CALL SIGNS

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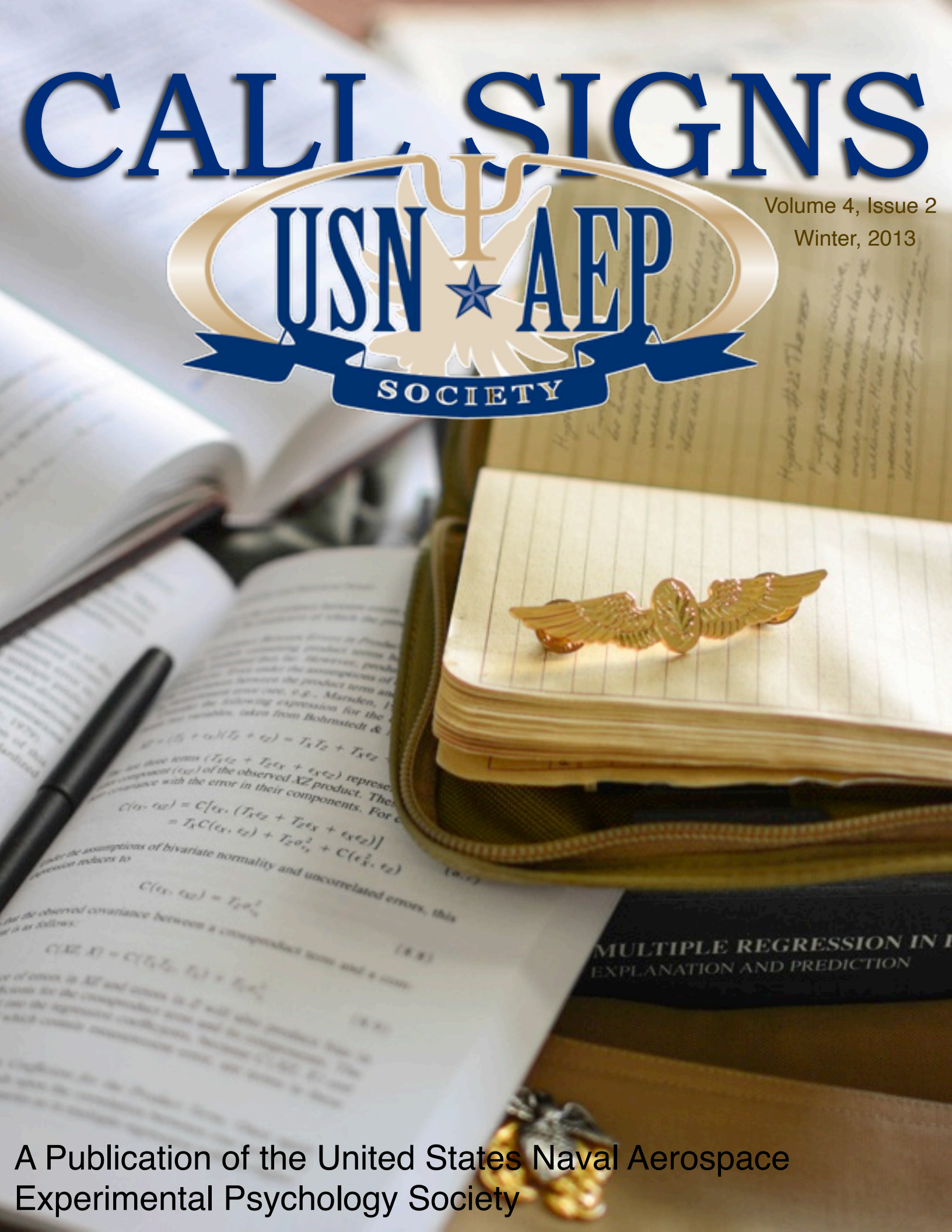


A Publication of the United States Naval Aerospace Experimental Psychology Society

Contents

About the USN ★ AEP Society

As military transformation continues to affect today's and tomorrow's Department of Defense and the Navy Medical Service Corps, the need to promote the role of Aerospace Experimental Psychologists as leaders and innovators in aerospace psychology continues.

Naval Aerospace Experimental Psychologists offer a unique combination of education, knowledge, skills, and experiences to address current and emerging challenges facing the Navy, joint, and coalition environments.

The U.S. Naval Aerospace Experimental Psychology Society (USNAEPS) is an organization intent on:

- Integrating science and practice to advance the operational effectiveness and safety of Naval aviation fleet operators, maintainers, and programs
- Fostering the professional development of its members and enhancing the practice of Aerospace Experimental Psychology in the Navy
- Strengthening professional relationships within the community

Message from the President

This past summer, I was honored to assume the Presidency of the United States Naval Aerospace Experimental Psychology Society (USNAEPS). I would like to express my sincere thanks and appreciation to LCDR Chris Foster, our outgoing President, and the Executive Committee members who supported him, for their hard work and strong leadership. Building upon the efforts of LCDR Foster and his team, the Society will be focusing its attention in the upcoming year on three key areas: outreach and engagement, historical documentation and archiving, and updating our web site and member records. I would like to briefly highlight two efforts currently underway. First, LCDR Jeff Grubb, USNAEPS Historian, with support from a number of USNAEPS members, is leading an effort to develop a display chronicling the history of the AEP community (in conjunction with the other Navy aeromedical communities) at the National Naval Aviation Museum in Pensacola, Florida. Second, as USNAEPS membership continues to grow in both number and diversity, I have asked LT Kirsten Carlson, USNAEPS Membership Outreach Coordinator, to lead an effort to ensure current member information is updated and to solicit additional information from our members that we hope will increase member familiarity with one another on both a personal and professional level and serve as a resource for specialized skills and expertise. Finally, I am happy to announce that as a result of the diligent efforts of our Treasurer, LCDR Will Wells, USNAEPS has been granted tax-exempt status. So, what exactly does this mean for the Society? It means that USNAEPS can accept financial contributions from potential donors, contributions the Society can use to fund important initiatives. Also, the Society now has the ability to apply directly for government and foundation grants should the need or opportunity arise.

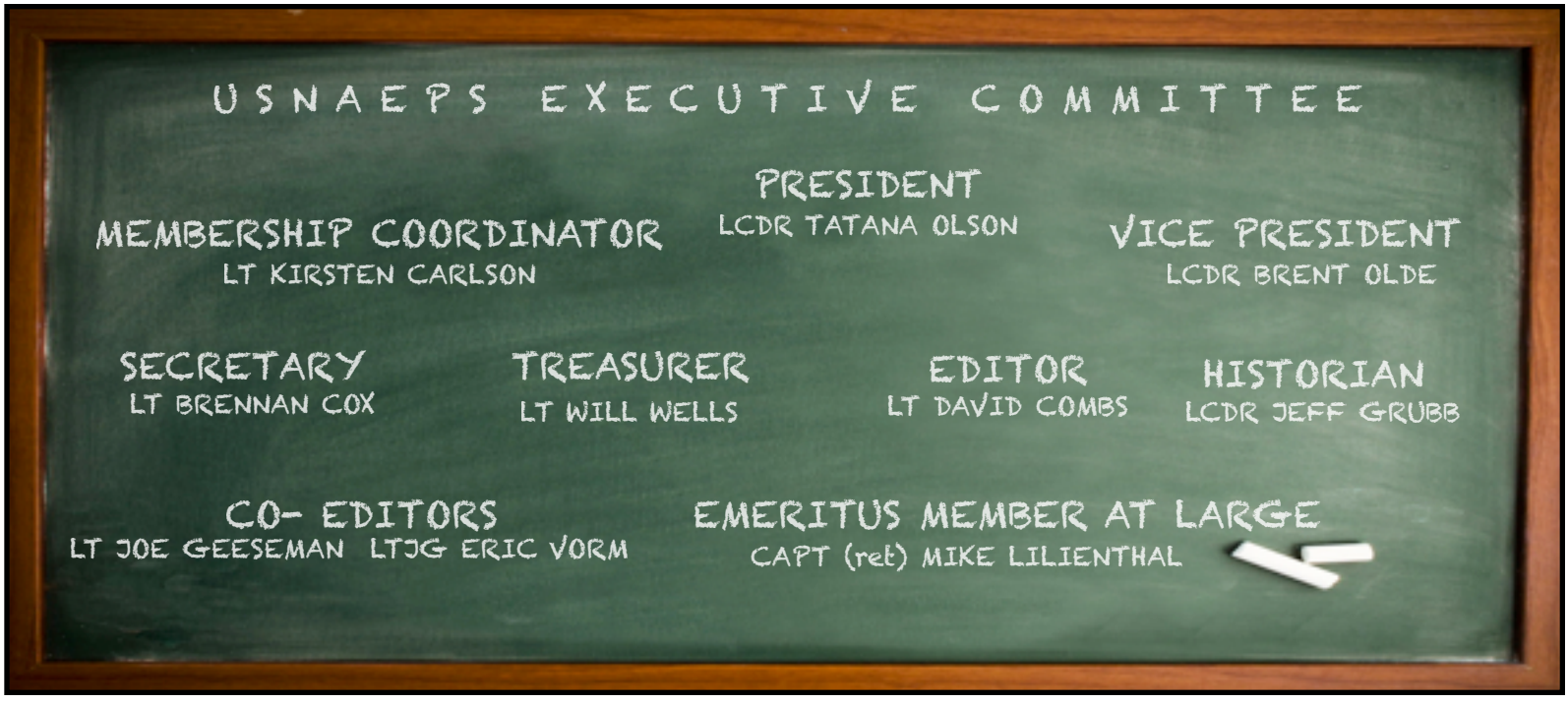
Prior to being Vice-President and now, President, of USNAEPS, I was the Editor of Call Signs. There is a tremendous amount of hard work, dedication, and persuasion that goes into producing every issue. So, it is with great pleasure that I present our 8th (Winter, 2013) issue of Call Signs, the first under the leadership of our new Editor, LT David Combs. In this issue, we go back to our roots and focus on the bench-level research contributions of AEPs. The strength of the AEP community has always come from the diversity of its members – diversity of backgrounds, education, experiences, and expertise – and an enduring commitment to relevant, high-quality research that supports the needs of the warfighter. Perhaps it is the intersection of these two qualities that drives AEPs to pursue such interesting and important research endeavors. This issue highlights a number of these exciting research endeavors, both within traditional AEP research domains, to include LT Kirsten Carlson's work to develop an appropriate "control group" to better

understand the role of human factors in aviation mishaps, LT Brennan Cox's efforts to incorporate personality assessment into aviation selection, and LT Stephen Eggan's research mapping human spatial processing, as well as within some non-traditional domains, such as LT David Combs' work examining the generation of trust in a counterinsurgency context and LCDR Pete Walker's efforts to address the issues surrounding the analysis of "Big Data." Additionally, the issue features an article from the AEP community Specialty Leader, CDR Jim Patrey, discussing the "State of the AEP Community," and an excellent piece on Science & Technology funding contributed by Ms. Laura Worcester at the Office of Naval Research. And of course, no Call Signs issue would be complete without a historical note from a member of the retired AEP ranks and a few entertaining articles chronicling life as an AEP!

In closing, as we enter the holiday season, a time to reflect and give thanks for the important things in our lives, I would like to take this opportunity to express how thankful I am for your continued support of the Society. On behalf of the entire USNAEPS Executive Committee, have a safe and joyful holiday season and best wishes for the New Year!

LCDR Tatana Olson currently serves as the Navy Liaison Officer and Special Advisor to the Director at the Defense Forensics and Biometrics Agency in Arlington, Virginia. In addition to learning a lot about the Army in this position, she represents the Navy's biometrics and forensics equities within the Joint Enterprise, integrates efforts across Navy and Marine Corps biometrics and forensics stakeholders, provides acquisition, S&T, and maritime biometrics expertise support to the Director, and ensures alignment of Navy requirements, standards, and policies with overarching DoD guidance.

LCDR Olson lives in Vienna, Virginia with her husband of nine years, Frank Moglia, an Information Dominance Officer in the Navy Reserve, and their daughter, Delaney Sophia.



State of the AEP Community

By: CDR Jim Patrey

Fellow AEPs,

It has been a while since our last state of the community article and there is much to report on our recent accomplishments and pending opportunities. I recently attended the Medical Service Corps Specialty Leaders meeting convened by RDML Moulton. I learned a great deal about how we fit within the Medical Service Corps and it reified what a unique community we are – with equal footing in the medical and aviation worlds and little presence in the Military Treatment Facilities (MTFs; which are a large focus of Navy Medicine). I also gained a greater appreciation for the challenges we are faced with regarding our community billet structure, promotion and outfill opportunities, and the value of aviation-based fleet and acquisition expertise to Navy Medicine. In particular, I'd like to highlight some areas of emphasis from MSC Leadership:

Joint Professional Military Education (JPME) – There is continued interest in growing the joint knowledge and credentials of the MSC, but it was stated that there seems to be an inordinate amount of emphasis on JPME I, which has led many junior officers to pursue it during their first tour. MSC leadership made it clear that it was more important for junior officers to excel in their jobs and that mid-grade O4s should be seeking opportunities to complete JPME I. Furthermore, while it is viewed as a valuable part of a promotion package, it is not mandatory for promotion to any rank.

FITREPs –MSC leadership is encouraging the use of a standard FITREP format. It is a format that I believe most of us are familiar with – impactful opening statement with soft-breakout, white space, 3-4 cause-and-effect bullets, white space, closing with promotion recommendation. If you're not asking your fellow AEPs for help with your FITREPs, you are doing yourself a disservice!

Promotions – Zones have been among the tightest ever, with the last O5 zone being the smallest ever recorded with records spanning 20+ years. While it is expected to swing back towards normal, expect them to remain small and competitive for the foreseeable future.

RDML Moulton has several independent groups supporting his priorities, as follows:

Professional Development – Emphasis thus far has been primarily on acquisition certification within Navy Medicine, something for which AEPs are a model community, with roughly half of our community possessing some level of acquisition certification (note that CDR (S) Phillips has been supporting this group). This group also includes an emphasis on mentoring, and is exploring tools and approaches for effective mentoring (something we'll hear more about in the coming months). Finally, they have asked that we refresh our community's career roadmap and several AEPs (CDR (S) Phillips, LCDR Olde, LCDR Foster, LCDR Olson, LCDR Walker, and LCDR Grubb) contributed to revising these roadmaps.

MSC Operational Toolbox – This project assessed the deployment needs of all MSC subspecialties and is developing an assortment of tools to support just-in-time training for deployment. While this is relevant to only a small number

of AEP billets, we have had four IAs in the last eight years and we stand to benefit from improved training.

Communication – There is continued emphasis on improving communications from and to MSC leadership, to include the quarterly VTCs, NKO messaging and Sharepoint, social media, more efficient email lists, and monthly newsletters with updates and questions from the field.

Finally, I'd also like to note that AEPs are held in high esteem by MSC leadership, thanks to the exceptional efforts of CAPT (ret.) Schmorrow and CDR (sel) Hank Phillips in communicating our accomplishments and value to MSC leadership. Their efforts, along with CAPT Schoeler's (Deputy MSC), familiarity with our community and the work of numerous AEPs from his recent role as the MSC Health Care Scientist Detailer, have helped to ensure a solid relationship with MSC leadership. We have been encouraged to pursue more leadership opportunities within Navy Medicine as our skills and experiences are viewed as highly valuable, and we will continue to likewise encourage our officers to prepare for and seek such opportunities.

I believe it is important to note the changing structure of our community. In FY13, we had six O6s and an average AEP tenure of roughly 14 years. By the end of FY15, all of our current O6s may be retired (though we hope to add some new O6s by then), we expect seven new accessions into the AEP community, and our average tenure length is projected to be approximately eight years! While we continue to be blessed with high quality accessions and expect that to continue, it seems likely that such a change will produce some challenges for us. I encourage you all to seek advice and advise each other, collaborate on projects, funding opportunities, and papers, and pursue advanced training and assorted professional opportunities to grow your (and thereby our) knowledge, skills, and abilities.

Our accomplishments for FY13 were impressive and include:

Five promotions/selections with Brian Johnson, Jennifer Johnson, and Greg Gibson all pinning on LCDR this year, Eric Vorm being selected for LT, and Hank Phillips being selected for CDR. Hearty congratulations to our promotees and we look forward to a whale of a wetting-down!

We have had two of our AEPs selected for significant outfills within Navy Medicine. CAPT Street was selected for the TRANSCOM Deputy Force Surgeon position and will be assuming those duties at Scott Air Force Base in Illinois later this year. LT Anglero was selected to fill a Clinical Psychology billet in Okinawa, Japan. These are noteworthy leadership opportunities within Navy Medicine, so please congratulate them on rising to the challenge within Navy Medicine!

