**Second Year Students**

**Lauren Antal**

The Comparison of Dream Recall in Patients with Sleep Apnea to Control Group

It has been found that patients with severe sleep apnea have difficulty remembering their dreams. Sleep apnea patients can stop breathing up to 600 times a night, which causes the patient to have less deep Rapid Eye Movement sleep. Rapid Eye Movement (REM) sleep is the deepest stage of sleep in the sleep cycle during which most dreaming occurs. Lucid dreaming occurs during the deepest stage of REM sleep. Lucid dreaming is the hybrid state between waking and dreaming. A lucid dream is described as awareness of dreaming while asleep. There is a conscious state of mind that can analyze the dream and remember it the next morning. The objective of this research is to examine the relationship between sleep apnea patients and the recall of the dreams. The dream questionnaire completed by the participants focuses on lucid dreams and a particular dream a person has had multiple times. It is hypothesized that the control group without sleep apnea will have a higher recall than the sleep apnea group. Findings may help improve treatment for sleep apnea patients and help raise awareness about sleep apnea. Studying their dreams helps determine the effect of the Continuous Positive Airway Pressure (CPAP) system on their state of mind during sleep.

**Aishvarya Arora**

Interpretive Biases for Ambiguous Information in Body Dysmorphic Disorder

Body Dysmorphic Disorder (BDD) is a psychiatric disorder in which patients develop a debilitating obsession with a perceived physical defect. In their mind the individuals see themselves as abnormally formed or ugly and believe that others see them this way as well. BDD is known to affect 1-2% of the population.  Past research has shown that these perceptions result from negative interpretive biases of social situations. Often times, this will seriously hinder proper social functioning skills and, in severe cases, may lead to depression, deliberate self-harm, and suicidal behavior. Future research will utilize surveys that present hypothetical social situations to test whether adolescents that are just developing or already suffering from BDD display the same interpretive biases as their adult counterparts. If successful, this research will allow for BDD to be diagnosed and treated much earlier in life, thus leading to an improved quality of life for those who suffer from it.

**Breanna Austin**

The Correlation, Risk Factors, and Prevalence of Asthma and Obesity

Asthma is a chronic condition of the airways that affects a person’s ability to breathe. Symptoms can be caused by inhaling allergens, also known as triggers, such as pollen, pet dander, or air pollutants. When these allergens are inhaled, it may cause a person to wheeze. Wheezing is a whistling or rattling noise caused by obstructed airway passages. These symptoms can be exasperated when a person is obese. Obesity is defined as having an excess of body fat in proportion to one’s height and weight; this is calculated using a body mass index chart. For most individuals, having a BMI of 30 or higher puts them in the category of being obese. This results from a combination of factors such as unhealthy eating habits, inactivity, and lack of sleep. Obesity has plagued Americans for years, and the numbers of obese individuals continues to rise. Asthma and obesity can both greatly affect an individual’s lifestyle, overall health, and life span. For years, researchers have been debating and trying to identify the link between the two diseases, and future research hopes to find concrete evidence associating these two diseases.

**Gina Baglieri**

The Effects of Household Corrosive Chemicals on Pig Bones and Human Tissue

The most important goal in forensic anthropology is to achieve a positive identification.  This can be challenging because attempts to hide the identity of a victim are frequent.  One way to hide a victim’s identity is the dissolution of the body in household chemicals.  These easily obtainable substances may be used to disfigure a body by dissolving the soft tissue and causing it to appear different than it did before.  The objective of this research is to see the effects of everyday, household corrosive chemicals on pig bones, human hair, and human nails.  In order to meet the objective, the study will consist of two experiments.  The first will include recording the effects of the chemicals on the bones, hair, and nails for an extended period of time. The second will include recording the effects of the chemicals on altered pig bones.  Alterations will include burning, freezing, and chopping bone segments.  After observing trial experiment results, it is hypothesized that the altered bones will dissolve and change faster than the unaltered bones.  Whether the effects of the chosen chemicals are major or minor, the results will contribute to the information Forensic Anthropologists are striving to obtain about the effects corrosive chemicals have on the body. These findings can help aid in the identification of victims in future forensic investigations.

**Elena Byrne**

False Recall and the Stroop Effect

A false memory is a fabricated or distorted recollection of an event that did not actually happen. False memories are caused by inaccurate perception, inferences made during an event, similarities between events, or interferences while encoding the details of an event. False memories can be examined through the Deese-Roediger-McDermot (DRM) Paradigm, which involves presenting a set of associated words and then asking participants to recall the words. The Stroop Task is sometimes used with the DRM Paradigm to increase the amount of false memories. Participants are shown a list of words printed in varicolored ink and asked to name the color of each word rather than the word itself. The objective of this research is to decrease false memories in those in a negative mood. Before beginning the tasks, a positive or negative mood will be induced. In the first block of the experiment, participants will be given a normal Stroop task using DRM lists. In the second block, participants will receive a partial Stroop task using DRM lists. Finally in the last block, participants will be given a Stroop task using DRM lists, except all of the words in the list will be colored the same color to show that the words are related. At the end of each block, there will be a recognition task during which participants will say whether or not a word was shown previously. It is believed that using the third block, participants will see a relationship between all of the words that are colored the same and therefore lower the rate of false memories. In the future this can be used to see how false memories are controlled unconsciously and how they are selectively controlled.

**Salvatore Cocchiaro**

Identifying the Potential Factors of Childhood Obesity

Childhood obesity is a growing problem in the United States and throughout the world. In the last 30 years, the prevalence has nearly tripled, and now one in every three children is obese. Childhood obesity is caused by excess body fat, which can result from a poor diet, poor exercise, heredity, and a variety of other factors. The objective of this research is to identify commonalities amongst children with childhood obesity. The research is being done in collaboration with the Red Light, Green Light, Eat Right program in New York, whereby the parents of the program’s participants completed surveys allowing us insight into the potential factors of childhood obesity. These surveys then were computerized and are being tested for a relationship with childhood obesity. Potential factors being studied include meal frequency, amount of fast food eaten, and amount of exercise. It is hypothesized that those who eat fewer meals, more fast food, and exercise less frequently are at a greater risk of being obese as children. These commonalities may very well serve as indicators, or factors, of childhood obesity, and by identifying these factors, nutritionists and parents worldwide can make an effort to limit its potential causes.

