Wesleyan College, Norfolk, VA, 23502-5599. The way in which perception of others is related to self-efficacy and situation outcome was investigated in this study. Each of the 32 male subjects was given the Self-efficacy Scale to complete and then the subjects were placed into cells according to whether they exhibited high or low self-efficacy. A situation in which the subject's success or failure was manipulated was then introduced with half of each of the low and high efficacy groups being placed in the success situation and half in the failure situation. The perception that the subjects had of others was then measured and neither main effect for situation outcome nor for self-efficacy was found to be significant. The interaction between self-efficacy and situation outcome was also insignificant. The study concludes with an evaluation of the study and with suggestions for the course of future studies dealing with this topic.

SENSATION SEEKING, PERSONALITY, AND ALCOHOL INTOXICATION: PREDICTING LEVELS OF IMPAIRMENT AT UNIVERSITY PARTIES. John P. Jones, Joanne M. Benedetto, Amy E. Molnar, & Brandon Fallon, Dept. of Psychology, Va. Polytechnic Inst. and State Univ., Blacksburg, Va. 24061. Several personality variables (sensation seeking and locus of control) were investigated in a pilot study to identify a possible relationship between them and increased alcohol consumption. Rotter's Locus of Control Scale and Zuckerman's Sensation Seeking Scale were administered to eleven fraternity members (of legal age) at a weekend social function. After the social function, their Blood Alcohol Concentration (BAC) were ascertained using a Datamaster II breathalyzer. Results indicate that locus of control was significantly related to increased BAC, $r = .63$, $p < .05$. A significant relationship between sensation seeking and increased BAC, however, was not found, $r = -.19$, $p \geq .10$. Implications of these findings are discussed.

THE RELATIONSHIP BETWEEN ALCOHOL USE AND SEXUAL ASSAULT. Kathryn J. Karageorge, Helen J. Crawford*, Dept. of Psychology, Va. Polytechnic Inst. & State Univ., Blacksburg, VA 24061. Alcohol consumption and sexual assault are alarmingly serious problems on American college campuses. The relationship between alcohol consumption and sexual assault as well as the expectancies of drinking alcohol were evaluated in this present study. A sample of 179 female and 89 male (Mean age=19.5 years) undergraduates at a large southeastern university were surveyed. Rape was reported by 14.4% of the students, while attempted rape and fondling without consent was reported by 19.9% and 46.8% of the respondents, respectively. Of these incidents, over half of the perpetrators and victims had been drinking alcohol in the four hour period prior to the assault. These findings indicate that there is a strong relationship between alcohol use and sexual assault on college campuses. Continuous studies need to be done to further evaluate this problem, while sexual assault prevention programs need to be created and updated across all American colleges and universities.

STUDIES ON THE USE OF CONTEXTUAL CUES IN THE RAT. Allison G. Lewis, L. Ashley Myler*, Clarissa J. Reese*, Terry L. Davidson, and Leonard E. Jarrard, Dept. of Psychology, Washington and Lee Univ., Lexington, VA. 24450.

The present experiment was designed to better understand contextual learning in rats. Stage I investigated whether or not normal rats can learn to distinguish between two contexts when presented on alternate days. In Stage II the reinforcement contingencies were reversed and both contexts were presented in the same session. Results indicated that in Stage I the rats were able to demonstrate discrimination between contexts. In Stage II the animals demonstrated negative transfer. These results will be described as they relate to contextual learning.

USE OF A SIMPLE SOBRIETY TEST TO PREDICT BLOOD ALCOHOL CONCENTRATION: A FIELD TEST. Kristy L. Maddox, Kent E. Glindemann, Jennifer Zimmerman, A. Shawn Metzler, & Steven W. Clarke. Dept. of Psychology, Va. Polytechnic Inst. and State Univ., Blacksburg, VA 24061. There is a need to investigate methods by which drinkers can be made aware of their level of alcohol impairment prior to driving. One such method is to have potential drivers who have been drinking perform a simple sobriety test to demonstrate to them any decrements in their psychomotor performance. This study tested one such simple sobriety test -- a ruler drop test. A ruler is dropped between a subject's forefinger and thumb, and they are instructed to catch the ruler as soon as possible. The dependent variable is the number of inches the ruler drops before it is caught, which is correlated with BAC. This study examined 59 subjects (45 Male, 14 Female) in a naturalistic environment. Subjects' mean BAC reached 0.060, with a range from 0.000 to 0.151. Results indicated that the correlation between overall performance on the ruler drop test and BAC was $r=.30$, $p\leq.05$. Other relevant results, as well as implications for using this device as an intervention for preventing driving under the influence of alcohol are discussed.