The AEP curriculum, run by the Department Head at the Naval Aerospace Medicine Institute in Pensacola, has been accredited by the American Council on Education for 14 graduate credit hours. This will be of great help to any of our Master's level students as they pursue their PhDs - it should lighten their course load, as well as help our occasional ABDs who might be short credit hours. Bravo Zulu to LCDR Foster and LT Cox for their efforts to get this approved and to the great many AEPs who contributed to developing the current curriculum.

We have also implemented a revision of the AEP section of the Military Personnel Manual (MILPERSMAN 1210-080) to align it with content included in Aviator and other aeromedical officer MILPERSMANs. This included updates to sections on AEP qualification, revocation, and requalification. The format and content we submitted is being used by BUPERS and the other aeromedical communities to make similar updates.

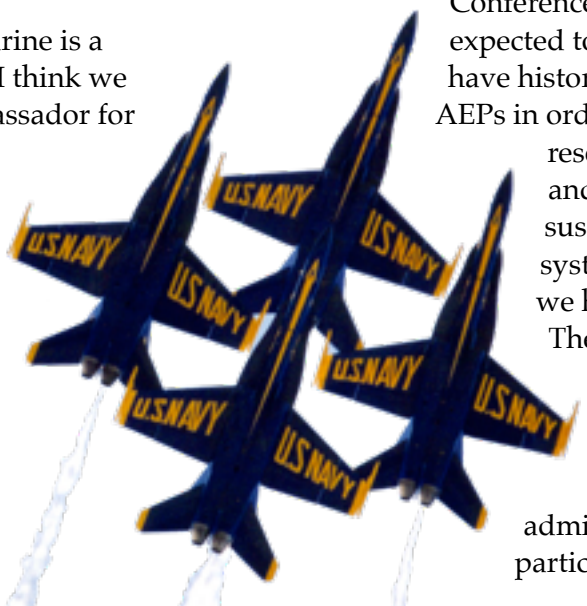
USNAEPS put out its first Call Signs Compendium, passed new by-laws, and has recently received its long-awaited non-profit status! The Society also opened membership to professionals who have worked with and supported the AEP community over the years. Individuals nominated for membership can now join and formalize their relationship with our community, opening up further opportunities for collaboration. In addition,

USNAEPS is currently working with other Navy aeromedical communities to build a display at the National Naval Aviation Museum in Pensacola, FL that will provide a history of our respective communities. It is exciting to see our history formally captured and prominently displayed at our national museum! Kudos to LCDR Grubb, LCDR Foster, LCDR Olson, LT Rozovski, and LT (sel) Vorm for making that happen!

The Office of Naval Research has two ongoing projects that have tied together many AEPs across multiple commands. The Live-Virtual-Constructive Training Fidelity project has seven AEPs at four different commands collaborating to support the development of integrated training solutions to enable fleet readiness. This team just won the 2013 Admiral Jeremy M. Boorda Award for Outstanding Integration of Analysis and Policy-Making for their work. The Unmanned Aerial System Interface, Selection and Training Technologies project (UASIST) has 10 AEPs at six commands actively involved and expects to have a profound impact on the human systems side of unmanned systems. The ASTB-E, which has been under development for the better part of a decade and has been worked on by almost half of our community, has been signed into action and will be released on December 9th. The Interim Firescout AVO Selection System is being worked on by AEPs at three commands. As a community that is geographically distributed, these collaborative efforts are key to allowing us to remain engaged, to leverage the expertise that each of us bring to such programs, and to deliver critical capabilities to the Navy and Marine Corps team.

Much as the saying goes that every Marine is a rifleman and every sailor is a fireman, I think we need to note that every AEP is an ambassador for the community (perhaps not as impressive as being a rifleman, but work with me here!). The size of our community means that by definition, we have a small footprint. We all need to collectively and individually ensure that in all of our interactions, we continue to communicate our capabilities and the value we provide as a community. We need to constantly be looking for new opportunities to support the Navy's mission by engaging in key projects or programs and identifying new positions where we can add value to the Fleet or Navy Medicine to ensure we continue to be a valued resource.

As we look toward FY14, there are new challenges in front of us. On the aviation side, there are several trials ahead. All DoD Special Pays are undergoing revision, including our aeromedical flight pay, Aviation Contingent Incentive Pay (ACIP). While this was initially slated to be eliminated in FY13, the hard work of CDR White, CDR (sel) Phillips, LCDR Foster, LCDR Olson, and LT Cox created a compelling business case for the value of ACIP to the aeromedical communities. Their effort, in great measure, contributed to extending the current ACIP through FY14, with likely continuation to FY17, and a growing possibility that it will stay intact, as is, through revision to the recently enacted changes in law. Our aviation training in Pensacola has taken a hit in that the fixed wing aeromedical officer training is currently on hold due to limited aircraft availability and ongoing budget constraints. Please be attentive to minding your monthly, quarterly, semi-annual, and annual flight requirements; understand that flying is at the heart of our value to the Navy, so I urge you to meet your statutory flight requirements as well as adhere to the spirit of the OPNAVINST 3710. Failure to fly (that is, willful malingering rather than missing a gate or a month of flight pay) can potentially result in BUMED/BUPERS revoking a service member's flight authority and even designator!



Conference attendance and travel, in general, is expected to remain tight in FY14. Conferences have historically proven to be highly valuable to AEPs in order to stay current on pertinent research, interact with critical colleagues and stakeholders, and for general sustenance of our aviation human systems situational awareness; I believe we have already been compromised. There are permissible trips and processes for getting conferences, meetings, and such approved. I encourage you to pursue those and persist through the necessary administrative processes to enable your participation in conferences and other such

travel to keep the AEP community in peak shape.

Authorization for new accessions in FY13 was zeroed out in the summer and precluded us from accessing some qualified candidates. It is unclear how many accessions we will receive in FY14; we have informed MSC leadership that we risk as many as five gapped billets by the end of FY14 if we do not get sufficient accessions. We were tentatively allotted three direct accessions in FY14, but that has not been confirmed. The initial MSC leadership accession authorization was much lower than requested, and they are working to increase that number. We hope to be authorized at least three accessions in FY14. In order to offset our projected gapped billets, we are also looking at other means of building new AEPs, including lateral transfer boards, where we can redesignate aviators to our specialty. I request that each of us be aware of potential new accessions and transfers, and be ambassadors for our community so that those who might be interested in, and are good fits for, our community are aware of the opportunities to become an AEP.

LCDR Foster, LT Sciarini, and I have just returned from a recruiting trip at the Human Factors and Ergonomics Society annual meeting. CDR White, who was local to the event, was also able to attend part of the meeting. We were able to go to the meeting thanks to BUMED and CNRC Speaker Bureau support. We even had local recruiters on hand to assist, which provided a value added opportunity to educate them on the AEP community. At the meeting, we reviewed a number of resumes and interviewed seven promising candidates. Several of them were referred to us from other interactions with the AEP community or as a result of seeing us give talks at conferences; so kudos to those AEP ambassador moments you have provided and please keep seeking such opportunities. While we expect to need seven new AEPs in the next two years, we have a healthy queue of candidates and are hopeful that we'll continue to be able to access candidates of the highest caliber. Please maintain your efforts to find these individuals as we routinely lose great prospects due to factors out of our control. The bottom line is that we can never have too many qualified candidates ready to become AEPs.

BUMED has been using a modeling tool called MEDMACRE to develop and validate its manpower; According to this model, AEPs are undermanned. So, we have an inherent opportunity for growth within BUMED. Furthermore, Navy Medicine is striving to adopt more rigorous and standardized acquisition processes and our community's credentials and expertise in acquisition look to be highly useful in supporting these goals. We also have some interest from the safety, testing, and personnel communities, and may see billet growth in these areas as well.

Lastly, we are beginning a review of our community in order to develop a blueprint/roadmap for our community overall. This is driven by the many comments we've received from our folks regarding why we have certain billets, why we don't have other billets, where we seek to grow billets, etc. To that end, I recently sent out an email with instructions on how to submit inputs to this planning process. We seek 100% community participation in this, whether you think you don't know enough to contribute, you're about to retire or PCS, in a peripheral outfill, you're ecstatic with how things or going, or disgruntled with the state of the community – share your ideas, air your grievances, applaud our successes, but most of all – **PARTICIPATE!**

I'm honored to serve as your community Specialty Leader and will continue to work to best serve the needs of our 'tribe.' I hope that you enjoy this issue of Call Signs and sincerely appreciate the hard work the editorial staff has put into making this such an outstanding edition.

CDR Jim Patrey is currently the Assistant Director of S&T, Human Systems Department, at the Naval Air Warfare Center Aircraft Division where he supports a diverse portfolio of S&T projects supporting aircrew protective equipment and human-machine interfaces with an emphasis on UAS.

He and his wife Catie have 4 children and live in the Patuxent River, MD area.

Funding 101 for Science & Technology Research

By: Laura Worcester, Office of Naval Research

Over the past 20 years in the Science and Technology (S&T) industry, I think the most frequently asked questions that I have received centers around S&T funding. What is S&T funding, and what are the different types of S&T funding? Who has it? How do I get some? And, what do I need to know to be successful in order to continue to get funding?

Before I provide answers to the questions posed above, it's important to provide perspective with regard to my experience and understanding of S&T funding, budgeting, programming, planning, and execution. I have worked for the US Navy as a government program analyst in the Comptroller's Office; as a contractor project manager for the Navy and Marine Corps; and as an IPA (which stands for Intergovernmental Personnel Act) Deputy to the Department Head within the Expeditionary Maneuver Warfare S&T Department at the Office of Naval Research. As an IPA, my roles and responsibilities are the same as a government employee's. I'm responsible for the programming, planning, and execution of Navy and Marine Corps S&T dollars totaling approximately $150M/year. In addition to a career that's heavily focused on S&T budgets, I also have been closely tied to the Aerospace Experimental Psychology (AEP) team since 1991. I have a clear understanding of the mission, the billets, and the challenges associated with getting a foot in the door when trying to establish funded research projects during an AEP career. With all of that in mind, I will address some of the questions that have been posed to me by researchers, scientists, and program managers seeking help trying to navigate through the complex S&T budget arena.

A very brief overview of budget and fiscal accounting classification is necessary to understand what is meant by "categories of funding." The Department of Defense bins its funding into Program Elements (PEs). To simplify, PEs are eight-digit accounts, with each of the eight digits providing identifying information as to which type of funding is in the account, and to whom the funds belong. As a research scientist or project manager begins the quest for S&T funds to support his or her research projects, it is important to understand what type of funding he or she will need, how to know what type of funding the sponsors own, and how best to sell the research so it fits into the category that a sponsor has.

What is S&T funding, and what are the different types of S&T funding?

DoD Financial Management Regulation (DOD 7000.14-R) Volume 2B, Chapter 5, dated September 2012 provides detailed definitions of Research, Development, Test, and Evaluation (RDT&E) Appropriations. RDT&E Program Elements begin with 06 (aka Program 6), to designate that the funds are to be used for RDT&E. The following two digits distinguish what type of RDT&E funds are in the element, ranging 01 through 07. S&T funding are those funds that come from 6.1, 6.2, and 6.3 Program Elements. The categories, as defined in DOD 7000.14-R, are:

6.1 – Budget Activity 1 – Basic Research

Basic research is systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind. It includes all scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. It is farsighted high payoff research that provides the basis for technological progress. Basic research may lead to: (a) subsequent applied research and advanced technology developments in Defense-related technologies, and (b) new and improved military functional capabilities in areas such as

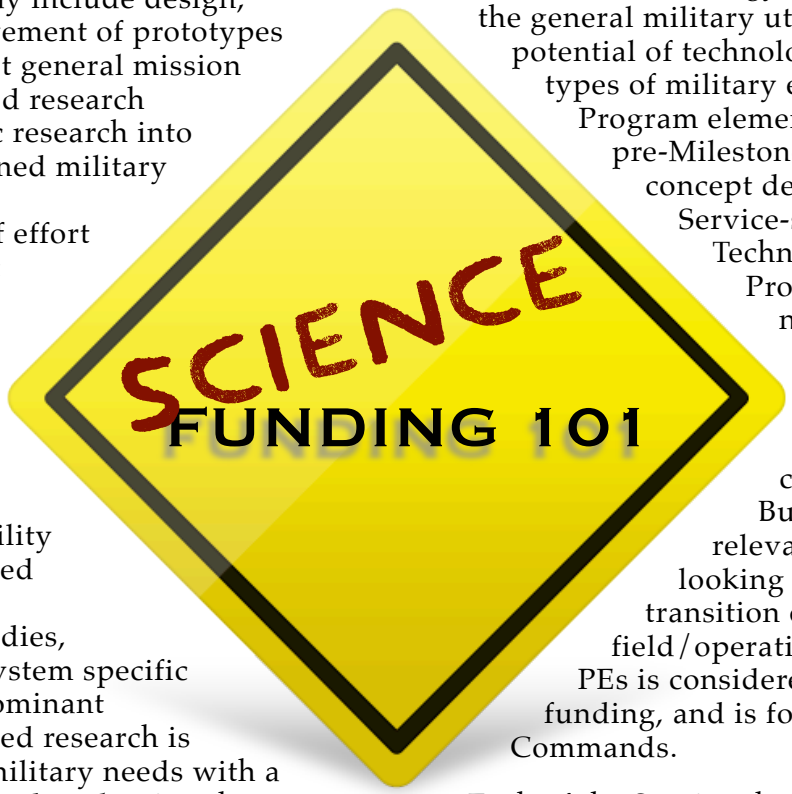
communications, detection, tracking, surveillance, propulsion, mobility, guidance and control, navigation, energy conversion, materials and structures, and personnel support. Program elements in this category involve pre-Milestone A efforts.

6.2 - Budget Activity 2 – Applied Research

Applied research is systematic study to understand the means to meet a recognized and specific national security requirement. It is a systematic application of knowledge to develop useful materials, devices, and systems or methods. It may include design, development, and improvement of prototypes and new processes to meet general mission area requirements. Applied research translates promising basic research into solutions for broadly defined military needs, short of system development. This type of effort may vary from systematic mission-directed research beyond that in Budget Activity 1 to sophisticated breadboard hardware, study, programming and planning efforts that establish the initial feasibility and practicality of proposed solutions to technological challenges. It includes studies, investigations, and non-system specific technology efforts. The dominant characteristic is that applied research is directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters. Applied Research precedes system specific research. Program control of the Applied Research program element is normally exercised by general level of effort. Program elements in this category involve pre-Milestone B efforts, also known as Concept and Technology Development phase tasks, such as concept exploration efforts and paper studies of alternative concepts for meeting a mission need.

6.3 - Budget Activity 3 – Advanced Technology Development (ATD)

This budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment. ATD includes concept and technology demonstrations of components and subsystems or system models. The models may be form, fit and function prototypes or scaled models that serve the same demonstration purpose. The results of this type of effort are proof of technological feasibility and assessment of subsystem and component operability and producibility rather than the development of hardware for service use. Projects in this category have a direct relevance to identified military needs. Advanced Technology Development demonstrates the general military utility or cost reduction potential of technology when applied to different types of military equipment or techniques. Program elements in this category involve pre-Milestone B efforts, such as system concept demonstration, joint and Service-specific experiments or Technology Demonstrations. Projects in this category do not necessarily lead to subsequent development or procurement phases.



Although not included in the category of S&T funding, Budget Activity 4 (6.4) is relevant for those researchers looking for funding to support a transition of technology from the lab to field/operational use. Funding from 6.4 PEs is considered research and engineering funding, and is found at the Naval Acquisitions Commands.

Each of the Services has S&T leaders who own and execute S&T funding on behalf of the Department of Defense. For example, Naval S&T funding is owned and executed by the Office of Naval Research. The Chief of Naval Research is responsible for the execution of all Navy and Marine Corps S&T funds. Air Force S&T funding is owned by two primary organizations, Air Force Research Lab (AFRL) and Air Force Office of Scientific Research (AFOSR). The Army, however, has a complex web of organizational hierarchies that own and execute its S&T funding. Depending on which research area one may be interested in, the search may lead down multiple paths. In addition to these leading organizations, each of these Service Headquarters has multiple Research Labs operating under them, where billions

of S&T dollars are executed annually in support of the advancement of science and technology for our military operators. It's also important to include the Defense Advanced Research Project Agency (DARPA) as a leader within the S&T community responsible for executing billions of research funding each year. DARPA is often viewed as the pinnacle of the S&T landscape where many research scientists and project managers venture, due to the compelling nature of its self-imposed challenge to solve "DARPA-hard problems."

Who has S&T funding and how do I get some?

Whether the S&T funds are owned by the Services or by DARPA, each organization has similar methods for getting funds to research scientists and project managers who have ideas that support the S&T organizations' mission areas. Here are a few suggestions, in no particular order, on how to approach your customer/partner target. (For the purposes of this article, I refer to customer/partner as the Program Manager.)