**Rachel D’Amato**

Detecting Deception in Police Interrogations

Prior to a police interrogation, a police interview takes place. Police interviews are information gathering processes in which the police investigator decides whether they believe a suspect is innocent or guilty. If the investigator believes the individual is guilty, the interrogation process begins. Interrogations are highly confrontational, psychologically oriented, and guilt-presumptive. Occasionally, suspects are induced to confess during this process, and a false confession could be extracted. A false confession is a confession in which an individual admits committing a crime that they did not actually commit. There are three types of false confessions: voluntary, coerced-compliant, and coerced-internalized. A voluntary false confession is one in which the suspect confesses to a crime they did not commit without prompting from the police.  A coerced-compliant false confession is one in which a suspect confesses to a crime to escape an unpleasant interrogation, avoid a threat, or gain a reward. Lastly, a coerced-internalized false confession is one in which the innocent suspect truly believes that he or she has committed the crime. Future research will include a survey study in which laypeople will be asked the extent of their knowledge on false confessions in the interrogation process. It is hypothesized that everyday individuals will be unknowledgeable about false confessions and will not correctly guess the occurrence of false confessions. This research is significant because laypeople act as jurors in a jury. It is important for jurors to know about false confessions and how easily they could occur, so that they could use this when forming opinions regarding a suspects’ guilt or innocence.

**Brianna Dillon**

The Effectiveness of CIMT and HABIT in the Rehabilitation

of Children with Hemiplegic Cerebral Palsy

Cerebral Palsy (CP) is a disorder that results from damage to the brain during development, affecting an individual’s ability to coordinate and control their body movement. Hemiplegic cerebral palsy is when the arm, leg and body are affected on one side of the body, while the other side of the body is not affected. One major area of interest is the development of useful rehabilitation to be used on children with hemiplegic cerebral palsy. Constraint Induced Movement Therapy (CIMT) and Hand Arm Bimanual Intensive Therapy (HABIT) have been used in recent years to help a child increase his or her hand movement through the use of the affected hand in tasks designed to build up strength. HABIT requires both the non-affected and the affected hand to be used in tasks, whereas CIMT focuses on the use of just the affected hand. These two prominent types of therapy have only focused on upper extremities which include the shoulder, arm, forearm, wrist or hand. Further research will include assessing a child’s lower extremities, which include the hips, thighs, legs, ankles, or feet, and determining if these two forms of therapy can prove to be useful forms of rehabilitation when it comes to a child's lower extremities.

**Kelly Flynn**

Bay Scallop Distribution and Growth Rates Within a Seagrass Habitat

Bay scallops, *Argopecten irradians*, are bivalves found in all of the world's oceans. In 1994, the population of bay scallops on Long Island, NY decreased due to devastating algal blooms. The algal blooms overloaded the ecosystem with nutrients and killed off many native species of plants that scallops use as their habitat. Since the most recent algal bloom, research aimed at restoring the scallop population has come to the conclusion that eelgrass is the preferred habitat of scallops. While within the eelgrass habitat, scallops tend to gravitate toward the interior of the grass canopy to avoid predation, even though their growth rates are slightly lower there than they are on the perimeter. As they grow and mature, the bay scallops' dependency on the eelgrass canopy decreases, and they begin to detach from eelgrass and shift to the bare sea floor. Future research will attempt to create a three dimensional understanding of the scallop habitat, incorporating growth rates and predatory death rates in relation to location of the scallop within the canopy itself.

**Alexis Nicole Gaviola**

The Correlation Between Diabetes Distress Triggers and the

Prevalence of Depression with Glycemic Control Over Time

Diabetes mellitus (DM) is a metabolic disorder in which deficiencies in the pancreas counteract the production of insulin, therefore increasing the levels of sugar in the bloodstream. More importantly, it is a multivariate disease, affecting even one’s psychological state. Patients diagnosed with diabetes mellitus are at a greater risk for developing depressive symptoms, or Major Depressive Disorder (MDD). One past study found that distress was correlated with activity, blood glucose control, diet, and medical adherence. Disease-related concerns often further complicate a patient’s emotions towards diabetes. Another study concluded that negative life events, such as poor blood sugar control, predicted the development of MDD in Type 2 Diabetes patients. Since it has been determined that lifestyle behaviors and availabilities of treatment and medication associated with socioeconomic status (SES) have impacted the development of depressive symptoms, one must take into consideration the limitations that are placed on Type 1 Diabetes (T1DM) and T2DM patients. This brings into question if finances and SES affect one’s adherence to diabetes management, the development of depressive symptoms, and the progression of T1DM and/or T2DM.

**Caline Gin**

The Effects of Emotions and Message Framing on the Decision-Making Process

Previous studies have found that one’s need for cognitive stimulation (high vs. low need) determines the degree of influence of mood states on decision making. Studies have also found that message framing affects the decision making process through persuasion. A message frame can be either positive or negative. A loss frame message refers to message framing that focuses on the potential loss of a given situation. Conversely, a gain frame message focuses on the gain of a situation. This study was conducted to investigate the effect of one’s positive or negative emotions on his or her decision making process when faced with a risk-taking behavior. 210 students were presented with movies to manipulate their emotions in a positive or negative direction. After being shown a gain frame or loss frame message through a short scenario, their willingness to engage in risk-taking behavior while driving was assessed. It is expected that participants who are presented with a positive gain frame message will be more likely to reduce risky driving practices. The results of this study will help support the hypothesis that emotion and message framing have a direct correlation to the decision making process.

**Matthew Hackett**

Effects of Norepinephrine Transporter (NET) Dysfunction on Stress Related Stimuli in PTSD

Post-traumatic stress disorder (PTSD) has many physiological effects in addition to the underlying psychological disturbances of the disorder. Both noradrenergic and serotonergic neurotransmitter systems have been used to identify core neurological symptoms of PTSD. The norepinephrine transporter (NET) is specified in the re-uptake of synaptic norepinephrine (NE) in the brain. This regulation is key to controlling the fight-or-flight response to traumatic, stressful stimuli. Consequently, dysfunction of NET function in regions with high densities of NET negatively impact the regulation of NE during stressful stimulation. The noradrenergic systems in patients with PTSD are found to be hyperresponsive to stressful stimuli. This hyperresponsivity explains the sensitization model of PTSD which claims that stressor response increases over time. To substantiate this idea, combat-related PTSD was shown to be associated with a postmortem decreased number of NETs in the locus coeruleus (LC) on the right side of the brain. This explains the increase of NE due to the decrease of the NET in PTSD. However, this model needs to be verified in vivo in PTSD. The objective of this project is to examine the function of the NET in PTSD and its impact on the NE system facilitating the development of the PTSD phenotype. Positron emission tomography (PET) and a NET-specific radioligand will be used to clarify this question. Demographical and clinical data along with PET scan data will be used to interpret the amount of deviation from standard human models. Results from this study can aid in the development of novel treatments and therapeutic procedures for PTSD patents.

