

# **David C. Knight, PhD**

Laboratory of Brain and Cognition, National Institute of Mental Health,  
10 Center Dr. MSC 1148, Bethesda, MD 20892-1148,  
301-402-1359 (Phone), 301-402-1370 (Fax), knightd@mail.nih.gov (Email)

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## **Education**

- 1994**                   **B.S. in Psychology**, Magna Cum Laude  
Truman State University, Kirksville, MO
- 1999**                   **M.S. in Psychology**  
University of Wisconsin-Milwaukee  
  
Thesis: *Functional Neuroanatomy of Conditional Fear*
- 2001 – 2002**       **Neuropsychology Internship**  
West Virginia University School of Medicine  
  
Rotations: Neuropsychology & Adult Psychology
- 2002**                   **Ph.D. in Psychology**  
University of Wisconsin-Milwaukee  
  
Majors: Neuroscience & Clinical Psychology  
  
Dissertation: *Event-Related fMRI of Neural Substrates Mediating Human Delay and Trace Fear Conditioning*
- 2002 – present**     **Postdoctoral Fellowship**  
Section on Functional Imaging Methods  
Laboratory of Brain and Cognition  
National Institute of Mental Health
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## **Research Grants & Awards**

F31 (MH11722)          Knight (PI)          (1/1/98 to 12/31/00)  
NIH/NIMH

Project Title: Functional Neuroanatomy of Fear Conditioning.  
The objective of this project was to identify the neural substrates that subserve aversive emotional states in humans.  
Role: Principal Investigator

### **Academic & Professional Awards**

Edward D. Blanchard Award (1992, 1993, & 1994)  
All American Scholar (1992)  
Association of Applied Psychophysiology and Biofeedback Outstanding Poster Award (1992 & 1996)  
Psi Chi Honor Society (1993)  
Phi Kappa Phi Honor Society (1997)  
Sigma Xi Grant in Aid of Research (1998)  
NIMH, Predoctoral NRSA (1998-2000)  
Fazio Research Award (2000)  
NIMH Seymour S. Kety Memorial Fellowship (2004-2006)

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### **Professional Affiliations**

American Psychological Association  
Cognitive Neuroscience Society  
Organization for Human Brain Mapping  
Pavlovian Society  
Society for Neuroscience

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### **Research Experience**

#### **1990 – 1994**

##### **Undergraduate Research**

Truman State University, Kirksville, Missouri.

Projects: Human psychophysiology and clinical biofeedback.

*Supervisor: F.B. Shaffer, PhD*

#### **1995 – 2001**

##### **Graduate Research**

University of Wisconsin-Milwaukee

Projects: Functional MRI of human Pavlovian fear conditioning.

*Supervisor: F.J. Helmstetter, PhD*

#### **2002 – Present**

##### **Postdoctoral Fellow**

Section on Functional Imaging Methods

Laboratory of Brain and Cognition

National Institute of Mental Health

Projects: fMRI of fear expression, Role of awareness in fear conditioning.

*Supervisor: P.A. Bandettini, PhD*

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### **Teaching/Supervision Experience**

- 1995 – 1996**      **Teaching Assistant-Physiological Psychology**  
University of Wisconsin-Milwaukee, Milwaukee, Wisconsin.
- 1999 – 2000**      **Psychotherapy Supervision Practicum**  
University of Wisconsin-Milwaukee Psychology Clinic, Milwaukee, Wisconsin.
- 2002 – Present**      **Supervision of NIMH Postbaccalaureate IRTAs**  
National Institute of Mental Health, Bethesda, Maryland.
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### **Selected Clinical Experience**

- 1998 – 2000**      **Neuropsychology Practicum**  
Medical College of Wisconsin Neuropsychology Clinic, Milwaukee, Wisconsin.  
Responsibilities: Neuropsychological assessment of patients with neurobehavioral disorders.  
*Supervisors: T. Hammeke, PhD ABPP; M. Parsons, PhD; S. Swanson, PhD ABPP*
- 2001 – 2002**      **Clinical Neuropsychology Internship**  
West Virginia University School of Medicine, Morgantown, West Virginia.  
Responsibilities: Assessment, consultation, and psychotherapy with patients with neurological, psychiatric, and medical problems.  
*Supervisors: M. Haut, PhD ABPP-cn; M. Parsons, PhD; C. Wilson, PhD*
- 2002**      **PhD Clinical Psychology**  
University of Wisconsin-Milwaukee  
*Supervisors: F. Helmstetter, PhD; D. Osmon, PhD*
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## **Manuscripts**