1. **Know your customer-** Before approaching a targeted customer (Program Manager or PM), do some research regarding his/her programs. Understand the vision and goals. Have an idea where your ideas may support the success of the program. If the customer has a support team, whether technical or business, it's in your best interest to know the team makeup. You may even want to meet with a member of the team first, before the PM, in order to gain any insight that may help you develop a "pitch" to demonstrate how you can uniquely support the PM's program. Program Managers may open the door to hear your story, but if you make them work at trying to figure out where your idea fits in to their efforts, they may just as easily close that door.

2. **Research Broad Agency Announcement (BAA) opportunities -**Most S&T organizations have ongoing research BAAs that remain open all year long. S&T organizations also have targeted BAAs (with specific research goals aimed at outcomes or products) that open and close during the year. Although government labs are not eligible to respond to BAAs by submitting white papers (BAAs are open to industry and academia only), labs can submit unsolicited white papers in association with the BAA. These unsolicited white papers are generally reviewed at the same time as all other white papers received under the BAA.

3. **Form partnerships-** It is my experience that many Program Managers like to see a team of researchers with industry, government, and academia memberships. Reach out to your colleagues to form teams!

4. **Offer to participate on a selection panel-** Program Managers will at times review hundreds of white papers, depending on the BAA. Most PMs organize panels of experts to help in the down select process. Demonstrate your expertise in a research area by assisting PMs cull through white papers to find those efforts with merit.

5. **Offer your services as a technical "agent"-** Program Managers have many challenges to face, whether it be getting approval for an idea within their organizations, or generating the technical and business plans required once they do have approval. Unfortunately, one of the key evaluation criteria used to assess the success of PMs is how well they are executing the funding they were given. PMs are looking for help from government agents (partners) to manage technical programs and contract; serve as scientists and engineers in support of their efforts; and to provide an avenue for contracting to program performers. If you are in a position to work with a PM by providing assistance with contract award services at your organization, many PMs will find this extremely compelling and valuable.

6. **Start small, finish big-** In the current environment with budgets on the decline and Program Managers trying to meet current needs, having funding for new ideas can be a rare exception. Consider starting with small white focused white papers (less than $150K) to get a project rolling. Program Managers without an existing BAA or new program solicitation may be looking for small projects with big payoffs, risk mitigation ideas, and targeted ideas to support problem areas within their existing programs.

What do I need to know to be successful in order to continue to get funding?

Starting with the obvious, do good work. Program Managers will surround themselves with team members who can be relied on, who work hard, and who are responsive. If you become a trusted agent

to a PM, the partnership can last multiple years. If you are a government employee, and if you have an advanced technical degree or a Ph.D., you have an advantage over the other team members. Program Managers with S&T funding often need help not only with the research itself, but also with the management of other research projects. It isn't unheard of to be a Principal Investigator on one project, and also a technical lead or manager of another research area for the same Program Manager. PMs rely on their government team members to assist in leadership tasks that they cannot rely on industry and academia partners to help perform. If you are interested in this type of role, let the PM know.

As mentioned previously, S&T Program Managers are evaluated on how well they are executing their programs. Although developing technology and transitioning products to the Services is very important, PMs must commit, obligate, and expend funding to meet the benchmarks set by their Services/Agencies. The funding status of "committed" refers to the point at which funding has been designated by a Comptroller as assigned to a particular project or contract. The funding status of "obligated" refers to the point at which funds are received and accepted by a government organization to be spent in house, or at which point funds are placed on a contract and the contract is signed. The funding status of "expended" refers to the point at which a report is generated citing the hours / costs spent on a project (in the case of funds spent in-house) and submitted to the accounting system used by the agency, or when a contractor submits an invoice to the government citing the hours/costs spent on the contract.

RDT&E funding, as described at the beginning of this article, must be obligated within two years of its fiscal year release. It must be expended within five years of its fiscal year release. However, most agencies want the funding executed within the same fiscal year of its release. This is often challenging due to the difficulties in planning during fluid budget environments; continuing resolutions versus approved budgets; and lengthy/burdensome contracting processes. Despite these issues, Program Managers are expected to meet benchmarks at the very least, but preferably execute all dollars within the fiscal year of release. Those with knowledge and experience with not only understanding how to navigate through the funding execution labyrinth, but also success in executing funding in an efficient manner, will be sought after by PMs as a partner and valued team member.

Summary:

Whether your research endeavors focus on fundamental phenomenology (basic research), the application of knowledge toward a product (applied research), or the proof of feasibility and utility of a technology (advanced technology development), there are many opportunities to receive S&T funding from the OSD and the Services. The key to success is not only truly understanding where your ideas will fit within a customer's program needs, but also demonstrating your knowledge of the S&T domain as an excellent research scientist with unique technical expertise, a conscientious project manager who can lead and integrate multiple efforts, and a detail oriented administrator responsible for timely execution of S&T funding.

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She coordinates and evaluates the technical and programmatic plans for basic and applied research, as well as advanced technology development projects for application on current and future Marine Corps and Navy S&T programs.

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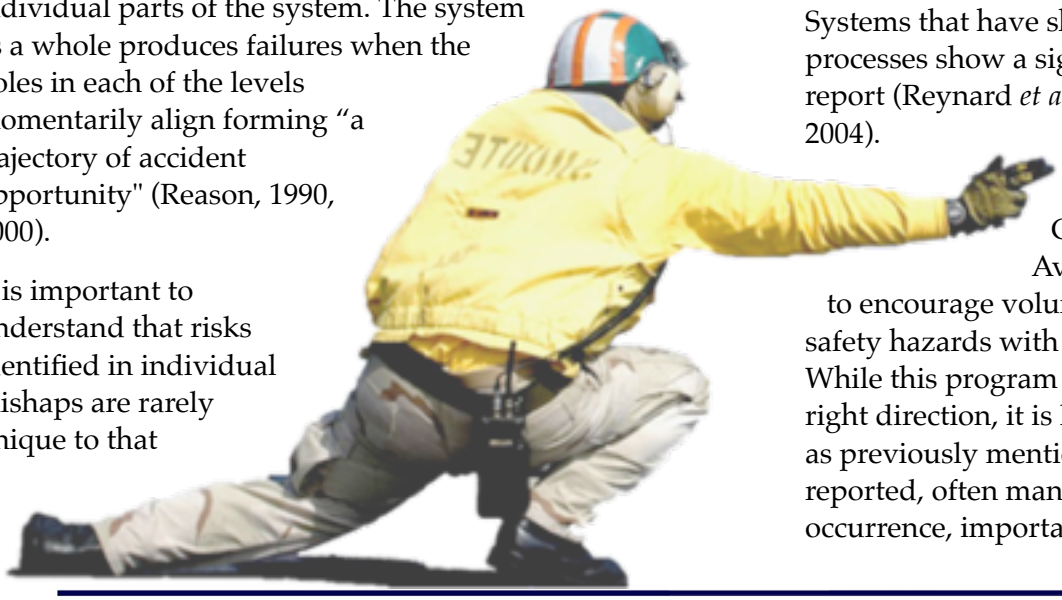
Developing a Control Group for Aviation Mishap Investigation

By: LT Kirsten "Meatballs", "CoCo" Carlson

According to data provided by the Naval Safety Center (NSC) in Norfolk, VA, the 10-year average for occurrence of Class A mishaps alone in Naval Aviation is nearly 23/year (Navy: 14/year; Marines: 8.6/year). In a 12-month period there have been 18 Class A mishaps causing a total of $569M in physical damage. Over the same time span, there have been 17 Class B mishaps, totaling over $12M in damage. However, the most wrenching losses in that timeframe were the deaths of 19 Sailors and Marines.

Human factors are deemed responsible for 80-90% and 50-60% of Class A and Class B aviation mishaps, respectively. Therefore, human error is the single greatest mishap hazard (Wiegmann & Shappell, 2003). It is unknown, however, what percentage of ***successful*** (non-mishap) flights also involve risk due to human factors. According to the "Swiss Cheese" model, there are four "slices" or levels at which active failures and latent failures/conditions may occur within complex operations leading to mishaps. The model theorizes that each level serves as a barrier to failures; whereas, holes in these levels represent individual weaknesses in individual parts of the system. The system as a whole produces failures when the holes in each of the levels momentarily align forming "a trajectory of accident opportunity" (Reason, 1990, 2000).



It is important to understand that risks identified in individual mishaps are rarely unique to that mishap. By identifying these system failures/conditions, a clearer picture develops of their contributing role in mishaps. Moreover, determining their presence alone, and in concert with other hazards, may aid in developing a means of mitigating risk - the ideal strategy for correction before a mishap occurs. Without a benchmark for comparison with non-mishap flights, data from mishaps is limited to retrospective "best guesses" rather than systematic side-by-side comparisons of successful flights. It is possible that mishaps have been attributed to factors that are not in fact critical, while other factors have gone undetected or unreported. For example, while aviator fatigue in the cockpit is a known human factors risk leading to mishaps, it may well be that fatigue is a factor in the majority of non-mishap flights as well. Alternatively, if analyzing mishap along with non-mishap data reveals that an interaction of fatigue and dehydration, are factors in mishaps, but not non-mishap flights, a more specific set of factors on which to focus preventative efforts is revealed.

According to Connell (2002), the National Aeronautics & Space Agency's Aviation Safety Reporting System (NASA ASRS) is one of the largest safety reporting systems, with an annual average of 30,000 reports. Because submission of reports is voluntary, however, underreporting of near-miss events due to fear of retribution often occurs. Systems that have shifted to confidential submission processes show a significant increase in willingness to report (Reynard *et al.*, 1986, Madsen, 2001; Noerbjerg, 2004).

The Air Force and Air National Guard have implemented the Military Aviation Safety Action Program (ASAP) to encourage voluntary and anonymous reporting of safety hazards with the goal of preventing mishaps. While this program is commendable and a stride in the right direction, it is likely limited by its voluntary nature as previously mentioned. By the time an incident is reported, often many hours, days, or weeks from its occurrence, important details of the event may be lost.

The Navy has implemented ASAP with one major difference. Rather than requesting voluntary reporting, OPNAVINST 3710.7U mandates post-flight "self-disclosed reporting to identify errors, potential precursors to mishaps, and improve operational efficiency." It is unknown whether subtle but powerful contributors to mishap risk (e.g., a few less hours of sleep, reduced hydration, a simple change in routine, etc.) are commonplace. While Operational Risk Management (ORM) forms are required pre-flight to address these more subtle human factors risks, the process is not anonymous and as such, willingness to disclose risks may be severely lacking. The data provided through ASAP is likely to be much more informative.

Thorough mishap investigation is necessary to determine the trajectory of cascading events causal to a mishap. An important tool for mishap investigation is the application of the Department of Defense Human Factors Analysis & Classification System (DoD-HFACS). Closely following Reason's model, HFACS incorporates a systematic approach describing four main tiers of failures/conditions: 1) Acts, 2) Preconditions, 3) Supervision, and 4) Organizational Influences. Working backwards from the mishap event, the first tier is characterized as an Active Failure; the three tiers thereafter are characterized as Latent Failures/Conditions. According to the DoD, the overarching purpose of HFACS is to provide "a detailed analysis of human error for on-scene investigation and post-hoc mishap data analysis, revealing previously unidentified human-error trends and hazards" (DoD-HFACS, 2005).

While mishaps are investigated via a thorough and arduous process, the investigative process is, by necessity, reactive. Currently, ASAP is the sole method for a naval aviator to anonymously and systematically report potential hazards without fear of retribution. It is important to note, however, that an aviator may not even characterize their normal, routine behaviors as potential hazards. Misperception of vulnerabilities within an individual or an organization is commonplace and can lead to the creation of failure pathways (AMA, 1998). Implementing detailed and thorough data mining within the ASAP system to capture these otherwise overlooked factors would essentially provide a "pre-mishap" window to identify which factors or cluster of factors are the most risky.

The overall goal of this research effort is to develop a control group consisting of data from a subset of non-mishap flights in order to determine which human factors – or combination of factors – result in the highest risk for mishap occurrence. Currently, there is no systematic comparison being done between mishap and non-mishap flights to determine whether differences exist - quantitatively or qualitatively - in terms of human factors risks. Additionally, data from this work could provide a nearly real-time cross-section of human factors risks, allowing an opportunity for intervention to prevent potentially hazardous behaviors and practices.

Specific aims of this project include:

- Examining the dataset provided by ASAP, the current post-flight software widely utilized in Naval Aviation.
- Examining existing aircraft-recorded flight data (Military Flight Operations Quality Assurance or MFOQA).
- Comparing ASAP and MFOQA data to the mishap database currently maintained at NSC.

This work could prove critical to the safety and preservation of naval fleet resources. With over $580M in damage to aircraft in the last year alone, efforts to reduce mishaps cannot come too soon. Short-term benefits to Naval Aviation include the availability of data to highlight the most critical factors occurring in mishap flights as compared with non-mishap flights and to aid in the development of more focused preventative approaches to increase warfighter performance and decrease the risk of mishaps. Long-term benefits include the potential for reductions in lost aircraft and, most importantly, loss of life. The project has the potential to represent a truly collaborative effort across the fleet - developing a successful proof of concept for an *a priori* analysis of human factors risk could also be adopted for ashore and afloat mishap investigation.

In collaboration with the NSC, the first phase of the project will involve data mining to identify the top human factors causal to mishaps, as well as the squadrons most frequently involved in mishaps.

Additional analysis will be done to determine the number of non-mishap flights required to provide meaningful data comparison to mishap flights.

Based upon the top causal human factors implicated in mishaps, the second phase of the project will focus data mining efforts within the ASAP/MFOQA software systems. This method of data analysis will closely follow the model put forth by Johnson & Wichern (1998, 2002).

Work will continue in collaboration with ASAP and MFOQA to continuously evaluate data to identify the most common risks present in non-mishap flights. These data will then be compared against mishap data to determine which hazard cascades are most similar between non-mishap and mishap flights. Exploratory factor analysis will be utilized to determine interdependency and pattern delineation of particular hazard cascades (Lee et al., 2005). Assessment of these patterns will help determine which factors are most critical versus those that may serve inadvertently as so-called "red herrings" in mishap investigations.

MFOQA will provide objective flight data to complement subjective ASAP responses, leading to a clearer picture of factors that may be specific to non-mishap versus mishaps flights. While MFOQA is designed to analyze aircraft-recorded flight data using historically determined mishap-related factors, this proposed work is to determine which factors/conditions are, in fact, *unique* to mishaps. In discussing this approach with subject matters experts at PMA-209, it is expected that as leading indicators are identified through these proposed analyses, events could be added to the MFOQA analysis tool to be incorporated as new baseline queries.

LT Kirsten "Meatballs" Carlson is the Aeromedical Human Factors Branch Head for the Naval Safety Center (COMNAVSAFECEN, Norfolk, VA). Her current projects include continuing revision, validation, and implementation of the DoD Human Factors Analysis and Classification System (HFACS) and data mining for comparison of human factors in mishap and non-mishap flights. Additionally, she is an aeromedical representative for aviation mishap investigative roundtables and squadron safety culture surveys.

Her professional interests include neuro-restoration in degenerative disease and traumatic brain injury, root cause analysis, and aviation safety. In her spare time, Kirsten enjoys hiking, hunting, and the flying trapeze (not kidding).

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Mapping Human Spatial Processing Using Dense-Array EEG

By LT Stephen "Bacon" Eggan

Establishing orientation in one's environment is necessary for the performance of virtually all aspects of normal behavior; thus, it is not surprising that spatial disorientation (SD) poses a significant hazard during physically and cognitively demanding activities such as aviation. The Naval Safety Center continues to cite SD as the principal contributing factor of Class A naval aviation mishaps, causing an average loss of $400 million in Department of Defense assets, 20 destroyed aircraft, and the fatality of 25 flight personnel annually. Fortunately, the overall rate of aviation mishaps has declined over the last several decades; however, some statistics indicate that the rate of SD-related mishaps has remained steady and might be rising. Together these data suggest that the efforts to mitigate SD have not been proportionate to the threat that it poses. Recognizing the need to develop new countermeasures for SD, the Naval Medical Research Unit Dayton (NAMRU-D), in collaboration with the University of Dayton (UD), is conducting neuroscience research aimed at advancing our understanding of the human brain's spatial representation system.

Previous animal studies demonstrated that a network of specialized neurons (composed of place cells, head direction cells, grid cells, and boundary cells) within the hippocampus (the brain region principally responsible for learning and memory) and adjacent entorhinal cortex, encode an animal's spatial orientation in an environment. Within this network, "place cells," respond to external visual cues and fire only when an animal is in a specific area of an environment, i.e. "place field," providing animals with "you are here" information. "Grid cells" on the other hand have multiple place fields within an environment that form a remarkably periodic triangular array, or grid, and provide "latitude and longitude-like" or coordinate information. Head direction cells, responding to external visual and internal vestibular cues, fire over a restricted range of head directions and provide "compass-like" information. Finally, boundary cells fire when close to the borders of an environment and are thought to anchor grid and place fields to a geometric reference frame. Together, these cells integrate motion cues from the visual and vestibular systems to encoded changes in spatial orientation within, and movement through, an environment. Linked to other specific brain regions important to spatial processing, this network creates an "anatomical spatial display" that operates much like a GPS system, orienting an organism to its position within an environment.