**Shaminy Manoranjithan**

Bec-1 Assists in Cell-Mediated Death and Prolonged Life Spans in *Caenorhabditis Elegans*

Bec-1 is a gene that promotes autophagy, the self-degradation of cell components, in *C. elegans*. This degradation leads to the recycling of cellular components that can be useful to a cell when it undergoes stresses such as starvation, hypoxia, or DNA damage. In normal bec-1 cell lines, the bec-1 is expressed in the hypodermis, intestine, nervous system, pharynx, and reproductive organs in the tissue. Cep-1 is a gene in *C. elegans* that is a homolog to the p53 gene in humans. It mediates cellular damage through controlling checkpoints in the cell cycle. Cep-1, when combined with bec-1, leads to an increased lifespan in these worms. Exploring the various roles of cep-1, which is attributed to apoptosis, and bec-1, attributed to autophagy, is a promising novel molecular therapy for a variety of diseases, particularly cancer because cancers often bypass cell cycle checkpoints. After various crosses the homozygous mutants depleted of bec-1 will be examined for loss of function in critical areas of the worm, such as intestines, pharynx, etc. as noted by GFP markers. The areas where loss of function occur in the bec-1 depleted worms, shown by the GFP markers, can indicate that bec-1 is required for cell-mediated death in worms. This can further aid in the study of *C. elegans* and the role of bec-1 and autophagy in mediated cell-death. Understanding this cell death can help control tumors and initiate cell-mediated death in situations where cell damage has occurred.

**Beatriz Martinez-Flores**

The Effect of Theories of Intelligence and Achievement Goals on Student Performance

A person’s theory of intelligence is a person’s belief about his/her intelligence and ability. These beliefs and opinions greatly influence one’s goals, motivation, and even his or her level of success. The objective of this research is to examine how a student's motivation to achieve on tests is related to measures of executive functions, like perseveration control, the ability to maintain a particular mental set, working memory capacity, and cognitive flexibility. 120 students from St. Francis Prep participated in the computerized Reading Span and Wisconsin Card Sorting Task and filled out a questionnaire to assess their theory of intelligence and goals, along with their extra-curricular activities and level of classes. It is hypothesized that students with incremental theories will succeed and respond better to a set shift than those with entity theories.These findings will help assess whether a student's theory of intelligence, along with their goals, can affect a student’s performance in school and on tests. With this research being one of the first to be done on a large group of high school students, it will be very interesting and significant to social and cognitive psychologists, as well as educators. It will provide proper data on how students’ goals and motivations, along with time spent on extra-curricular activities, can affect the achievement of high school students.

**Kendra McCalla**

Effects of Ecological and Demographic Factors on the Terrapin Population

*Malaclemys terrapin* were in major decline during the 1900s due to commercial harvesting for stews. To protect the species, the government put many programs and regulations in place, and subsequently the population began to rise. Terrapins are again in decline today due to animal and anthropogenic threats. Many fatalities have occurred because of unnatural dangers, such as crab traps, motor vehicles, watercraft propellers, and pollution. Current research will focus on the *Malaclemys terrapin* subspecies at Jamaica Bay Wildlife Refuge and the effects of natural and unnatural threats on the population. By using data collected from an ongoing study of terrapins at Jamaica Bay, the most common injuries sustained, the year at which the most injuries occurred, and how long on average it takes for terrapins to heal will be determined. All of these factors can help in the conservation of the species by providing information on how the terrapin population is being affected by the growing number of threats and how people can help further protect the species.

**Desiree McPherson**

Intentions and Their Effect on Eyewitness Identification

Eyewitness identification is the process in which a witness must identify a criminal by picking them out through a lineup. Past studies have shown that different factors, such as pressure, have a negative effect on identification. The objective of this project is to study how people’s intentions and age affect errors in eyewitness identification. To do this, the participants will watch a video of a crime being committed that either shows a criminal with neutral or bad intentions committing the crime. After watching the video, participants will be asked to rate how bad the crime was and to identify whether making a false positive or false negative error would be worse. After they answer the participants will choose what punishment the criminal should receive. It is hypothesized that younger children will have more errors in identification compared to older children because older children have a better understanding of consequences. The results of this research will provide insight into the different factors that affect eyewitness identification and how the process can be made more reliable and effective.

**Michael Moravek**

The Effect of Air Pollution and Viral Infections on the Development of Asthma

Asthma is a chronic respiratory disorder, characterized by inflammation in the bronchioles of the lungs. Exposure to air pollution has been shown to damage the epithelial lining in the bronchioles, which affects the immune response of the damaged area. Alternatively, a respiratory viral infection has been shown to increase the inflammation of the bronchioles by increasing the concentration of pro-inflammatory cytokine release. The objective of this study is to investigate the effects of the damage to the epithelium caused by air pollution, and to determine if this makes a person more susceptible to developing a viral infection, thus leading to a greater asthma exacerbation. The methods for this study include analyzing publically available city-wide data of pollution levels and comparing these data to questionnaires completed by subjects based on asthma symptoms, such as breathing difficulty, or exacerbations. It is expected that a person’s susceptibility to developing asthma symptoms will be increased if he/she is exposed to high pollution levels and a virus, such as rhinovirus or influenza virus. Future implications of this study include taking preventative measures against exposure to these substances and looking into other possible side-effects of exposure to heavy air pollution and viral particles.

