Abstract

The main purpose of this study was to examine the relationship between self-reported Attention Deficit-Hyperactivity Disorder (ADHD) symptoms and select working memory tests. Seventy-seven college student participants were assessed with an ADHD self-report questionnaire and the Stroop Color and Word, WAIS Digit Span, and Trails B tests. Significant positive correlations were found between inattentiveness and both time and errors on Trails B. However, measures could not clearly identify participants with ADHD symptoms or diagnosed ADHD.

Introduction

Theoretical Background

Symptoms of ADHD include an inability to pay attention or keep focused, difficulty controlling emotions or impulsivity, and hyperactivity (APA, 1994). There are three subtypes to this disorder: predominantly hyperactive-impulsive, predominantly inattentive, and combined.


Main Hypothesis

Higher ratings of ADHD symptoms should correlate with poorer test performance.

Secondary Hypothesis

There would be a meaningful difference in self-reported ADHD symptoms in clinical groups.

Tertiary Hypothesis

A presence of a diagnosed learning or emotional disorder (anxiety or depression) would correlate with poorer test performance.

Method

Participants

77 college students

• 16 males, 61 females

• 11 previously diagnosed with ADHD

• 7 previously diagnosed with a learning disorder

• 14 previously diagnosed with an emotional disorder (anxiety or depression)

Materials

Table 1. Measures used

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD Self-Report Questionnaire</td>
<td>Diagnostic criteria corresponding directly to DSM-IV-TR examining degree of severity ADHD symptoms</td>
</tr>
<tr>
<td>Trails B</td>
<td>Connect the dot activity that alternates between letters and numbers</td>
</tr>
<tr>
<td>WAIS Digit Span</td>
<td>Requires participants to repeat back a sequence of numbers forwards and then backwards</td>
</tr>
<tr>
<td>Stroop Color and Word</td>
<td>Participants are given 45 seconds to read color words, colored ink, and the color of the ink that color words are printed</td>
</tr>
</tbody>
</table>

Procedures

• Tests were individually administered by one of three examiners.

• The order of completion was:

  1. informed consent form
  2. demographic form
  3. ADHD self-report questionnaire
  4. three working memory tests, which were given uniformly with a strict adherence to standardized procedures
  5. debriefing form

Results

Main Hypothesis

• Self-reported inattentiveness correlated with greater time to complete Trails B, r (74) = .326, p = .005, r² = .106

• Higher inattentiveness correlated with more errors on Trails B, r (74) = .243, p = .037, r² = .052.

Secondary Hypothesis

• Compared to non-diagnosed students, ADHD diagnosed showed a trend toward high inattentive ratings (p = .067) and more hyperactive-impulsive symptoms (p = .060).

• Participants diagnosed with an emotional disorder (anxiety or depression) endorsed more inattentive symptoms on the ADHD self-report questionnaire (M = 15.692, SD = 4.906) than participants not diagnosed with an emotional disorder (M = 12.984, SD = 4.249), p = .046.

Discussion

• The data gathered offered weak support for the hypothesis that higher scores on the ADHD self-report questionnaire would relate to poorer performance on the three working memory measures. Since difference were found on Trails B, perhaps assessments examining the ability to attend to more than one stimulus at a time could be useful at distinguishing between clinical and nonclinical populations.

• Participants who were previously diagnosed with an emotional condition indicated higher inattentive symptoms on the ADHD self-report questionnaire. This is understandable because the these participants may often be preoccupied with anxious feelings or thoughts of the factors leading to their depression (Eysenck, 1988, Wilkinson & Goodyer, 2006).

• These three simple assessments of working memory and attention were not effective at distinguishing between participants with and without diagnosed ADHD. Continued projects should search for rapid cognitive assessments that can aid in differential diagnosis of ADHD and other disorders.

• More prominent differences may be found in unmedicated populations or with participants who suffer from more severe symptoms.