- Knight, D. C., Smith, C. N., Stein, E. A., & Helmstetter, F. J. (1999). Functional MRI of human Pavlovian fear conditioning: Patterns of activation as a function of learning. *NeuroReport*, 10 (17), 3665-3670.
- Cheng, D. T., Knight, D. C., Smith, C. N., Stein, E. A., & Helmstetter, F. J. (2003). Functional MRI of human amygdala activity during Pavlovian fear conditioning: Stimulus processing versus response expression. *Behavioral Neuroscience*, 117 (1), 3-10.
- Knight, D. C., Nguyen, H. T., & Bandettini, P. A. (2003). Expression of conditional fear with and without awareness. *Proceedings of the National Academy of Sciences*, 100 (25), 15280-15283.
- Knight, D. C., Cheng, D. T., Smith, C. N., Stein, E. A., & Helmstetter, F. J. (2004). Neural substrates mediating human delay and trace fear conditioning. *Journal of Neuroscience*, 24 (1), 218-228.
- Knight, D. C., Smith, C. N., Cheng, D. T., Stein, E. A., & Helmstetter, F. J. (2004). Amygdala and hippocampal activity during acquisition and extinction of human fear conditioning. *Cognitive, Affective, and Behavioral Neuroscience*, 4 (3), 317-325.
- Haut, M., Kuwabara, H., Leach, S., Moran, M., Arias, R., Knight, D. (2005). The effect of education on age-related functional activation during working memory. *Aging, Neuropsychology, and Cognition*, 12, 216-229.
- Knight, D. C., Nguyen, H. T., & Bandettini, P. A. (2005). The role of the human amygdala in the production of conditioned fear responses. *NeuroImage*, 26, 1193-1200.
- Knight, D. C., Nguyen, H. T., & Bandettini, P. A. (2006). The role of awareness in delay and trace fear conditioning in humans. *Cognitive, Affective, and Behavioral Neuroscience*, 5 (2), 157-162.
- Cheng, D. T., Knight, D. C., Smith, C. N., Stein, E. A., & Helmstetter, F. J. (In Press). Human amygdala activity during the expression of fear responses. *Behavioral Neuroscience*.
- Knight, D. C., Waters, N. S., & Bandettini, P. A. (Submitted). Distinguishing the neural substrates of declarative and nondeclarative fear memory.
- Dunsmoor, J. E., Bandettini, P. A., & Knight, D. C. (Submitted). Impact of continuous versus intermittent CS-UCS pairing on human brain activation.
- Smith, C. N., Knight, D. C., Cheng, D. T., McIntosh, A. R., Chau, W. K., Stein, E. A., & Helmstetter, F. J. (In Progress). Acquisition and reversal of differential fear conditioning in humans using fMRI.
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## Abstracts

Shaffer, F., Sponsel, M., Johnson, D., Schenck, C., Wehmeyer, T., Belcher, J., Knight, D., & Lewis, M. (1992). The sit-up effect: Acute sitting angles produce thoracic breathing. Biofeedback and Self-Regulation, 17 (4), 344.

Shaffer, F., Sponsel, M., Hollensbe, J., Belcher, J., Knight, D., Sauder, M., & Lewis, M. (1992). Tight shoulders and designer jeans prevent diaphragmatic breathing. Biofeedback and Self-Regulation, 17 (4), 309-310.

Shaffer, F., Sponsel, M., Knight, D., Belcher, J., Stratmann, J., Sauder, M., Zimmerman, T., Wehmeyer, T., Simmons, J., Dithardt, J., Seemater, S., Jansen, C., Wallen, C., & Peper, E. (1993). A double-blind test of brain-wave synchronizer effectiveness in inducing relaxation or alertness. . Biofeedback and Self-Regulation, 18 (3), 196.

Shaffer, F., Sponsel, M., Knight, D., Belcher, J., Stratmann, J., Sauder, M., Simmons, J., Zimmerman, T., Wehmeyer, T., Jansen, C., Seemater, S., Dithardt, J., Wallen, C., Stoff, G., & Peper, E. (1993). Attention to the abdomen promotes diaphragmatic breathing. Biofeedback and Self-Regulation, 18 (3), 197.

Shaffer, F., Knight, D., Sponsel, M., Belcher, J., Stratmann, J., Sauder, M., Simmons, J., Zimmerman, T., Wehmeyer, T., Seemater, S., Dithardt, J., Jansen, C., Wallen, C., Stoff, G., & Peper, E. (1993). Vigilance reduces inhalation volume: Nintendo play may reinforce dysfunctional breathing. Biofeedback and Self-Regulation, 18 (3), 198.