**Kelly Rose Nunziata**

Cyberbullying Perpetration in Adolescents

Cyberbullying is the use of technology to spread hurtful text and pictures that are intended to intimidate or hurt someone's feelings or reputation. As internet-based technology becomes more and more prominent in today's society, the topic of cyberbullying has become increasingly important. In the past year, up to 43% of adolescents have been victimized by cyberbullies. Email and text messages have been found to be the most commonly used means of cyberbullying, but the use of social networking to publically cyberbully adolescents is growing. Being a victim of any form of bullying can lead to terrible consequences, such as depression and even suicide. The objective of this study is to determine the motivation behind the perpetrators of cyberbullying and explore their mindset while they take part in the cyberbullying. High school students in grades 9 through 12 took an online survey. The survey consisted of questions that addressed the reasons behind cyberbullying and the way people felt when they saw cyberbullying. This study can help show parents and teachers what issues need to be addressed when dealing with a cyberbully. By finding out how people feel when they see cyberbullying occurring and if they want to join the cyberbully, it could help identify and prevent future cyberbullies.

**Elissa Raduazzo**

Perceived Ethnic Discrimination and Its Effect on the Psychological Health of Adolescents

It has been determined that the average birthweight of African American children is significantly lower than the average birthweight of those of other ethnicities. These differences in average birthweight may result from perceived discrimination during pregnancy due to racism-related stressors. Racism-related stress can have a negative effect on a mother's blood pressure and psychological well-being, thereby influencing the child's development. The current research objective is to determine if racism related stress leads to lower birthweights in pregnant teens of African American, White and Latina descent. The investigation hopes to understand if teenage girls perceive the same amount of racial discrimination as their older peers, as well as if their pregnancy was affected in the same way. Young pregnant women aged 14-25 and of different races were recruited from the Centering Pregnancy Program and given a questionnaire while their pregnancy was monitored until after birth. It is hypothesized that while African Americans will have the lowest birthweights because of the high amounts of perceived racism, Latinas will have an average birthweight that is still lower than the birthweights of the Caucasian newborn children. The significance of this research is to determine why the children of minority races may be born either prematurely or with low birthweights, and eventually find a way to change this.

**Giuseppe Restagno**

Element Abundance May Provide Clues into Supernovae Frequency and Intensity

In space, certain light elements such as Hydrogen and Carbon are created through nuclear fusion inside the core of a star. Every star is able to produce these light elements first by combining Hydrogen into Helium, then Helium into Lithium and so on. In super massive stars that are roughly 15-20 times the mass of our sun, this process can produce very heavy light elements such as Calcium and Titanium. However, when a star eventually runs out of fuel it will explode into a supernova and heavy elements such as iron and copper, which could not be previously made, are now produced. This research focuses on the concentration of these elements as detected by satellites. Using 4 different satellites, elemental cosmic ray abundances were recorded and, using Java, a basic abundance chart will be created.  The results of this data may provide insight into galactic element abundances, which can lead to valuable supernova data relating to frequency and intensity.

**Justin Reyes**

Predator-Prey Size Relationships and Rates of Predation

of the Bay Scallop by Channeled Whelks

Bay Scallops (*Argopecten irradians*) are marine mollusks that live beneath the ocean water. Scallops are typically found in large eelgrass, sand, or codium beds. They are constantly being preyed on by different species of animals, such as crabs and sea stars. Starting in the year 2004, researchers have noticed a new predator of scallops: channeled whelks (*Busycotypus Canaliculatus).* Past research has studied the whelks’ lifestyle and how they interact with scallops in different environments, elevations, and ecosystems. Researchers have begun investigating how temperature, elevation, scallop and whelk density, types of habitats, and the different movements of both species throughout their ecosystems affect the predation of the bay scallop by the channeled whelk. Results of these studies will provide scientists with the information they need to ensure that the bay scallop does not become extinct or endangered.

**Rossella Scarpa**

Folic Acid: A Possible Cause for Autism

Autism is a complex neurological and developmental disorder that affects the nervous system, and most importantly, the conventional development of a person’s brain.  Folic acid is a complex B vitamin that is given to women throughout their pregnancy because it has been proven to help close the neural tube of an embryo during the first trimester.  However, recent studies have shown that folic acid may be harmful for women to take during their pregnancy because it could cause autism.  In this study, proteomics, a combination of gel electrophoresis and mass spectroscopy, will be used to analyze the effect different concentrations of folic acid have on lymphoblastoid cells.  Lymphoblastoid cells are tissues from infected areas in the body.  They are the best choice of cell type to use in this experiment because they show DNA patterns more clearly than any other cell type.  It is hypothesized that high concentrations of folic acid will lead to genetic alterations in lymphoblastoid cells, which can lead to the development of symptoms of autism.  This research is significant because it can potentially find a cause for the development of autism and can raise awareness of the importance of only taking folic acid during the first trimester of pregnancy.

**Mazi Sinclair**

The Reality of the Stereotypical Effects of the Menstrual Cycle

There are many stereotypical effects that women claim to have during their menstrual cycle. Most women claim to have mood swings and appetite cravings, mostly for sweets. This study looked at the occurrence of these stereotypical effects in a community of women from Upper Manhattan, New York. The women ranged from 25-40 years old. These women filled out questionnaires asking about any mood changes or appetite cravings. Surprisingly, it was found that most of these women did not experience mood changes or appetite cravings. Since most women claim to have these effects, a question remains about what makes these women in this study different from the "typical' woman who does experience these effects. Further research will attempt to answer this question in the hopes of addressing if women really experience mood swings and appetite cravings or if these effects are merely stereotypes.

**First Year Students**

**Luisa Alvarez**

Increased Alcohol Consumption and Drug Use Among Energy Drink Consumers

Energy drinks are known to affect alcohol consumption and drug intake in negative ways. Past studies have found that people who consume energy drinks are more likely to have alcohol or drug dependence problems. The consumption of energy drinks causes time between sleeping episodes to protract. This enables individuals to drink more and possibly develop an addiction to alcohol. Energy drinks might also lead to use of drugs such as marijuana. Individuals who consume caffeinated drinks are often those who desire stimulation, and that desire for stimulation may lead them to drug use. By conducting surveys over a period of time, future studies should establish a better knowledge of the effect of energy drinks on alcohol dependence and drug intake.