References


Potential development of a perched aquifer in shallow basalt flows on an extinct Pleistocene shield volcano, Tamaula, Guanajuato, Mexico

K. Rey, C. Smith Barnes, M. Bunds, S. H. Emerman, Dept. of Earth Science, Utah Valley University

INTRODUCTION
Tamaula, a village of approximately 400 residents in the State of Guanajuato, Mexico is located near the top of a Pleistocene shield volcano, in the Trans-Mexican Volcanic Belt. In May 2008 Utah Valley University in connection with CHOICE Humanitarian provided faculty and students the opportunity to combine science education and humanitarian work. The work included assessing water supply options for the village and collecting data on local springs to identify sources that meet the needs of the village. The long term goal is to develop a viable water system for Tamaula.

BACKGROUND
Tamaula’s population relies on three local sources for water; 1) six natural springs, 2) two reservoirs, and 3) rooftop catchment systems. These sources are insufficient and additional water must be trucked over 10 miles of dirt roads. Three options exist to provide additional local water; 1) development of additional springs in a perched aquifer, 2) expansion of the catchment area of reservoirs, and 3) development of a deep well (250-650m) to access the main water table.

METHODS
The viability of the perched aquifer as a water source was assessed by performing a bail-down test in which approximately 2500 L was removed from one spring that had been developed into a shallow well. The dynamic water table height was observed over a period of nine days. Using the Bouwer-Rice slug test and assuming the depth of the aquifer equals the depth of the well, the hydraulic conductivity K of the aquifer was found to be $K = 2.2 \times 10^{-5}$ m/s, which is typical for shallow fractured basalt.

RESULTS
The refill graph shows an excellent linear fit indicating the aquifer is a relatively simple system. The recharge of the spring was equivalent to a yield of 120L/day. A drop in water level from a second spring 150m away indicates that all springs utilized by residents may be tapping the same perched aquifer so that further development of the aquifer is unlikely to satisfy the village’s estimated culinary water need of 20L/person/day.

CONCLUSION
Further development of the aquifer is unlikely to satisfy the village’s estimated culinary water need. Due to political concerns the village does not want additional development of surface water, therefore, expanding the catchment area of the reservoirs is not an option. The deep well, proposed by the State Water Commission, appears to be the best option. In cooperation with CHOICE, UVU has had an ongoing relationship with this village since 1999 and will continue to assist the people of Tamaula in their effort to develop enough local water.

ACKNOWLEDGEMENTS

FUNDING
U.S. Synarchics
May Foundation
Robert Johnson
College of Science and Health, UVU
Utah Geological Association

REFERENCES
Google Earth, accessed Sept. 29, 2008
A Rodent Model of Parkinson’s Disease: 6-Hydroxydopamine (6-OHDA) Lesions of the Striatum

Marissa Babnew¹, Dominique Scutella¹, Jesse Nunn² & Michael Kerchner¹
¹ Washington College, Chestertown MD
² Brown University, Providence, RI

Introduction
Parkinson’s Disease (PD) plagues over one million people in the United States, with the risk being highest for those over sixty according to the American Parkinson’s Disease Association. PD causes positive symptoms including muscular rigidity and a tremor at rest, along with negative symptoms including bradykinesia, a poverty or slowing of movement, disturbances of posture, and cognitive difficulties (Deumens, Blokland, & Pickartz, 2002). PD is a progressive neurodegenerative disease with an onset of symptoms that is slow and subtle; most patients do not realize they have the devastating disease until it is too late.

Aim
The aim of this study was to utilize a unilateral lesion of the striatum to create an accurate rodent model of Parkinson's Disease. This model will then be used to further refine surgical procedures and protocols as well as investigate the protective effects of melatonin in PD.

Method
Surgical Procedures
Unilateral depletion of dopaminergic striatal neurons was achieved via stereotaxic administration of the neurotoxin 6-hydroxydopamine (6-OHDA) hydrobromide (20µg/20µl saline; Sigma, St. Louis, MO). Coordinates for these injections were determined using the Paxinos and Watson atlas (AP: 1.0 mm anterior to bregma, L: 2.6 mm from midline, D: 4.5 mm from the dura).

The animals were allowed to recover for 12-14 days before behavioral testing began. There were 3 6-OHDA lesion animals and 3 controls that received the identical surgical procedure with the absence of the injection of 6-OHDA, which served as controls.