EFFECTS OF THE LEVEL AND TIMING OF ANXIETY ON REACTION TIMES. Jeanne Maquire-Cattau, D.G. Wolfgang,* M.C. Zimmerman, & V.E. Teter.* Dept. of Psy., Va. Wesleyan College, Norfolk, Va. 23502. Eighty undergraduate students were used to test whether anxiety has a greater effect on an individual's recall reaction time when induced before the original learning or immediately prior to recall. The subjects were required to view a series of 20 words, watch a video, and perform a nonanxiety-inducing task. The order of these events varied with condition. An anxiety-producing video was used to induce anxiety in one group either prior to learning or prior to recall. A neutral video was similarly used with the nonanxiety group. All the groups were shown a second series of 20 words, and were asked to identify whether or not they had previously seen the words. Reaction time was calculated by the computer program. The effect of whether or not anxiety was induced was insignificant, as was the interaction with timing of induction, but the timing induction effect was significant ($\alpha < .05$). These results confirm the findings of other researchers in that the level of anxiety does not appear to have an effect on recall reaction times.

THE ROLE OF THE CENTRAL NUCLEUS OF THE AMYGDALA IN FEEDING AND MONITORING INTERNAL STATE CUES IN THE RAT. Douglas C. Matia, J.K. Gladwell, K. Stutzman*, L.E. Jarrard and T.L. Davidson. Dept. of Psychol., Washington and Lee Univ., Lexington, VA 24450; Dept. of Psychol. Sciences, Purdue Univ., West Lafayette, IN 47907.

The role of the central nucleus of the amygdala (CN) in ability to use internal and external cues was studied. Half received Pavlovian discrimination training prior to ibotenate lesions of the CN while the other half were trained after surgery. Rats were placed on an-alternating 24 hr, 0 hr food deprivation schedule and were shocked under one of the two levels of deprivation in combination with an auditory stimuli. In extinction, rats were tested with deprivation cues alone, then with auditory cues alone.

Rats trained prior to surgery were able to learn to discriminate between conditions. In postoperative extinction, they did not show discrimination between levels of deprivation, but did discriminate between auditory stimuli. Rats trained after surgery were unable to learn either discrimination. These results suggest that the CN is crucial in acquisition, but not retention of fear conditioning. Furthermore, it appears that there are different mechanisms that underly the utilization of internal and external cues.

INTERNALIZATION OF RELIGIOUS BELIEFS IN IRISH BAHAI ADOLESCENTS. Johanna M. Merritt, Dept. of Psych., Old Dominion Univ., Norfolk, Va. 23529. Internalization of religious beliefs in adolescent followers of the Baha'i Faith in the Republic of Ireland was examined. Through case study analysis of common cross-subject themes, a co-constructionist approach demonstrates the development of religious- and self-identity. Nineteen Irish youth raised in a Baha'i context were interviewed. Internal dynamics interact dependently with environmental context to formulate self-definition and individual beliefs. An analysis of factors influencing religious identification indicated that all youth use external aspects to aid formation of an internalized religious framework. The study concentrated on the issue of intrinsic versus extrinsic belief systems. These belief systems were found to be primarily dependent upon parental pressures and peer involvement. Other factors include how the youth perceive the Baha'i laws and believe in the possibility that an independent choice of religious affiliation is available to them.