**Jackie Angielczyk**

The Effects of Environmental Factors on the Different Stages of Marine Life

The growth and mortality of marine organisms have been severely impacted by rising water temperatures and carbon dioxide levels in the ocean. Bivalves, which are important members of their ecosystem and a common food source throughout the world, are one such organism that has been affected. Past studies have showed that bivalves are affected negatively by the present and especially the predicted future levels of CO2 and water temperature. Under these conditions, the bivalves have stunted growth and lower survival rates, threatening their future population. This research project involves observing the activity of bivalves and the effect that temperature and other human activities, such as pollution and overfishing, have on the reproduction, growth, and survival of these organisms. The findings will help discover a way in which the bivalves can be saved from a further decrease in population. Ensuring their population does not decline will help balance the ecosystem and maintain an important food source.

**Katie Angielczyk**

Depressive Disorders in Parents and Their Effect on Children

Child temperament is the combination of mental, physical, and emotional traits of a person. A child is born with a specific temperament, but it can be shaped or changed based on his/her environment and the influences around them. Past research has found that certain environmental influences, such as having a parent who suffers from depression or alcohol abuse, can affect the child drastically. A part of shaping a child’s temperament is when they observe their parent’s actions. If a child sees a parent acting negatively, then they too may act that way. The way the child’s siblings interact with him/her is also a big influence. A poor temperament, such as a child being overactive or too shy, can lead to poor behavior at home and in school. It can also negatively impact their relationships and interactions with others. The intended research is to determine which environmental influences have the most impact on a child’s temperament. These findings can help to find ways to prevent or stop the negative impact from continuing to occur and thus improve the temperament of children.

**Daniel Bogun**

Reversible Temperature Regulation of Conductivity and Magnetism in Alloys and Solutions

The manipulation of physical properties of alloys and solutions has influenced technology throughout the history of the human race. Ever since magnetism was discovered, inventors have tried to find revolutionary alloys and methods of energy conversion. It has been found that certain alloy mixes have unique physical and chemical properties that enable them to have a magnetic field, among other things. Adding solutes and particulate matter to a liquid increases its electrical conductivity. The potential of such alloys and solutions can be analyzed by changing variables that affect the physical properties. In the future, these will be enhanced to suit particular functions in technology including energy production and transformation, as well as computer technology.

**Romina Burger**

Dance as a Therapy for Neurological Disorders

Parkinson’s disease (P.D.) is one of the most common neurodegenerative diseases in the United States. Around 50,000 people get diagnosed each year. Patients with P.D. suffer from postural instability, gait difficulties, and reduced functional mobility that increasingly lower the individual’s quality of life. Tango dancing has proven to help individuals who suffer from these side effects. Past research has found that tango dancing can be used as a form of therapy to improve balance and stability in P.D. patients. This research hopes to find the most effective style of dance that will help P.D. patients, as well as which environments make dance therapy most successful. The medications often used to help these patients are very costly and can have negative side effects. Forms of therapy, like dance, are much more affordable and safe. Thus, findings of this research project may provide a safer, more affordable, and more enjoyable form of treatment for P.D. symptoms.

**Jacqueline Heffner**

The Effect of Newcastle Disease Virus on Cancer Treatment

Through the Enhancement of Oncolytic Properties

Newcastle Disease Virus (NDV) has been shown to possess oncolytic properties. This virus may be used in the treatment of cancers; however, the efficiency may be very low. Researchers have performed studies to enhance the oncolytic properties of Newcastle Disease Virus through the antagonism of cellular innate immune responses and through the use of reverse genetics. Cellular innate immune responses are responses to a viral infection with a nonspecific component and various forms of defense. Reverse genetics is when genetic sequences are looked at to make helpful changes or learn about their functions. Both processes have been found to make NDV a more effective cancer treatment. Future research will look at different viral vectors that can target tumors and hopefully lead to improved and successful cancer treatments.

**Suriah Iqbal**

Determinants and Perspectives on Mammography in Women with Intellectual Disabilities

Cancer is a disease in which normal cells go unchecked and divide at an abnormal rate, resulting in tumor formation. In breast cancer, these abnormalities are most often found in the lobules or milk ducts, structures both associated with production and release of breast milk, respectively.  Many women over the age of 40 regularly undergo mammography, a technique used to take an x-ray of the breast, allowing doctors to confirm the absence or presence of abnormal tissue in the breast.  Unfortunately, women with intellectual disabilities have limited communication skills and capability of understanding.  These women are less likely to undergo annual mammograms when compared to typical women, despite the fact they have the same incidence rate of breast cancer.  In the future, an intervention should be developed to promote awareness of breast cancer and mammography among women with intellectual disabilities.

**Diane Lachhman**

Differing Trends and Simulations in the Tropical Surface

Temperatures and Precipitation Over Land and the South Atlantic Ocean

Sea Surface Temperatures (SST) is the temperature of water that is closest to the ocean’s surface. The General Circulation Model (GCM), a numerical representation of the atmosphere and its phenomena, uses SSTs to track climate changes. By recording and analyzing the temperature and precipitation over the land and oceans, the results of past studies that utilized the GCM have shown an increase in SSTs during the summer and increased rainfall over the ocean. Data for the past 50 years has shown that temperatures were increasing within the ocean. However, data on the changes in precipitation throughout the atmosphere is still lacking. Future research will use a coupled atmosphere and ocean general circulation model (AOGCM), a more comprehensive type of GCM, to help forecasters predict future changes in climate.

**Sabrina Lall**

The Role of Early Life Environmental Risk Factors in the Development of Parkinson’s Disease

Parkinson’sDisease is a neurodegenerative disease primarily affecting the mobility and movement of the elderly. Past findings indicate that Parkinson’s is caused by the death of dopamine-producing neurons in the substantia nigra region of the midbrain. Dopamine plays a major role in controlling muscle movement. The depletion of these neurons leads to low levels of dopamine, which in turn causes severe motor symptoms that can make simple everyday tasks difficult and maybe even impossible. The factors that trigger the development of this disorder are still unknown. However, current research is attempting to discover specific environmental factors, such as pesticides, neurotoxins, and possibly smoking duration and intensity, that may serve as triggers. This research may lead to treatments for Parkinson’s disease, as well as knowledge that can help prevent its development altogether.