Behavioral Measures
• Behavioral Measures
Multiple behavioral tests were employed to assess the degree to which unilateral 6-OHDA lesions in the right striatum had depleted dopamine, thereby leading to contralateral sensorimotor deficits.

• Open Field Activity
The animals were observed in an open field for 10 minutes for any indication of motor deficits or dyskinesia.

• Rearing Measure
The animals were placed in a clear plastic cylinder for 5 mins. or until they had reared 10 times. The preferred paw during rearing was recorded to measure motor impairments in the paw contralateral to the lesion.

• Rotation Measure
The animals were placed in the same cylinder and the number of ipsilateral and contralateral turns were recorded. Contralateral turning was considered evidence of sensorimotor deficits contralateral to the lesion.

• Rubber Band Measure
To assess any fine sensorimotor impairments in the forepaws, an orthodontic rubber band was fitted around the right and then the left forepaw. The duration of time spent attending to the band as well as whether it was removed, and the latency to do so was recorded.

• Drug-induced Rotation Measure
The animals were treated with the dopamine receptor agonist apomorphine (1 mg/kg), and placed in the same cylinder in which they performed the drug free rotations. The number of contralateral and ipsilateral turns were recorded. Contralateral turning in response to an apomorphine challenge signals depletion of dopamine in the lesioned striatum.

• Fruit Loop Task
The animals were placed in their home cage and given fruit loops. The task measured any fine motor deficits that were apparent while grasping, manipulating and eating the fruit loop.

Results

Key Findings
• Although no significant motor deficits were found in the open field activity, there was observable swaying in the majority of the 6-OHDA lesioned animals.
• Use of the ipsilateral paw in rearing increased in the lesioned group across the five trial days while it decreased in control animals.
• A general increase in drug free ipsilateral rotations was found in the lesioned group as compared to a general increase in contralateral rotations in the control group.
• A significantly higher number of ipsilateral rotations were found in the lesioned group in response to an apomorphine drug challenge.
• The rubber band and fruit loop tests showed no significant fine motor or sensory impairments in the lesioned animals.

Conclusions
• Lesions which cause dopamine depletion in the striatum cause Parkinson’s like symptoms in the rodent
• TH-IHC is necessary to verify the location and extent of the lesions
• Dopamine depletion causes motor deficits in rearing and rotation in the paw contralateral to the lesion
• Lesions of the striatum do not cause fine motor and sensory impairments
• Higher concentrations on 6-OHDA are necessary to create more immediate symptoms of PD

Literature Cited

Acknowledgements
We wish to thank Gail Russell for technical assistance throughout this project. Funding for this research was provided by a grant from the Hodson Trust awarded to M.B. and D.S.
The Unfinished Business of Permanency: Show Me the Data!

Introduction

When a child is adopted from foster care we know it. We carefully track when children exit foster care and we call this adoptive family the child’s “forever family.” (See figure 1). Enormous public resources are brought to bear on increasing the number of placements from foster care into adoption because we assume adoption begets permanency and permanency is the goal.

This project draws attention to the reality of our collective ignorance with regard to the success or failure of current policy. At achieving or failing to improve permanency for children through adoption. Simply put we do not systematically collect the data that would help us to know if we are succeeding at achieving permanency or not, even though we can say with assurance that we have exited children from foster care by placing them in adoptive homes. As such, we don’t know if state and federal legislation is moving us closer to the goal of permanency for children exiting temporary care settings, or further from it.

The Problem

Professionals working with children and families in temporary care settings will tell you that adoption is often the best chance for permanency many children in temporary care settings can hope for. And, we know through an extensive, broad and deep body of child welfare literature that a lack of permanency exposes children to probable risks of grave lifelong negative effects that are extremely costly to tax payers to treat and cope with through the lifespan. It logically follows then that providing permanent caring environments for children to grow up in, is preferable.

In pursuit of permanency, federal and state legislative initiatives, such as the Adoption Safe Families Act (ASFA) of 1997 and 2008, were designed to increase the number of children placed from temporary care to adoption and thereby obtainable permanency. The problem is we have not yet fully considered or figured out how to collect the appropriate data needed to accurately and adequately calculate how many adoptive “forever families” are indeed permanent and conversely how many adoptions fail to be permanent. Crafting methods to collect national disruption and dissolution statistics is required in order to evaluate policy interventions claiming to improve permanency outcomes, but to date this has not been accomplished.

