

Vitae (March 16, 2009)

Identification Data

Name: Edward A. Wasserman

Birth Date: April 2, 1946; Los Angeles, CA

Address: Department of Psychology
The University of Iowa
Iowa City, Iowa 52242

Phone: 319/335-2445 (Office); 319/335-1229 (Laboratory); 319/512-1457 (Home)

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Academic Appointments:

First appointed to The University of Iowa as Assistant Professor--August, 1972

Promoted to Associate Professor at The University of Iowa--August, 1977

Promoted to Professor at The University of Iowa--August, 1983

Education:

Institution	Dates attended	Major	Degree	Date
UCLA	9/64-6/68	Psychology	B.A.	6/68
Indiana University	9/68-1/72	Psychology	Ph.D.	1/72

Special Recognition:

Institution	Awards and Honors
UCLA	University and Psychology Honors; Phi Beta Kappa; Psi Chi (Chapter President)
Indiana University	Indiana University Fellow; NDEA Fellow; NIMH Predoctoral Fellow
University of Sussex	NSF Postdoctoral Fellow; Research Fellow
University of Iowa	Old Gold Fellow; Summer Teaching Fellow; Who's Who in Midwest; American Men & Women of Science; Outstanding Young Men of America; Who's Who in America; University House Fellow; American Psychological Association Fellow; Association for Psychological Science Fellow; Who's Who in Science and Engineering; Van Allen Natural Sciences Fellow; Stuit Professor of Experimental Psychology; Regents Award for Faculty Excellence; Society of Experimental Psychologists; Michael J. Brody Award for Faculty Excellence in Service; Who's Who in American Education; Outstanding Honors Teacher;

Academic and Professional Experience:

Title	Institution	Date
NSF Undergraduate Researcher (Supervisors: J. P. Houston, B. Weiner)	UCLA	1967
RA and TA (Supervisors: T. Trabasso, C. Walker, B. Weiner)	UCLA	1967-1968
Indiana University Fellow	Indiana University	1968-1969
NDEA Fellow	Indiana University	1969-1970
RA and TA (Supervisor: B. S. Markman)	Indiana University	1969-1970
NIMH Predoctoral Fellow (Supervisors: E. Hearst, G. A. Heise)	Indiana University	1970-1971
NSF Postdoctoral Fellow (Supervisor: N. S. Sutherland)	University of Sussex, England	1972
Assistant Professor	University of Iowa	1972-1977
Old Gold Fellow	University of Iowa	1975
National Academy of Sciences Exchangee (Sponsor: E. A. Asratyan)	Institute of Higher Nervous Activity and Neurophysiology, USSR	1976
Summer Teaching Fellow	University of Iowa	1976
Research Fellow	University of Sussex, England	1976
Associate Professor	University of Iowa	1977-1983
Old Gold Fellow	University of Iowa	1982
Professor	University of Iowa	1983-
University House Fellow	University of Iowa	1987
James Van Allen Natural Sciences Fellow	University of Iowa	1994-1995
Stuit Professor of Experimental Psychology	University of Iowa	1997-
Visiting CNRS Scientist	Center for Research in Cognitive Neuroscience, Marseille, France	1999
Visiting Professor	Keio University, Tokyo, Japan	2001
Collaborating Scientist	Great Ape Trust	2006-

Research Support:**Prior grants**

Operant conditioning and autoshaping: Graduate College Research Grant, 1972-1973

Excitation, inhibition, and autoshaping: NIMH Grant, 1974-1975

Autoshaping and the operant-respondent distinction: NSF Grant, 1976-1977

The form and direction of autoshaped behaviors: NSF Grant, 1977-1981

Cognition and causation: University House Interdisciplinary Research Grant, 1987 (with E. Fales)

The role of Alzheimer's disease in the genesis of "helplessness" depression: Committee on Aging Grant, 1987-1988 (with M. W. O'Hara)

An animal model of fetal alcohol syndrome: Interdisciplinary Research Grant: 1990-91 (with J. R. West)

Determinants of nonsimilarity-based categorization: NIMH Grant, 1994-1999 (with S. L. Astley, Cornell College)

The natural science of mind: Van Allen Natural Sciences Fellowship, 1994-1995

Causal discounting: Laws and mechanisms: CIFRE grant, 1995

Communication, consciousness, and comparative cognition: Obermann Center for Advanced Studies

Interdisciplinary Research Grant, 1997 (with J. Ringen)

Entropy and same-different conceptualization: NSF Grant, 1999-2004 (with M. Young)

Same-different conceptualization by baboons: Human Frontier Science Program, 2000 (with J. Fagot)

Articulating the Animal: Obermann Center for Advanced Studies Interdisciplinary Research Semester, 2005 (with T. Mangum, J. Desmond, M. Trachsel, K. Marra, and P. Trimpe)

Great ape perception and cognition: Great Ape Trust, 2006-2008

Continuing grants

Perceptual bases of visual concepts in pigeons: NIMH Grant, 1991-2009 (with I. Biederman, USC)

Current Budget Period: 06/01/2008–05/31/2009, DC \$172,805.00

Professional Service

Associate Editor:

Learning and Motivation (1982-2000)

Board of Editors:

Learning & Behavior (1998-)

Behaviorism (1985-1989)

Journal of the Experimental Analysis of Behavior (1978-1981; 1996-1999; 2001-2003)

Journal of Experimental Psychology: Animal Behavior Processes (1985-2003)

Journal of Experimental Psychology: General (2002-2009)

Journal of Experimental Psychology: Learning, Memory, and Cognition (1993-1995)

Corresponding Associate Commentator:

Behavioral and Brain Sciences (1978-)

Journal Reviewer:

American Journal of Psychology

American Psychologist

Animal Learning & Behavior

Behavior Research Methods & Instrumentation

Behavioral and Neural Biology

Bird Behavior

Cognitive Psychology

Current Psychology of Cognition

International Journal of Comparative Psychology

Journal of Experimental Child Psychology

Journal of Experimental Psychology: General

Journal of the Experimental Analysis of Behavior

Journal of Pharmacology and Experimental

Therapeutics

Memory and Cognition

Pavlovian Journal of Biological Sciences

Pharmacology, Biochemistry, and Behavior

Psychological Bulletin

Psychological Review

Psychonomic Bulletin & Review

Science

American Journal on Mental Retardation

Animal Behaviour

Applied Cognitive Psychology

Behavioral and Brain Sciences

Behavioural Processes

Canadian Journal of Experimental Psychology

Current Directions in Psychological Science

Interamerican Journal of Psychology

Journal of Comparative Psychology

Journal of Experimental Psychology: Animal Behavior Processes

Journal of Experimental Psychology: Learning, Memory, and Cognition

Journal of Personality and Social Psychology

Learning and Motivation

Neuroscience Letters

Perception

PNAS

Psychological Reports

Psychological Science

Quarterly Journal of Experimental Psychology

Member:

Psychobiology and Behavior Research Review Committee, National Institute of Mental Health (1991-1994)

Psychobiology, Behavior, and Neuroscience Research Review Committee, National Institute of Mental Health (1994-1995)

Basic Behavioral Science Research Subcommittee D, National Institute on Drug Abuse (1998)
Committee on Animal Research and Ethics, American Psychological Association (1996-1998;
Chair, 1998)

Behavioral and Social Sciences Review Integration Panels I and II, National Institutes of Health (1998)

Distinguished Visiting Professor:

National Science Foundation conference on neurobiology techniques, cognition, and computer simulation, Colorado State University, 1990

Invited Participant:

Science Advocacy Training Conference, American Psychological Association, 1995

Science Leadership Conference, American Psychological Association, 2006

Grant Reviewer:

Austrian Science Foundation

Iowa Science Foundation

Leverhulme Trust

Montanans on a New Trac for Science

National Institute of Mental Health

National Research Council of Canada

National Science Foundation

Natural Sciences and Engineering Research Council of Canada

PSC-CUNY Research Award Program

Wellcome Trust

External Ph.D. Dissertation Examiner:

Peter W. D. Dodd, Queen's University, Kingston, Ontario, Canada, 1978

R. T. Pithers, The University of Sydney, Sydney, NSW, Australia, 1981

External Honors Examiner:

Helen Gruetzmacher, Knox College, Victor Miller; 1985

David Hordiner, Jordi Kleiner, David Seligman; Swarthmore College, 1995

Professional Organizations:

American Psychological Association (Fellow of Divisions 1, 3, 6, and 25; Division 3 Member-at-Large, 2000-2003, President, 2007-2008; Division 6 President, 2003-2004; Master Lecturer, 2007)

Association for Psychological Science (Charter Fellow)

Cognitive Science Society

Comparative Cognition Society (President, 2000-2001)

Midwestern Psychological Association (Program Committee, 2002-2004)

Phi Beta Kappa

Psi Chi

Psychonomic Society (Governing Board, 1999-2004)

Society of Experimental Psychologists (2004-)

Sigma Xi

Steering Committee:

International Conference on Comparative Cognition (1993-)

Colloquia:

Title	Location	Date
Associative Determinants of Autoshaping Psychology and Ethology	University of Sussex, England	1972
Autoshaping	University of Sussex, England	1972
Autoshaping and Constraints on Learning	Cambridge University, England	1972
Operant and Respondent Factors in Autoshaping	Oxford University, England	1972
Autoshaping and Two-Process Theory	Drake University	1975
Conditioning and Autoshaping	Institute of Higher Nervous Activity, USSR	1976
Autoshaping	University of Sussex, England	1976
Autoshaping: Implications for Two-Process Theory	Drake University	1977
A Bird's Eye View of Memory	CUNY, Hunter College	1977
Memory and the Operant	Michigan State University	1978
On Animal Memory	Dalhousie University, Canada	1978
Toward a Cognitive Theory of Operant Behavior	University of California, Berkeley	1980
Psychological Aspects of Foraging	Drake University	1981
Ecology and Psychology of Short-Term Memory	Simon Fraser University, Canada	1984
Forward- and Backward-Looking Memory Models	Simon Fraser University, Canada	1984
Words, Actions, and Contingencies	University of British Columbia, Canada	1984
Processes of Short-Term Memory in Pigeons	Drake University	1984
Contingency and Contiguity in Causal Perception	University of Wisconsin, Milwaukee	1984
A Behavioral Analysis of Concepts	McGill University, Canada	1986
Conceptualization in Pigeons	Grinnell College	1990
Comparative Cognition: A Purview	Augustana College	1990
Do Pigeons Learn Concepts?	Earlham College	1990
Conceptualization in Pigeons	Indiana University	1990
Concepts, Categories, and Pigeons	Purdue University	1991
In What Sense Do Pigeons Learn Concepts?	Columbia University	1991
A Behavioral Analysis of Concepts	CUNY, Hunter College	1991
An Associative Approach to Cause and Effect	SUNY, Stony Brook	1991
Processes of Visual Recognition by Pigeons	SUNY, Binghamton	1993
Conceptualization in Pigeons	Columbia University	1994
Conceptualization by Pigeons	Drake University	1994
Basic and Higher-Order Concepts in Pigeons	Cornell College	1995
Conceptualization by Pigeons and Humans	University of Kentucky	1995
Conceptualization by Pigeons and Humans	University of Texas	1998
Entropy Detection in Pigeons and People	Iowa State University	1998
Conceptualization by Pigeons	CNRS, Marseille, France	1999
Same-Different Conceptualization	CNRS, Marseille, France	1999
Abstract Conceptualization	Cognitive Science Institute, Lyon, France	2000
Concepts in Pigeons and People	Kent State University	2000
Abstraction in Pigeons?	Franklin and Marshall College	2001
Abstraction in Pigeons and People	University of Nebraska	2001
Abstraction in Pigeons and People	Western Kentucky University	2003
Abstraction in Pigeons and People	Ohio State University	2003
Abstraction in Pigeons and People	University of Deusto, Bilbao, Spain	2003
A comparative approach to abstract thought	McMaster University, Canada	2004
A comparative approach to abstract thought	Wilfrid Laurier University, Canada	2004

The Rational Mind: Reason Amid a Savage World	UCLA	2005
The Rational Mind: Reason Amid a Savage World	Villanova University	2005
Visual Object Discrimination by Pigeons	Rikkyo University, Tokyo, Japan	2006

Publications

1. Wasserman, E. A., Weiner, B., & Houston, J. P. (1968). Another failure for motivation to enhance trace retrieval. *Psychological Reports*, 22, 1007-1008.
2. Wasserman, E. A., & Jensen, D. D. (1969). Olfactory stimuli and the “pseudo-extinction” effect. *Science*, 166, 1307-1309.
3. Wasserman, E. A., & Jensen, D. D. (1970). Olfactory stimuli and the “pseudo-extinction” effect. *Science*, 169, 402.
4. Dinsmoor, J. A., Browne, M. P., Lawrence, C. E., & Wasserman, E. A. (1971). A new analysis of Wyckoff’s observing response. *Proceedings, 79th Annual Convention, APA*, 679-680.
5. Wasserman, E. A. (1972). *Auto-shaping: The selection and direction of behavior by predictive stimuli*. Doctoral Dissertation, Indiana University.
6. Wasserman, E. A. (1973). The effect of redundant contextual stimuli on autoshaping the pigeon’s keypeck. *Animal Learning & Behavior*, 1, 198-206.
7. Wasserman, E. A. (1973). Key-peck persistence on autoshaping procedures. *Proceedings, 81st Annual Convention, APA*, 877-878.
8. Wasserman, E. A. (1973). Pavlovian conditioning with heat reinforcement produces stimulus-directed pecking in chicks. *Science*, 181, 875-877.
9. Wasserman, E. A. (1974). Responses in Pavlovian conditioning studies. *Science*, 186, 157.
10. Wasserman, E. A. (1974). Stimulus-reinforcer predictiveness and selective discrimination learning in pigeons. *Journal of Experimental Psychology*, 103, 284-297.
11. Wasserman, E. A., & Anderson, P. A. (1974). Differential auto-shaping to common and distinctive elements of positive and negative discriminative stimuli. *Journal of the Experimental Analysis of Behavior*, 22, 491-496.
12. Wasserman, E. A., Franklin, S. R., & Hearst, E. (1974). Pavlovian appetitive contingencies and approach versus withdrawal to conditioned stimuli in pigeons. *Journal of Comparative and Physiological Psychology*, 86, 616-627.
13. Wasserman, E. A., & McCracken, S. B. (1974). The disruption of autoshaped key pecking in the pigeon by food-tray illumination. *Journal of the Experimental Analysis of Behavior*, 22, 39-45.
14. Wasserman, E. A., Hunter, N. B., Gutowski, K. A., & Bader, S. A. (1975). Autoshaping chicks with heat reinforcement: The role of stimulus-reinforcer and response-reinforcer relations. *Journal of Experimental Psychology: Animal Behavior Processes*, 1, 158-169.
15. Wasserman, E. A., & Molina, E. J. (1975). Explicitly unpaired key light and food presentations: Interference with subsequent auto-shaped key pecking in pigeons. *Journal of Experimental Psychology: Animal Behavior Processes*, 1, 30-38.
16. Wasserman, E. A. (1976). Successive matching-to-sample in the pigeon: Variations on a theme by Konorski. *Behavior Research Methods & Instrumentation*, 8, 278-282.
17. Deich, J. D., & Wasserman, E. A. (1977). Rate and temporal pattern of key pecking under autoshaping and omission schedules of reinforcement. *Journal of the Experimental Analysis of Behavior*, 27, 399-405.
18. Wasserman, E. A. (1977). Conditioning of within-trial patterns of key pecking in pigeons. *Journal of the Experimental Analysis of Behavior*, 28, 213-220.
19. Wasserman, E. A., Deich, J. D., Hunter, N. B., & Nagamatsu, L. S. (1977). Analyzing the random control procedure: Effects of paired and unpaired CSs and USs on autoshaping the chick’s key peck with heat reinforcement. *Learning and Motivation*, 8, 467-487.
20. Wasserman, E. A. (1978). Interrelations between motor and secretory reactions in classical alimentary conditioning. *Journal of Higher Nervous Activity*, 28, 493-497. (in Russian)
21. Wasserman, E. A., Carr, D. L., & Deich, J. D. (1978). Association of conditioned stimuli during serial conditioning by pigeons. *Animal Learning & Behavior*, 6, 52-56.

22. Nelson, K. R., & Wasserman, E. A. (1978). Temporal factors influencing the pigeon's successive matching-to-sample performance: Sample duration, intertrial interval, and retention interval. *Journal of the Experimental Analysis of Behavior*, *30*, 153-162.
23. Wasserman, E. A. (1978). Bindra's theory: Some successes and precursors. *Behavioral and Brain Sciences*, *1*, 80-81.
24. Wasserman, E. A. (1978). The relationship between motor and secretory behaviors in classical appetitive conditioning. *Pavlovian Journal of Biological Science*, *13*, 182-186.
25. Grayson, R. J., & Wasserman, E. A. (1979). Conditioning of two-response patterns of key pecking in pigeons. *Journal of the Experimental Analysis of Behavior*, *31*, 23-29.
26. Lucas, G. A., Vodraska, A., & Wasserman, E. A. (1979). Technical note: A direct fluid delivery system for the pigeon. *Journal of the Experimental Analysis of Behavior*, *31*, 285-288.
27. Wasserman, E. A. (1979). New trends in behavior analysis. A review of B. Schwartz's *Psychology of learning and behavior*. *Contemporary Psychology*, *24*, 123-124.
28. Wasserman, E. A., Nelson, K. R., & Larew, M. B. (1980). Memory for sequences of stimuli and responses. *Journal of the Experimental Analysis of Behavior*, *34*, 49-59.
29. Weisman, R. G., Wasserman, E. A., Dodd, P. W. D., & Larew, M. B. (1980). Representation and retention of two-event sequences in pigeons. *Journal of Experimental Psychology: Animal Behavior Processes*, *6*, 312-325.
30. Wasserman, E. A. (1981). Response evocation in autoshaping: Contributions of cognitive and comparative-evolutionary analyses to an understanding of directed action. In C. M. Locurto, H. S. Terrace, & J. Gibbon (Eds.), *Autoshaping and conditioning theory*. New York: Academic Press. Pp. 21-54.
31. Wasserman, E. A. (1981). Comparative psychology returns: A review of Hulse, Fowler, and Honig's *Cognitive processes in animal behavior*. *Journal of the Experimental Analysis of Behavior*, *35*, 243-257.
32. Honig, W. K., & Wasserman, E. A. (1981). Performance of pigeons on delayed simple and conditional discriminations under equivalent training procedures. *Learning and Motivation*, *12*, 149-170.
33. Lucas, G. A., Deich, J. D., & Wasserman, E. A. (1981). Trace autoshaping: Acquisition, maintenance, and path dependence at long trace intervals. *Journal of the Experimental Analysis of Behavior*, *36*, 61-74.
34. Nelson, K. R., & Wasserman, E. A. (1981). Stimulus asymmetry in the pigeon's successive matching-to-sample performance. *Bulletin of the Psychonomic Society*, *18*, 343-346.
35. DeLong, R. E., & Wasserman, E. A. (1981). Effects of differential reinforcement expectancies on successive matching-to-sample performance in pigeons. *Journal of Experimental Psychology: Animal Behavior Processes*, *7*, 394-412.
36. Wasserman, E. A., Grosch, J., & Nevin, J. A. (1982). Effects of signalled retention intervals on pigeon short-term memory. *Animal Learning & Behavior*, *10*, 330-338.
37. Lucas, G. A., & Wasserman, E. A. (1982). US duration and local trial spacing affect autoshaped responding. *Animal Learning & Behavior*, *10*, 490-498.
38. Wasserman, E. A. (1982). Further remarks on the role of cognition in the comparative analysis of behavior. *Journal of the Experimental Analysis of Behavior*, *38*, 211-216.
39. Wasserman, E. A. (1983). Is cognitive psychology behavioral? *Psychological Record*, *33*, 6-11.
40. Wasserman, E. A. (1983). Ecology and learning: Some historical and analytical perspectives. *Behavioral and Brain Sciences*, *6*, 183-184.
41. Wasserman, E. A., Chatlosh, D. L., & Neunaber, D. J. (1983). Perception of causal relations in humans: Factors affecting judgments of response-outcome contingencies under free-operant procedures. *Learning and Motivation*, *14*, 406-432.
42. Wasserman, E. A., & Maier, S. F. (Eds.). (1983). Contingency, contiguity, and causality.

Learning and Motivation (Special Edition), 14, 381-553.