Expanding on animal findings, a recent human study used functional magnetic resonance imaging (fMRI) techniques to examine the potential existence of similar neural processes in the human brain. In line with animal findings, strong fMRI activation (BOLD response) was observed in the entorhinal cortex when participants engaged in a simulated spatial awareness task. However, the interpretation of these findings is limited because 1) participants are required to remain physically immobile during fMRI imaging and 2) fMRIs measure hemodynamic responses (blood flow) – an indirect measure of brain activity with low temporal resolution – rather than neuroelectical signals. This restriction has

LT Eggan fits the dense-array electroencephalography (dEEG) recording electrode net on a participant.

limited applicability regarding how the vestibular system impacts neural activation during spatial processing, and has made it difficult to accurately model human spatial awareness and SD in real world operational settings.

Technical Approach/Methodology

To overcome this limitation, this project sought to quantify and localize human neural activity (measured by dense-array electroencephalography--- dEEG) during combinations of participant motion and/or visual stimulus motion. Our goal was to distinguish between somatic-vestibular and visual influences on spatial processing. Dense-array EEG has the advantage of allowing for limited participant motion during recording and high temporal resolution, unlike fMRI. In addition, unlike standard EEG technology that uses just 10-30 electrodes and can only provide gross neuroelectrical activity at the scalp, dEEG (GES 300 System from Electrical Geodesics, Inc.) uses 256 electrodes to record neuroelectrical signals that can be reconstructed in three-dimensional (3D) space and localized to specific anatomical brain structures to generate images with fMRI-like spatial resolution.

Image of the Neuro-Otologic Testing Center (NOTC) rotating chair.

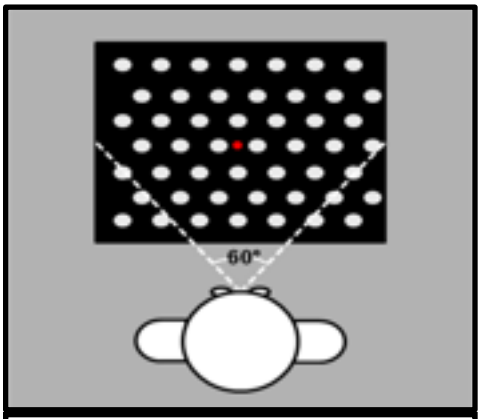
Methods

Eight right-handed participants (to control variability attributable to lateralization of function) were recruited from the UD student body, fitted with the dEEG head net, and secured into the rotating chair of NAMRU-D's Neuro-Otologic Testing Center (NOTC), which delivered the visual and vestibular stimuli. The NOTC (a motorized Barany chair) consists of a multi-axis rotating chair housed in a light-tight cylindrical enclosure, and contains a ceiling mounted optokinetic sphere that projects a full-field light pattern onto the walls of the enclosure (to provide environmental texture/spatial reference). A laser mounted on top of the rotating chair projected an eye level visual target (red laser dot) onto the enclosure wall at the participant's visual center point. The chair, OKS, and laser were programmed to oscillate at an acceleration of 2° per second^2 between 30° left and 30° right (60° total arc) of the participant's visual center point and the participants were instructed to track the target by making eye movements only.

Dense-array EEG data was recorded first during a baseline condition where the rotating chair, the visual target, and the OKS light field all remained stationary (the participant experienced neither visual nor vestibular stimuli). Participants then participated in three subsequent experimental conditions. In condition 1, participants tracked the oscillating visual stimulus while the chair remained stationary (a visual stimulus only). In condition 2, the participants tracked the visual target, which remained fixed on the enclosure wall, while the chair oscillated, producing participant rotation and eye movements (both vestibular and visual stimuli). In condition 3, both the chair and visual target oscillated in synchrony, so the target appeared to be static to the participant although it was physically moving, causing participant motion while the eyes remained fixed (a vestibular stimulus only).

Following dEEG recording, participants underwent standard magnetic resonance imaging (MRI) so that for each subject, dEEG data could be mapped onto structural images obtained from each individual participant rather than the typical procedure of mapping individual dEEG data to a "generic" MRI scan. This allows for precise delineation and identification of brain regions that become activated during the experimental conditions, thereby reducing experimental variance and increasing the ability to detect differences in dEEG activity across experimental conditions.

Currently, dEEG data from each of the eight subjects are being processed and transformed into a 3D reference grid representing the participant's brain volume. Noise/artifact removal was performed to remove noises/



Representation of baseline condition. The participant fixated on a visual target (red dot) presented in an OKS light field (white dots) and dEEG recording occurred while both the target and the subject's rotating chair remained stationary. During experimental conditions, the visual target, OKS light field, and/or the subject's rotating chair oscillated across a total of 60°.

artifacts that are usually present in EEG recordings, such as eye blinks and movements, 60 Hz line noise, etc. Activation signal strength and location are being embedded into a 3D brain model using a validated source localization algorithm and mapped onto images of each individual participant's brain derived from MRI. Within the 3D brain model (map), signal location and strength are graphically represented using color coding and numerical representations. dEEG signals at the brain regions of interest will also be categorized into different functional frequency bands (Delta, Theta, Alpha, Beta, and Gamma bands), which will be further segregated into energy spectra for additional analysis.

Results

Given that the hippocampus and entorhinal cortex contain specialized neurons that activate in response to visual and/or vestibular stimuli, it was hypothesized that: 1) compared to baseline recordings, the intensity of localized activity in these regions would be greater during experimental conditions compared to baseline and 2) activity would be greatest during the condition that employed visual tracking and subject motion simultaneously. Preliminary qualitative analysis suggests that experimental conditions elicited greater activity in the entorhinal cortex compared to baseline. Preliminary statistical analysis from one subject suggests that activation in the entorhinal cortex was greatest during experimental condition 2 where both vestibular and visual pathways were stimulated, supporting our hypothesis. However, any conclusions are tentative at this time given the preliminary nature of the analyses. Ongoing statistical analyses will assess differences in dEEG activity and location during experimental conditions compared to baseline and across experimental conditions.

Relevance

Findings from this collaborative basic research could identify tools and techniques for future applied NAMRU-D research designed to measure SD during flight situations in simulators. In addition, this research will lay the groundwork for developing future methods of detecting SD and countermeasures that will help reduce the risk of aviation- related SD in operational settings.

LT Stephen "Bacon" Eggan is a Principal Investigator at the Naval Medical Research Unit Dayton (NAMRU-D). Currently, LT Eggan is the lead or co-investigator of several aeromedical research programs in collaboration with academia and the US Air Force that include investigating the neural localization of human spatial processing using dEEG to develop solutions to pilot spatial disorientation, assessing the impact of pharmaceuticals on physical and cognitive performance in military training environments, using working memory training to enhance cognitive readiness and increase fatigue resistance, and evaluating new color vision screening tests for special-duty candidate selection.

LT Eggan is married to the former Miss Brittanie Sather of Ogden, Utah. They have three beautiful children, a five-year-old son, Everett, a three-year-old daughter, Annika, and a two-year-old son, Asher. The Eggan family currently resides in Dayton, OH.

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Personality Assessment in Naval Aviation Selection

By: LT Brennan D. Cox

Those charged with selecting naval aviators have long searched for a valid, cost-efficient method for assessing "the right stuff." This article provides a historic overview of the Navy's efforts to use personality-based assessment tools to index this complex quality, with a focus on the current test: the Naval Aviation Trait Facet Inventory.

Historical Overview

In WWI, the primary tool for selecting aviators was the physical examination, which ruled out candidates who were of poor health or who lacked the physical characteristics required for performance in the flight environment. Assessing the physical characteristics of a candidate, however, proved insufficient for assessing flight proficiency, as aviation training mishap and attrition rates were astoundingly high throughout the war. The aeromedical community soon realized that additional factors must be considered in determining the minimum requirements for entering flight training. Their solution was to supplement the physical exam with a psychiatric interview, marking the first of several efforts aimed at assessing naval aviation candidates based on their *total personality*.

There are several methods for assessing personality. Among them, the interview is one of the more costly and time consuming, as it requires the individualized attention of a trained specialist. When used appropriately, interviews are effective for selection, which is why many organizations today reserve them for late-stage testing of applicants. During WWI, best practices in personality assessment were not yet established. Accordingly, the aviation psychiatric interview added to the WWI flight physical violated many of the testing principles that are now taken for granted.

As mere additions to the physical exam, the WWI psychiatric interviews were performed by flight surgeons, not psychologists. With no formal training, the interviewers' techniques tended to be non-standardized and unstructured, with some interviewers relying on trick questions, hunches, and other nonscientific procedures to qualify candidates for training. By one account:

One interviewing officer – and it was then possible for any applicant to be turned down as the result of a single interview – believed that no man could be a good pilot if he were a virgin at the age of 24. Another interviewing officer held that careful, painstaking persons such as stamp-collectors could not become effective fighting pilots; a third discarded all those interviewees who were left handed '…because I never knew a left handed man who made a good aviator.[2]

By the 1930s, it was evident that this form of "psychological assessment" was ineffective, having resulted in no measurable reduction in pilot failure, as well as producing unintended consequences on recruiting, with up to 40% of aviation applicants being disqualified based on their interview scores alone.[3]

As WWII approached, two Medical Corps officers stationed at NAS Pensacola – LCDR Rex White and LT William Kellum – began to explore the use of more standardized psychological measures for aviator selection, including the Strong Interest Inventory (SII) and the Bernreuter Personality Inventory (BPI). The SII assessed candidates' personal interests as related to career choices, while the BPI assessed six global personality factors, including neurotic tendency, self-sufficiency, dominance-submission, introversion-extraversion, confidence, and sociability.

Unfortunately, White and Kellum were unable to complete their study (they reportedly lacked resources in terms of scoring capability and performance measurement[4]); however, their efforts attracted enough attention for the Civil Aeronautics Authority (now the Federal Aviation Administration) to fund the *Pensacola Project on the Selection of Naval Aviators* in July, 1940.

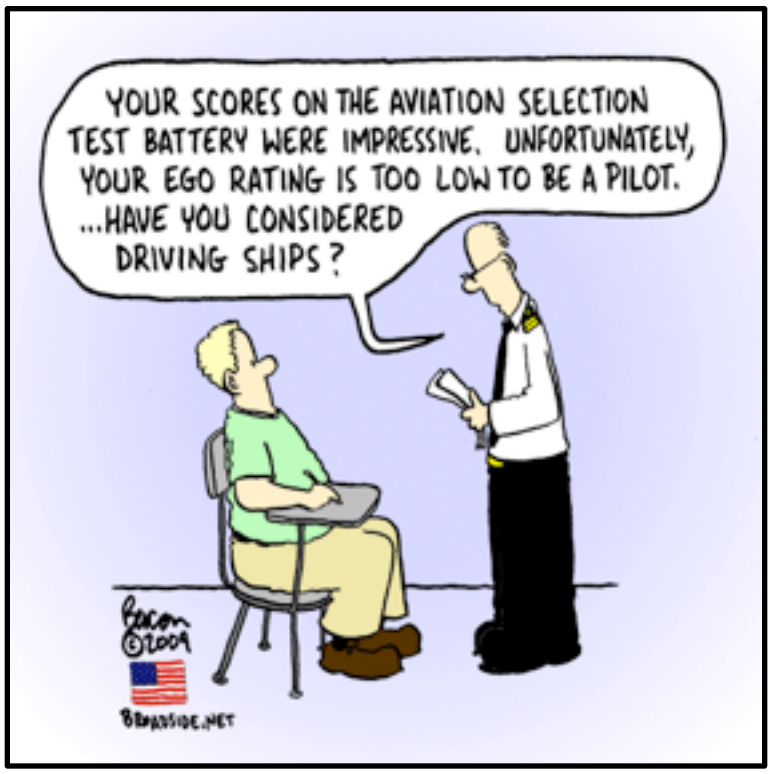
The *Pensacola Project* (a.k.a. the *Thousand Aviator Study*) was performed by a team of civilian and active duty psychologists who evaluated the degree to which approximately 60 psychological, physiological, and psychomotor tests predicted success in Navy flight training[5]. The results were used to create a selection battery composed of an intelligence test, a mechanical comprehension test, and a biographical data (biodata) inventory designed for assessing *temperament*. Of note, many elements of this selection battery remain operational in today's Aviation Selection Test Battery (ASTB).

In psychology, *temperament* refers to the enduring characteristics of personality that an individual is born with, rather than those that are learned or developed over time. On a biodata form, items assessing temperament might appear in dichotomous (e.g., yes/no, true/false) or rating scale formats (e.g., How often do you engage in the following …, *Not at all* to *All the time*). At face value, these items would be well-suited for assessing such innate qualities as adaptability, activity level, or persistence – qualities that might help determine whether a candidate is a good fit for flight school.

Indeed, previous versions of the ASTB have featured personality-based biodata items that were valid predictors of performance and attrition in naval aviation training. However, these items were highly subject to intentional response distortion, or applicant faking. This became evident through the years, as word got out that if applicants responded to these items like *Top Gun's* "Maverick," they would have a greater chance of being selected for training. Over time, these items began to exhibit such declining validity (because the majority of applicants were responding in the same way) that the biodata inventory was removed from the ASTB altogether.

Current Direction

In the early 2000s, a plan of work was developed to identify requirements for the next naval aviator selection system: ASTB series E. ASTB-E would be designed to address reasons why student aviators fail to complete training. At the time, the most common reason a student did not complete training was not flight failure, physical disqualification, or academic failure,



but rather *drop on request* (DOR), or voluntary attrition. When asked, DOR students reported that the primary reason they no longer wished to pursue naval aviation was due to career interest/motivation issues – or, put another way, they did not see themselves fitting into the "fraternity" of aviation.

As keepers of the ASTB, Aerospace Experimental Psychologists (AEPs) at the Naval Aerospace Medical Institute (NAMI) determined that a personality inventory, among other tests, would be an appropriate avenue for reducing DORs for reasons related to career fit. The challenge was finding a way to assess personality without succumbing to the measurement problems of previous efforts. The solution was the ASTB-E's Naval Aviation Trait Facet Inventory (NATFI), a computer-adaptive, forced-choice, aviation-based personality inventory featuring uni- and multi-dimensional trait statement pairings matched on desirability.

The NATFI was developed in-house through the collaborative effort of experts at NAMI, NAVAIR, and the Naval Aerospace Medical Research Lab (NAMRL, now Naval Medical Research Unit Dayton). The test's content targets a specific set of personality dimensions derived from job analysis data on the common and unique knowledge, skills, abilities, and other

characteristics (KSAOs) required of successful student naval aviators and flight officers. Items written for the NATFI cover the full range of response extremity (i.e., for each dimension, dozens of mild, moderate, and extremely flattering and unflattering statements were created), and each item was independently rated for social desirability. Using advanced statistical modeling based on item response theory (IRT), NATFI items were paired based on their IRT parameters and social desirability scores, and each item pairing was algorithmically entered into a computer-adaptive testing engine for administration and scoring.

LT Cox prepares test subjects to take new subtests of the ASTB-E exam in the lab.

So, how is the NATFI different from traditional personality measures?

Traditional self-report personality measures rely on trait statements and Likert-type response scales.

Example:

I like telling others what to do.

- *Strongly Disagree*
- *Disagree*
- *Agree*
- *Strongly Agree*

The problem with using these items for selection is that they can be easily faked, as they have obvious "correct" answers (i.e., Option D is clearly the best choice for a leadership position).

The forced-choice format offers an alternative to rating-scale items by requiring respondents to select which of a set of trait statements is most descriptive of their own behavior. Example:

Which of the following statements is more like you:

- *In group projects, I am usually the one with the best solutions.*
- *I do not make contributions to the group unless I have to.*

However, this method is similarly limited in that both statements typically measure the same trait; so, again, in most instances there is an obvious "correct" response (i.e., Option A is more desirable).

The NATFI addresses this shortcoming by presenting both uni- and multidimensional item pairs, with each item pair matched on social desirability.

Example:

Which of the following statements is more like you:

- *I often fail to put things back in their proper places.*
- *When I hear others whispering, I often think they are saying bad things about me.*

In this example, both statements are equally unflattering, and each statement measures a different trait (e.g., Option A assesses *Responsibility*, while B assesses *Self-Esteem*). Candidates are instructed to select

the statement that is most descriptive of their behavior, even if they would not actually engage in the behavior in real life.

Each NATFI item response is essentially an endorsement of a particular trait at a particular extremity level. With each item response, the test's sophisticated scoring system estimates candidates' standing along each trait dimension. The computer-adaptive testing program then generates the next item pair to present, which ensures that while each possible trait combination is presented, only on rare occasions will any two candidates see the same set of NATFI items.

