

A. Title Page

Professional Development Grant Report
Arkansas Tech University

Plenary Lecture and Research Presentations on Combative Sport Science

by

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B. Restatement of Problem Researched

This Professional Development Grant allowed Dr. Jason E. Warnick to travel to the *International Neuroscience "Stress and Behavior" Conference* in New Orleans, LA from June 21-26, 2011. Dr. Warnick was invited to give a Plenary Lecture and also presented three other presentations that detail his research on the combative sports (e.g., boxing, mixed martial arts, etc). The three research presentations included ATU students who have worked in Dr. Warnick's laboratory as co-authors. This opportunity was unique as it provides a new audience for Dr. Warnick to discuss his research in the combative sports and the conference has traditionally been attended by researchers in the field of animal modeling (Dr. Warnick's primary research interest). Many of the attendees have been featured in a book Dr. Warnick has published (Warnick & Kalueff, 2010) and this conference was used as a venue to solicit book chapters for another edited book. Further, continued connections with these researchers have provided ATU students access to further training opportunities in diverse areas of psychology and the neurosciences after graduation.

C. Experiences and Outcome of the Conference Presentations

Attaining this Professional Development Grant allowed Dr. Warnick to travel to the the *International Neuroscience "Stress and Behavior" Conference* in New Orleans, LA to present a plenary lecture and four other research presentations. One of these presentations was featured as a story on the medical news outlet Medscape.com. This story was also used as a feature on the Summer 2011 edition of Tech Action. This exposure has lead Dr. Warnick to make new contacts of the field of combative sports. Also, Dr. Warnick used the conference as an opportunity to solicit other researchers to contribute book chapters to a new edited book on the topic of translational neuroscience. These opportunities would not have been possible without the aid of a professional development grant.

D. Conclusions and Recommendations

This conference had a small audience that was very supportive of students presenting research. In spite of the small number of attendees, there were luminaries in the neurosciences and pharmacological sciences in attendance and there was also a notable media presence throughout the conference. I plan on attending this conference regularly as it was a great experience for both myself and my lab students.

Day 3. June 24, 2011

Main Auditorium, Tulane University Medical School (1430 Tulane Avenue), Downtown Campus, New Orleans, LA, USA

9.00-9.30 Conference Presentation: L Colbert (Somerville, USA) JOURNAL OF VISUALIZED EXPERIMENTS: INCREASING STANDARDIZATION AND IMPROVING EDUCATION IN BIOMEDICAL SCIENCES

9.30-11.30 Conference Symposium 4: ZEBRAFISH NEUROSCIENCE SYMPOSIUM – ZEBRAFISH NEUROSCIENCE RESEARCH CONSORTIUM SYMPOSIUM

Chairs: M Viana, C Bonan (presentations 1-2: 30 min, presentations 3-4: 30 min)

- INTRODUCTION
- AL Piato, G Ghisleni, DB Rosemberg, KM Capiotti, AM Siebel, AP Herrmann, MR Vianna, MR Bogo, DR Lara, CD Bonan (Porto Alegre, Brazil) MODELING ACUTE RESTRAINT STRESS PROTOCOL IN ZEBRAFISH (DANIO RERIO): IMPLICATIONS ON BEHAVIORAL AND PURINERGIC SIGNALING PARAMETERS
- MR Vianna, AL Piato, KM Capiotti, AR Tamborski, JP Oses, LJ Barcellos, MR Bogo, DR Lara, CD Bonan (Porto Alegre, Brazil) PHYSIOLOGICAL AND BEHAVIORAL IMPACTS OF AN UNPREDICTABLE CHRONIC STRESS MODEL IN ZEBRAFISH
- AV Kalueff, E Kyzar, I Zapolsky, S Gaikwad, A Roth, J Green, M Pham, PG St. Pierre, B Hirons (New Orleans, USA) ZEBRAFISH NEUROPHENOME PROJECT
- JE Warnick, A Linker (Russellville, USA) THE ASSESSMENT OF MAXIMUM PREDICTIVE VALUE IN A ZEBRAFISH ANXIOLYTIC SCREENING ASSAY

11.30-12.00 Exhibition and Coffee break

12.00-13.00 Conference Mini-Symposium 5: BIOLOGICAL PSYCHIATRY II

Chairs: AV Kalueff, YV Kyrylenko (presentations 20 min)