It is estimated that ASFA requirements and incentives have resulted in an additional 34,000 adoptions from 1998 to 2000 that would not have otherwise occurred.

Risks to Permanency

A few things we know

- Children who have had previous placements are at risk of dissolution.
- As a child ages his risks of dissolution increase.
- Children with special needs are at higher risks of dissolution.
- Since ASFA more children were who were once considered unadoptable are now included in the adoptable population.

What we don’t know

- The actual number of children that are impacted by adoption dissolution.

Section 479, A.1, of The Safe Families Act guidelines were given to develop a set of outcome measures that included:

- Length of stay in foster care placements,
- Number of foster care placements and number of adoptions (AFCARS FY 2009 data).

The guidelines do not require the tracking of permanency outcome measures.

- In this list of guidelines there is no recommendation to aggregate data for dissolution rates.
- Other researchers suggest barriers: e.g. that tracking these numbers is difficult because when an adoption dissolves it reenters the system under a new name.

Listed as paramount concerns in the ASFA legislation were, “to shorten the time frames for making permanency planning decisions and to promote the adoption of children who cannot return safely to their homes” (ASFA, Responding to Challenges).

It seems strange that this significant effort to achieve permanency wouldn’t also provide a road map to maintain it or at least assess it.

Coakley and Berrick, in their review on Preventing Adoption Disruption, asserted that the “paucity of Information in this area and the fact that there are no data collection mechanisms currently in place to study the issue may be a cause for concern” (p 102). Currently Child Welfare Gateway reports that data is inconsistently reported by states.

Discussion

In summary report, Assessing the field of Post-Adoption Services: Family Needs, Program Models, and Evaluation Issues; submitted to the U.S. Department of Health and Human Services, and to the Office of the Assistant Secretary for Planning and Evaluation, noted only five programs listed as systematically assessing the need for and efficiency of post adoption services to prevent adoption disruption and dissolution (Gibbs & Siebenaler, 2002). These states were, Washington, Oregon, Iowa, Illinois, and Maine. Though most states offer some post adoption supports, they can be as little as providing a list of resources for the adoptive families.

Understanding and assessing the need for post adoption services is a critical and necessary step in achieving our national goal of removing children out of foster care and into forever families. So why are such measures unimpractical absent from federal and state policy explicitly intended to improve permanency for children who would otherwise languish in foster care?

We also know these issues are risks to permanency...

- Children placed in child welfare have experienced trauma.
- Children in foster care often experience multiple placements before being placed in and adoptive home.
- Children with special needs, once considered unadoptable are now being adopted due to more case worker training and subsidy entrance to states and families.
- Children in the child welfare system tend to be older by the time they are available for adoption.
- Children with emotional, cognitive, abuse histories and children who have been exposed to substance abuse – Most children are placed in DHHS custody with one or more of these criteria.

Data we don’t like, we don’t even process.

Maine? Once out in front of this problem has unfortunately cut its only promising program that specifically addressed adoption dissolution issues. Now Maine’s adoptive parent’s are expected to access services the same way other families do. According to the research it is common knowledge that adoptees are fragile and carry with them a set of unique challenges.

This work is supported by the Margaret Chase Smith Policy Affairs Scholarship.
http://mcsps polic ycenter. umaine.edu/?q=scholarships
Materials & Methods
To gather data from town residents, a survey was designed so that citizens accessed an online questionnaire. Three towns were chosen for this study after careful deliberation.

Holden was chosen as a Pay-As-You-Throw community. This is a type of trash disposal system where all 3,000 residents are required to purchase an approved bag for pick-up by a private contractor. Regulations are intended to encourage residents to recycle as a means of lowering household costs.

Using a curb-side pick-up program, Orrington was chosen to represent the 40% of the State that uses this type of recycling system. Orrington also uses a zero-sort process, where all 3,500 residents can store all recyclables together instead of sorting before materials are processed.