43. Wasserman, E. A., Deich, J. D., & Cox, K. E. (1983). The learning and memory of response sequences. In M. L. Commons, R. J. Herrnstein, & A. R. Wagner (Eds.), *Quantitative analyses of behavior: Vol. IV, Discrimination processes*. New York: Ballinger. Pp. 99-113.
44. Hughes, L. M., Wasserman, E. A., & Hinrichs, J. V. (1984). Chronic diazepam administration and appetitive discrimination learning: Acquisition versus steady-state performance in pigeons. *Psychopharmacology*, 84, 318-322.
45. Wasserman, E. A. (1984). Animal intelligence: Understanding the minds of animals through their behavioral "ambassadors." In H. L. Roitblat, T. G. Bever, & H. S. Terrace (Eds.), *Animal cognition*. Hillsdale, NJ: Erlbaum. Pp. 45-60.
46. Wasserman, E. A., DeLong, R. E., & Larew, M. B. (1984). Temporal order and duration: Their discrimination and retention by pigeons. *Annals of the New York Academy of Sciences*, 423, 103-115.
47. Wasserman, E. A., & Lucas, G. A. (1984). The role of the magazine-response contingency on signal-directed responding in pigeons. *Learning and Motivation*, 15, 156-172.
48. Wasserman, E. A., & Shaklee, H. (1984). Judging response-outcome relations: The role of response-outcome contingency, outcome probability, and method of information presentation. *Memory and Cognition*, 12, 270-286.
49. Wasserman, E. A. (1985). Animal thinking. *American Scientist*, 73, 6.
50. Chatlosh, D. L., Neunaber, D. J., & Wasserman, E. A. (1985). Response-outcome contingency: Behavioral and judgmental effects of appetitive and aversive outcomes with college students. *Learning and Motivation*, 16, 1-34.
51. DeLong, R. E., & Wasserman, E. A. (1985). Stimulus selection with duration as a relevant cue. *Learning and Motivation*, 16, 259-287.
52. Guttenberger, V. T., & Wasserman, E. A. (1985). Effects of sample duration, retention interval, and passage of time in the test on pigeons' matching-to-sample performance. *Animal Learning & Behavior*, 13, 121-128.
53. Wasserman, E. A. (1985). Prospection and retrospection as processes of animal short-term memory. In D. F. Kendrick, M. Rilling, & M. R. Denny (Eds.), *Animal memory*. Hillsdale, NJ: Erlbaum. Pp. 53-75.
54. Lobmeyer, D. L., & Wasserman, E. A. (1986). Preliminaries to free throw shooting: Superstitious behavior? *Journal of Sport Behavior*, 9, 70-78.
55. Neunaber, D. J., & Wasserman, E. A. (1986). The effects of unidirectional versus bidirectional rating procedures on college students' judgments of response-outcome contingency. *Learning and Motivation*, 17, 162-179.
56. Shaklee, H., & Wasserman, E. A. (1986). Judging interevent contingencies: Being right for the wrong reasons. *Bulletin of the Psychonomic Society*, 24, 91-94.
57. Wasserman, E. A., & Neunaber, D. J. (1986). College students' responding to and rating of contingency relations: The role of temporal contiguity. *Journal of the Experimental Analysis of Behavior*, 46, 15-35.
58. Bhatt, R. S., & Wasserman, E. A. (1987). Choice behavior of pigeons on progressive and multiple schedules: A test of optimal foraging theory. *Journal of Experimental Psychology: Animal Behavior Processes*, 13, 40-51.
59. Chatlosh, D. L., & Wasserman, E. A. (1987). Delayed temporal discrimination in pigeons: A comparison of two procedures. *Journal of the Experimental Analysis of Behavior*, 47, 299-309.
60. Wasserman, E. A., Bhatt, R. S., Chatlosh, D. L., & Kiedinger, R. E. (1987). Discrimination of and memory for dimension and value information by pigeons. *Learning and Motivation*, 18, 34-56.
61. Wasserman, E. A., & Maier, S. F. (Eds.) (1987). Animal memory and cognition. *Learning and Motivation (Special Edition)*, 18, 1-146.

62. Solomon, R. E., Wasserman, E. A., & Gebhart, G. F. (1987). Tolerance to antinociceptive effects of morphine without tolerance to its effects on schedule-controlled behavior. *Psychopharmacology*, *92*, 327-333.
63. Bhatt, R. S., Wasserman, E. A., Reynolds, W. F., Jr., & Knauss, K. S. (1988). Conceptual behavior in pigeons: Categorization of both familiar and novel examples from four classes of natural and artificial stimuli. *Journal of Experimental Psychology: Animal Behavior Processes*, *14*, 219-234.
64. Wasserman, E. A., Kiedinger, R. E., & Bhatt, R. S. (1988). Conceptual behavior in pigeons: Categories, subcategories, and pseudocategories. *Journal of Experimental Psychology: Animal Behavior Processes*, *14*, 235-246.
65. Wasserman, E. A., Schroeder, G. W., & O'Hara, M. W. (1988). Operant and alternative button pressing by male and female college students on DRL and RR schedules of points reinforcement. *Bulletin of the Psychonomic Society*, *26*, 319-322.
66. Wasserman, E. A. (1988). Response bias in the yoked control procedure. *Behavioral and Brain Sciences*, *11*, 477-478.
67. Wasserman, E. A., & Bhatt, R. S. (1989). Memory and concepts in pigeons. *24th International Congress of Psychology, Vol. 6, Psychobiology: Issues and Applications*, 81-88.
68. Bhatt, R. S., & Wasserman, E. A. (1989). Secondary generalization and categorization in pigeons. *Journal of the Experimental Analysis of Behavior (Special Issue on the Experimental Analysis of Cognition)*, *52*, 213-224.
69. Wasserman, E. A. (1989). Pavlovian conditioning: Is contiguity irrelevant? *American Psychologist*, *44*, 1550-1551.
70. Wasserman, E. A. (1990). Detecting response-outcome relations: Toward an understanding of the causal texture of the environment. In G. H. Bower (Ed.), *The Psychology of Learning and Motivation*. San Diego: Academic Press. Pp. 27-82.
71. Wasserman, E. A., Dorner, W. W., & Kao, S. F. (1990). The contributions of specific cell information to judgments of interevent contingency. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *16*, 509-521.
72. Wasserman, E. A. (1990). Attribution of causality to common and distinctive elements of compound stimuli. *Psychological Science*, *1*, 298-302.
73. Wasserman, E. A. (1991). The pecking pigeon: A model of complex visual processing? A review of *Quantitative analyses of behavior (Volume XIII): Behavioral approaches to pattern recognition and concept formation*, M. L. Commons, R. J. Herrnstein, S. M. Kosslyn, & D. M. Mumford (Eds.), *Contemporary Psychology*, *36*, 605-606.
74. Gionet, T. X., Thomas, J. D., Warner, D. S., Goodlett, C. R., Wasserman, E. A., & West, J. R. (1991). Forebrain ischemia induces selective behavioral impairments associated with hippocampal CA1 injury. *Stroke*, *22*, 1040-1047.
75. Thomas, J. D., Goodlett, C. R., Wasserman, E. A., & West, J. R. (1991). Motor coordination deficits associated with cerebellar damage in adult rats induced by alcohol exposure during the brain growth spurt. *Alcoholism: Clinical and Experimental Research*, *15*, 336.
76. Astley, S. L., & Wasserman, E. A. (1992). Categorical discrimination and generalization in pigeons: All negative stimuli are not created equal. *Journal of Experimental Psychology: Animal Behavior Processes*, *18*, 193-207.
77. Wasserman, E. A., & Bhatt, R. S. (1992). Conceptualization of natural and artificial stimuli by pigeons. In W. K. Honig and J. G. Fetterman (Eds.), *Cognitive aspects of stimulus control*. Hillsdale, NJ: Erlbaum. Pp. 203-223.
78. Fales, E., & Wasserman, E. A. (1992). Causal knowledge: What can psychology teach philosophers? *Journal of Mind and Behavior*, *13*, 1-27.
79. Gormezano, I., & Wasserman, E. A. (Eds.) (1992). *Learning and memory: The behavioral and biological substrates*. Hillsdale, NJ: Erlbaum.

80. Chatlosh, D. L., & Wasserman, E. A. (1992). Memory and expectancy in delayed discrimination procedures. In I. Gormezano and E. A. Wasserman (Eds.), *Learning and memory: The behavioral and biological substrates*. Hillsdale, NJ: Erlbaum. Pp. 61-79.
81. Goodlett, C. R., Bonthuis, D. J., Wasserman, E. A., & West, J. R. (1992). An animal model of central nervous system dysfunction associated with fetal alcohol exposure: Behavioral and neuroanatomical correlates. In I. Gormezano and E. A. Wasserman (Eds.), *Learning and memory: The behavioral and biological substrates*. Hillsdale, NJ: Erlbaum. Pp. 183-208.
82. Wasserman, E. A., DeVolder, C. L., & Coppage, D. J. (1992). Nonsimilarity-based conceptualization in pigeons via secondary or mediated generalization. *Psychological Science*, *3*, 374-379.
83. Van Hamme, L. J., Wasserman, E. A., & Biederman, I. (1992). Discrimination of contour-deleted images by pigeons. *Journal of Experimental Psychology: Animal Behavior Processes*, *18*, 387-399.
84. Wasserman, E. A., Elek, S. M., Chatlosh, D. L., & Baker, A. G. (1993). Rating causal relations: The role of probability in judgments of response-outcome contingency. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *19*, 174-188.
85. Wasserman, E. A. (1993). Comparative cognition: Beginning the second century of the study of animal intelligence. *Psychological Bulletin*, *113*, 211-228.
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11. Nelson, K. R., & Wasserman, E. A. Effects of partial reinforcement on autoshaped key pecking under response-independent and omission schedules. *Midwestern Psychological Association*, 1976.
12. Deich, J. D., & Wasserman, E. A. Autoshaping the chick’s key peck: Trace conditioning at short and long interstimulus intervals. *Midwestern Psychological Association*, 1976.
13. Wasserman, E. A. Studying response-reinforcer influences on autoshaped behavior. *Midwestern Psychological Association*, 1977. *Invited paper*.
14. Taylor, F. F., & Wasserman, E. A. Autoshaping the pigeon’s key peck with increasing CS-US intervals: Inhibition of delay. *Midwestern Psychological Association*, 1977.
15. Nelson, K. R., & Wasserman, E. A. Temporal factors influencing the pigeon’s successive matching-to-sample performance: Sample duration, intertrial interval, and retention interval. *Midwestern Psychological Association*, 1977.
16. Deich, J. D., & Wasserman, E. A. Reinforcement of observing behavior. *Midwestern Psychological Association*, 1977.
17. Wasserman, E. A., Carr, D. L., & Deich, J. D. Association of conditioned stimuli during serial conditioning. *Psychonomic Society*, 1977.
18. Wasserman, E. A. The occurrence of motor and secretory behaviors during classical appetitive conditioning. *Psychonomic Society*, 1977.
19. Lucas, G. A., & Wasserman, E. A. Autoshaping: The interaction of stimulus-reinforcer and response-reinforcer dependencies. *Midwestern Psychological Association*, 1978.
20. Wasserman, E. A., & Larew, M. B. The retention of stimulus order by pigeons. *American Psychological Association*, 1978.
21. Lucki, I., Nelson, K. R., & Wasserman, E. A. Rate-dependent effects of amphetamine on successive matching-to-sample performance in the pigeon. *Midwestern Psychological Association*, 1979.
22. Nelson, K. R., & Wasserman, E. A. Proactive effects on associative memory in the successive matching procedure. *Midwestern Psychological Association*, 1979.
23. Wasserman, E. A. Delayed simple and conditional discrimination in the pigeon. *Psychonomic Society*, 1979.