- INTRODUCTION
- E Kyzar, S Gaikwad, M Pham, J Green, A Roth, Y Liang, V Kobla, AV Kalueff (New Orleans, USA). TOWARDS HIGH-THROUGHPUT PHENOTYPING OF COMPLEX PATTERNED BEHAVIORS IN RODENTS: FOCUS ON SELF-GROOMING
- Y Kyrylenko (Bremen, Germany) PSYCHIATRIC CASE STUDY
- L Elling, H Schupp, JBayer, A-K Bröckelmann, C Steinberg, C Dobel, M Junghofer (Muenster, Germany) ACUTE PSYCHOSOCIAL STRESS MODULATES MAGNETOENCEPHALOGRAPHIC CORRELATES OF VISUAL ATTENTION

13.00-14.00 Lunch Break

14.00-14.45 Plenary Lecture: JE Warnick (Russellville, USA) USING SCIENCE TO IMPROVE THE "SWEET SCIENCE": AN EVIDENCE-BASED APPROACH TO OFFICIATING TRAINING, ATHLETE QUALIFICATIONS, AND FIGHTER SAFETY

14.45-16.00 Conference Symposium 6: ARKANSAS TECH UNIVERSITY-TULANE COLLABORATIVE INITIATIVE SYMPOSIUM ON STRESS PSYCHOLOGY

Chair: JE Warnick (presentations 20 min)

- INTRODUCTION
- D Hughes, WD Martin, J Warnick (Russellville, USA) LINGUISTIC ANALYSIS OF PRECOMPETITION INTERVIEWS PREDICT THE OUTCOME OF PROFESSIONAL BOXING BOUTS
- D Hughes, B Mader, A Linker, J Osben, R Williams, WD Martin, JE Warnick (Russellville, USA) THE INFLUENCE OF THE "HOME FIELD ADVANTAGE" IN PROFESSIONAL BOXING
- B Mader, J Osben, D Hughes, A Linker, WD Martin, JE Warnick (Russellville, USA) INVESTIGATING THE ABILITY OF THE STRUGGLE INDEX SCORE TO QUANTITATIVELY SUMMARIZE A PROFESSIONAL BOXING BOUT
- DISCUSSION

16.00-16.30 Exhibition and Coffee Break

16.30-17.40 GUIDED POSTER SESSION

- Y Shirakawa, A Senoo, S Nakamura, M Koshiba (Tokyo, Japan) CORRELATION ANALYSIS OF BRAIN MONOAMINES AND SOCIO-EMOTIONAL BEHAVIORS
- A Stewart, S Gaikwad, AV Kalueff (New Orleans, USA) SPATIOTEMPORAL STABILITY OF ADULT ZEBRAFISH EXPLORATION IN A NOVEL ENVIRONMENT
- S Gaikwad, J Cachat, P Hart, E Kyzar, A Stewart, A Roth, J Green, M Pham, AV Kalueff (New Orleans, USA). VISUALIZING ADULT ZEBRAFISH 3D BEHAVIOR AND ITS UTILITY FOR NEUROSCIENCE RESEARCH
- J Green, S Gaikwad, E Kyzar, A Stewart, A Roth, M Pham, AV Kalueff (New Orleans, USA). ANXIOTIC EFFECTS OF AMPHETAMINE IN ZEBRAFISH
- M Pham, P Hart, E Kyzar, S Gaikwad, J Green, A Roth, R Riehl, M Pham, AV Kalueff. MODELING THE EFFECTS OF KETAMINE IN ZEBRAFISH (DANIO RERIO)
- S Chanin, C Fryar, D Varga, J Raymond, E Kyzar, J Enriquez, S Bagawandoss, S Gaikwad, A Roth, M Pham, I Zapolsky, I Bruce, J Hester, J Green, D Desmond, A Stewart, AV Kalueff (New Orleans, USA). ASSESSING STARTLE RESPONSES AND THEIR HABITUATION IN ADULT ZEBRAFISH
- K Mimura, S Nakamura, M Koshiba (Tokyo, Japan) MULTIVARIATE REPRESENTATION OF CHICK'S SOCIAL BEHAVIORAL DEVELOPMENT AND CORRELATED CELL STRUCTURAL MODULATION IN AMYGDALA CORE NUCLEUS

17.40-18.00 Closing Ceremony. Announcing the 2012 "Stress and Behavior" Conference

Pregame Language Predicts Outcomes of Boxing Matches

Caroline Helwick

June 27, 2011 (New Orleans, Louisiana) — Outcomes of boxing matches can be predicted based on the boxer's use of language immediately before the bout, a linguistic analysis of precompetition interviews presented by Jason Warnick, PhD, a behavioral neuroscientist at Arkansas Tech University in Russellville, shows.