PERCEIVED ABILITIES OF DISABLED JOB APPLICANTS IN PERFORMING ESSENTIAL JOB FUNCTIONS. Rebecca W. Miller & Terry L. Dickinson*, Dept. of Psych., Old Dominion Univ., Norfolk, VA 23529. The Americans with Disabilities Act (1990) brought about a strong concern for equal rights among persons with disabilities by indicating that discrimination in various environments, including the workforce, is unlawful. Frequently, false perceptions regarding abilities of different disabled job applicants cause employers to make inaccurate hiring decisions. A questionnaire was administered to 29 males and females, predominantly Old Dominion University graduate students in Tidewater, Virginia. Participants assessed whether the essential job functions for three different jobs could be performed by persons with one of five disabilities. They were also asked what accommodation might be needed and the cost. Results of a repeated measures analysis of variance indicated that there was a significant difference in perceived abilities of different disabled job applicants as compared to an expert base measure $F(4,112) = 16.24, p < .0001$. Visually impaired and hearing impaired applicants were perceived as less able to perform the job functions, paraplegic applicants were rated most accurately, and applicants with multiple sclerosis and epilepsy were perceived as more capable of performing the job functions (lenient ratings) as compared to the expert base ratings.

PERSONAL PERCEPTION OF COUPLE'S CLOTHING SELECTION. Tonya Miller and Barry Gillen, Dept. of Psy., Old Dominion Univ., Norfolk Va. 23529. Individual's perception of a couple who are matched or mismatched based on their clothing selection for a moderately formal situation was investigated. One hundred and fifty subjects participated in this study. Each subject was asked to evaluate slides depicting couples varying in formality of dress. Each couple was seen in one of five conditions. Each condition was determined by the formality or informality of the couple's attire. One of the five conditions was the control condition, where the female was moderately formally dressed and the male was moderately formally dressed. Participants were asked to evaluate the couple using the Body-Self Relation Questionnaire (BSRQ) and the BEM Sex-Role Inventory (BSRI). The results of the study indicated that the male and female subjects agree on several attributes when rating the male and female targets. Because of an unexpected outcome with the control condition further

DEVELOPMENT OF A MEASURE OF HOMOSEXUAL STRESS. Lynn Morris, Robin J. Lewis & Valerian J. Derlega, Dept. of Psychology, Old Dominion Univ., Norfolk, Va. 23529. Though many recent articles have dealt with the concept of homosexual stress, a review of the literature reveals few attempts at measuring stressors specific to those with a homosexual orientation. In the present study a sample of 21 gay men and lesbian women completed a specially developed open-ended questionnaire that focused on stressors unique to this population. Content analysis of their responses revealed that the main sources of stress specific to a homosexual lifestyle include rejection by loved ones, social and legal inequity, difficulties in the workplace, fears associated with AIDS, harassment and violence based on sexual orientation, and feelings of alienation from the heterosexual world. A 70-item measure of homosexual stress was created based on these categories, and further work will focus on norming and refining this measure.

GENDER DIFFERENCES IN THE PERCEPTION OF ALCOHOL ABUSE AMONG MALE AND FEMALE COLLEGE STUDENTS. Jennifer Anne Park, and Barbara Winstead, Old Dominion University. The present study examined the differences in perceptions of male and female student drinkers. Sixty-four subjects from Old Dominion University, 20 males and 44 females, served as voluntary participants. Subjects read one of four vignettes. Two of the vignettes featured male student drinkers and the other two featured female student drinkers. Subjects then completed a questionnaire addressing their perceptions about the vignettes. Contrary to what was expected, female student drinkers ($M=6.1250$) were not viewed as having more of a drinking problem than male student drinkers ($M=5.3458$), $F(1,56) = 1.39$, $p=.2429$. However, there was a significant interaction between the sex of the subject and the sex of the student drinker, $F(1,56)=8.59$, $p=.0045$. Female subjects rated female student drinkers ($M=6.45$) as having more of a drinking problem than male student drinkers ($M=5.04$). Also, male subjects rated male drinkers ($M=5.04$) as having more of a problem than female drinkers ($M=5.40$). Future researches may want to examine a larger sample size of the male population and also study the effects that different college programs have on changing the perceptions of student drinkers.