**Erene Litis**

The Effects of Bipolar Disorder and Impulsivity in Criminal Conviction

There are multiple factors that lead to criminal conviction, such as psychological disorders, impulsivity, and social schemas. 75% of the criminals convicted have some sort of mood disorder, such as bipolar disorder. Bipolar disorder (BD) consists of alternations between depression and mania. This disorder often leads to impulsivity, a feeling of aggression that arises unexpectedly. The more impulsive an individual is in a situation, the more likely he or she will be to commit a crime. Social schemas, which include the culture of the individual, where he/she was raised, and the environment they were brought up in, affect the impulsivity and criminal characteristics of an individual. Even the sense of smell has been found to trigger a crime. Future research should investigate further how these factors influence a criminal's victim choice. This research can bring awareness to which factors can influence a criminal and what prevention strategies would be necessary and most useful.

**Paul Mai**

Common Genetic and Environmental Risk Factors for

Parkinson’s Disease in an Ethnic Chinese Population

Parkinson's Disease (PD) is the most common neurodegenerative movement disorder, characterized by resting tremor, bradykinesia, postural instability, and rigidity. Individuals with PD exhibit stiffness and muscle cramps, slow, erratic movements, poor balance, expressionless face, depression and anxiety. Treatments for PD include prescription medication, surgery, and rehabilitation programs, but no option offers a true cure or full recovery for patients. This is because the specific causes of PD are unknown. PD may be caused by age, genetics, environmental factors, or even a combination. The objective of this research is to examine two of the main potential causes of PD: environmental factors and genetic mutations. The environmental factors include exposure to pesticides, toxins, and drinking well water. The genetic mutations include mutations in the α-synuclein, parkin, DJ-1, PINK1, and LRRK2 genes. Understanding more about the causes of PD will aid in the prevention of this debilitating disease.

**Angel Michelli**

The Effect of Telomere Length on Human Aging and Methods of Treatment

Telomeres are cap-like structures on the ends of chromosomes that are used as protection. Telomeres keep chromosomes from eroding during the division of cells. If a telomere erodes completely, cells lose their ability to divide correctly, and signs of aging begin to show. The enzyme telomerase, which keeps telomeres long and healthy, can be a good way to help prevent signs of aging. Telomeres have also been proven to be involved in carcinogenesis, the creation of cancer, according to past research. The objective of this research is to discover if telomeres greatly affect how and when you begin to age, and if they do, in what way. This research could help create new anti-aging treatments, treat cancer or stop it before it starts, or show how to keep chromosomes from eroding over time once telomeres are lost.

**Samantha Moreno**

The Importance of Biomarkers for Alzheimer’s Disease

Alzheimer’s disease (AD) is an irreversible, progressive brain disease that slowly destroys memory, thinking skills, and even the ability to carry out the simplest tasks. Alzheimer’s disease is most commonly diagnosed among those who reached the age of 65. In fact, approximately 1 in 5 women over 65 and 1 in 10 men over 65 have Alzheimer’s Disease. Over the years, scientists have done a wide variety of tests to discover various biomarkers of this disease. Biomarkers are neurochemical indicators used to assess the risk or presence of the disease. These biomarkers include Alz (Alzheimer), BioAge and Inflame. Together these biomarkers provide a detailed description of the aging process and its contribution to Alzheimer’s disease progression. With this information, the biomarkers can be used to help diagnose AD in a very early stage and also provide reliable measures of disease progression.

**Umay Mughal**

The Role of Caffeinated and Decaffeinated Coffee on Biological Risk Factors

There is plausible biological evidence as well as epidemiologic evidence to suggest coffee consumption may lower endometrial cancer risk and lower the risk of type 2 diabetes. Past studies found that consuming caffeinated and decaffeinated coffee may improve insulin sensitivity, thereby lowering the risk for type 2 diabetes. Past studies have also shown that since coffee consumption lowers levels of insulin and estrogen, hormones which have been previously linked to endometrial cancer, coffee may reduce the risk of endometrial cancer.  Therefore, it can be concluded regular and decaffeinated coffee may play an important role in reducing risk factors for certain health disorders and diseases. Future research should further investigate the specific components of coffee that have this protective effect.

**Mayra Perez**

The Influence of Light, Food, and Temperature Availability on Coral Bleaching

Corals are marine animals that typically live in tropical oceans and form a hard calcium-carbonated skeleton. The majority of their nutrients come from zooxanthellae, an algae that is capable of undergoing photosynthesis and therefore forms a symbiotic relationship with the coral. For the past decade, coral bleaching has been responsible for the greatest number of coral deaths. Coral bleaching is a process that disrupts the symbiotic relationship between corals and zooxanthellae, causing the coral to release zooxanthellae and thus be unable to photosynthesize. Without zooxanthellae, corals are unable to obtain the necessary nutrients and also have trouble protecting themselves from any bacteria and infections. Scientists are currently investigating if food and light availability play a role in coral bleaching. Future studies should investigate these factors in an attempt to help corals fight off or be immune to coral bleaching.

**Kevin Power**

The Effect of Alcohol Programs on Underage Drinkers

The abuse of alcohol is very common among college students. Alcohol, if not used carefully, can lead to many negative side effects including fainting, vomiting, and even death. It could also affect the way a person thinks, causing an individual to participate in dangerous activities such as driving while intoxicated, unprotected sex, and violent acts. There are many programs available to help these students with alcohol problems. Some of these programs are successful in getting the students to minimize drinking temporarily, but usually after several months students go back to their old drinking habits. Future research can be used to design a program that combines the most effective pieces of already existing alcohol help programs. This program could help college students show a drastic decrease in alcohol use that will hopefully be maintained for the rest of their lives.

**Kimberly Rosal**

Bullying Victimization Among Adolescents and Its Association With Weight Status

Bullying is a set of aggressive behaviors involving an imbalance of power between the bully and the victim. Bullying can be categorized as physical, verbal, emotional, or cyber bullying. Past research has found that the association between bullying victimization and weight status suggests that an abnormal body mass leads to becoming a target for bullies. Future research is needed to examine the association between a child’s weight status and verbal, emotional, physical, and cyber bullying, as well as to determine which type of bullying each weight status (overweight, underweight, and obese) is associated with more often. This research will aid parents, teachers, and counselors to become more aware of what leads to bullying, especially why overweight children become victims. This can lead to creating prevention strategies or legislation to reduce or eliminate bullying within society.