Dr. Warnick, a lifelong boxing fan, is conducting some of the first-ever scientific studies of the sport.

"Professional boxing is the oldest sport known to man, but there have been virtually no scientific studies of this. Combative sports in general have received little attention from the behavioral sciences, aside from a focus on traumatic brain injury," he told delegates attending the 16th Annual International 'Stress and Behavior' Neuroscience and Biopsychiatry Conference. The study's first author is Destiny Hughes.

Dr. Warnick has researched officiating bias, athlete qualifications, fighter safety, the influence of "home field advantage," and numerous other aspects of the sport.

His previous work has also shown that success of a boxing bout can be predicted based on success in previous bouts, success in the most recent bout, high number of previous victories, previous wins against the current opponent, and previous wins in a common location.

"These are suggestive of an increase in self-efficacy from experiencing success. We wanted to see what other potential psychological variables might predict victories," he said.

Hidden Meaning of Words

The researchers used the Language Inquiry and Word Count (LIWC) software (<http://www.liwc.net>), which classifies words into categories.

The method has been used to analyze complex psychological variables, such as personality characteristics, emotional response to events, social relationships, social dominance and hierarchy, group processes, and cognitive mechanisms.

"Using this software, other researchers have shown that the words we use possess psychometric properties. We used the LIWC to analyze prefight language use and determine if any common usage patterns exist. And we aimed to detect potential psychological variables associated with success," he said.

The study was based on interviews, press conference quotes, and press release statements given by professional boxers before boxing matches during a 21-month time span. Most text was taken from a major combative sports news Web site (www.fightnews.com), which links to most boxing societies.

Text for each fighter (approximately 100 quotes in total) was analyzed by the linguistic software. The outcome of each fighter's bouts was retrieved from an online database of professional boxing results.

Correlation analyses revealed that several patterns were associated with winning a bout: words conveying positive emotions ($r = 0.25$; $P < .05$), words focusing on health ($r = 0.23$; $P < .05$), and words focusing on work ($r = 0.28$; $P < .05$), Dr. Warnick reported.

'Combative' Words Not Predictive

Examples of phrases conveying positive emotions were "I'm coming back because I love the sport." (Israel Vazquez)

and "This is a great arena and the idea of more than 50,000 spectators gives me additional motivation. After a break of 7 months I am really looking forward to stepping back into the ring." (Wladimir Klitschko).

Examples of health-focused phrases were "I feel really good physically and mentally" (Israel Vacquez) and "I feel great. I did everything I had to do in camp. I had great sparring, great strength and condition. Diet was good." (Darrell Madison).

Examples of a work focus phrases were "I'm ready and come fight night I'll just go in there and do my thing" (Brian Vitoria).

The following were associated with losing a boxing bout: increased grammatical nuances ($P < .05$), which included function words ($r = -0.28$), pronouns ($r = -0.23$), third-person plural words ($r = -0.31$), impersonal pronouns ($r = -0.34$), verbs ($r = -0.33$), auxiliary verbs ($r = -0.33$), and past tense ($r = -0.24$); words conveying social functions ($r = -0.24$; $P < .05$); and words conveying tentativeness ($r = -0.34$; $P < .01$).

An example of social function words was "I have the right team, the right managers and a good coach." (Nagy Aguilera), whereas tentativeness was conveyed by such phrases as "Experience plays an important part but so does youth. We'll see what comes out on top." (John Ruiz).

"Interestingly, combative words did not correlate either for wins or losses," said Dr. Warnick.

Starting Point

Although it is impossible to understand just what this all means, Dr. Warnick acknowledged, he believes that words conveying positive emotions may reflect both affect and immersion in the sport, and words suggestive of health and work might indicate dedication to these factors.

Words conveying social functions can reflect a focus "outside of oneself," and words conveying tentativeness suggest doubt. Increased grammatical nuance is harder to understand, he said.

"This investigation provides a starting point for future studies using more direct measures on combative sports participants," Dr. Warnick concluded.

Ludger Elling, PhD, a neuroscientist affiliated with the Institute of Biomagnetism in Muenster, Germany, said he was fascinated by the study's methods.

"This is an interesting field, the development of language in research. This reminds me of what happens with eyewitness reports, which has been studied in terms of form vs content. In conveying what he has seen, an eyewitness demonstrates certain characteristics, such as repetitiveness and grammar," he said.

Dr. Warnick and Dr. Elling have disclosed no relevant financial relationships.

16th Annual International 'Stress and Behavior' Neuroscience and Biopsychiatry Conference. Presented June 23, 2011