THE EFFECTS OF CHILDREARING ON THE SOCIAL DEVELOPMENT, AND SELF-PERCEPTIONS OF LEARNING DISABLED AND NON-LEARNING DISABLED BOYS. Justine K. Perry, Jeffrey A. Burns*, Karen Collier, & Michelle L. Kelley*, Dept. of Psyc., Old Dominion Univ., Norfolk, VA. 23529. The purpose of the study was to examine social, behavioral and childrearing differences between learning disabled (LD) and non-LD children, as well as relations between childrearing and development in LD and non-LD children. Mothers of 57 boys (28 LD and 29 non-LD) were administered the Vineland Adaptive Behavior Scales, the Child Behavior Checklist, and several parenting questionnaires. Children were administered the Self-Perception Profile for Children. Children with LD reported lower perceptions of cognitive ability, self-worth, behavioral control, and social skills. Mothers reported higher levels of internalizing and externalizing behavior, and lower levels of communication, self-help, and socialization abilities in LD children. Mothers of LD children reported exhibiting more protective/problem solving parenting practices, however, no differences existed on the amount of maternal warmth or family organization.

THE EFFECT OF APAMINE ON OPERANT RESPONDING IN THE RAT. Melissa A. Phillips, Janet Y. Cho, Christiane Mourre, and Leonard E. Jarrard, Dept. of Psychology, Washington and Lee University, Lexington, VA 24450. This experiment sought to determine the effects of apamine, a neurotoxin extracted from bee venom, on the bar pressing rates of rats. It specifically sought to find the dose-response and time response-dosages relations of apamine. Specifically, the rats were injected with 0.2 mg/kg, 0.4 mg/kg, 0.6 mg/kg and a non-drug control saline injection. The injections were given following a Latin Square design after the rats had obtained a steady level of bar pressing. The 0.6 mg/kg dosage significantly decreased bar pressing activity as compared to the saline injection on the day of the injection. While there was a tendency for the 0.4 mg/kg to increase bar pressing, the difference was not significant. The day after the injection, the 0.4 mg/kg and 0.6 mg/kg dosages significantly decreased bar pressing activity. In addition, it was found that the 0.6 mg/kg dosage of apamine took about 30 minutes to affect the rats, while the lower dosages took longer to take affect. These findings are useful to researchers planning future studies with apamine.

THE EFFECTS OF PARENTAL ATTITUDES AND PARENTING BEHAVIORS ON AGGRESSIVE AND ALTRUISTIC BEHAVIOR THROUGHOUT THE LIFESPAN.

Paul G. Schloemer, and Michelle L. Kelley PhD., Dept. of Psychology, Old Dominion Univ., Norfolk, VA 23529. The present study addressed whether aggression and altruism are stable traits throughout the lifespan. College student subjects rated themselves on aggression/altruism and parents retrospectively rated the subject's childhood levels of aggression/altruism. Parents also completed a parental attitude survey to determine what parenting styles were related to levels of aggression/altruism both when the subjects were children and as adults. Significant correlations were found indicating the stability of aggression over the lifespan, however, significant correlations were not found for the trait of altruism. No correlations between parenting styles and childhood behavior were found, but parenting styles were significantly correlated with adult levels of altruism and aggression. The results supported the view that aggression is a stable characteristic, and that nurturing parenting styles are negatively correlated with aggression, whereas authoritarian parenting styles are negatively correlated to altruism.

ASSESSING THE MASCULINITY IDEOLOGY CONSTRUCT: AN ANALYSIS OF INTERNAL RELIABILITY AND CONVERGENT AND DISCRIMINANT VALIDITY.

Jeffrey S. Sinn & Valerian J. Derlega, Dept. of Psychology, Old Dominion University, Norfolk, VA 23529. The present study investigated masculinity ideology, or the extent to which an individual endorses traditional male-role norms. The standard measure of this construct, the Male Role Norms Scale (MRNS; Thompson & Pleck, 1986), was examined by assessing its internal consistency and factorial structure. The convergent and discriminant validity of masculinity ideology relative to other gender constructs were also examined through correlational and factorial analysis. The MRNS demonstrated acceptable internal reliability, and a moderately clean factor structure. Correlational analyses indicated good convergent validity but found some problems with discriminant validity. Factor analyses, however, indicated both good convergent and discriminant validity.

REPETITION EFFECTS ON PROCESSING OF TERMINAL-WORD SEMANTIC AND PRAGMATIC ANOMALIES: EVIDENCE FROM ERP DATA.