24. Wasserman, E. A. Successive matching-to-sample: Application of Konorski's paradigm to processes of memory in animals. Association for Behavior Analysis, 1980. *Invited symposium paper.*
25. Wasserman, E. A., Deich, J. D., & Cox, K. E. The learning and memory of response sequences. Harvard Symposium on Quantitative Analyses of Behavior: Acquisition, 1980. *Invited paper.*
26. Wasserman, E. A. The effects of time tags on pigeon short-term memory. Psychonomic Society, 1980.
27. Wasserman, E. A. Memory and the operant. Association for Behavior Analysis, 1981. *Invited address.*
28. Wasserman, E. A., & DeLong, R. E. Prospection and retrospection in animal memory. American Psychological Association, 1981.
29. Wasserman, E. A., & Olson, M. W. Delayed control by prior excitatory and inhibitory stimuli. American Psychological Association, 1981.
30. Wasserman, E. A., & Shaklee, H. Perceiving the relationship between responses and outcomes. Psychonomic Society, 1981.
31. Wasserman, E. A. Animal intelligence: Understanding the minds of animals through their behavioral "ambassadors." Harry Frank Guggenheim Conference on Animal Cognition, 1982. *Invited paper.*
32. Wasserman, E. A. Is cognitive psychology behavioral? Association for Behavior Analysis, 1982. *Invited symposium paper.*
33. Neunaber, D. J., Wasserman, E. A., & O'Hara, M. W. Judgment of control and operant responding in depressed and nondepressed college students. Association for the Advancement of Behavior Therapy, 1982.
34. Wasserman, E. A., Schlapkohl, R. J., & Olson, M. W. Do pigeons forage optimally from progressive and fixed ratio alternatives? Psychonomic Society, 1982.
35. Wasserman, E. A., DeLong, R. E., & Larew, M. B. Temporal order and duration: Their discrimination and retention by pigeons. New York Academy of Sciences Conference on Timing and Time Perception, 1983. *Invited paper.*
36. Wasserman, E. A., Neunaber, D. J., Chatlosh, D. L., & O'Hara, M. W. Judgment of cause-effect relations by college students. Psychonomic Society, 1983.
37. Wasserman, E. A. Response to and judgment of operant schedules by college students. Association for Behavior Analysis, 1984. *Invited address.*
38. Olson, M. W., & Wasserman, E. A. The pigeon's response to foraging contingencies. Association for Behavior Analysis, 1984. *Invited symposium paper.*
39. Wasserman, E. A. Animal rights and behavior analysis: Perspectives from comparative psychology. Association for Behavior Analysis, 1984. *Invited symposium paper.*
40. Wasserman, E. A., Bhatt, R. S., Neunaber, D. J., Chatlosh, D. L., & Dorfman, D. D. Relative contiguity: Toward a time-based theory of operant behavior. Psychonomic Society, 1984.
41. Shaklee, H., & Wasserman, E. A. Judging interevent contingencies: Being right for the wrong reasons. Psychonomic Society, 1984.
42. Wasserman, E. A. Do animals have minds? Exploring the concept of mind. Humanities symposium, The University of Iowa, 1985.
43. Wasserman, E. A., & Chatlosh, D. L. Temporal discrimination: Pigeons' performance under two different procedures. American Psychological Association, 1985.
44. Wasserman, E. A., & Neunaber, D. J. Different rating procedures affect judgments of causal relations. American Psychological Association, 1985.
45. Chatlosh, D. L., & Wasserman, E. A. Differential reinforcement expectancies as a source of stimulus control in pigeons' successive matching-to-sample performance. Midwestern Psychological Association, 1985.

46. Chatlosh, D. L., Guttenberger, V. T., Morgan, S., & Wasserman, E. A. Delayed position and stimulus discriminations in pigeons. Midwestern Psychological Association, 1985.
47. Wasserman, E. A. The effects of contingency and contiguity on causal perception: Implications for helplessness and depression. Association for Advancement of Behavior Therapy, 1985.
48. Neunaber, D. J., Wasserman, E. A., & O'Hara, M. W. Perception of response-outcome relations by depressed and nondepressed individuals. Association for Advancement of Behavior Therapy, 1985.
49. Solomon, R. E., Wasserman, E. A., & Gebhart, G. F. Dissociation of functional tolerance from other types of tolerance to the effects of morphine on schedule-controlled behavior. Society for Neuroscience, 1985.
50. Wasserman, E. A., Hussar, K. A., & Bhatt, R. S. Disentangling effects of delay of reinforcement from rate of reinforcement. Psychonomic Society, 1985.
51. Wasserman, E. A., & Moore, J. Some comments on the temporal law of effect. Association for Behavior Analysis, 1986. *Invited address*.
52. Wasserman, E. A. Animal memory: Evaluating the cornerstone of the science of nonhuman cognition. Midwestern Psychological Association, 1986. *Symposium organizer*.
53. Wasserman, E. A. Short-term memory of dimension and value information in pigeons. Midwestern Psychological Association, 1986. *Symposium paper*.
54. Neunaber, D. J., Chatlosh, D. L., & Wasserman, E. A. Discriminating contingent from noncontingent reinforcement: Response to and report of changing and unchanging schedules of reinforcement. Association for Behavior Analysis, 1986. *Invited symposium paper*.
55. Chatlosh, D. L., & Wasserman, E. A. Three-dimensional discrimination learning and selective attention in pigeons. Psychonomic Society, 1986.
56. Chatlosh, D. L., Elek, S. M., & Wasserman, E. A. Causal judgment: Mapping the response-outcome contingency space. Midwestern Psychological Association, 1987.
57. Bhatt, R. S., & Wasserman, E. A. Acquisition and generalization of a four-category discrimination by pigeons. Psychonomic Society, 1987.
58. Olson, M. W., & Wasserman, E. A. Sensitivity to within-patch food parameters. American Psychological Association, 1987. *Invited symposium paper*.
59. Wasserman, E. A., & Bhatt, R. S. Memory and concepts in pigeons. International Congress of Psychology, 1988. *Invited symposium paper*.
60. Chatlosh, D. L., & Wasserman, E. A. Compound stimulus control in pigeons: A new test of blocking. Midwestern Psychological Association, 1988.
61. Bhatt, R. S., & Wasserman, E. A. Effects of category size on categorization learning and generalization. Psychonomic Society, 1988.
62. Bhatt, R. S., & Wasserman, E. A. Selective attention, secondary generalization, and categorization in pigeons. Midwestern Psychological Association, 1989.
63. Gormezano, I., & Wasserman, E. A. Learning and memory: The behavioral and biological substrates. Second biennial symposium organizers. The University of Iowa, 1989.
64. Wasserman, E. A., & Chatlosh, D. L. Memory and expectancy in delayed discrimination procedures. Second biennial symposium on learning and memory. The University of Iowa, 1989.
65. West, J. R., Goodlett, C. R., Bonthius, D. J., & Wasserman, E. A. Learning deficits in a radial maze task in adult rats exposed to alcohol during the neonatal brain growth spurt. Research Society on Alcoholism, 1989.
66. Wasserman, E. A. Conceptualization of natural and artificial stimuli by pigeons. Conference on cognitive aspects of stimulus control. Dalhousie University, 1989. *Invited paper*.
67. Wasserman, E. A. Conceptualization in animals: Evidence from the pigeon. American Psychological Association, 1989. *New Fellow address*.
68. Goodlett, C. R., Bonthius, D. J., Wasserman, E. A., & West, J. R. Deficits in radial maze learning in adult rats following alcohol exposure during the brain growth spurt: Association of working