A transfer station is the most common type of recycling system in the State of Maine, with over 60% of communities using a drop-off center to collect recyclables. With around 5,000 people living in Millinocket, it was the most heavily populated town in this study.

Project Objectives
- Identify current recycling activities by town residents.
- Use baseline data to assess effectiveness and success of current policy objectives.
- Assess resident’s willingness to participate in composting activities.
- Formulate hypotheses to improve total amount of recycled material state-wide.

Discussion
This project is currently in progress. The results will be used to identify which socioeconomic factors and recycling system attributes significantly influence residential recycling. The project also gathers data regarding resident’s opinion on the system used in their town, to assess real and perceived barriers to higher recycling rates, and to assess the feasibility of composting as a possible supplement to recycling activities.

Selected References

This work is supported by the Margaret Chase Smith Policy Affairs Scholarship.
http://mcs.policycenter.umb.edu/?q=scholarships
A revision of the Afrotropical genus *Stentorceps* Quinlan, 1984 (Hymenoptera: Figitidae) with a description of five new species

Matthew Nielsen (NHRE Intern) and Matthew Buffington (SEL)

**Introduction**

With nearly 3000 described species, the Cynipoidea represent an incredibly diverse superfamily of parasitic wasps, and the figitid subfamily Eucoilinae contains nearly one third of these species (Ronquist, 1999). Some of these species have proven economically important as parasitoids of many different leaf-mining pests (Buffington, 2010) and fruit-flies (Wharton et al., 1998). Despite their economic importance and almost 1000 described species, the diversity of Eucoilinae remains poorly understood throughout the world, with an estimated 80-95% of species not yet described (Nordlander, 1984).

Quinlan (1984) described *Stentorceps tubicen*, a new eucoiline genus and species from Kenya characterized by many unusual features, including extremely large mandibles, a peculiar trumpet-shaped protrusion between the antennae, and two smaller knobs beneath them (Quinlan, 1984). Despite these distinctive characters, *Stentorceps* has received almost no attention since its description, so even its basic morphology and diversity remain poorly understood. This summer, we have started investigating this lack of knowledge by revising this previously monotypic genus in light of a detailed investigation of recently collected specimens from Kenya and Madagascar.

**Methods**

Specimens were collected using malaise traps in Kenya and Madagascar. Scanning electron microscopy images for this project were made using coated specimens at the Scanning Electron Microscopy Lab, NMNH; light microscope images were generated at the Hymenoptera Imaging Suite, NMNH. We used vSysLab for species description (http://vsyslab.osu.edu); images are stored on MorphBank (www.morphbank.net); all species are registered with ZooBank (www.zoobank.org).

**Key to the species of Stentorceps**

1. Corniculum large, obscuring most of the frons and part of toruli (in anterior view), heavily flared.........................................................2
2. Corniculum small, much of the frons and all of the toruli exposed, flaring weak or absent.................................................................4
3. Anterior half of the dorsal surface of scutellum smooth; dorsal surface of corniculum variably shaped, but not oblong............................................3
4. Anterior half of dorsal scutellar surface striate; dorsal surface of corniculum oblong.................................................................S. n. sp. 4
5. Dorsal surface of corniculum circular..................................................S. n. sp. 5

**Conclusions**

We have described five new species of *Stentorceps* in addition to Quinlan’s original *S. tubicen*. The two species from Madagascar are extremely similar, suggesting radiation following vicariance on the island, while the phylogenetic affinities of the Kenyan species are more obscure. Further genetic work using these specimens could test and resolve these relationships and determine the location of *Stentorceps* among the Rhoptrumpenius genus group, believed to contain the most closely related genera (Quinlan, 1984). Most specimens from both geographic regions came primarily from traps associated with riverine, swampy, or littoral forest, indicating a characteristic habitat for *Stentorceps* and its hosts.

Like the host, the purpose of the bizarre head morphology remains a mystery. The corniculum is entirely unique among Hymenoptera. The diaprids *Coptera* and *Psilus* have wedge-shaped heads with armaments similar to the pyriform protuberances in *Stentorceps*, but even in these taxa, the function of the unusual morphology remains unknown. Nevertheless, we have gained a clearer understanding of the basic morphology and diversity of *Stentorceps* and can now begin a more thorough investigation of the many questions about this unusual genus.