Cara L. Snyder, Tom Mason, Thomas P. Urbach, Dept. of Psychology, Washington and Lee University, Lexington, VA, 24450. Event-related potential (ERP) research in psycholinguistics has found a negative deflection (N400) occurring approximately 400 msec. following the onset of an incongruous or contextually unexpected word. Theoretical linguistics distinguishes between semantic knowledge as a fairly static representation of language-specific meaning relations, and pragmatic knowledge as a fairly dynamic body of real-world information. The present experiment examines the amplitude of the N400 component as a function of the repetition of sentences ending with either a semantically congruous word, a semantically incongruous word, or a pragmatically incongruous word. Fifteen undergraduate students participated and the sentences were presented three times in pseudo-randomized blocks. Each sentence was displayed word-by-word on a computer screen at an SOA of 550 msec.. If the theoretical distinction between semantics and pragmatics marks a real psychological distinction in processes involved in on-line sentence comprehension, it is reasonable to expect the amplitude of the N400 response to these two types of anomaly to be differentially modulated by repetition.

ONE DAY AT A TIME: RETROSPECTIVE DIARY VS QUANTITY-FREQUENCY MEASURES; A REPLICATION OF "PATTERNS OF ALCOHOL USE IN A VIRGINIA COMMUNITY COLLEGE." Osmond Tan, Michael Rehbaum, and James O'Brien, Virginia Beach Campus, Tidewater Cmnty. Col., Virginia Beach, Va 23456. This replication of Wray, et al. (1992) sought to employ a sample more representative of campus demographics, to further refine the instrument, and to compare typically used quantity-frequency (QF) with retrospective diary (RD) measures. Subjects, 187 students, received the survey and a personal data form during the first 5-10 minutes of their day or evening classes. QF results showed (1) 10.7% reported no use ever (Wray, et al : 5%), (2) 62.5% reported at least 1 drink in the last 30 days (Wray, et al ; 68.5%), and (3) 27.3% consumed 5 drinks at a time at least once in the previous 2 weeks (Wray, et al: 27.3%). Of these, (2) and (3) are 10-15% lower than Virginia and national figures (1990 and 1991) for 4-year schools, and data on (1) from this and Wray et al. bracket state and national 4-year data. For (3), the consistent 27.3% is higher than the 1993 Governor's Task Force results for 2-year schools (20.1%). RD data on a 1 week period for (3) of 38.5% among our subjects supports the suggestions in the literature of greater accuracy for RD than QF. This sample's demographics were more closely representative of the subject campus on all variables but gender.

HYPERVIGILANCE IN POLICE OFFICERS: A COGNITIVE PERSPECTIVE. John A. Wangler, JoAnne Brewster*, Ph.D., Lennis Echterling*, Ph.D., Dept. of Psychology, James Madison Univ., Harrisonburg, VA 22807. Hypervigilance is one of the possible consequences of repeated exposure to police stressors. From a cognitive perspective, hypervigilance involves basic assumptions regarding vulnerability, benevolence, and the trustworthiness of others. Hypervigilance has negative effects on family and social life. A stress questionnaire was administered to assess frequency of exposure to stressors and their perceived stressfulness. Three measures (Cynicism, Paranoia, and Picture Completion) were used to measure hypervigilance. Pearson correlations revealed that these measures appear to be independent of one another. Furthermore, perceived stressfulness of External, Personal, Agency, and Total stressors significantly correlated with Cynicism. Finally, a t-test analysis revealed no differences in perceived stressfulness between the subjects in this study and Houston police officers.

THE ROLE OF TRAITS AND BEHAVIORS IN IMPRESSION FORMATION. Sheri Wynn, Cory Chung*, and Jennifer Gladwell, Dept. of Psychology, Washington and Lee Univ., Lexington, VA 24450. Previous research indicates that people make trait inferences on the basis of behaviors, and then impressions are formed from the trait inferences. One theory is that the memory for inferences as well as the original behaviors determine impression formation. This idea was tested in the present work by examining impression formation after students either focused on trait inferences or on the behaviors of characters in stories. The results showed that impression formation was sensitive to the type of person described, but it was not determined by whether impressions were made following trait inferences or descriptions of behavior.

Statistics

AN OPTIMAL LEVELING OF THE INTENSITY OF A NON-STATIONARY POISSON PROCESS.