- memory impairments with CA1 neuron loss. Society for Neuroscience, 1989.
69. Wasserman, E. A., Tassinari, L. G., Bhatt, R. S., & Sayasenh, P. Pigeons discriminate emotion and identity from photographs of the human face. Psychonomic Society, 1989.
 70. DeVolder, C. L., Wasserman, E. A., & Biederman, I. Perceptual processes of visual categorization in pigeons: Recognition-by-components? Midwestern Psychological Association, 1990.
 71. Kao, S. F., Levin, I. P., & Wasserman, E. A. Contingency judgment: Unequal effects of cell information. Midwestern Psychological Association, 1990.
 72. Wasserman, E. A. Origin of directed action: The role of stimulus-reinforcer relations. Midwestern Psychological Association, 1990. *Invited symposium paper.*
 73. Thomas, J. D., Gionet, T. X., Goodlett, C. R., Warner, D. S., Todd, M. M., Wasserman, E. A., & West, J. R. Forebrain ischemia induces selective behavioral impairments associated with hippocampal CA1 injury. Society for Neuroscience, 1990.
 74. Wasserman, E. A., DeVolder, C. L., Van Hamme, L. J., & Biederman, I. Recognition by components: Comparative evaluations of visual discriminations by pigeons. Psychonomic Society, 1990.
 75. Levin, I. P., Wasserman, E. A., & Kao, S. F. Multiple methods for examining contingency judgments. Psychonomic Society, 1990.
 76. Wasserman, E. A. Conceptual coherence in pigeons: Assessing the structure of visual categories. Midwestern Psychological Association, 1991. *Invited paper.*
 77. Levin, I. P., Kao, S. F., & Wasserman, E. A. Biased information usage in contingency judgments. Midwestern Psychological Association, 1991.
 78. DeVolder, C. L., & Wasserman, E. A. Strategic shift in the retrospective and prospective processing of visual forms. Midwestern Psychological Association, 1991.
 79. Chatlosh, D. L., Franson, D. K., & Wasserman, E. A. Operant learning in college students: Behavioral effects of unsignaled changes in the controllability of outcomes. Midwestern Psychological Association, 1991.
 80. Thomas, J. D., Goodlett, C. R., Wasserman, E. A., & West, J. R. Motor coordination deficits associated with cerebellar damage in adult rats induced by alcohol exposure during the brain growth spurt. Research Society on Alcoholism, 1991.
 81. Wasserman, E. A., & Astley, S. L. A Spencian model of categorization. Psychonomic Society, 1991.
 82. Wasserman, E. A. Comparative cognition: Toward a general understanding of cognition in behavior. Psychonomic Society, 1991. *Invited symposium paper.*
 83. Levin, I. P., Kao, S. F., & Wasserman, E. A. Learning effects and cell information use in contingency judgments. Society for Judgment and Decision Making, 1991.
 84. Chatlosh, D. L., & Wasserman, E. A. Multidimensional stimulus control in pigeons: Selective attention and other issues. Animal cognition: A conference honoring Donald A. Riley, 1991. *Invited paper.*
 85. Thomas, J. D., Goodlett, C. R., Andersen, K. H., Wasserman, E. A., & West, J. R. Behavioral deficits induced by short-term exposure to alcohol during the brain growth spurt. Research Society on Alcoholism, 1992.
 86. Thomas, J. D., Coppage, D. J., & Wasserman, E. A. Generalization and discrimination of natural stimuli by pigeons. Midwestern Psychological Association, 1992.
 87. Astley, S. L., & Wasserman, E. A. Discrimination of simulated human faces by pigeon subjects. Midwestern Psychological Association, 1992.
 88. Wasserman, E. A. Similarity- and nonsimilarity-based conceptualization. Harvard Symposium on Quantitative Analyses of Behavior: Stimulus Relations, 1992. *Invited paper.*
 89. Biederman, I., & Wasserman, E. A. Processes of visual object conceptualization. Psychonomic Society, 1993. *Invited symposium organizers.*

90. Wasserman, E. A. Object conceptualization by pigeons. Psychonomic Society, 1993. *Invited symposium paper*.
91. Wasserman, E. A., Kirkpatrick-Steger, K., Oden, G. C., & Biederman, I. Pigeons differentially observe drawings that differ only in spatial organization. Psychonomic Society, 1993.
92. Wasserman, E. A. Conceptualization in animals: A behavioral analysis. American Psychological Association, 1993. *Invited address*.
93. Thomas, J. D., Goodlett, C. R., Wasserman, E. A., & West, J. R. Long-lasting learning deficits in rats depend on timing of alcohol exposure during the brain growth spurt. Research Society on Alcoholism, 1993.
94. Wasserman, E. A. Conceptual behavior in pigeons. Midwestern Psychological Association, 1993. *Invited paper*.
95. Kirkpatrick-Steger, K., Wasserman, E. A., Van Hamme, L. J., & Biederman, I. Pigeons are sensitive to the spatial organization of complex visual stimuli. Midwestern Psychological Association, 1993.
96. Van Hamme, L. J., & Wasserman, E. A. Associative mechanisms of causality judgments. Midwestern Psychological Association, 1993.
97. Gagliardi, J. L., Wasserman, E. A., & Biederman, I. Pigeons recognize objects rotated in depth. Midwestern Psychological Association, 1993.
98. Kao, S. F., & Wasserman, E. A. Applicability of information integration theory to contingency judgment. Midwestern Psychological Association, 1993.
99. Wasserman, E. A. Short-term memory: Long-term remembrances. Midwestern Psychological Association, 1993. *Invited symposium paper*.
100. Wasserman, E. A. Strategies for revitalizing the field of comparative cognition. Conference on Comparative Cognition, 1994.
101. Wasserman, E. A. Causal perception: The meeting ground of cognitivism and associationism. Midwestern Psychological Association, 1994. *Symposium organizer*.
102. Kirkpatrick-Steger, K., Wasserman, E. A., & Betti, C. The development of temporal responding on the peak procedure. Midwestern Psychological Association, 1994.
103. Wasserman, E. A. Basic level and superordinate concepts in pigeons and people. Association for Behavior Analysis, 1994. *Invited symposium paper*.
104. Kirkpatrick-Steger, K., Wasserman, E. A., & Biederman, I. Effects of spatial rearrangement of object components on picture recognition in pigeons. Psychonomic Society, 1994.
105. Wasserman, E. A. Peristeronic cognition: Basic, superordinate, and abstract concepts in pigeons. Conference on Comparative Cognition, 1995.
106. Wasserman, E. A. Conceptual behavior in pigeons: Basic, superordinate, and abstract concepts. Rocky Mountain Psychological Association, 1995. *Invited address*.
107. Kirkpatrick-Steger, K., Hall, F. D., & Wasserman, E. A. The what and the where of the pigeon's processing of complex visual stimuli. Midwestern Psychological Association, 1995.
108. DeVolder, C. L., Tranel, D., & Wasserman, E. A. Disruption in memory performance following frontal or temporal lobe damage. Psychonomic Society, 1995.
109. Kirkpatrick-Steger, K., Wasserman, E. A., & Biederman, I. Effects of deletion, movement, and scrambling of object components on picture perception in pigeons. Psychonomic Society, 1995.
110. Wasserman, E. A. Behavior and cognition: The case for conceptualization in pigeons. Southeastern Association for Behavior Analysis, 1995. *Invited address*.
111. Wasserman, E. A. Much ado about nothing: The role of nonpresented stimuli in human causal judgment. Conference in honor of Eliot Hearst, 1996.
112. Wasserman, E. A. Contingency judgment: Data, theory, and implications for psychological science. XXVI International Congress of Psychology, 1996. *Invited symposium convener*.
113. Kao, S. F., & Wasserman, E. A. Information integration and associative learning as accounts of

- human contingency judgment. XXVI International Congress of Psychology, 1996.
114. Katagiri, M., Kao, S. F., Wasserman, E. A., & Simon, A. Ratings of causal efficacy under constant and changing interevent contingencies. XXVI International Congress of Psychology, 1996.
 115. Kirkpatrick-Steger, K., & Wasserman, E. A. Picture perception in pigeons. Conference on Comparative Cognition, 1996.
 116. Young, M. E., Johnson, J. L., & Wasserman, E. A. Positive and negative patterning in a human causal judgment task. Psychonomic Society, 1996.
 117. Wasserman, E. A., & Young, M. E. Abstraction in people and pigeons. Conference on Comparative Cognition, 1997.
 118. Peissig, J. J., Young, M. E., Wasserman, E. A., & Biederman, I. The pigeon's discrimination of single geons rotated in depth. Midwestern Psychological Association, 1997.
 119. Astley, S. L., & Wasserman, E. A. Transfer from novel to familiar stimuli in superordinate category formation. Midwestern Psychological Association, 1997.
 120. Astley, S. L., Wasserman, E. A., & Hawkins, J. Superordinate categories: Is association with a common delay to reinforcement sufficient for their creation? Midwestern Psychological Association, 1997.
 121. Wasserman, E. A. Comparing human and animal behavior: A key component for unifying psychological science. American Psychological Society, 1997. *Invited symposium organizer.*
 122. Wasserman, E. A. Interrelations between associative learning in animals and causal judgment in humans. American Psychological Society, 1997.
 123. Wasserman, E. A., & Rovee-Collier, C. Linking human and animal behavior: Concepts and categories in human infants and pigeons. American Psychological Association, 1997.
 124. Wasserman, E. A., & Young, M. E. Abstraction in people and pigeons. American Psychological Association, 1997. *Invited address.*
 125. Young, M. E., Johnson, J. L., & Wasserman, E. A. Occasion setting in a causal induction task. Psychonomic Society, 1997.
 126. Wasserman, E. A., & Young, M. E. The classification of display variability by people and pigeons. Psychonomic Society, 1997.
 127. Wasserman, E. A. Conceptualization in humans and animals. Congress of the Spanish Society of Comparative Psychology, 1997. *Invited address.*
 128. Wasserman, E. A. Conceptualization: It's not just for humans any more. Eastern Psychological Association, 1998. *Invited address.*
 129. Young, M. E., & Wasserman, E. A. Successive same-different discrimination in pigeons: Data and theory. Conference on Comparative Cognition, 1998.
 130. Wasserman, E. A. Conceptualization by pigeons. Southwestern Psychological Association, 1998. *Invited address.*
 131. Astley, S., & Wasserman, E. A. Superordinate categorization via association with differential delays and probabilities of reinforcement. Midwestern Psychological Association, 1998.
 132. Wilson, J. M., Young, M. E., & Wasserman, E. A. Attentional tradeoffs in pigeons learning to discriminate complex visual stimuli. Society for Neuroscience, 1998.
 133. Young, M. E., Johnson, J. L., & Wasserman, E. A. Occasion setting in causal induction: The importance of temporal relations among the candidate causes. Judgment and Decision Making Society, 1998.
 134. Young, M. E. & Wasserman, E. A. Discriminating differences in categorical variability. Psychonomic Society, 1998.
 135. Peissig, J. J., Young, M. E., Wasserman, E. A., & Biederman, I. The pigeon's discrimination of single geons rotated in depth. Psychonomic Society, 1998.
 136. Wasserman, E. A. Entropy detection by pigeons and people. Southwestern Psychological Association, 1999. *Invited paper.*