Questions and concerns regarding use of the NATFI tend to fall in three general categories:

(1)Is the NATFI fakable?

(2)Are NATFI scores reliable?

(3)Does the NATFI add value to the ASTB?

These issues have all been addressed by AEPs at NAMI with promising results.

To answer the faking question, student naval aviators completed the NATFI under two sets of instructions: respond honestly and respond as favorably as possible. Scores for each administration were compared and showed little change, indicating that the NATFI is far more resistant to intentional response distortion than other self-report personality tests.

With regard to reliability, students completed the NATFI under honest conditions on various occasions representing a wide range of test-retest windows. Comparisons of scores across administrations supported modifications to the test, to include more unidimensional item pairings and more item pairings overall. Follow-up studies demonstrated that these modifications improved test-retest reliability to acceptable levels, and also helped to inform the preferred ASTB-E test-retest windows for operational use.

In terms of value added to the ASTB-E, studies are on-going. Preliminary analyses show that NATFI accounts for variance in student naval aviator training performance beyond the variance accounted for by the ASTB's existing subtests. Perhaps most importantly, results of these studies suggest that including scores from the NATFI in the ASTB-E scoring scheme have the potential to improve gender and racial diversity among candidates selected for training.

Conclusion

Efforts to include personality assessments in the naval aviator selection system have been underway since WWI, when it was made clear that there are certain non-physical factors which might help identify the most qualified candidates for training. Although there are a number of valid methods for measuring personality, self-report measures tend to be the most cost and time-efficient, particularly for large-scale selection efforts, although they are not without their shortcomings. AEPs have sought to overcome these challenges by employing proven technology and state-of-the-art science in the development of the NATFI, the ASTB-E's innovative new personality inventory designed as a fake-resistant indicator of the *right stuff*.

LT Brennan Cox is the Biostatistics Division Officer at the Naval Aerospace Medical Institute, Pensacola, FL, where he manages development and delivery of the Aviation Selection Test Battery. He has a PhD in Industrial-Organizational Psychology from Auburn University, with expertise in developing, evaluating, and implementing technologies that enhance individual and organizational performance via selection, classification, and training.

LT Cox was also a proud participant in the NMOTC "Movember" mustache contest.

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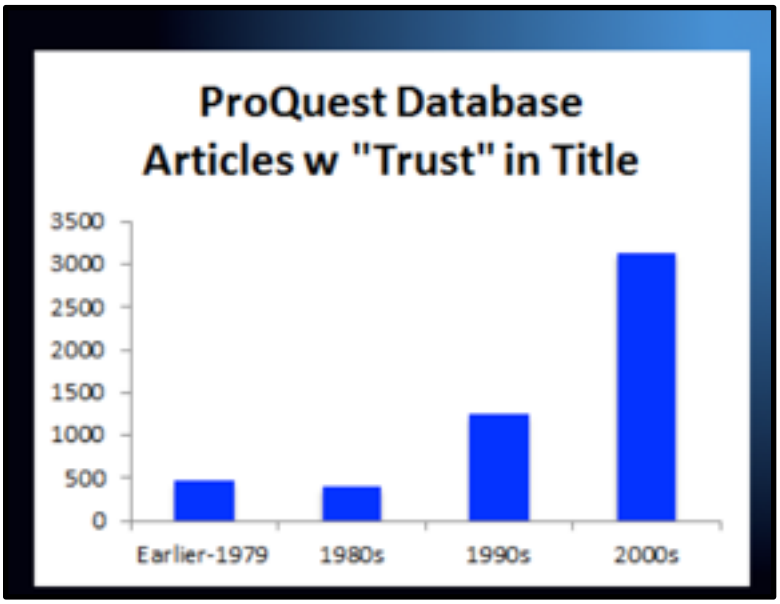
Trust Research for the DoD Context

By LT David "Honey," "COIN," "Diddy," Combs

According to multiple authors, articles, text books, and talking heads, "trust" is the foundation of – well, everything. Not to be hyperbolic, but a United Nations report suggested that "trust is the underpinning of all human contact and institutional interaction," a top advisor to the NATO alliance in Afghanistan suggested that trust building, at least in the counterinsurgency context, is the military's "true main effort, everything else is secondary," and even General Stanley McCrystal, former ISAF Commander, as well as Commander of U.S. Forces Afghanistan, recently wrote that "pure trust – the kind that spread across our Task Force every day… saved lives on the battlefield every night. Trust elevated our organization beyond the traditional understanding of excellence. It allowed us to move past being merely an assortment of world-class warriors, and towards becoming a single team with a shared consciousness."

Even though people in positions of power are starting to realize that understanding trust could help DoD operators in a variety of contexts, the fact is, trust, as a psychological construct, is still poorly understood. However, the social sciences are rising to the challenge of understanding this concept. By way of evidence, the number of articles with "trust" in the title has more than doubled from the 1990s to the first decade of the new millennium (as noted by the newly formed "Journal of Trust Research").



From a DoD perspective, interest in trust has never been greater. In fact, I chaired a meeting on "Trust Research in the DoD (and Broader) Context" at DARPA earlier this year that brought together well over 100 people from across the US Government, including DoD, the Intelligence Community, the Department of State, and others. We had four panels that represented different USG research lines on trust, to include the Defense Advanced Research Projects Agency's (DARPA) Social Media in Strategic Communication program, which attempts to better understand trust as it relates to social networks, the Intelligence Advanced Research Projects Activity's (IARPA) TRUST program, which attempts to understand whether trust can be sensed and measured via physiological markers, the Air Force Office of Scientific Research's (AFOSR) Trust and Influence Program, which attempts to better understand cross-cultural trust formation as well as trust between humans and autonomous systems, and, my own Naval Research Laboratory (NRL) panel, which presented research projects designed to better understand "person level" trust.

NRL Trust Research

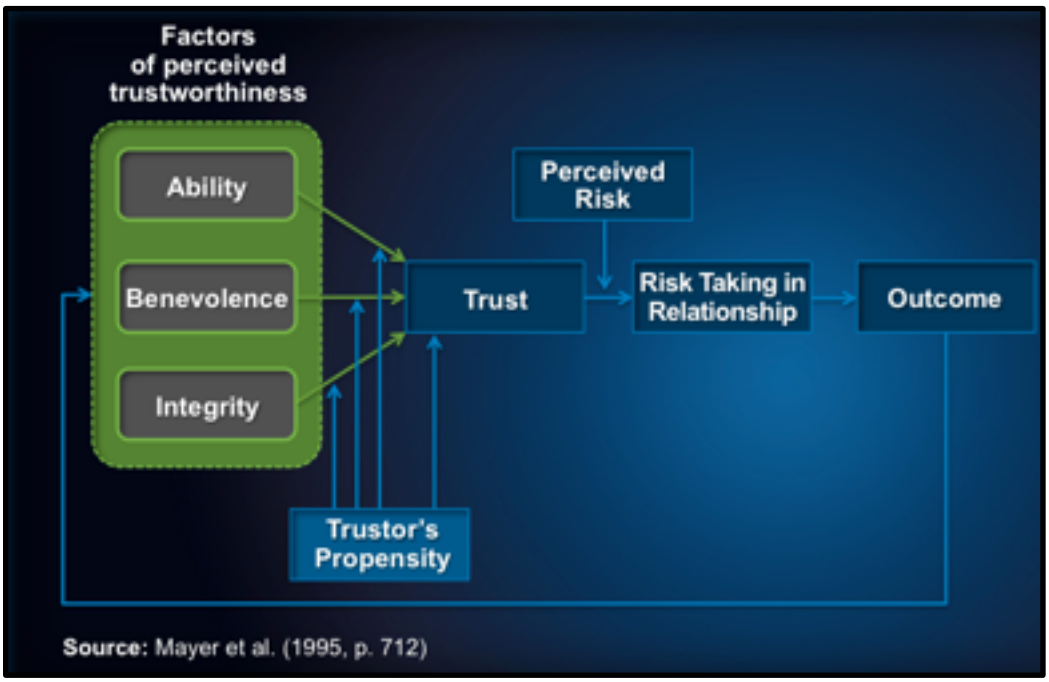
While there is a lot of remarkable trust related research within DOD, I am writing this article to briefly describe the trust research I am leading at NRL. My team and I are currently working on two projects related to trust - the first relates to citizen trust in government, and the second relates to trust generation in the counterinsurgency context.

Trust in Government

Several academic traditions (perhaps most commonly, political science) attempt to understand citizens' reports of trust in government. However, most (if not all) have done so using a piecemeal approach that attempts to link one or two variables with reports of trust in government. Further, the definition of trust

varies from paper to paper in many cases. Our research at NRL is attempting to use a unified theory of trust based on Mayer's (1995) Integrated Model of Organizational Trust.

Mayer and his colleagues define trust as the "willingness to be vulnerable to the actions of a trustee…" (The definition is more complex than this, but this is the main idea.) Mayer's model (see Figure 1) is designed to predict reports of trust in organizational settings. Specifically, Mayer (an organizational sciences researcher) and his colleagues designed his model to help predict trust as it exists in a business setting. Without going into too much detail, his model helps us understand when an employee trusts, for example, his manager at the local Radio Shack. Mayer and his colleagues suggest that four variables predict when a person (the trustor) will trust another person (the trustee). The first variable, *ability*, captures a trustor's perceptions that a trustee has the ability to successfully get a job done. The second variable, *benevolence*, captures a trustor's perceptions that a trustee cares about the trustor and wants good outcomes for the trustor. The third variable, *integrity*, captures a trustor's perceptions that the trustee has, and lives up to, some kind of moral code that the trustor does not find objectionable. Finally, the fourth variable, *trust propensity*, captures personality traits of the trustor that make him or her a more trusting person (or not) overall.



From Mayer's perspective, provided a trustor perceives sufficiently high levels of ability, benevolence, and integrity on the part of the trustee (and perhaps has some useful level of trust propensity), then the trustor should be willing to trust the trustee when some kind of risk presents itself. Subsequently, some outcome of the situation occurs, for good or for ill, and this outcome feeds back and updates the trustor's perspectives of the trustee.

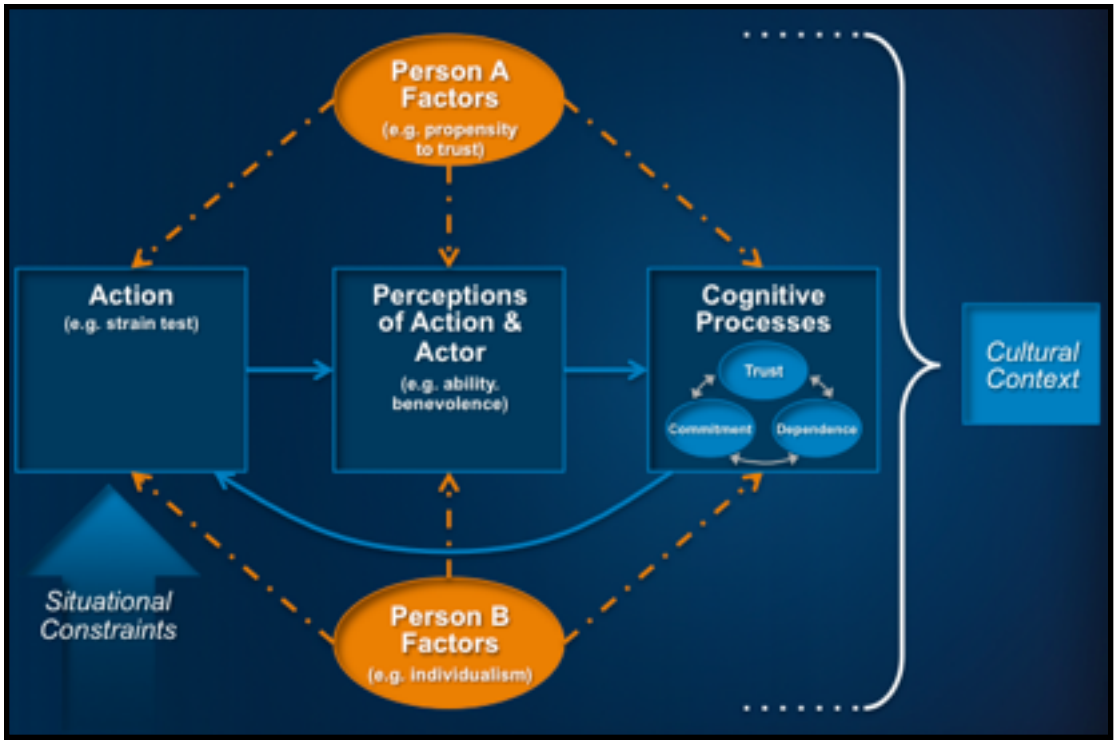
While Mayer's model has been tested many times now since its initial publication, usually attempting to determine when, for example, employees trust a manger, there has been no research that examines whether Mayer's model is robust for predicting trust directed at organizations, such as a businesses or a government (though, Mayer and his colleagues contend that the model should apply to this domain).

Our research at NRL leveraged preexisting survey data from four African nations (Burkina Faso, Nigeria, Senegal, and Mali) to see if Mayer's model would predict citizen reports of trust in government.

The survey did not contain explicit items measuring ability, benevolence, and integrity (though it did contain explicit measures of trustor propensity and trust in government); however, it did contain many items that functioned as proxies for ability, benevolence, and integrity for our research. For example, there were items that measured perceptions that the government was able to provide things like security, roads, general infrastructure, and the like (which we took to be a form of "ability" related items), whether the government is responsive to the needs of its citizens (benevolence related items), and items measuring whether the government is corrupt (integrity related items). Surprisingly, since the survey was not designed to test Mayer's model, there were also items that examined how trusting people were in

general, as well as items that examined explicit reports of trust in government.

As Mayer would have predicted, factor analyses found that ability, benevolence, and integrity related items "hung together" and formed three distinct factors (though, the factors differed somewhat from nation to nation). After we conducted our factor analysis, we conducted both regression and structural equation modeling analyses, both of which indicated that all three trust predictors (ability, benevolence, and integrity) were significant predictors of trust in government across all four nations (this paper is currently in preparation with an intended outlet of Political Psychology).



Trust in the Counterinsurgency Context

In addition to our work on trust in government, we are also working to understand how trust develops cross culturally with the intent of applying this work to the counterinsurgency context. Over the last decade or so, as the U.S. has engaged in counterinsurgency (COIN) campaigns in both Afghanistan and Iraq, multiple texts, manuals, articles, etc. noted that generating trust between U.S. service personnel and local populations was perhaps the most important element of COIN.

However, how trust develops cross culturally is not well understood in the social sciences, and this lack of understanding has led to piecemeal and conflicting reports of how to generate trust on the COIN battlefield.

In response to this problem, my NRL team and I examined whether or not any of the existing psychological theories on trust development were appropriate for understanding how an 18-year old U.S. Marine, who is armed to the teeth, wearing body armor and sunglasses, and rides around in a heavily armored Humvee can generate trust with a villager in Afghanistan, who might actually believe that the Marine is a Soviet soldier (this is no joke - a number of folks we spoke with who have participated in COIN operations in Afghanistan noted that many Afghan locals they came into contact with were not aware of the events of September 11, 2001 and had no sense that the Soviets had ever left Afghanistan, or that the Soviet Union was not a political entity anymore).

We reviewed a number of trust theories (such as the Mayer model, noted above) and ultimately decided that a hybrid model of multiple theoretical frameworks would be most appropriate for the COIN battlefield. As a result, my colleagues and I have written up a new theory of trust generation which we refer to as the Model of Culturally Contextualized Trust Formation or MCCTF.

This model brings together multiple theoretical frameworks from across the social sciences and attempts to integrate them into one unified theory of trust formation (this paper is currently under review with the Journal of Trust Research).

We pitched our new model to AFOSR and have received our first increment of funding to actually test the model. We tentatively plan to collect experimental survey data on this model in the nation of Tunisia sometime in calendar year 2014.

The Way Forward

Our work at NRL is profoundly exciting and has the potential to redefine how we understand trust both at the individual level as well as at the organizational level.

As noted at the beginning of this article, senior level DoD leadership recognizes the critical importance of this research domain. Yet, much work needs to be done. The work we are currently engaged in at NRL is only the first step on a very long path towards seriously understanding the concept of trust.

From my perspective, if done properly, government research on trust could ultimately be fused with

Trust is one of the most important components- and perhaps the most essential ingredient—for the development and maintenance of happy, well functioning, relationships

- Social Psychology: Handbook of Basic Principles

computational social sciences technology tools to do things like mine social media data for trust related signatures, which could help us understand and predict trust levels in governments around the world. Presumably, this would help us better understand when levels of trust in a government rise and fall, why they do so, and if such levels have an impact on nation state stability. Such research could eventually provide commanders with an indications and warnings system to help them detect instability in their AORs, and possibly enable them to take actions useful in the given situation.