**Kaitlyn Routh**

The Prevalence of Social Phobia in Body Dysmorphic Disorder

Body Dysmorphic Disorder (BDD) is a chronic mental illness in which an individual cannot stop thinking about a flaw with his or her appearance, a flaw that is either minor or imagined. People with BDD fixate on personal flaws to such a degree that they may obsess for hours a day over the flaw, avoid mirrors, pick their skin, or refrain from social situations that may seem threatening. Social phobia is characterized by severe anxiety about social situations, being evaluated by others, or interactions with other people. Past research has found that subjects with BDD have reported greater avoidance of social situations due to self-consciousness about their appearance. Future research into the correlation between BDD, social phobia, and even obsessive-compulsive disorder can provide a better understanding of this under-diagnosed disorder and its possible causes and cures.

**Alex Seyad**

Synaptic Dysfunction in Alzheimer’s Disease and Parkinson’s Disease

Alzheimer’s disease (AD) and Parkinson’s disease (PD) are both neurodegenerative disorders, characterized by the loss of the structure and/or function of neurons. Neurons are the primary cells of the nervous system. They transmit vital information throughout the body by sending electric-like impulses to one another across a space called the synapse. Synaptic dysfunction occurs when neurons cannot release neurotransmitters, the chemical messengers that travel across synapses, as fast as the brain and body require. Past studies have cited synaptic dysfunction as a possible factor in the development and progression of AD and PD. In the future research of the factors that affect synaptic transmission or the rate at which impulses travel across the synapse will lead to an effective way to treat and/or prevent AD and PD.

**Robert Shea**

PTSD and Its Effects on Children and Adolescents Dealing with Traumatic Events

Traumatic events that children and adolescents experience may result in the development of a psychological problem known as Post Traumatic Stress Disorder (PTSD). PTSD symptoms include flashbacks to a traumatic event, destabilization of one’s sanity, depression and anxiety, inability to socialize well, and possible risk of suicide. The objective of this research is to analyze how the minds of children and adolescents respond to these traumatic events over time and to see how their development is affected by the trauma of the event. Along with this, the goal is to find an effective therapy system that can be individualized to the specific needs of people. This can allow people who have been affected by traumatic events to have a sense of recovery, help them cope with the traumatic event, and encourage them to move forward in life.

**Ashley Simons**

Effects of Maternal Smoking and Gender on Arousability of Sleeping Infants

Sudden infant death syndrome (SIDS) is the unexpected, sudden death of a child under age 1 in which an autopsy does not show an explainable cause of death. Most cases of SIDS occur between the ages of 2 to 4 months, a critical period of development, maturation, and organization of sleeping states. Infants with SIDS have been shown to have abnormalities in arousal pathways, which range from subcortical activation (incomplete arousal) to cortical activation (complete arousal). Interestingly, about 60% of SIDS victims are male, and previous research has shown that male infants have delayed cortical maturation compared to females. Past research has also shown that the risk of SIDS is higher for infants who are exposed to maternal smoking and who sleep in prone position. Further research on the effects of maternal smoking and gender differences on arousability will help identify the risk factors of SIDS and lead to methods of preventing this sudden tragic death of infants.

**Thalia Tamay**

The Olfactory and Visual Senses of Domestic Dogs

In past research, dogs have been tested on their ability to discriminate between various objects using their olfactory and visual senses. Dogs rely largely on their sense of smell to analyze and interpret their environment. They have the ability to separate scents, break them down, and concentrate on individual scents. Although dogs are not able to see color and detail as vividly as humans, their large pupils and greater number of rods, the photoreceptor cells that are sensitive to light and dark, give them an advantage in dim light conditions. Their vision is suited for discriminating light and dark and detecting movement. Future research should focus on how dogs’ visual and olfactory senses work together and what can be done to improve the capacity of information a dog can collect by using both senses together.

**Annie Turkeshi**

The Role of Genetics, Abuse, and Low Birth Weight on Depression

Depression is a medical illness that causes a persistent feeling of sadness and loss of interest in day-to-day functions. Also called major depressive disorder, it affects how one feels, thinks and behaves. The exact cause of depression is not known. Many researchers believe it is caused by chemical changes in the brain, which may be genetic or triggered by certain stressful events such as abuse or neglect, death of a loved one, losing one’s home, or even drug/alcohol abuse. More likely, it is a combination of both. Future studies should look specifically into how low birth weight (LBW) and childhood abuse correlate with the occurrence of MDD in adulthood. This can make it possible for specialists to provide more accurate treatments for these patients.

**Yuvraj Verma**

A nAl and Ice Propellant

Propellants are composed of chemical mixtures that are burned to produce thrust, a push forward, in rockets. These mixtures consist of a fuel and an oxidizer. They are burned via the oxidizer, producing large volumes of gases at high temperatures, which expand until thrust is created from the back of the rocket. There are three types of rocket propellants: solid, liquid and hybrid propellants. Solid propellants are the simplest and most modern of all rocket designs; they contain a longer shelf life, which may extend to years. Aluminum powder is currently being investigated as a potential solid rocket propellant to increase thrust. Nano-aluminum powder has shown a significant increase in performance of propellants, in comparison to currently used propellants. Mixing ice with nano-aluminum will result in a nano-aluminum and ice propellant (ALICE), which may prove to be suited for deep space exploration. Furthermore, the products of ALICE, H2 and Al2O3, are non-toxic, allowing for it to be considered an eco-friendly “green” propellant. Future research will combine the ALICE propellant with additional metals to increase its efficiency and obviate all unnecessary exhaust products.

**Expression of MDM2/HDM2 Antigen on Cancer Cell Plasma Membrane:**

**Selective Target and Binding Site of Anti-Cancer Peptide PNC-27**

Anticancer peptide PNC-27 has been shown to be cytotoxic to cancer cells but not to normal cells. Selective binding of PNC-27 kills cancer cells by forming a transmembrane pore. Further findings suggest that PNC-27 mediates its cell selective effect by binding to HDM2 present in the cell membrane of cancer cells. The present study was undertaken to learn if PNC-27 is also cytotoxic to primary human cancer cells (PHCC). Low passages of primary human ovarian cancer cells established directly from tumor tissue and stored frozen in our laboratory were re-cultured and treated with PNC-27, resulting in 100% cell death and inhibition of cell growth. Cell death and growth inhibition were measured using cytotoxicity assays. The presence of HDM2 protein on the surface membrane of cancer cells was shown by fluorescence activated cell sorting (FACS) of live cells with HDM2-specific antibodies. Strong staining of PHCC was recorded by confocal microscopy. Cell surface staining was absent in presence of an N-terminal peptide of HDM2 and after trypsin treatment. The results showed that PHCC were sensitive to PNC-27 and that HDM2 is present on the cells' membrane. The findings are promising for the further development of a novel and potent anti-cancer drug and its unique target molecule on cancer cells.