137. Peissig, J. J., Young, M. E., Wasserman, E. A., & Biederman, I. The pigeon's ability to form a generalized structural description. Cognitive Neuroscience Society, 1999.
138. Wasserman, E. A., Peissig, J. J., & Astley, S. L. Reinforcement mechanisms of superordinate category formation by pigeons. Conference on Comparative Cognition, 1999.
139. Astley, S. L., Wasserman, E. A., & Peissig, J. J. Binding of categorical stimuli by different numbers of pellet reinforcers: Will categorization transfer to the reinforcers themselves? Midwestern Psychological Association, 1999.
140. Young, M. E. & Wasserman, E. A. Entropy detection by pigeons and people. Midwestern Psychological Association, 1999. *Invited paper.*
141. Elek, S. M., Chatlosh, D. L., & Wasserman, E. A. Detecting response-consequence contingency in social and nonsocial settings. Small group meeting on classic and connectionist approaches to causal inference and social judgment (Sponsored by the European Association of Experimental Social Psychology and the Belgian FWO Research Community), 1999. *Invited paper.*
142. Wasserman, E. A. Configural and elemental processing in complex discrimination learning. Special-interest meeting on cue competition in associative learning (Sponsored by the European Association of Experimental Social Psychology and the Belgian FWO Research Community), 1999. *Invited paper.*
143. Young, M. E., Wasserman, E. A., & Dierking, K. L. Faster learning of causal interactions when causes are presented serially. Psychonomic Society, 1999.
144. Peissig, J. J., Young, M. E., Wasserman, E. A., & Biederman, I. Stimulus size and the pigeon's ability to recognize objects. Psychonomic Society, 1999.
145. Peissig, J. J., Young, M. E., Wasserman, E. A., & Biederman, I. Object recognition in pigeons: The role of stimulus features. Annual workshop on Object Perception and Memory (OPAM), 1999.
146. Wasserman, E. A. Same-different conceptualization by pigeons and baboons. International Symposium on the "Phylogeny of Cognition and Language," 2000. *Invited plenary presentation.*
147. Wasserman, E. A., Fagot, J., & Young, M. E. Same-different conceptualization by baboons (*Papio papio*): The role of entropy. Conference on Comparative Cognition, 2000.
148. Fagot, J., Young, M. E., & Wasserman, E. A. Relational matching by baboons. Conference on Comparative Cognition, 2000.
149. Shu, S., Young, M. E., & Wasserman, E. A. Number interpolation and extrapolation by pigeons. Psychonomic Society, 2000.
150. Young, M. E., & Wasserman, E. A. Predictive learning: The effects of attentional capacity and cue order. Psychonomic Society, 2000.
151. Wasserman, E. A. Instructed and uninstructed relational perception by pigeons. Conference on Comparative Cognition, 2001.
152. Peissig, J. J., Wasserman, E. A., Young, M. E., & Biederman, I. Object recognition in pigeons: The effects of a dynamic light source. Conference on Comparative Cognition, 2001.
153. Young, M. E., & Wasserman, E. A. Visual variability discrimination in the pigeon is not determined by spatial regularity. Vision Sciences Society, 2001.
154. Wasserman, E. A., DiPietro, N. T., & Young, M. E. The effects of occlusion on pigeons' object recognition. Vision Sciences Society, 2001.
155. Wasserman, E. A., & Neuringer, A. Adapting to a changing world: Variability of stimuli, responses, and strategies. American Psychological Association, 2001. *Invited symposium organizers.*
156. Wasserman, E. A., & Young, M. E. Stimulus variability and the control of human and animal behavior. American Psychological Association, 2001. *Invited symposium paper.*
157. Peissig, J. J., Young, M. E., Wasserman, E. A., & Biederman, I. The pigeon's recognition of depth rotated objects. Psychonomic Society, 2001.

158. Young, M. E., Ellefson, M. R., & Wasserman, E. A. Spatial organization and perceived variety. Judgment and Decision Making Society, 2001.
159. Frank, A. J., Murphy, M. W., & Wasserman, E. A. Same-different discrimination of 2-icon displays using differential reinforcement of response rate schedules. Conference on Comparative Cognition, 2002.
160. Gibson, B. M., & Wasserman, E. A. Pigeons learn both stimulus identity and stimulus relations during a same-different discrimination task. Conference on Comparative Cognition, 2002.
161. Young, M. E., & Wasserman, E. A. A computational model of variability discrimination: Finding differences. Society for the Quantitative Analysis of Behavior, 2002. *Invited paper.*
162. Peissig, J. J., Young, M.E., Wasserman, E. A., & Biederman, I. Object recognition in pigeons: The effects of spatial frequencies. Vision Sciences Society, 2002.
163. Wasserman, E. A. Creating equivalent stimuli through conditioning. Midwestern Psychological Association, 2002. *Invited symposium paper.*
164. Castro, L., Young, M. E., & Wasserman, E. A. Aprendizaje del concepto igual-diferente en palomas: Entropía y similitude. La Sociedad Española de Psicología Experimental, 2002.
165. Wasserman, E. A. Nature's Turing test: Perceptual classes. Cognitive Science Society, 2002. Symposium paper.
166. Wasserman, E. A., & Castro, L. Much ado about nothing: Reassessing absent stimuli in causal learning. American Psychological Association, 2002. *Invited symposium paper.*
167. Lazareva, O. F., Levin, J., Vecera, S. P., & Wasserman, E. A. Object-based attention in pigeons? Annual workshop on Object Perception and Memory (OPAM), 2002.
168. Lazareva, O. F., & Wasserman, E. A. Transposition in pigeons and people? Psychonomic Society, 2002.
169. Frank, A. J., & Wasserman, E. A. Associative symmetry in the pigeon. Conference on Comparative Cognition, 2003.
170. Lazareva, O. F., & Wasserman, E. A. Transposition in pigeons. Conference on Comparative Cognition, 2003.
171. Lazareva, O. F., & Wasserman, E. A. Transitive responding in pigeons with reinforcement history controlled. Conference on Comparative Cognition, 2003.
172. Frank, A. J., & Wasserman, E. A. Associative symmetry: A demonstration in the pigeon. Workshop on Stimulus Equivalence, 2003. *Invited paper.*
173. Frank, A. J., & Wasserman, E. A. Bidirectional conditioning in the pigeon. Russian Academy of Science Conference on Fundamental and Clinical Aspects of the Integrative Activity of the Brain, 2003. *Invited paper.*
174. Wasserman, E. A. The rational mind: "Thin colonies of reason amid a savage world." American Psychological Association, 2003. *Invited keynote address.*
175. Lazareva, O. F., Freiburger, K. L., & Wasserman, E. A. Concurrent basic and superordinate categorization of photographic images by pigeons. Psychonomic Society, 2003.
176. Wasserman, E. A., & Castro, L. Surprise and change: Variations in the strength of present and absent cues in causal learning. Psychonomic Society, 2003. *Invited symposium presentation.*
177. Wasserman, E. A., Lazareva, O. F., & Vecera, S. P. Object perception by pigeons. Symposium on the "Diversity of Cognition: Evolution, Development, Domestication, and Pathology. Kyoto, Japan, 2003. *Invited paper.*
178. Wasserman, E. A. Same-different discrimination learning in pigeons, baboons, and people. Symposium on the "Cognitive Neuroscience of Category Learning," 2003. *Invited paper.*
179. Lazareva, O. F., Vecera, S. P., & Wasserman, E. A. Pigeons perform object discrimination using both local and global cues. Annual workshop on Object Perception and Memory (OPAM), 2003.

180. Wasserman, E. A., Lazareva, O. F., & Vecera S. P. Object discrimination in pigeons: The roles of global and local cues. Conference on Comparative Cognition, 2004. *Invited symposium presentation.*
181. Lazareva, O. F., Freiburger, K. L., & Wasserman, E. A. Pigeons concurrently categorize photographs at both basic and superordinate levels. Conference on Comparative Cognition, 2004.
182. Gibson, B. M., Wasserman, E. A., & Kamil, A. C. Pigeons are efficient travelers. Conference on Comparative Cognition, 2004.
183. Lazareva, O. F., Young, M. E., & Wasserman, E. A. Pigeon's recognition of occluded objects: Differential effects of training experience. Vision Sciences Society, 2004.
184. Wasserman, E. A., Lazareva, O. F., Gibson, B. M., Gosselin, F., Schyns, P. G., & Biederman, I. Geons and Bubbles: Object recognition by pigeons. Vision Sciences Society, 2004.
185. Frank, A. J., & Wasserman, E. A. Associative symmetry in the pigeon through arbitrary and identity training. Association for Behavior Analysis, 2004. *Invited symposium presentation.*
186. Wasserman, E. A. Transposition in discrimination learning: The problem of relational stimulus control. American Psychological Association, 2004. *Division 6 Presidential Address.*
187. Wasserman, E. A., Lazareva, O. F., & Young, M. E. Factors affecting the pigeon's recognition of occluded objects. International Congress of Psychology, 2004. *Invited paper.*
188. Castro, L., Young, M. E., & Wasserman, E. A. Effects of number of items on humans' discrimination of same from different visual displays. Joint international meeting of the International Society for Comparative Psychology and the Spanish Society for Comparative Psychology, 2004.
189. Ringen, J., & Wasserman, E. A. Nonhuman communication about private states: A second look. Joint meeting of the Society for Philosophy and Psychology and the European Society for Philosophy and Psychology, July, 2004.
190. Cook, R. G., & Wasserman, E. A. Relational matching by pigeons. Psychonomic Society, 2004.
191. Lazareva, O. F., & Wasserman, E. A. Nonverbal transitive inference: Effects of task and awareness on performance. Psychonomic Society, 2004.
192. Young, M. E., Beckmann, J. S., Wasserman, E. A. The pigeon's discrimination of Michotte's launching effect. Conference on Comparative Cognition, 2005.
193. Lazareva, O. F., Vecera, S. P., & Wasserman, E. A. Figure-ground assignment in pigeons. Conference on Comparative Cognition, 2005.
194. Castro, L., Lazareva, O. F., Vecera, S. P., & Wasserman, E. A. Figure-ground assignment in pigeons: The effect of different sizes. Conference on Comparative Cognition, 2005.
195. Frank, A. J., Wasserman, E. A., & Young, M. E. Item and relation control in same-different discrimination. Conference on Comparative Cognition, 2005.
196. Wasserman, E. A. Relational responding by people and pigeons. Society of Experimental Psychologists, 2005.
197. Wasserman, E. A. Sensitivity to metric and invariant changes in pigeons: Effects of different behavioral techniques. Vision Sciences Society, 2005.
198. Gibson, B. M., Lazareva, O. F., Wasserman, E. A., Gosselin, F., Schyns, P. G., & Biederman, I. Use of the Bubbles Procedure to isolate visual features controlling categorical behavior in people and pigeons. Vision Sciences Society, 2005.
199. Lazareva, O. F., Castro, L., Vecera, S. P., & Wasserman, E. A. Figure-ground assignment in pigeons: Effect of object area. Vision Sciences Society, 2005.
200. Lazareva, O. F., Freiburger, K., & Wasserman, E. A. Effects of stimulus manipulations on basic-level and superordinate-level categorization. Society for the Quantitative Analysis of Behavior, 2005. *Invited paper.*
201. Lazareva, O. F., Miner, M., Wasserman, E. A., & Young, M. E. Transposition in pigeons and people using multiple-pair discrimination training. Association for Behavioral Analysis, 2005.