John A. Barnes and Richard A. Meili, Dept. of Math. Sciences, Va. Commonwealth Univ., Richmond, VA 23284-2014. A non-stationary Poisson arrival process with periodic intensity is considered. The arriving entities (customers) are to be held and released so that they depart the system according to a *stationary* Poisson process. The situation is modeled using an $M_1/G_1/\infty$ queueing system. The feasibility of this approach has been demonstrated in the literature. In this presentation, a hold and release scheme is given which accomplishes the objective with minimum average delay and minimum average number of held customers. The approach is not only optimal in this sense but is a significant improvement on previous methods.

AN EXTENSION OF C-S INEQUALITY AND STATISTICAL APPLICATIONS. N. R.

Chaganty & Akhil K. Vaish, Dept. of Math. & Stat., Old Dominion Univ., Norfolk, VA 23529. Let \mathbf{b} be a vector in \mathbb{R}^n and \mathbf{B} be a nonnegative definite matrix of order $n \times n$. Let \mathbf{B}^+ be the Moore-Penrose inverse of \mathbf{B} . In this paper we first obtain the general form of C-S inequality which is given by: $(\mathbf{b}'\mathbf{y})^2 \leq (\mathbf{b}'\mathbf{B}^+\mathbf{b})(\mathbf{y}'\mathbf{B}\mathbf{y})$, for all \mathbf{y} in the column space of \mathbf{B} . This result has several interesting statistical applications. For example, we deduce numerous inequalities that are useful for the detection of outliers as a simple consequence of the above result. As another application, we have extended the Scheffé's S -method of construction of simultaneous confidence intervals for the case of linearly dependent estimable functions. Finally, we use the above inequality to characterize the class of all nonnegative definite g -inverses of the centering matrix that occurs in statistics.

A SCORING METHOD FOR MULTINOMIAL DISTRIBUTIONS WITH ORDERED CAT-

EGORIES WITH APPLICATIONS TO REPEATED MEASURES DATA. Michael Fay & Chris Gennings, Dept. of Biostatistics, Med. Col. of Va. at Va. Commonwealth Univ., Box 32 MCV Station, Richmond, Va. 23298. A generalization of midrank scores is proposed. When n individuals each have one 1-dimensional response, these responses can be ranked by using midranks. This paper examines the case where each individual has a response or responses described by a $1 \times k$ vector representing the probability of responding in each of k ordered categories. Scores are developed when these probability vectors are known, and randomization tests are developed for data samples where they are unknown. When this methodology is applied to repeated measures data the probability vector represents the probability of a typical response from an individual. In an unbalanced experiment when there is no time effect this methodology, unlike many model based approaches, has the advantage that individuals with many responses do not have undue influence on the hypothesis test. In a balanced experiment where the responses change over time this approach will control for the time effect by averaging over the time points.

SURROGATE MODELS IN ILL-CONDITIONED REGRESSION. Donald R. Jensen, Dept. of

Statist., Va. Polytech. Inst. and State Univ., Blacksburg, Va. 24061. Given two first-order designs in regression analysis, a third design can be constructed that is at least as efficient as either of the original designs. These methods are used to construct surrogate models in ill-conditioned regression having better conditioning than the original model. Bias and dispersion properties of the resulting estimators are compared with those from other approaches to ill-conditioned systems. The methods are illustrated using ill-conditioned data from the literature.

DIRECTION: THE INVISIBLE PLAYER, Robert E. Johnson, Department of Mathematical Sciences, Virginia Commonwealth University, Richmond, VA 23284-2014 and David G. Herr *, Department of Mathematics, University of North Carolina at Greensboro, Greensboro, NC 27412. The analysis of variance table is a common summary/descriptive tool for problems related to linear models. The ANOVA sums of squares describe the magnitude of the vector of total variability (corrected total) and the magnitude of the vector related to the model which best approximates the total variability vector. It is the direction of the vector of total variability, however, which is of primary interest. Our task is to find a model whose directions are "close" to this vector. Geometry allows us to "see" these directions and their relationships. Examples of simple linear regression, multiple regression, and variable selection will be presented in this context. These issues are important to students in the health sciences. The ideas expressed here may be used to clarify some of these issues.