**Role of Peripheral NMDA-NR2B Receptors in Chronic Neuropathic Pain**

Due to the lack of good treatments for chronic pain, researchers/clinicians have focused on helping patients better cope with chronic pain. Because pain medications are limited and potentially addictive, those suffering from this condition have few options. Hence, it is important to not only develop better treatments, but also to better understand chronic pain. The current study focused on mechanical allodynia, a pain that occurs when a non-noxious stimulus is presented and patients still feel extreme discomfort. The role of N-Methyl-D-aspartic acid (NMDA) receptors in acute pain perception is clear, and receptors present in the spinal cord are known to contribute to chronic pain. However, the role of NMDA receptors present in the peripheral dorsal root ganglia (DRG) in the development or maintenance of chronic pain is only vaguely understood. The goal of this study was to investigate the role of the NMDA receptor containing the NR2B subunit at the DRG. To focus on the NR2B subunit, two modalities of the Spared Nerve Injury (SNI) animal model were used. The Sural-SNI animals were hypothesized to be in more pain than the Tibial-SNI animals due to a higher level of nerve damage. However, the results indicated higher levels of NR2B in the Tibial-SNI animals that displayed a recovery from mechanical allodynia. These results are unique because past studies have found that higher levels of NR2B within the spinal cord are associated with higher levels of pain. However, in the current study, the opposite correlation was found in the DRG.

**The Role of BC1 RNA in the Circadian Rhythm**

The absence of FMRP is known to cause Fragile X syndrome, which results in congenital mental retardation. Previous studies have shown that FMRP knockout mice also had disruption in the circadian rhythm cycle. Another study found that a double knockout FMRP and BC1 RNA caused mice to have higher neural excitability when compared to single variant knockout mice. The objective of this study was to see if BC1 RNA has a role in the circadian rhythm, since FMRP and BC1 RNA are translation repressors that are known to work together in regulating mRNAs. By examining the locomotor averages between the four types of mice, it was found that BC1 RNA -/-and the FMRP/BC1 -/- are able to maintain their original circadian rhythms far better than the wild type when placed in darkness for 10 weeks. This study found that BC1 RNA does play a role in the circadian rhythm. Future research should examine more closely the relationship between BC1 RNA and clock proteins.

**Inhalants as a Potential Gateway Drug for Adolescents**

The gateway hypothesis states that drug use generally begins with a substance in the licit drug category, such as alcohol or tobacco. The user then progresses to use an illicit drug, such as marijuana. Past research has mainly focused on common drugs; however, inhalants are also frequently abused. Inhalants are gases or vapors that can be inhaled through the nose or through the mouth. They are most popular among adolescents. Inhalants are considered to be a co-drug and not a gateway drug that can later lead to more severe drug use. Since little is known about inhalant use, a study was conducted to analyze adolescent inhalant use and determine if inhalants can be gateway drugs. Participants included adolescents in the sixth grade, and variables such as race and free lunch, which was used as a measure of socioeconomic status, were analyzed. Results showed that White adolescents continued to increase their percentage of inhalant use up to their 8th grade year. This study also found that adolescents who did not receive free lunch, meaning they had a higher socioeconomic status, had a higher percentage of inhalant use. The research conducted added to the study of the gateway hypothesis. Thus, it was concluded that inhalants may be a gateway drug for today’s adolescents, in particular for White adolescents and those of higher socioeconomic status. Future research should further analyze alternatives to the gateway hypothesis and use this information to improve drug prevention and treatment programs for adolescents.

**The Allocation of Infant Developmental Resources Results in Dynamic Cognitive Motor Trade-Offs**

Human infant development can be classified into the cognitive, physical, and socioemotional domains. Studying the domains separately gives a limited view of the infant mind. The new cornerstone theory in applied developmental psychology is the interconnected domains of development. This theory proposes that the physical and cognitive domains and their components are overlapping and integrated within the whole child. This integration was confirmed in this study, which found that there is a correlation between the onset of a new motor milestone and language acquisition. Archival behavioral data on infants in their naturalistic environment was obtained. The data consisted of videotapes of infants over a six-week period during the transition from pre-locomotion to crawling. The sessions were coded for frequency of infants’ vocalizations, words, postures, and movements. The infants were studied longitudinally in a naturalistic environment, providing for the most accurate analysis of their behavior. It was found that as infants focused on learning how to crawl, their language acquisition came to a standstill, supporting the theory of interconnected domains. These findings give valuable insight into how the mind processes and organizes information, which could lead to advances in early childhood education, child rearing techniques, and developmental delay diagnostics.

**Ancestral Priorities in Visual Attention: Animate Objects Capture Attention and “Slow” Time**

Visual attention prefers animate objects over inanimate objects; the detection and recognition of animate objects is a greater priority. However, it has not been clearly shown whether this bias permeates into higher-level processing. Given the robust interaction between attention and the higher-level process of time perception, it was hypothesized that visual attention should have an impact on the latter. A variant of the “oddball” paradigm was used, in which the participants were to report which image of a sequence of nine appeared to have a longer duration than the rest. It was found that images containing animate objects, such as people and animals, were reported to last longer significantly more often than images containing inanimate objects, such as flowers and vehicles. These findings attest to the presence of a general animate-inanimate bias in the brain that affects all levels of processing, from simple detection/recognition to complex time-dilation effects. Thus, the previously separate processes of visual attention and time perception were sensibly connected through evolutionary priorities, suggesting that evolutionary psychology can act as an integrative framework for many psychological disciplines. The results of this study also reveal a general influence of visual attention on subjective time experiences, such that increased visual attention to a stimulus can lengthen its subjective experience relative to its physical duration. This may foreshadow the future development of training protocols that decrease the likelihood of individuals being stunned during emergencies and increase their ability to act extraordinarily in a short amount of time.