202. Frank, A. J., & Wasserman, E. A. The necessity of identity training for emergent symmetry in pigeons. Association for Behavior Analysis, 2005.
203. Castro, L., Lazareva, O. F., Vecera, S. P., & Wasserman, E. A. Figure-ground assignment in pigeons. Spanish Society for Comparative Psychology, 2005.
204. Castro, L. & Wasserman, E. A. Causal Learning: Cue Competition with two vs. three-cue compounds. Psychonomic Society, 2005.
205. Wasserman, E. A., Lazareva, O. F., & Young, M.E. Transposition in pigeons: Reassessing Spence's (1937) associative learning theory. Paper presented at the conference to honor Shepard Siegel, McMaster University, 2005. Invited paper.
206. Racey, D. E., Young, M. E., & Wasserman, E. A. Discriminating continuous variability: Evidence for the Finding Differences Model. Conference on Comparative Cognition, 2006.
207. Young, M. E. & Wasserman, E. A. A theory of variability discrimination: Finding differences. Conference on Comparative Cognition, 2006.
208. Nagasaka, Y., & Wasserman, E. A. Concept discrimination with the reassignment paradigm in pigeons. Conference on Comparative Cognition, 2006.
209. Frank, A. J., & Wasserman, E. A. Pigeons process both items and relations in multi-element visual arrays. Conference on Comparative Cognition, 2006.
210. Lazareva, O. F., Miner, M., Wasserman, E. A., & Young, M. E. Transposition in pigeons: Multiple-pair training facilitates relational responding. Conference on Comparative Cognition, 2006.
211. Brooks, D. I., & Wasserman, E. A. Same/Different concept learning with trial-unique stimuli in pigeons. Conference on Comparative Cognition, 2006.
212. Wasserman, E. A., Lazareva, O. F., & Luck, S. J. Change detection in pigeons: Stimulus attributes and binding. Vision Sciences Society, 2006.
213. Lazareva, O. F., Castro, L., Vecera, S. P., & Wasserman, E. A. Figure-ground assignment in pigeons: Smaller area and longer pre-exposure enhance figural advantage. Vision Sciences Society, 2006.
214. Nagasaka, Y., Lazareva, O. F., & Wasserman, E. A. Prior experience affects amodal completion in pigeons. Vision Sciences Society, 2006.
215. Brooks, D. I., Lazareva, O. F., Gosselin, F., Schyns, P. G., & Wasserman, E. A. Stimulus control in categorization: An application of the Bubbles procedure. Vision Sciences Society, 2006.
216. Lazareva, O. F., & Wasserman, E. A. Nonverbal transitive inference: Effects of task and awareness on performance. Midwestern Psychological Association, 2006.
217. Wasserman, E. A. & Castro, L. Causation and association: Parallels between human and animal cognition. Midwestern Psychological Association, 2006.
218. Fagot, J., Wasserman, E. A., & Davidoff, J. Cross-species differences in perceptual processing. Experimental Psychology Society, 2006.
219. Wasserman, E. A., Nagasaka, Y., & Lazareva, O. F. Seeing the unseen: Visual completion in pigeons? American Psychological Association, 2006. *Invited symposium paper.*
220. Wasserman, E. A. Same-different discrimination and abstraction. International Symposium on the Integration of Comparative Neuroanatomy and Cognition. Keio University, Tokyo, Japan, 2006. *Invited symposium paper.*
221. Lazareva, O. F., Young, M. E., & Wasserman, E. A. A three-component model of relational learning in the transposition paradigm. Winter Conference on Animal Learning & Behavior, 2007.
222. Castro, L., Kemp, H., & Wasserman, E. A. Nonidentical items from the same category: Are they same or different? Conference on Comparative Cognition, 2007.
223. Frank, A. J., & Wasserman, E. A. Factors affecting pigeons' processing of items and relations in multi-element visual arrays. Conference on Comparative Cognition, 2007.

224. Lazareva, O. F., Doyle, J., & Wasserman, E. A. Pigeons' perception of similarity among different basic-level categories. Conference on Comparative Cognition, 2007.
225. Brooks, D. I., & Wasserman, E. A. Connectionist account of item set and relation discrimination in multi-element arrays. Conference on Comparative Cognition, 2007.
226. Acerbo, M. J., Lazareva, O. F., Frank, A., Poremba, A., & Wasserman, E. A. Metabolic mapping of brain structures involved in figure-ground assignment in pigeons. Conference on Comparative Cognition, 2007.
227. Castro, L., & Wasserman, E. A. Can pigeons learn to complete an analogy? Conference on Comparative Cognition, 2007.
228. Wasserman, E. A., Lazareva, O. F., & Biederman, I. Pigeons are more sensitive to nonaccidental than to metric changes in visual objects. Conference on Comparative Cognition, 2007.
229. Wasserman, E. A. Humans, animals, and computers: Minding machines? American Psychological Association, 2007. *Master Lecture*.
230. Lazareva, O. F., Acerbo, M. J., Poremba, A., & Wasserman, E. A. Metabolic mapping of figure-ground segregation in pigeons: Subregions of the nucleus rotundus. Society for Neuroscience, 2007.
231. Castro, L., Soto, F. A., & Wasserman, E. A. Associations between absent events in contingency judgment. Psychonomic Society, 2007.
232. Wasserman, E. A. Development and evolution of cognition. Special paper session. Psychonomic Society, 2007. *Session organizer*.
233. Wasserman, E. A., Brooks, D. I., Lazareva, O. F., & Miner, M. A. A vocabulary test for pigeons (*Columba livia*). Psychonomic Society, 2007.
234. Wasserman, E. A. Conceptual behavior in humans and animals: All different and yet the same. Eastern Psychological Association, 2008. *Richard L. Solomon Lecture*.
235. Castro, L., Soto, F. A., & Wasserman, E. A. Associations between absent events in contingency judgment. Eastern Psychological Association, 2008.
236. Brooks, D. I., & Wasserman, E. A. Same/Different discrimination with trial-unique stimuli by pigeons. Conference on Comparative Cognition, 2008.
237. Brooks, D. I., Rasmussen, I. P., Hollingworth, A., & Wasserman, E. A. Contextual cueing in the pigeon. Conference on Comparative Cognition, 2008.
238. Lazareva, O. F., Soto, F. A., & Wasserman, E. A. Basic-level superiority: Effect of between-category similarity. Conference on Comparative Cognition, 2008.
239. Kennedy, P. L., Castro, L., & Wasserman, E. A. Conditional same-different discrimination in pigeons. Conference on Comparative Cognition, 2008.
240. Acerbo, M. J., Lazareva, O. F., Poremba, A., & Wasserman, E. A. Metabolic mapping of figure-ground segregation in pigeons: Subregions of the nucleus rotundus. Conference on Comparative Cognition, 2008.
241. Soto, F. A., & Wasserman, E. A. Application of an elemental model of associative learning to perceptual categorization in pigeons. Society for Quantitative Analyses of Behavior, 2008.
242. Nagasaka, Y., Brooks, D. I., & Wasserman, E. A. Prior experience affects amodal completion in bonobos. Vision Sciences Society, 2008.
243. Wasserman, E. A. The yin and yang of same-different discrimination learning: Concrete versus abstract stimulus control. American Psychological Association, 2008. *Division 3 Presidential Address*.
244. Castro, L., Kennedy, P. L., & Wasserman, E. A. Conditional same-different discrimination in pigeons: Effects of number of items and stimulus mixtures. Conference on Comparative Cognition, 2008.
245. Brooks, D. I., & Wasserman, E. A. Mechanisms of same/different discriminations by pigeons. Conference on Comparative Cognition, 2008.

246. Soto, F. A., & Wasserman, E. A. Stimulus generalization in two axes of rotation of a three-dimensional object by pigeons. Conference on Comparative Cognition, 2008.
247. Lazareva, O. F., & Wasserman, E. A. Nonverbal transitive inference in adults: Effects of task and awareness on performance. Conference on Comparative Cognition, 2008.
248. Wasserman, E. A., & Castro, L. Nonidentical items from the same category: *Same or different?* Psychonomic Society, 2008.
249. Lazareva, O. F., Soto, F., & Wasserman, E. A. Between-category similarity determines basic-level superiority. Psychonomic Society, 2008.
250. Soto, F. A., & Wasserman, E. A. Competition between stimulus- and category-specific attributes in pigeons' categorization of natural images. Psychonomic Society, 2008.
251. Wasserman, E. A. Minding machines: Humans, animals, and computers. First National Congress of Ethology and Comparative Psychology of Chile, 2008.
252. Wasserman, E. A. Comparative cognition: The science of mental evolution. American Association for the Advancement of Science, 2009. *Symposium organizer.*
253. Wasserman, E. A. Abstraction in pigeons and baboons. American Association for the Advancement of Science, 2009.
254. Brooks, D. I., & Wasserman, E. A. A measure of pigeons' continuous discrimination in the simultaneous S/D task. Conference on Comparative Cognition, 2009.
255. Soto, F. A., & Wasserman, E. A. A common-elements model of visual category learning in pigeons. Conference on Comparative Cognition, 2009.
256. Wasserman, E. A., & Soto, F. A. Blocking of categorical control by prior individual exemplar learning. Conference on Comparative Cognition, 2009.
257. Soto, F. A., & Wasserman, E. A. Pigeons' discrimination of identity and emotion in photographs of human faces. Conference on Comparative Cognition, 2009.
258. Lazareva, O. F., & Wasserman, E. A. Transitive inference in pigeons: Measuring the associative values of B and D. Conference on Comparative Cognition, 2009.

Description of Research Activities

I have researched four distinctive topics in my 36 years at the University of Iowa. In the first, I investigated autoshaping in pigeons and chickens. In the second, I studied memory in pigeons. In the third, I explored the problem of causal judgment in people. And, in the fourth, I studied categorization in pigeons and people.

From 1972 to 1984, I published a series of papers and chapters on autoshaping in birds. I found that pecking emerged and persisted even when the reinforcer—either infrared heat or water injected directly into the mouth—did not elicit pecking or when pecking cancelled the reinforcer altogether. I further found that the key light had to be the best predictor of the reinforcer for robust responding to emerge. Redundant illumination from the house light or from the feeder adversely affected autoshaped key pecking; when multiple key lights were available, the birds pecked the one that was most highly correlated with the reinforcer. Finally, the exact timing and duration of key illumination and reinforcer delivery strongly determined the autoshaped responses of both pigeons and chicks. Despite these clear stimulus-reinforcer influences on key pecking, I also found that the rate and temporal pattern of pecking is affected by response-reinforcer relations, thereby testifying to the complex determination of this seemingly simple act.