**Acknowledgements**

Our thanks to Robert Copeland (ICPE) for providing specimens from Kenya and Robert Zuparko and Brian Fisher (CASC) for providing specimens from Madagascar. At The Natural History Museum, David Nottin provided loans of *S. tubicen* paratypes from the collection, and Andy Polaszek assisted M. Buffington with conducting research. Scott Whittaker provided SEM training and support for M. Nielsen. We would also like to thank Elizabeth Cotrell, Gisele Hunt, Virginia Power for running the 2010 NHRE program and Christian Samper for providing funding.

**References**


Antropogenic Change in the Chesapeake Bay
Archaeology and Historical Ecology of the Eastern Oyster (Crassostrea virginica)
Sheel Jagani, University of California, Berkeley
Torben Rick, Smithsonian Institution, National Museum of Natural History, Washington, DC

Big Picture: The Chesapeake Bay is the largest estuary in the United States. For well over a century, the Bay has been devastated by overfishing, pollution, agricultural runoff, and climate change. Antropogenic environmental change is well documented in contemporary records, especially the collapse of the Bay’s oyster fishery and associated changes in ecosystem structure. Questions remain about the nature of the oyster fishery in prehistoric times, when Native Americans intensively harvested oysters and other bay resources for millennia. How intensively were oysters harvested compared to other ancient resources? What were the baselines of oyster populations like prior to Historical over-exploitation? How did prehistoric harvesting affect the age and size distribution of ancient oyster populations? These questions related to shifting biodiversity baselines can be addressed using archaeology (Erlendonk and Rick 2010). We use archaeology to introduce a prehistoric perspective on the ecology of the Chesapeake Bay and to analyze how Native peoples may have influenced its structure and ecology, most notably by intensive harvesting of the Eastern oyster (Crassostrea virginica).

Site: The Chesapeake Bay has a long history of human occupation spanning the Holocene and terminal Pleistocene, making it an ideal site for investigating ancient human-environment interactions. Excavations were carried out at a number of shell middens at Fishing Bay on Maryland’s Eastern Shore (figure 1). We focus on a site (18-DO-35) on Elliot’s Island in the southern part of Fishing Bay. This is an area with large and dense shell middens that provide evidence for focused and likely seasonal harvest of the Eastern oyster. Site 18-DO-35 (figure 2) dates from AD 1460-1510, part of the Late Woodland period and just prior to initial contact with Europeans. The site is located 3-2 m high on a terrace on the southwestern side of the island and covers approximately 50m along the sea cliff and 20-30 m inland. Oyster shell and small amounts of pottery are visible on the site surface and eroded along the shore.

Subsistence Strategies and Human Harvest of Eastern Oysters
Excavation of 18-DO-35 produced large amounts of oyster shell, including whole valves and fragments, and a small number of artifacts, other shellfish, and vertebrate remains (figure 6). Since 99.8% of the sample were oyster shells, we looked at the effects of this focused predation on the age (figure 8) and size (figure 9) distribution of oysters over the roughly 60 years (AD 1450-1510) represented by our sample. Level 3 contains the earliest deposition of oyster shells, while level 1 represents the most recent. Intensively harvesting these shellfish may have affected the quantity of larger, older oysters available for subsistence, thus resulting in the observed drops in average age and height. However, where the age distribution increases slightly in level 1, the height does not, suggesting a possible drop in the growth rate due to sustained and focused predation, a change that is more significant than age or size distributions alone.

Conclusions and Implications: Oyster harvesting at 18-DO-35 was a very focused activity. Within a span of only 50-60 years, we can demonstrate a change in age and size distributions of oysters harvested from the Chesapeake Bay due to intense human predation. Our next step is to perform stable isotope analysis of the oyster remains and investigate the midden at 18-DO-439 on Elliot’s Island, which represents a period of occupation just prior to 18-DO-35. This broader time scale will enable a diachronic analysis of the development of seasonal subsistence on oysters in Fishing Bay.