In addition, our research regarding trust in the COIN context could be used for a host of applications ranging from training (to help our warfighters build trust with locals with the intent of avoiding conflict), to Military Information Support Operations (MISO) messaging campaigns (with the intent of generating trust between larger populations), and perhaps one day, even feed technology tools designed to provide operators with predictive models tailored to understanding individual level behavior of local populations in theater.

As you might imagine, my team and I are filled with excitement about our work at NRL and can't wait for the next stage in the research. Hopefully an upcoming issue of Call Signs will have a photo of my team and I in Tunisia!

LT David JY Combs is currently stationed at the U.S. Naval Research Laboratory (though, he seems to have badges to half the offices in Washington D.C.). There he manages research on cross cultural trust, trust in government, and is authoring a manual on social psychological processes in the counterinsurgency context. He also collaborates on a host of projects with the Office of the Secretary of Defense, The Joint Staff J7, the Department of State, and the IC. Because he has completely given up on having a reasonable work/life balance, he is also taking night courses at The George Washington University to achieve a certificate in Mass Survey Methods.

He has been married to Lyla Combs (who is kicking serious behind in her own right and is currently on an assignment with the Department of State), whom he hopes will never wise up and think better of the arrangement. They have been married for 10 years and seem to still like each other.

When he's not at work, LT Combs can be found a few blocks from his apartment in Del Ray, Virginia, at his favorite wine bar reading this week's issue of The Economist.

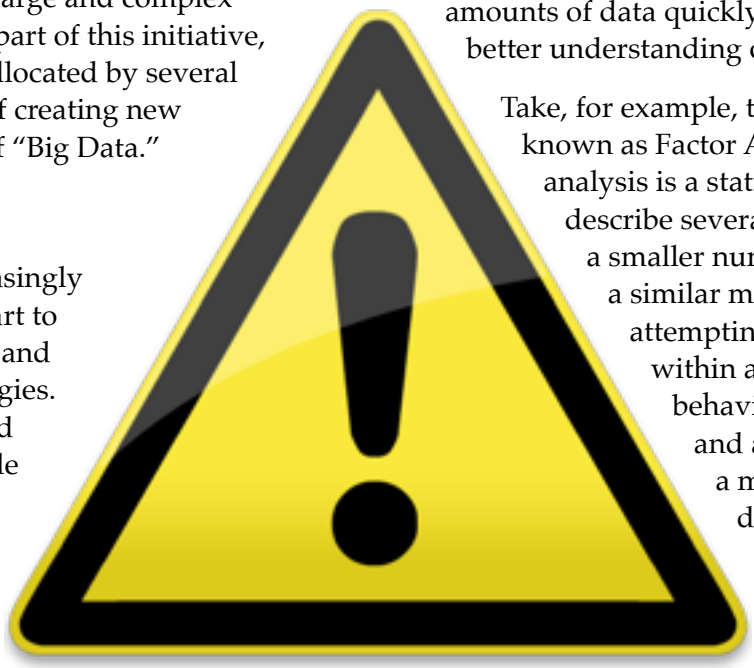
Guided Learning: Addressing the Big(gest) Issue Behind Big Data

By: LCDR Peter B Walker

In March of 2012, the White House released the "Big Data Research and Development Initiative" marking a formal acknowledgement for the growing need to extract knowledge and insights from large and complex collections of digital data. As part of this initiative, more than $200 million were allocated by several federal entities with the goal of creating new technologies for the analysis of "Big Data."

Big Data is here to stay.

Information has become increasingly more available, due in large part to increases in computing power and advances in database technologies. As of 2012, most experts agreed that the size of data sets feasible to process in a reasonable amount of time were measurable in exabytes of data. In little over a year, that size has increased to petabytes. Given the exponential increase in the size and complexity of these datasets, the question should be asked, "How can we formally characterize these complex datasets?"



By today's standards, Big Data is described using the "3 Vs": **volume** (the amount of data available), **velocity** (the rate of data input), and **variety** (the different sources of data). Together, these components comprise what many researchers believed to be a comprehensive list of the big issues surrounding the Big Data phenomenon. However, in this essay, it is argued that the biggest issue has yet to be addressed: **volition** (the intent of the analysis of that data set).

The analysis of Big Data has traditionally focused on fast, efficient and mathematically reliable approaches. Because these datasets are often large and the underlying phenomena behind them may not be well understood, fast and efficient data analytic approaches have quickly become the norm. However, these data analytic approaches often provide very little insight into the Big Data. In other words, just because we can analyze large amounts of data quickly does not mean that we have a better understanding of the data itself.

Take, for example, the data reduction approach known as Factor Analysis. Simply put, factor analysis is a statistical approach that attempts to describe several different variables according to a smaller number of variables that behave in a similar manner. Factor analysis works by attempting to identify latent behaviors within a complex dataset. These latent behaviors are represented as factors and allow a dataset to be reduced to a much lower number of dimensions.

When dealing with Big Data, approaches such as factor analysis can be very appealing. In essence, these approaches attempt to take the thousands of different elements and describe them using a smaller number of correlated data points.

Suppose, for example, we have a group of 200 people that attend a psychology convention. It turns out that half of the attendees are experimental psychologists and the other half are clinicians. Factor analysis attempts to differentiate the two groups of people by identifying commonalities among one group that are different from the other group. However, this is done in a pseudo post-hoc fashion. That is, whoever is analyzing the data is left to *infer* what latent factors differentiated the two groups.

The problem becomes much less clear when the analyst does not know (a priori) what latent factors differentiate the two groups.

Over the past several years, my research has been devoted to developing algorithms that are both mathematically reliable and ecologically valid for understanding Big Data (ecological validity refers to an analytic approach tailored towards answering specific questions regarding the Big Data). The general paradigm under which this has been accomplished is called Guided Learning. Rather than analyzing the data and attempting to interpret patterns post hoc, Guided Learning attempts to address the latent factors within a data set a priori and use those questions to guide the analysis.

What is Guided Learning?

Guided Learning represents a movement to develop data analytic techniques that are both mathematically rigorous and ecologically valid. As alluded to earlier, many currently available data analytic techniques provide an opportunity to decompose very dense datasets into smaller and (potentially) more meaningful pieces of information. However, often times, these approaches may aggregate across one or more dimensions of data, potentially overlooking other meaningful interactions.

Similarly, many current state-of-the-art data analytic techniques require the user to first analyze the data set and then theorize how the reduction of data may conform to one or more currently held beliefs. Guided Learning is an attempt to incorporate a true *a priori* hypothesis-testing analytic approach, which uses known factors or assumptions to guide the analysis.

Why Guided Learning?

In some instances, Guided Learning may not be necessary. For example, in situations where the data is well understood, sufficiently simple, or easily replicable, the use of data reduction techniques may be adequate. However, for data sets with multiple dimensions or where the phenomenon may not be well understood, the use of Guided Learning provides some inherent advantages over other techniques.

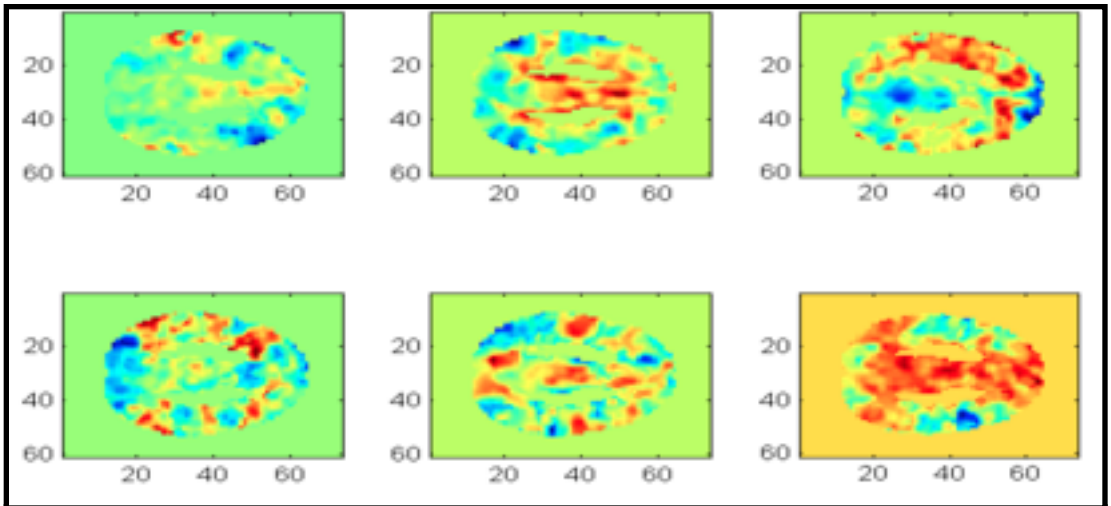


Figure 1: *Lack of test-retest reliability in fMRI. A healthy young individual received two fMRI scans in rapid succession. The top and bottom rows show the three top-ranked clusterings for the first (top row) and second scans (bottom row).*

An Illustrative Example for Guided Learning

In order to illustrate the need for Guided Learning, let's examine the use of functional Magnetic Resonance Imaging (fMRI). fMRI provides the unique opportunity to visualize neural activity in the brain in an on-line modality. Still in its infancy, fMRI has begun to receive high praise for its applicability in both clinical and diagnostic settings. For example, functional connectivity studies have explored issues such as the study of post-traumatic stress disorder (PTSD), chronic traumatic encephalopathy (CTE) and traumatic brain injury (TBI).

While there has been tremendous excitement surrounding the use and applicability of fMRI, a review of the literature surrounding the use of fMRI has raised some concerns. Specifically, analysis of functional connectivity data is often limited by poor test/re-test reliability. As is seen in Figure 1, results from separate

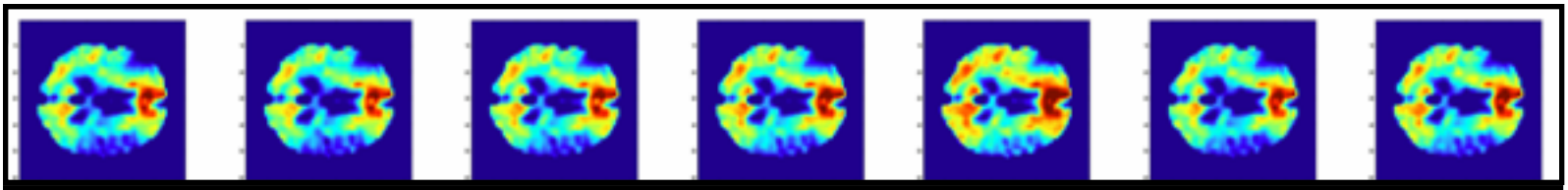


Figure 2: *Increased test-retest reliability in fMRI through guidance. A healthy young individual received several fMRI scans in rapid succession. The series of scans show similar activation patterns across time.*

scans may yield very different results. In this figure, we see the results for two resting state fMRI data sets of the same healthy young individual, acquired in short succession. Barring a major medical event between the two scans, the spatial and temporal patterns of resting state activity should be very similar. Yet, the data analytic approach used on this data set identified different patterns of activation across the two sets of scans.

In the above example, the lack of test-retest reliability is almost entirely attributable to the data analytic approach. Typically, in the case of fMRI (and other complex datasets), factor analytic techniques are employed where the objective is to group portions of the data (in this case, activation in the brain) that behave in a similar manner.

Here, the limitation with this form of data analytic approach is that the analysis is focused solely on mathematical replication. That is, we are merely concerned with how different areas of brain are correlated with one another in terms of activation. However, this approach does not take into account any of the theoretical underpinnings for the phenomena of interest. Alternatively, we could potentially analyze this dataset by attempting to identify specific regions of interest. For example, suppose we focused the analysis on how different anatomical regions correlated against one another.

Such a strategy lies at the center of the Guided Learning movement. In previous work, we applied Guided Learning in the form of Subject Matter Expertise (SME) inputs to help increase the test-retest reliability for fMRI analysis (as well as other datasets). In the case of fMRI, the addition of guidance helps to rule out solutions that are non-actionable (trivial) by restricting the solutions to be consistent with known domain knowledge and expectations. For example, one manner in which guidance was incorporated for fMRI data was to simply identify *a priori* the boundaries of 116 known anatomical regions. By doing so, the algorithm can then focus on relationships that occur within and between these areas while ignoring any influence of outside "noise."

Figure 2 illustrates a single individual that received several different fMRI scans over time. As can be seen from this figure, the scans reveal nearly identical patterns of activation (as would be expected). As was pointed out earlier, the reason for the increased level of reliability in this case is due solely to the fact that the algorithm was now made aware of known biological markers within a healthy brain. In other words, if we provide the algorithm with some baseline knowledge, the algorithm can then work to find the most reliable (ecologically and mathematically) pattern within that dataset.

Guided Learning in Other Operational Settings

Thus far, the discussion on Guided Learning has focused on the need for guidance and provided data that illustrates the utility of Guided Learning in the laboratory. This section is intended to explore how Guided Learning might be employed in operational settings to increase the capabilities of our warfighters.

As mentioned previously, Guided Learning is particularly beneficial in those scenarios involving data possessing multiple dimensions or where the phenomenon may not be well understood. Take, for instance, understanding the interactions between social and event networks and how individuals within a particular social network might influence the events that occur within and between other individuals in that network.

Social networks are a social structure consisting of a set of social actors (individuals or groups of individuals) and a set of ties (relationships) that binds these individuals together. The earliest theories on Social Networks were introduced in the fields of Sociology and Anthropology

in the 1950s. Today, Social Network Analysis influences fields ranging from psychology and neuroscience to economics. Event networks are a much newer avenue of study. Similar to social networks, the goal behind event network analysis is to identify how different events may be related to one another.

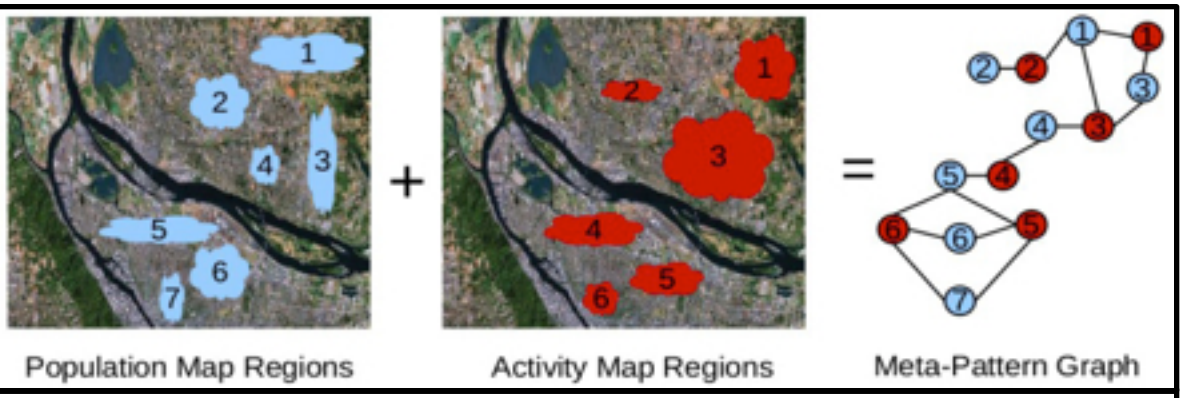


Figure 3: *Identifying complex patterns in Big Data. Guided Learning was used to help identify meta-patterns occurring between population and adversarial activity maps.*

As part of the Human Social, Cultural, and Behavioral (HSCB) program, our group sought to apply the principles of Guided Learning to identify patterns of data from two separate sources (socio-cultural regions and adversarial activity). Using correlated patterns of activity within each of these groups, we sought to identify meta-patterns within the data by encoding prior knowledge into the data-mining algorithms to help guide them (see Figure 3).

Using this approach in several different experiments, Guided Learning algorithms provided more actionable insights to the analyst. In addition, these insights were more reliable and allowed the analyst to test "hypotheses" about the dataset of interest.

The Way Ahead

This article suggested that a shift in data analytics may be necessary. As information continues to become more readily available, and we seek to identify how and when different datasets may be related, it will become more important than ever to apply data analytic approaches that are grounded by theoretical constraints. Guided Learning is one reliable method for accomplishing this goal.

This article introduced two separate problem domains in which Guided Learning was employed successfully with very robust results. In both case, had Guided Learning not been used, important results may have been overlooked. These limited examples illustrate the need for the development of more robust algorithms that utilize guidance.

As these datasets become larger, more complicated, and the interactions more difficult to understand, it will become necessary for researchers to utilize tools that allow for both fast and efficient analysis of the data while incorporating the guidance of Subject Matter Experts to ground the results to patterns that are actionable and insightful.

LCDR Pete "BB" Walker is the Science Advisor to the Chief of Naval Air Training in Corpus Christi, Texas. His expertise in statistics and applied mathematics have been instrumental in identifying new methodologies for predicting downstream success of student military aviators.

He is currently funded under two separate Office of Naval Research Grants and actively collaborates with both academia and private industry.