NON-PARAMETRIC CONTROL CHARTS FOR BIVARIATE DATA USING SMALL SAMPLES. Alexandra Kapatou, & Marion R. Reynolds, Jr., Dept. of Stat., Va. Polytechnic Inst. & State Univ., Blacksburg, VA 24061. Quality control of a product or a process often involves the assumption that the measurements follow a Normal distribution. If this assumption is difficult to verify, for example in a short production run, or, simply, does not hold true an alternative method would be to use a non-parametric control chart. Such charts are less efficient than the parametric control charts if the measurements indeed follow a Normal distribution, but they improve significantly if the measurements follow a distribution with heavier tails. Another advantage of the non-parametric over the parametric charts is that the former do not require variance estimates. The problem at hand is quality control of a product or a process where the means of two correlated variables are monitored simultaneously by collecting a small fixed random sample at fixed time intervals. Past sample information is retained through a bivariate exponentially weighted moving average (EWMA) statistic. Control charts using the sign statistic and the sign rank statistic are explored. Some simulation results are presented.

INFERENCE FOR VARIANCE COMPONENTS IN STAGGERED NESTED DESIGNS. R. Khattree, Dept. of Math. Sci., Oakland Univ., Rochester, MI 48309, & D. N. Naik, Dept. of Math. & Stat., Old Dominion Univ., Norfolk, Va. 23529. In this article, we present various approaches to the variance component estimation for a general p-stage random effects staggered nested design. In addition to ANOVA and maximum likelihood estimation, two new approaches are introduced. The main features of these approaches are their simplicity and ability to always yield the nonnegative estimates of various variance components.

MEAN BALANCED SAMPLING DESIGNS TO ESTIMATE BIOLOGICAL CONCENTRATIONS. Hassan Lakkis, Department of Mathematics and Statistics, Old Dominion University, Norfolk, VA. 23529
In this article, we consider a continuum domain R of a study variable z in n dimensional space, where z is a measure of concentration of some biological factors in R (e.g. water in Chesapeake Bay is a continuum domain of Nitrogen in three dimensions). Over the domain R we place a fixed grid and give a random shift to it. Usually, the design of one mean balanced point per grid cell is commonly used in the literature and the integral of z over R is estimated but this design does not allow for variance estimation. In this study a mean balanced sample of size two is selected from each grid cell. Then an unbiased estimator of the integral of z over R is derived. In addition, an unbiased estimator of the variance of the integral estimator is derived.

TESTING FOR EFFECTS ON VARIANCE IN EXPERIMENTS WITH FACTORIAL TREATMENT STRUCTURE AND NESTED ERRORS. R. H. Lamb, Dept. of Mathematical Sciences, Va. Commonwealth Univ., Richmond, Va. 23284, D. D. Boos* & C. Brownie*, Dept. of Statistics, N. C. State Univ., Raleigh, N. C. 27695. Advances in quality engineering by Taguchi have stimulated interest in improving product quality by controlling the variability of quality characteristics. In industrial applications there are often two sources of variability, that which exists among runs or setups, and variability within runs. If setup changes are frequent, it is important to identify factors which affect variability among runs, as well as those affecting within-run variability. In this paper we present a model for effects on variance in experiments with factorial treatment structure and nested errors. Tests, based on normal theory likelihood ratio methods, for treatment effects on among-run and within-run variability are given. The null performance of such tests is highly sensitive to nonnormality. However, robust critical values may be obtained using a bootstrap procedure. Asymptotic results which justify the bootstrap approach and Monte Carlo results for its small sample performance are presented.

NON-BINARY, VARIANCE BALANCED, MV-OPTIMAL BLOCK DESIGNS. John P. Morgan, Dept. of Math. & Stat., Old Dominion Univ., Norfolk, Va. 23529. This talk is concerned with the experimental setting in which v treatments are to be compared in b blocks of $k < v$ experimental units each. The design problem asks, "How does one assign the v treatments to the bk units so that the resulting information on treatment effects is optimized?". For the usual model, additive in block and treatment effects with uncorrelated homoscedastic errors, the commonly held view is that any optimal design must be binary, that is, each treatment occurs at most once in each block. For instance, in *Theory of Optimal Designs* (Shah and Sinha, 1989, pg. 60), two conjectures are "Binary designs form an essentially complete class" and "When $k \geq 3$ an optimal design is necessarily (M,S)-optimal." These conjectures are here disproved.