Today, large oysters are rare in much of the Chesapeake, though they were once an abundant resource as evidenced by the middens at Fishing Bay (figure 11) and through historical catch data. Native Americans influenced oyster populations of the Bay and therefore the structure of the ecosystem well enough before European contact to indicate that records and studies of biodiversity baselines need to be pushed back in time. Our work complements recent studies that use archaeological data to understand Historical period oyster harvest in the Bay (Harding et al. 2008, 2010; Kirby and Miller 2005), but indicates that we need to investigate these patterns deeper in time as much of the Bay was influenced by human activities well prior to the contact period that began in the early 1600s. By contributing to an understanding of prehistoric human land use and ocean use, this work also has the potential to aid conservation efforts at estuarine and coastal environments suffering from degradation and shifting biodiversity baselines.

References and Acknowledgements

We would like to thank Jessica Sampson for his generous support of the NHRE program, and Liz Cottrell, Gene Hunt, and Virginia Power for help with our project. This project would not have been possible without the mentorship of Torben Rick and the work of the Fishing Bay excavation team. Thanks also to Bill Boykin, Courtney Holman, Jeff Speakman, Dave Rosehart, and Jim Krakauer.
Data from a local mid-sized New England University reveal that women account for only 20.4% of the STEM faculty. Menfaculty are more densely clustered in higher ranks (e.g., 75.7% Full Professors) and far outnumber women in all ranks. Other data are presented and discussed to highlight changes across the years (e.g., gender balance in new hires and salaries), as well as needed changes to improve the representation of women faculty in STEM fields.

- **Research institutions are starting to:**
  address the imbalance in the faculty gender composition across STEM disciplines by: (1) trying to have the number of women in their faculties mirror the number they educate; (2) preventing the erosion of women scientist at each step of the career line; (3) ensuring an equally positive experience for the genders; and (4) providing support and resources for faculty members with family responsibilities (Baylin, 2003).

<table>
<thead>
<tr>
<th>Year</th>
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<th>Male Hires</th>
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<tbody>
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- **Gender differences in research productivity can be attributed to personal and familial characteristics, as well as structural positions (differences in rank) (Xie & Shauman, 1998).**
- **Based on data from a large, nationally representative, cross-sectional sample, Xie and Shauman (1998) found that whereas the percentage of women scientists increased from 5% in 1969 to 24% 1993, the percentage of women faculty was still low relative to men.**
- **Women in general tend to make less than men. Further, the wage gap (i.e., difference between men’s and women’s earnings) is twice as large for those with historically traditional (e.g., scientists) versus egalitarian gender roles (Judge & Livingston, 2008).**

- **Quality of work-life issues (e.g., professional activities and career development, recognition for competence and expertise, department and external relationships, working conditions, and perceptions of discrimination) are important for academic leaders to address as they influence retention, and conversely, intentions to leave the institution (Rosser & Javinar, 2003).**

- **Gender differences in research productivity can be attributed to personal and familial characteristics, as well as structural positions (differences in rank) (Xie & Shauman, 1998).**

**Objective:**
- **Reveal findings from a mid-sized research institution regarding the progress of faculty members on a number of benchmarks (e.g., frequencies, salaries, rank in tenured positions, new hires), by gender.**
- **Reveal the influence of a National Science Foundation ADVANCE grant on institutional transformations to help advance women in the STEM fields on these benchmarks.**

**Methods:**
- **Institutional data was collected through the University of Rhode Island’s Office of the Provost to track progress on a variety of benchmarks.**
- **The analyses contain information reported during Academic Year (AY) 2007-2008.**
- **Data from Social and Behavioral Sciences (SBS) and from the Science, Technology, Engineering, and Math (STEM) disciplines were obtained.**

**Conclusions:**
- **There were 57 women and 222 men in our sample of tenured-tenure track STEM-SBS faculty at a New England University. Although there was a trend to hire more women from 2004-2006 at the peak of an NSF grant to advance women, male faculty are still hired at greater rates and have higher salaries over all levels (Assistant to Full Professor). More efforts are needed to recruit and retain women faculty in STEM-SBS fields, including programs and policies (e.g., family leave, dual career) that increase and maintain high quality of life.**