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Do NWUs Turn Orange When They Get Wet?

By: LCDR Brian R. Johnson

My academic background is in human factors, and I have been teaching human factors themed courses in my three semesters here at the Air Force Academy. In addition to providing academic training, I still feel, however, that part of my job is to teach cadets a bit about the Navy. An approach that I have borrowed from CDR Reddix is to begin each lecture with a "Navy Term." Most recently, I introduced the term "geedunk" and the Cadets just stared back in disbelief as if I am making up words (by the way, the Air Force equivalent of a geedunk is a "shoppette"). Cadets take all of their classes in Fairchild Hall, and I inform them that there is a geedunk in this building which really gets them guessing. Once the term is defined, I typically get more disbelieving stares, but it is a great way to build some rapport and get them curious about the Navy. Once they get comfortable, they ask questions about why we wear blue camouflage and if they turn orange when wet. More importantly, they seem more likely to engage in the learning objectives for the day.

My recent promotion was well received by my colleagues.

This billet is located in the Department of Behavioral Sciences and Leadership (DFBL). I would like to make a few brief points about this billet in the hope that everyone will consider a tour at USAFA at some point in their careers.

1. This billet is for everyone

This billet is for everyone in our community. Regardless of major, every cadet is required to take two courses in DFBL to graduate. We are all qualified to teach those two core courses, which are "Introduction to Behavioral Sciences" and "Foundations for Leadership and Character Development." Furthermore, each member of the faculty is assigned to one of five different academic disciplines (psychology, socio/cultural, experimental, leadership, and human factors). With my background in human factors, it has been a natural fit for me to teach courses in the human factors discipline. AEPs with different qualifications would teach in a discipline that matches their skill set.

2. You will be integrated within the Department

This department does an amazing job of integrating their Navy and Army officers. For example, during my first year here, I had the opportunity to direct my own courses. This academic year, I am serving as the Discipline Lead for human factors. The leadership of this department understands that we need opportunities to demonstrate increasing growth and responsibility, and they strive to find those opportunities. You will be integrated in the department, but they will not let you forget that you are in the Navy (see Figure 2).

3. Publish!

Although teaching loads tend to be heavy, there are opportunities to do research at USAFA. Currently, I am mentoring seven cadet research teams as they investigate a variety of topics, including: remote piloted aircraft, night vision goggles, helmet – mounted displays, and small group behavior. The goal of these research teams is to publish their findings as proceedings at next year's Human Factors and Ergonomics Society's Annual Meeting.

The command has an Institutional Review Board (of which I am a member) and cadets enrolled in their introductory behavioral science and leadership courses can earn extra credit by volunteering as research participants. To help you in your research efforts, the department recently created a research center. The research center provides the administrative support to process Institutional Review Board proposals and grant applications.

During my first Navy-Air Force football game, my colleagues filled my office with cups of goldfish.

4. Come at the right time

Something to consider is the optimal time, from a career planning perspective, to come to the Air Force Academy. For example, the billet is not acquisition coded and the nearest Defense Acquisition University training hub is at Hill Air Force Base, near Ogden, Utah. This does not mean that training is impossible, but it may require a little creativity. My best advice would be to discuss it with your mentor, Specialty Leader, and Assistant Specialty Leader. Together you will be able to come up with a great plan.

GO NAVY!

BEAT

AIR FORCE!

LCDR Brian R. Johnson is an Assistant Professor at the United States Air Force Academy. He is assigned to the Department of Behavioral Science and Leadership and he serves as its Human Factors Discipline Lead.

He and his wife Kate have been married for 14 years and they have two curious children (Leo age 2; Scarlet, age 1).

He can be reached at 719-333-2930 or Brian.Johnson@usafa.edu

Travel at the 11th Hour: My Experience at the Military Health System Research Symposium

By: LTJG Eric "Rustic" Vorm

It was late Friday afternoon and I was just getting ready to wrap things up after a long week of work when suddenly my phone rang. On the other end of the line was the research coordinator for the Navy Medicine Operational Training Center in Pensacola, Florida- my parent command. "Have I got a deal for you!" he says, enthusiastically.

He went on to explain that the Military Health System Research Symposium (MHSRS) was on the approved conference list for military attendees, and our command had committed to send a representative. Unfortunately, he explained, the individual chosen to attend was unavailable at the last minute and had to cancel. "So we've decided to send you in his place. Congratulations!"

"Oh," he added, "and the conference starts on Monday."

Despite the short notice, I was thrilled at this opportunity. The MHSRS conference hosts some of the most ground-breaking medical research across the DoD and affiliated organizations. As a former Corpsman who has deployed in an operational setting, the subject matter at this conference was of close, personal significance to me. Many of the organizations and individuals who helped develop technologies and devices which proved critical to my ability to treat patients on the battlefield were scheduled to be in attendance, and I was quite eager and excited to learn about their current research, as well as new technologies on the horizon.

When I arrived in beautiful Ft. Lauderdale, the conference was bustling with energy. Service members from all U.S. branches and international military organizations mingled in small groups of neatly pressed uniforms, joined with civilian researchers, scientists, and academics from affiliated organizations and universities from across the country and around the world. Every room was filled to capacity, and covered with over 350 posters, 70 vendors, and wall-to-wall people. The schedule of presentations and events was robust, with more than 220 individual presentations. The schedule even included a 5k run to benefit the Wounded Warrior Foundation. In terms of content, each day was packed with a mix of large presentations, smaller break-out sessions split up by focus area, and two blocks of poster presentations. From 08:00 to 17:30 every day

there was no shortage of fascinating topics or activities in which to engage.

There were some notable VIPs in attendance as well. Among the many speakers were RADM Bruce Doll, Commander of Navy Medical Research and Development Command; Dr. Terry Rauch, Office of the Assistant Secretary of Defense for Health Affairs; Louisiana Congressman Dr. John C. Fleming; and Dr. Alasdair J. Walker, Surgeon Commodore of the UK Joint Medical Command.

At first glance this conference might sound like it has little to do with Aerospace Experimental Psychology, but upon closer inspection I found virtually every one of the community's core focus areas represented. For the human factors folks there were breakouts on human performance optimization and ergonomic concerns of current and future protective gear. For the simulator and virtual reality folks there were several presentations on new simulator-based training and integrated sensor-based data capture devices. Dr. Brian Lu of Georgia Tech University offered a fascinating glimpse of the new Integrated Blast Effects Sensor Suite ("IBESS"). For the Neuroscientists there were a multitude of presentations surrounding traumatic brain injury and PTSD, including many new technologies designed to identify the presence of TBI before symptoms appear. My personal favorite neuroscience lecture was a presentation on epigenetic biomarkers of stress in high altitude conditions- something near and dear to my heart as an avid climber. For the I/O folks there were several presentations and discussions on the use of biological and neurological data in selection and assessment, including a fascinating look at the Israeli Defense Force's elite Paramedic Training Program, which recently cut their selection and assessment protocol by several days with no loss of validity using a combined approach of cognitive, physical, and biological screening.

In short, there was something for everyone at this conference. In a time when budgetary constraints have significantly limited the range of options for conferences, I think the MHSRS is an excellent example of the continued efforts of scientists coming together to ensure there will be future opportunities for networking and collaboration. For AEPs who may be experiencing a loss of their preferred conferences, MHSRS (which is very likely to be approved and funded for FY14) should be considered an excellent venue to present findings, share ideas, and gain useful insight into the range of military-related medical research across the DoD. It was, in my opinion, a great conference all around. The networking opportunities were plentiful, the presentations were exceptional, the science was superb, and the food wasn't half bad.

LTJG Eric "Rustic" Vorm is the Fleet Support Division Officer for the Operational Psychology Department, Naval Aerospace Medical Institute. There he manages the administration and operation of the ASTB-E, and the training of newly assessed AEP's. He is actively involved in a number of research projects across the Navy Marine Corps enterprise. LTJG Vorm's professional interests include research into epigenetics, neurobiological markers of resilience, and the use of neurobiological measures in selection and assessment. He has been married to his lovely wife Jennifer for 12 years, they have two young children, and live in Pensacola, Florida.

He can be reached at 850-452-4349 or

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Speak Softly and Carry a Big Stick

By LT David "PoPo" Rozovski

Hello fellow AEPs! The holidays are upon us – offering an appropriate time to reflect on events from the past years. It is hard to believe that I took my oath less than 24 months ago; though I can confidently say that this has been one of the most exciting times of my life. Becoming an Aerospace Experimental Psychologist (AEP) has been a fantastic adventure!

All of us have gone (or are going) through AEP training, but many of our individual experiences during the process have not been the same. During the course of my time in flight training, I had the opportunity to engage in a variety of incredible experiences including: flying the latest fully integrated ROBD (Reduced Oxygen Breathing Device) F-18 simulator, flying tactical approaches in the TH-57 at HT-28, flying in the front seat in the T-6A Texan II (an experience not usually afforded to "flight docs"). While there were a variety of incredible opportunities that I had the privilege to participate in, I believe the central theme of how I was able to obtain them is much more important.

LT Rozovski in the cockpit of the T-6. LT Rozovski has logged over 500 hours in more than 25 different aircraft.

During my AEP training, I learned a lot about our community and our roles in the Navy. One thing I realized during my training is that sometimes folks do not exactly know what it is that AEPs actually do! In many cases, people see the leaf on our lapel and categorize us as Flight Surgeons or Aerospace Physiologists without being aware of the differences across our specialty areas – and that these differences make us each important in distinct ways. As this realization slowly dawned on me, it occurred to me that that lumping AEPs in with other specialties probably has an impact on the experiences and exposures we receive--- and ability to impact our customer base.

An example of this was my opportunity to fly the T-6 from the front seat. When I initially inquired about this possibility at VT-10, my request was met with hesitation and denied. However, I believe that this initial rejection was due to the CO not really realizing what AEPs do. Once I explained some of the AEP duties and how our aeromedical community is intimately involved in areas such as human factors, systems engineering, training, selection, etc., the CO was incredibly positive and approved the request. This was eye opening to me. Of course, the approval to fly from the front seat was not simply deciding who got on the wing first, but required approval for additional funding for

add on simulator sessions and acceptance of the additional liability. The CO's willingness to take on all of this risk occurred because of a better understanding of what AEPs do, why our work is important to the aviation community, and how we can help the Fleet.

I believe that my discussion with the CO improved the local understanding of AEPs, and this increased awareness opened up a myriad of opportunities for me. For example, while I was still in Pensacola I received invitations to observe and provide feedback on T-45 simulator training at TRAWING 6, as well as ride in the jump seat during a V-22 Osprey hop at TRAWING 5.

Some may say this path is an anomaly that likely cannot be repeated; however, I believe that it can be. If I had to summarize how AEPs can maximize our exposure, I would say it comes down to two things: *demonstrating interest* in our clients' jobs (i.e., our Line Officers) and *exceeding expectations*.

In the short time that I have been with our community, I cannot state the number of times that seasoned line officers have had their face light up and engage me in fascinating and relevant conversations when they find out what AEPs do, and learn the direct impact that we can have on their well-being. I am extremely proud to be a new AEP, and I look forward with even greater anticipation to seeing you in the Fleet.

Hooyah!

LT David Rozovski was born in New York City, NY. In 1993 he moved with his family to Santiago, Chile. At the completion of high school, he returned to the US for college, earning a BS in Psychology from Linfield College, a Masters degree in Aviation Human Factors from University of Illinois Urbana-Champaign, and a PhD in Industrial Engineering; Aviation Human Factors from Purdue University.

His graduate work focused on a redesign of the V-22 Osprey power control interface and received both monetary and equipment use grants from NASA and the Canadian National Research Council (CNRC) to conduct his research. This work has secured him multiple domestic and international patents.

He holds instrument, commercial, and multi-engine fixed and rotary wing certifications in the US and Chile. LT Rozovski currently works at the Naval Air Warfare Center Training Systems Division in Orlando, FL.

AEP Profiles:

LCDR (Ret.) Jim Johnson, AEP# 9

My navy career was launched as a result of a recommendation by my major professor, Dr. Brant Clark, Chairman of the Psychology Department at San Jose State University. Dr. Clark was a friend of Captain Allen D. Grinsted, Head of Aviation Experimental Psychology, at the Naval Bureau of Medicine and Surgery (BUMED). Dr. Clark was in the Naval Reserve and spent summers, following World War II, conducting research on spatial disorientation at the lab in Pensacola.

My first assignment (direct commission because of U.S. Army experience during the Korean conflict) was at the U.S. Naval School of Aviation Medicine (SCHAVMED), Aviation Psychology Laboratory (Building 16) Pensacola, FL. In graduate school (Industrial Psychology), my primary interest was in the measurement and prediction of human performance in the workplace and that remains so. The "cradle of naval aviation" provided the foundation for my career as an Aerospace Experimental Psychologist (AEP). Shortly after reporting for duty in Pensacola, I was assigned to a Flight Surgeon Course to become acquainted with some of the aviation problems that I might encounter while in the Navy. While in the course, I went through flight training, up to the solo stage. On my first flight, while learning to taxi, I experienced my first example of poor workplace design. We heard a "mayday" from a plane in front of us. Shortly after becoming airborne, one of my fellow student flight surgeons turned off the fuel supply instead of the fuel boost pump. The instructor in the front seat did not have access to either of these controls, so he was unable to rectify the error and the plane had to make an unplanned landing in a farmer's field.

The lab was bustling with interesting activity (but not necessarily with the funding the Air Force received) because of developments in the space race. The Psychology Lab was involved with the selection of the original astronauts. Captain Ashton Graybiel, MC, USN and his group were concerned with, among other things, the effects of rotational forces on the vestibular system, weightlessness, radiation, design of the capsule seat, etc. One of my first assignments after flight training was to take Baker, the first surviving squirrel monkey who was launched into space, to an exhibition at a Health Fair in Denver Colorado. Monitoring the half dozen sailors that accompanied me turned out to be more complicated than caring for the monkey, even though she did escape and spent a day partying in the overhead of the auditorium.

For several reasons, including the space race, our name changed. When I reported to Pensacola we were known as Aviation Experimental Psychologists, but sometime around 1960, a reorganization of BUMED occurred and we became Aerospace Experimental Psychologists.

Believe it or not, upon my arrival in early April 1959, there was a sizable statistical section, because at that time we still depended on the old manual calculators

Ensign Jimmy H. Johnson, MSC., USNR, receiving instructions from Captain Richard J. Gowdy, USMC

produced by IBM for data analysis. We were all thrilled when we were able to purchase an IBM 1620 computer!

After entering the Navy, The first paper that I presented was at the California State Psychological Association meeting held in 1960 in San Jose California. That paper (basically my Masters Thesis) was concerned with the prediction of academic performance for recipients of the Master of Arts degree in Education. While at Pensacola, I independently designed studies, collected and analyzed data, and published results on a number of issues dealing with flight training and aviation problems. Some of these studies were concerned with things like: the effectiveness of a simulated pedagogic trim tab trainer device on flight performance, the usefulness of plow back students as flight instructors, and the effects of different primary pipeline training approaches (e.g., primary training in all propeller, all jet, or a combination) on subsequent pilot performance during basic and advanced training.

Near the end of this tour, a few of us (Madden, Shoenberger, Johnson and Hardacre) participated, on a part time basis, in the activities of the newly established Scientific Advisory Teams (SAT). We enjoyed the opportunity to engage in a number of antisubmarine operations in the Atlantic and Caribbean oceans and the Bermuda triangle region. I also participated, for several weeks, in coordinated antisubmarine exercises with American, British and French forces, in and around Northern Ireland. Commander William Madden and Lieutenant Commander Allen McMichael were with me. This experience with the SAT proved to be valuable during later assignments to the submarine and antisubmarine forces described below.

During 1963/1964 I was a Ph.D candidate in the Experimental Psychology Department at the University of Miami, Coral Gables, FL. Later I continued my education in the Applied/Experimental Psychology Program at the Catholic University of America in Washington DC, but because of work commitments, never completed the degree.

My assignment from 1964 to 1967 was at the Naval Submarine Medical Research Laboratory (NSMRL), Groton, CT. The lab was established in 1946 to study physiological, sensory, perceptual, environmental and behavioral problems associated with the submarine and diving community. When I arrived in 1964 the lab was under the jurisdiction of the newly established Submarine Medical Center. My billet was in the Human Factors Engineering Branch (interestingly, our new young secretary, Jean Derrousier, was still there for the 50th anniversary celebration in 1996). There were no other AEP's assigned to NSMRL at that time, but here was one MSC Clinical Psychologist, Buzz Inman, assigned to the Personnel Research Branch.

During this assignment I published on topics such as the prediction of enlisted submarine crew performance in sub school, based upon performance on a "motivation to excel" test (a modified Harvard Step Test). The rationale for the study was based upon an idea that Robert S. Kennedy had when we were together at Pensacola. It was Bob's notion that Marines possessed more "grit" than other flight students and were, therefore, less likely to DOR (drop on request) from flight training. The results of the motivation to excel study were, unfortunately, inconclusive.