Shaffer, F., Knight, D., Lubbe, C., Wehmeyer, T., Stratmann, J., Simmons, J., Demetriou, D., Havlac, L., Dithardt, J., Troyer, J., Sabo, A., Sauder, M., Rever, C., Seemater, S., Zimmerman, T., Jansen, C., Greve, E., Guntli, J., Hall, H., Stolzer, G., Revel, A., & Roth, K. (1994). Validation of two diaphragmatic breathing protocols with healthy undergraduates. Biofeedback and Self-Regulation, 19 (3), 271.

Shaffer, F., Knight, D., Lubbe, C., Wehmeyer, T., Stratmann, J., Simmons, J., Demetriou, D., Havlac, L., Dithardt, J., Troyer, J., Sabo, A., Sauder, M., Rever, C., Seemater, S., Zimmerman, T., Jansen, C., Greve, E., Guntli, J., Hall, H., Stolzer, G., Revel, A., & Roth, K. (1994). The effects of preferred music and volume on undergraduate psychophysiological responses. Biofeedback and Self-Regulation, 19 (3), 272-273.

Shaffer, F., Knight, D., Lubbe, C., Wehmeyer, T., Stratmann, J., Simmons, J., Demetriou, D., Havlac, L., Dithardt, J., Troyer, J., Sabo, A., Sauder, M., Rever, C., Seemater, S., Zimmerman, T., Jansen, C., Greve, E., Guntli, J., Hall, H., Stolzer, G., Revel, A., & Roth, K. (1994). Diaphragmatic training reduces the disruptive effects of common activities on respiration. Biofeedback and Self-Regulation, 19 (3), 271-272.

Shaffer, F., Knight, D., Lubbe, C., Wehmeyer, T., Stratmann, J., Simmons, J., Demetriou, D., Havlac, L., Dithardt, J., Troyer, J., Sabo, A., Sauder, M., Rever, C., Seemater, S., Zimmerman, T., Jansen, C., Greve, E., Guntli, J., Hall, H., Stolzer, G., Revel, A., & Roth, K. (1994). Comparison of diaphragmatic training methods. Biofeedback and Self-Regulation, 19 (3), 270-271.

Knight, D., Helmstetter, F., & Stein, E. (1996). Functional imaging of brain regions involved in Pavlovian Fear Conditioning in humans. Society for Neuroscience Abstracts, 22 (3), 1867.

Knight, D., Stein, E., & Helmstetter, F. (1997). Pavlovian fear conditioning in humans: an fMRI study. Human Brain Mapping Abstracts.

Knight, D., Smith, C., Stein, E., & Helmstetter, F. (1997). Functional MRI of fear conditioning in humans. Society for Neuroscience Abstracts, 23 (1), 209.

Knight, D., Smith, C., Cheng, D., Stein, E., & Helmstetter, F. (1998). Functional imaging of human conditional fear. NeuroImage, 7 (4), S53.

Smith, C., Knight, D., Cheng, D., Stein, E., & Helmstetter, F. (1998). Functional neuroimaging of human differential fear conditioning. Society for Neuroscience Abstracts, 24 (2), 1913.

Knight, D., Smith, C., Cheng, D., Stein, E., & Helmstetter, F. (1998). fMRI of brain regions involved in acquisition versus performance of human fear conditioning. Society for Neuroscience Abstracts, 24 (2), 1523.

Cheng, D. T., Knight, D. C., Smith, C. N., Stein, E. A., & Helmstetter, F. J. (1998). Response versus stimulus-based analysis of functional brain images in human fear conditioning. Society for Neuroscience Abstracts, 24 (2), 1913.

Knight, D. C., Smith, C. N., Cheng, D. T., Stein, E. A., & Helmstetter, F. J. (1999). Neural substrates of discrimination and reversal learning in human fear conditioning as revealed by fMRI. Society for Neuroscience Abstracts, 25 (2), 2067.

Smith, C. N., Knight, D. C., Cheng, D. T., McIntosh, A. R., & Helmstetter, F. J. (2000). Network analysis of human differential fear conditioning. Society for Neuroscience Abstracts, 26 (2), 1852.

Knight, D. C., Cheng, D. T., Smith, C. N., Stein, E. A., & Helmstetter, F. J. (2000). Event-related fMRI of neural substrates mediating human delay and trace fear conditioning. Society for Neuroscience Abstracts, 26 (2), 1852.