ML ESTIMATION OF AUTOREGRESSIVE PARAMETER IN AN AR(1) TIME SERIES UNDER ELLIPTICAL DISTRIBUTION. D. N. Naik, & Justine Shults, Dept. of Math. & Stat., Old Dominion Univ., Norfolk, Va. 23529. In this article, we consider an autoregressive time series, the AR(1) process. The maximum likelihood estimates (MLEs) of the parameters involved are obtained under any distribution from the class of elliptical distributions. It is observed that the MLEs are the same as those for the normal distribution, which is a member of the class of elliptical distributions. Testing the hypothesis about the autoregressive parameter is discussed.

DETERMINE ADJUSTMENT STRATEGIES TO MONITOR A PROCESS WITH VARYING SAMPLING INTERVALS. Shanthi Sethuraman, Jesse C. Arnold, and Marion R. Reynolds, Jr., Dept. of Stat., Va Polytechnic Inst. and State Univ., Blacksburg, VA 24061. The purpose of statistical process control (SPC) is to monitor the process by detecting and eliminating assignable causes. SPC charts can easily be applied to processes in which the successive observations are assumed to be independently and identically distributed, and with more care to autoregressive processes. On the other hand, there are autoregressive processes (manufacturing, chemical etc.) that are monitored for the purpose of adjusting the process to a target value. Some of these processes incur substantial costs when adjustments are made. In this paper, we discuss two kinds of strategies for a process adjustment problem in which the time to the next sample can vary as a function of the current sample. The process mean is assumed to follow an autoregressive (AR(1)) model. Our objective is to determine sampling and adjustment strategies that minimize the total expected loss. We will show comparisons with similar processes that use fixed sampling intervals.

CONDITIONS FOR LINEAR STATISTICS TO BE PITMAN ESTIMATORS. Shankar S Srinivasan, Dept. of Statistics, VPISU, Blacksburg, Va. 24061. In our paper, we look at equivariant estimation of the location parameter. The Pitman estimator is known to be the minimal risk equivariant estimator under squared error loss. For a sample of dependent normal observations, the Pitman estimator for the common mean is identical to the generalized least-squares estimator. We show that the least-squares estimator, the sample average, continues to be efficient when observations come from elliptically symmetric distributions, provided that the matrix of scale parameters has equal column sums. Further, when the matrix of scale parameters is known, and meets the sphericity condition due to Hyuhn and Feldt (1970), the Pitman estimator requires a simple correction to the sample average. A majorization result concerning efficiency is presented when the distribution meets this condition. Some extensions of these results will be made, through mixtures, to distributions which are not elliptically contoured.

INFERENCEAL STATISTICS USING INVERSE SAMPLING, James Syran and Robert E. Johnson, Department of Mathematical Sciences, Virginia Commonwealth University, Richmond, VA 23284-2014. In this talk I will discuss and demonstrate point estimation procedures for the mean of the negative hypergeometric distribution. Both an unbiased estimator and the maximum likelihood estimator will be derived. This distribution is one of several which are useful for modeling the sampling distribution of statistics related to a population proportion (urn models). I will also propose a hypothesis test using the likelihood ratio test for the single sample case.

A PROBABILISTIC ANALYSIS OF VIDEO POKER. Glenn Weber, Dept. of Math., Christopher Newport Univ., Newport News, VA, 23606. Ever since Bally Manufacturing Company introduced the video poker machine to the gaming public in 1976, the popularity of these machines has steadily increased. Initially a novelty machine, video poker now often takes up nearly 50% of the available slot floor space in modern casinos. Its popularity is growing since it allows the bettor the opportunity to use skill in an environment which, prior to the introduction of these machines, consisted of just straight luck slots. In this analysis, the optimal playing strategies for one type of video poker machine are given along with the corresponding expected payoff. In addition to the mathematics involved in developing these strategies, the results of a computer simulation of 500 million games are explicitly provided in a manner which would easily lend itself to further research.