Submarine Development Group Two (SUBDEVGPII) was an interesting place to work in those days. It was concerned with the development of new and advanced submarine tactics. One of the goals of SUBDEVGPII was the development of a measure of performance called Weapons Systems Effectiveness (WSE). Former tools such as the Wet Hen for navigation and other traditional technologies, such as the slide rule, were being replaced by the computer. The open mindedness and creative thinking of the staff at SUBDEVGPII made it a stimulating and intriguing place to perform research. Most of the work was of a classified nature and not available in the open literature.

Some of the factors involved in the equation for WSE were the probability of a kill, the probability of being killed, the reliability of the machinery and weapons, accuracy of the weapons, navigation systems, and the like. I devoted a lot of time and energy trying to solve some of these problems on a Honeywell computer (still used tubes and magnetic tapes in those days) housed in a large building at the Submarine School that we used for a lot of the SUBDEVGPII work. I spent many evenings there.

Unfortunately, for this billet I had to give up flight pay; however, the challenging work and the opportunity to ride submarines made up for the pay discrepancy. Once I rode the oldest submarine in the navy at that time, the USS GROUPER, for a few weeks and thoroughly enjoyed the cruise (particularly Bermuda). It was during this time that AEPs were authorized to wear wings and receive flight pay, rather than hazardous duty pay. We had a meeting of the entire clan in Pensacola where I had my wings pinned on me. In spite of the jokes about the "cracker-jack box" wings, I think we all enjoyed the privilege of wearing them (and certainly the extra pay).

Following my tour with the submariners, I served two, two year tours in the Norfolk vicinity as head of SATs. I was on the staff of the Commander, Fleet Air Wings Atlantic (FAIRWINGSLANT), then on the staff of the Commander, Antisubmarine Warfare Forces, Atlantic (COMASWFORLANT). During this time frame, another SAT was formed and attached to the staff of the Commander, Hunter Killer Forces, Atlantic (HUKFORLANT).

The first SAT was established in the early 1960's as a result of a liaison between offices in the Chief of Naval Operations (OPNAV) and BUMED. Bill Madden recognized that the human element (operator performance) was ignored during the calculations of systems performance effectiveness and created the SATs to determine the effectiveness of the human operator.

The original SAT, composed of AEPs, was assigned on a Temporary Additional Duty (TAD) basis to Task Group Delta, which was part of FAIRWINGSLANT. Task Group Delta was formed for the development and evaluation of advanced tactics and new technologies for airborne antisubmarine warfare. Task Group Delta was a small group of about 18 people, composed of Naval Aviators, Naval Flight Officers, civilian contractors (primarily acoustical and underwater sound and noise experts), support staff and dedicated aircraft and associated equipment.

Historically, the criteria of effectiveness for air antisubmarine warfare were generally measured by the probability of target detection (during cold war) and the probability of kill (during hot war). Such factors as sea state, sonabuoy effectiveness and reliability, and probability of being killed yourself were recognized as being factors in the probability of success. The reliability of machinery and equipment was recognized, but not the human operator. The Navy had a system of evaluating maintenance effectiveness in those days but when I recommended including the name and performance record of the maintenance man into the formula, the idea was rejected as being bad for morale.

The purpose of the SAT was to enhance effectiveness of prediction of weapon system performance by the addition of crew performance into the formula. SAT members attempted to develop techniques for the

NAMI and NAMRL, circa 1967 (Source: US Naval Institute)

measurement and evaluation of human operator performance during antisubmarine flight operations and performance of operators while monitoring underwater listening stations.

During the summer of 1967 I went to Pensacola for a flight physical and a month of "air refresher" training then I was transferred FAIRWINGSLANT to be the head of the team.

Prior to my transfer, another SAT was established at the headquarters of the Commander, Antisubmarine Warfare Forces, Atlantic (ASWFORLANT) Norfolk.

LCDR (Ret.) Johnson passing the Flag to CAPT Schmorrow at his retirement

In October of 1971 I moved on to Naval Air Systems Command (NAVAIR), Washington, DC in the Crew station Design and Human Factors Engineering Branch. Later I became Branch Head. During my tenure at NAVAIR, some of the newly designed aircraft and systems were the F-14, S-3, P-3, Light Airborne Multipurpose System (LAMPS) and F/A-18. All of the human factors engineering problems associated with older existing systems were also the responsibility of our branch. Some of our activities were of the "band aid" variety (e.g., coffee cup holder location, new relief tube for female aviators, pulsating seats), however, we also had responsibility for many major aspects of design (e.g., which stick is most effective for the F-14, crewstation design (including air conditioning) for LAMPS, F/A-18 cockpit design). One of our major problems was the dissemination of knowledge of the existence of our services. That problem was alleviated somewhat by implementing government rules and regulation, which required the acquisition program managers to receive our written approval for proposed systems and changes.

We were also involved in the research activities of various Navy and other military laboratories that was relevant to problems associated with performance of naval air systems acquired by the Navy. The plan was for us to provide the labs with requirements for the research we believed was needed and to monitor and coordinate the research conducted by NAVAIR laboratories, other military laboratories and civilian organizations when pertinent.

After retirement from the Navy, the Essex Corporation offered me the opportunity to continue and expand my interests in human factors engineering in aviation, as well as other platforms. One of the more interesting contracts I worked on required us to conduct an analysis and make recommendations to the Nuclear Regulatory Commission for improvements following the Three Mile Island accident. My Navy experience in crewstation design and knowledge of MIL-STD-1472 Human Engineering Design Criteria for Military Systems, Equipment and Facilities, and MIL-H-46855, Military Specification: Human Engineering Requirements for Military Systems, Equipment, and Facilities (which I and other AEPs had developed) provided valuable insight into determining control room design causes of the accident.

After retirement from Essex, I spent 10 years aboard several Navy ships as a part-time Professor in the Navy's Program Afloat for College Education Program (PACE). My previous Navy experience was beneficial in establishing rapport with the students and maintaining good relations in the Wardroom and the Chief's Mess, as well as on the mess deck.

In summary, I enjoyed the Navy. My career was very rewarding, and I believe that both myself and the Navy are better off as a result of my participation. The only thing it did not help me with was my golf game, although it did save me a few bucks.

Fair Winds and Following Seas

On 14 Jun 2013, the Aerospace Experimental Psychology (AEP) community said goodbye to a phenomenal officer, leader, and friend with the retirement of CAPT Dylan Schmorrow. His retirement was held at the Office of Naval Research and presided over by former AEP Assistant Specialty Leader, LCDR Henry Phillips. The guest speaker was Mr. Alan R. Shaffer, Principal Deputy, Assistant Secretary of Defense for Research and Engineering (ASD, R&E). CAPT (Ret.) Michael Lilienthal delivered the Invocation.

CAPT Schmorrow's retirement, like his career, was unique and memorable. The ceremony featured two sets of sideboys, one set of active duty AEPs for the Official Party's arrival, and a second set of senior and retired AEPs for the departure. At the ceremony, he was presented with a flag flown over DARPA and the NAMI schoolhouse at NAS Pensacola, the Cradle of Naval Aviation, on his birthday, 24 May, in 2005 and 2013, respectively. The flag was presented at the conclusion of a unique flag ceremony including not six members, but 24 active duty and retired AEPs, ranging from AEP #9, LCDR(Ret.) Jim Johnson to AEP #149, LTJG Eric Vorm. A photograph of the ceremony was displayed on www.navy.mil that afternoon. Among the gifts presented were a flight jacket with patches representing all the commands where AEPs are assigned, a beautiful shadow box in the shape of AEP wings, and a brass barometer from the Office of the Director, Human Performance, Training, and BioSystems Directorate, ASD(R&E). He also received a surprise visit from Pack 833 Webelos II Flaming Arrow Den, who presented him with a gift as their troop leader.

CAPT Schmorrow transferred the Aerospace Experimental Psychology Wings to the incoming AEP Specialty Leader (SL #18), CDR James Patrey, and upon the occasion of his retirement, received a second Defense Superior Service Medal, signed by the Secretary of Defense, Chuck Hagel.

CAPT Schmorrow also asked that the following be recognized for their contributions to the ceremony: CDR Katie Shobe, LT Brennan Cox, LTJG Eric Vorm, Ms. Cindy Barner, and Ms. Laura Worcester, his wife, who was also honored at the ceremony and piped ashore with CAPT (Ret.) Schmorrow, and their children Grace, Max, and Lily.

Bravo Zulu!

Admiral Jeremy M. Boorda Award

On 13 Oct 2013, the Admiral Jeremy M. Boorda Award for Outstanding Integration of Analysis and Policy-Making, Civilian Category, was won by the ONR Future Naval Capability Live-Virtual-Constructive Training Fidelity (LVC TF) Team including AEPs CDR Joseph Cohn, CDR Jim Patrey, LCDR Brent Olde, LCDR Henry Phillips, LCDR Jeff Grubb, LT Lee Sciarini, and LT David Rozovski. The team was comprised of a total of 18 military and civilian members from NAWCTSD, NAWCAD, NAVAIR, PMA-205, and ONR.

The team was recognized for its work developing capabilities that will impact Manpower, Personnel, Training and Education policy through anticipated reduction of live asset requirements and increased use of simulation for Navy Tactical task requirements. These capabilities will help enable Live-Virtual-Constructive integrative training events without commensurate increase in operator cognitive workload, misinterpretation, data inconsistencies, or induced artificialities.

This will enable live or virtual trainees to train with tactically realistic semi-autonomous forces while decreasing operator workload, supporting easier customization and adaptation of training content.

Benefits to the fleet will also include longer life of aircraft, decreased carrier qualification training costs, improved carrier qualification training efficiency and throughput, and improved flight safety during critical skill acquisition training. These capabilities represent a quantum leap forward in the use of simulation for flight training and integration of virtual and constructive entities for live aviation training augmentation.

Our sincerest congratulations to the LVC TF team on this recognition for your outstanding work.

USAFA Visits United Airlines Training Center

LCDR Brian Johnson (above far left), took his United States Air Force Academy cadets on a field trip to the United Airlines Training Center in Denver, CO. Pictured are 25 cadets who are majoring in human factors. Also pictured is Rob Strickland (front, center) who is a Fleet Technical Specialist at United Airlines and Air Force Academy graduate. During the tour, cadets learned about many of the human factors challenges that occur when airlines merge in terms of its effect on training and procedural guidelines. Cadets were also able to fly the Airbus 320 as well as the Boeing 747, 757, and 777 motion simulators.

Bravo Zulu!

USTRANSCOM

CAPT Street was hand selected for a critical outfill. He has orders to report to USTRANSCOM April 2014 as Deputy Surgeon.

ASTB-E Release

ASTB-E was officially released on 9 DEC 2013! NAMI's Operational Psychology Department, headed by LCDR Chris Foster and division officers LT Brennan Cox and LTJG Eric Vorm, released the newest installment of the Aviation Selection Test Battery: Series E (ASTB-E). Development of ASTB-E took most of a decade to complete and culminated in SECNAV approval on 31 October 2013. Almost every member of the AEP community influenced the development of the ASTB with much of the impetus for the new test coming out of work done in the 1990s. Major changes include implementation of a computer-adaptive testing format, an aviator-based personality measure, and a series of performance based measures requiring use of stick and throttle devices. ASTB-E is not only a more valid predictor of training performance than its predecessor, but it also demonstrates significant reductions in subgroup differences resulting in increased diversity of qualified candidates.

NRL Researcher Visits Oxford

LT David Combs was selected to work with the Joint Staff J7 on two multinational projects. As a result, he recently traveled to Oxford to present some of his NRL research on drivers of citizen trust in government to a joint meeting led by the British Ministry of Defense.
In addition, LT Combs was invited to collaborate with the Department of State's Office of International Information Programs to design advertising, using his NRL trust research as a guide, for a public diplomacy campaign conducted in both Germany and Pakistan.

2014 AsMA Conference Submissions

Congratulations to the following abstracts that were accepted into the 2014 AsMA Conference. These submissions represent a significant amount of AEP collaboration.

Cohn, J.V., Radparvar, M., Combs, D.J., Anglero, A., Johnson, B.R., Rozovski, D., Eggan, S., Cox, B., Carlson, K., & O'Neill, E. (2013). Dense Array, Low Field Magnetic Resonance Imaging Devices for Combat Casualty Care. Proceedings of Human Computer Interaction International.
Las Vegas, NV.

Cohn, J.V., Freedy,A., Chabuk,T., Weltman,G., Combs, D.J., Anglero, A., Johnson, B.R., Rozovski, D., Eggan, S., Cox, B., Carlson, K., & O'Neill, E. (2013). Apps for Rapid Epidemiological Analysis. (2013). Proceedings of Human Computer Interaction International. Las Vegas, NV.

Cohn, J.V., Combs, D.J., Anglero, A., Johnson, B.R., Rozovski, D., Eggan, S., Cox, B., Carlson, K., & O'Neill, E. (2103). Medical Modeling and Simulation Based Training Return on Investment Decision Model. Human Computer Interaction International. Las Vegas, NV.

Cohn, J.V., Morrison, T., Weltman, G., Chartrand, D., McCraty, R., Combs, D.J., Anglero, A., Johnson, B.R., Rozovski, D., Eggan, S., Cox, B., Carlson, K., & O'Neill, E. (2013). Stress Resilience Training System. Proceedings of Human Computer Interaction International. Las Vegas, NV.

Foster, T.C. & Cox, B.D. (2013) Topics in Human Factors, HSI, and Aerospace Medicine in Many Types of Systems.

Vorm, E., Saitzyk, A., LaVan, J. (2013). Not Always Fair Winds and Following Seas: Analysis of Self-Directed Violence on US Navy Aircraft Carriers.

2014 SIOP Conference Submissions

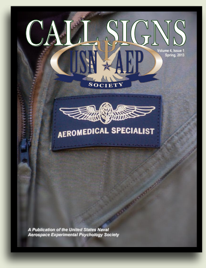
LCDR Tatana Olson will be chairing the panel featuring Dr. Rick Arnold (NMRU-Dayton), Dr. Laura Barron (Air Force Personnel Center), LT Brennan Cox (NAMI), LCDR Chris Foster (NAMI), LCDR Henry Phillips (NAWC-TSD). Topics to be addressed include selection of UAS Operators, assessment of operator performance, the operator-automation relationship, and organizational challenges associated with transitioning from manned to unmanned aviation.

LCDR Chris Foster will be participating in a panel presentation entitled Innovative I-O Practice and Application: The New Frontier.

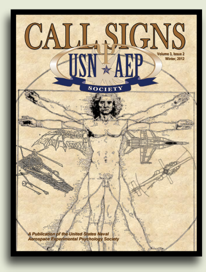
LCDR Chris Foster, LT Brennan Cox, and LTJG Eric Vorm of the NAMI Operational Psychology Department will be presenting two posters entitled Impact of Retesting and Score Estimation on Criterion-Related Validity, and Impact of Applicant Retesting on Subgroup Differences and Criterion-Related Validity.

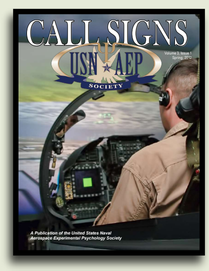
Call Signs is an electronic newsletter published on behalf of the United States Naval Aerospace Experimental Psychology Society (USNAEPS).

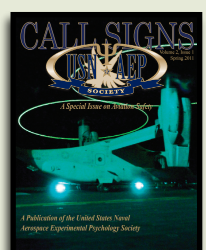
It is published two times annually with a biennial Summer Supplemental.

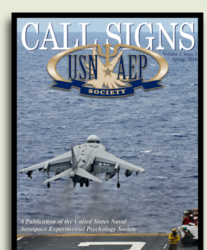


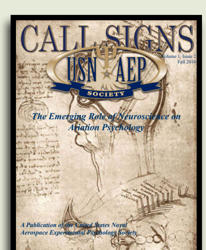
If you are interested in contributing to future editions, please submit articles via email to the editor, david.combs@nrl.navy.mil

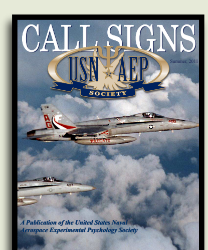












SAVE THE DATE!

Below is a calendar of upcoming events:

March 16-19, 2014- Chicago, IL

Human Factors and Ergonomics Society Symposium on Human Factors and Ergonomics in Health Care

May 11-15th, 2014- San Diego, CA

Aerospace Medical Association Annual Scientific Meeting

May 15-17, 2014- Honolulu, HI

29th Annual Conference of the Society for Industrial and Organizational Psychology

June 22-27, 2014- Creta Maris, Heraklion, Crete, Greece

International Conference on Human-Computer Interaction and International Conference on Augmented Cognition

August 7-10, 2014- Washington, D.C.

Annual Convention of the American Psychological Association