Cheng, D. T., Knight, D. C., Smith, C. N., Stein, E. A., & Helmstetter, F. J. (2000). Neural substrates of explicit and implicit memory performance during Pavlovian fear conditioning. Society for Neuroscience Abstracts, 26 (1), 709.

Knight, D., Cheng, D., Smith, C., Stein, E., & Helmstetter, F. (2001). Functional MRI of neural substrates of awareness during human fear conditioning. Journal of the International Neuropsychology Society, 7 (2), 251-252.

Cheng, D. T., Knight, D. C., Smith, C. N., Stein, E. A., & Helmstetter, F. J. (2001). Event-related FMRI of neural substrates important for learned responses during Pavlovian fear conditioning. Society for Neuroscience Abstracts, 27, Program No. 75.3.

Smith, C. N., Knight, D. C., Cheng, D. T., & Helmstetter, F. J. (2002). Concurrent development of explicit and implicit learning in differential delay and trace fear conditioning in humans. Midwestern Psychological Association.

Cheng, D. T., Smith, C. N., Knight, D. C., & Helmstetter, F. J. (2002). Dissociating declarative and non-declarative memory performance during human fear conditioning to categorical stimuli. Midwestern Psychological Association.

- Smith, C. N., Knight, D. C., Cheng, D. T., Stein, E. A., & Helmstetter, F. J. (2002). Brain activity during differential acquisition and reversal of fear conditioning. Human Brain Mapping Abstracts.
- Cheng, D. T., Knight, D. C., Smith, C. N., Stein, E. A., & Helmstetter, F. J. (2002). Neural substrates for autonomic response expression during Pavlovian fear conditioning. Human Brain Mapping Abstracts.
- Richards, J. A., Smith, C. N., Cheng, D. T., Thomas, T. L., Knight, D. C., Rao, S. M., & Helmstetter, F. J. (2003). Stimulus-evoked changes in brain activity during human fear conditioning: A multivariate analysis of early vs. late learning. Human Brain Mapping Abstracts.
- Haut, M. W., Kuwabara, H., Moran, M., Leach, S., Arias, R., Knight, D. C., & Parsons, M. (2003). Aging, cognitive reserve, and working memory: A positron emission tomography study. Human Brain Mapping Abstracts.
- Cheng, D. T., Smith, C. N., Thomas, T. L., Richards, J. A., Knight, D. C., Rao, S. M., & Helmstetter, F. J. (2003). Neural correlates of processing categorical stimuli during human Pavlovian fear conditioning: Implicit versus explicit Memory processing. Human Brain Mapping Abstracts.
- Knight, D. C. & Bandettini, P. A. (2003). Functional MRI of conditioned, unconditioned, orienting, and non-specific skin conductance responses during Pavlovian fear conditioning. Human Brain Mapping Abstracts.
- Knight, D. C., Nguyen, H. T., Bandettini, P. A. (2004). Expression of conditional fear with and without awareness. Cognitive Neuroscience Society.
- Knight, D. C., Nguyen, H. T., Bandettini, P. A. (2004). Amygdala activity associated with conditioned skin conductance responses during Pavlovian fear conditioning. Human Brain Mapping Abstracts.
- Nguyen, H. T., Knight, D. C., Bandettini, P. A. (2004). Role of awareness in delay and trace fear conditioning. Society for Neuroscience Abstracts.
- Cheng, D. T., Knight, D. C., Smith, C. N., Stein, E. A., & Helmstetter, F. J. (2004). Autonomic fear responses and human amygdala activity: An event-related fMRI Study. The Pavlovian Society.
- Knight, D. C., Nguyen, H. T., & Bandettini, P. A. (2005). Differences in the functional connectivity of the left and right amygdala. Human Brain Mapping Abstracts.
- Knight, D. C., Waters, N. S., & Bandettini, P. A. (2006). Brain regions showing unconditioned response diminution during Pavlovian fear conditioning. Cognitive Neuroscience Society.
- Knight, D. C., Waters, N. S., & Bandettini, P. A. (2006). Neural substrates mediating the aware & unaware expression of conditional fear. Human Brain Mapping Abstracts.
- Dunsmoor, J., Bandettini, P. & Knight, D. C. (2006). Functional MRI reveals the impact of the CS-UCS pairing rate on brain activity during Pavlovian fear conditioning. Society for Neuroscience Abstracts.
- Knight, D. C., Waters, N. S., & Bandettini, P. A. (2006). UCS expectancy and diminution of the unconditioned fMRI response during Pavlovian fear conditioning. Society for Neuroscience Abstracts.