From 1976 to 1992, I published a series of papers and chapters on short-term memory in pigeons. That work began with my development of a go/no go method for studying short-term memory that capitalized on the pigeon's predilection to peck at signals for food and to withdraw from signals for no food. I later exploited that method and several others in projects that helped to elucidate the nature of memory for single events, for multiple events (both stimuli and responses), and for time. Parallel studies of response sequence learning showed how memory may participate in the learning and (temporal and spatial) organization of response sequences. A key event in my work on animal memory was an extended trip that I took in 1978 to the laboratories of Mark Rilling, Bill Roberts, Ron Weisman, Vern Honig, Allan Wagner, and Stew Hulse. Not only did I learn about the latest developments in the field from its most respected researchers, but I formed close personal friendships and productive professional collaborations. Of special note is the work that I did with Vern Honig on prospective and retrospective memory processes. The possibility that both forward-looking and backward-looking memories might participate in animal behavior was originally suggested by Konorski, but Honig and I were among the first to document such participation; later research in both animal and human memory has further developed this intriguing notion.

Of course, Hulse, Honig, and Wagner edited the highly influential *Cognitive Process in Animal Behavior* volume, which signaled both a broadening of the scope of animal behavior research and a liberalization of the theories that might be invoked to explain complex animal behavior. I reviewed this book for the *Journal of the Experimental Analysis of Behavior*. My 1981 review and my 1982 addendum in the same journal afforded me the opportunity to place research in animal learning and behavior into historical, biological, and philosophical context. Many of my later writings have further considered the place of comparative cognition in contemporary psychology as well as its relationship to the field of cognitive ethology. My most recent contribution to the field was a 35-chapter, 704-page edited volume canvassing the realm of comparative cognition [Wasserman, E. A., & Zentall, T. R. (2006). *Comparative cognition: A natural science approach to the study of animal intelligence*. In E. A. Wasserman & T. R. Zentall (Eds.), *Comparative cognition: Experimental explorations of animal intelligence*. New York: Oxford University Press.]

In 1983, I began a new line of research into human causal judgment. My initial work investigated: the method of presenting contingency information; people's weighting of different kinds of contingency information; the role of necessity, sufficiency, and temporal contiguity in causal judgment; and people's use of different strategies in making contingency judgments. My later research has been more theoretically oriented. After replicating the relative validity effect with humans, I went on to show that people not only revalued reinforced and nonreinforced cues that were *given* on training trials, but they also revalued other possible causes that were *not given* on those trials. This result is not predicted by most associative learning theories; but, the modification of the Rescorla-Wagner model that Linda Van Hamme and I devised nicely does the trick. That theoretical modification also enables an associative account to explain the otherwise unexplainable phenomena of recovery from overshadowing and backward blocking. I have successfully documented both of these retrospective revaluation effects in human causal settings and have found that they may be mediated by within-compound associations. In collaboration with Mike Young, now at Southern Illinois University, I have also begun exploring other animal conditioning phenomena in human causal judgment, particularly occasion setting and positive and negative patterning. I am continuing this work on human contingency judgment with Leyre Castro.

In 1988, I began research into categorization by pigeons. Many years of teaching students about Herrnstein's studies of pigeons' discriminating photographic stimuli convinced me that much more could be learned about categorization processes by building on his innovative methods and analyses. My own work developed in three directions. First, I explored the pigeon's categorization of four different classes of photographic stimuli: cats, cars, chairs, and flowers. Not only did pigeons accurately discriminate the original training stimuli, but they also reliably discriminated novel testing stimuli—the hallmark of conceptualization. Follow-up work elucidated many of the conditions that are conducive to the categorization of basic-level stimuli. Collaborative research with Irv Biederman, a human visual scientist at USC, pursued the possibility that pigeons process visual stimuli in accord with a componential analysis of an object's irreducible geometric parts or "geons." Other collaborative research with Shaun Vecera, here at The University of Iowa, with Philippe Schyns, at the University of Glasgow, and with Frederic Gosselin, at the University of Montreal, has built on that work to provide a fuller understanding of the perceptual mechanisms of object categorization by pigeons. Second, with Sue Astley at Cornell College and with Olga Lazareva here at The University of Iowa, I studied the pigeon's forming of higher-level or superordinate categories. Superordinate categories defy explanation in terms of primary stimulus generalization, but they are readily explicable by means of secondary stimulus generalization via mediated associative links. We have found that pigeons do form such superordinate categories when exemplars from two basic-level categories are associated with the same response, delay of reward, probability of reward, or amount of reward. Third, with Mike Young and Brett Gibson, I studied the pigeon's forming an abstract same-different category. Clear evidence of abstraction by nonhuman animals had proven to be extraordinarily difficult. Nonetheless, with arrays of 16 same pictures or 16 different pictures, we have obtained unequivocal evidence that pigeons not only accurately discriminate the original training arrays, but they also reliably discriminate novel same and different arrays created from a palate of brand-new pictures. Follow-up research intriguingly suggests that the pigeons may not have learned a qualitative same-different category at all; rather, they may have based their discriminative responding on the variability or entropy in the stimulus array. This quantitative or dimensional possibility has received empirical support from a series of pigeon experiments, from several analogous experiments on baboons conducted in collaboration with Joël Fagot at the CNRS in Marseille, France, and from recently published experiments on college students here at The University of Iowa. I will continue my studies of animal and human categorization here at The University of Iowa, at the Great Ape Trust of Iowa in Des Moines, and with Robert Cook at Tufts University.

Description of Teaching Activities

Since coming to The University of Iowa in 1972, I have taught several courses at the Undergraduate and Graduate levels in the Experimental Psychology and Behavioral and Cognitive Neuroscience areas.

In the Undergraduate curriculum, I have taught 31:120 Experimental Psychology I. I have also taught sections of 31:121 Experimental Psychology II dealing with human and animal behavior. The last time that I offered this course, the class project yielded a published research paper [Wasserman, E. A., & Berglan, L. R. (1998). Backward blocking and recovery from overshadowing in human causal judgment: The role of within-compound associations. *Quarterly Journal of Experimental Psychology*, 51B, 121-138]. I have also taught 31:125 Introduction to Comparative Psychology and 31:135 Principles of Behavioral Analysis. More recently, I have taught 31:123 Psychology of Learning on three occasions. The 31:123 class is a broad course in the psychology of learning and adaptive behavior; it is organized around my recent undergraduate textbook [Schwartz, B., Wasserman, E. A., & Robbins, S. J. (2002). *Psychology of learning and behavior* (5th Ed.). New York: Norton]. I also co-teach with Jon Ringen 31:174 Mind and Behavior: Natural Science and Cognition after Darwin; this course is co-listed with Literature, Science, and the Arts. In my Undergraduate courses, my primary aims are: (a) to show that psychology is a science, (b) to show how the experimental method can reveal the principles of behavior, and (c) to elucidate how studying the behavior of nonhuman animals has disclosed fundamental insights into human nature. Beyond these activities, I have also lectured in 31:1 Elementary Psychology and in 31:3 General Psychology. I also offered a special class with Lisa Oakes, 31:180 Current Topics in Psychology: Cognition in Animals and Infants. Finally, I recently offered three sections of the 31:190 Psychology Seminar focused on behaviorism and cognitivism. This seminar proved to be a very rewarding experience for me and my students.

In the Graduate curriculum, I offered the course 31:237 Experimental Analysis of Behavior when enrollments were sufficiently large. The aim of that course was to acquaint our graduate students with the fundamental concepts of operant learning. I also offered the Behavior Theory Seminar 31:331 to deal with both historical and contemporary issues in the analysis of behavior and learning. I enlisted the constructive collaboration of Drs. Hinrichs, Randall, and Rosenbaum in an effort to make this seminar relevant to a number of interest groups within the Department. In more recent years, I have also taught the seminar in Neuroscience and Behavior, 31:338, with Robinson and Freeman. I also organized and participated in course offerings that were designed to be of special value to graduate students in the Neuroscience Program. These classes included: 31:241 Behavioral and Cognitive Neuroscience I, 31:242 Behavioral and Cognitive Neuroscience II (with Robinson and Freeman), and 31:244 Behavioral Neuroscience.

In addition to these activities, I have supervised a large number of high school, undergraduate, and graduate students, as well as postdoctoral investigators in research conducted in my laboratory. I have taken a special interest in SSTP, URP, SROP, SREP, USA, 31:091, and Honors Programs.

Finally, I have served as the Department's Coordinator of Undergraduate Studies, Coordinator of Graduate Studies, and Director of the Department's Honors Program.

Courses Taught at The University of Iowa:

- 00:091 Science Research: Fall, 1992 (1);
- 31:001 Elementary Psychology: Spring, 1977 (4 lectures); Fall, 1983 (3 lectures); Spring, 1985 (4 lectures); Fall, 1987 (3 lectures); Spring, 1988 (4 lectures); Fall, 1988 (3 lectures); Spring, 1989 (3 lectures); Spring, 1990 (3 lectures); Fall, 1990 (3 lectures); Spring, 1991 (3 lectures); Fall, 1991 (3 lectures); Spring, 1992 (3 lectures); Fall, 1992 (3 lectures); Spring, 1993 (3 lectures); Fall, 1993 (3 lectures); Spring, 1994 (3 lectures); Fall, 1994 (3 lectures); Spring, 1995 (3 lectures); Fall, 1996 (3 lectures); Fall, 1997 (3 lectures); Spring, 2007 (2 lectures);
- 31:003 General Psychology: Fall, 1984 (6 lectures);
- 31:120 Experimental Psychology I: Fall, 1972 (74); Spring, 1973 (56); Fall, 1980 (3 lectures); Summer, 1980 (9); Fall, 1983 (61) with Levin; Summer, 1984 (13);
- 31:121 Experimental Psychology II: Fall, 1973 (9); Fall, 1974 (7); Fall, 1975 (4); Spring, 1977 (6); Fall, 1977 (7); Fall, 1979 (6); Fall, 1980 (2); Fall, 1981 (4); Fall, 1982 (4); Fall, 1985 (9); Summer, 1986 (4); Fall, 1996 (11);
- 31:123 Psychology of Learning: Fall, 2002 (28); Fall, 2003 (9); Fall, 2004 (9); Spring, 2008 (42); Spring, 2009 (38);
- 31:125 Comparative Psychology: Fall, 1974 (12); Fall, 1975 (14); Fall, 1976 (16); Spring, 1978 (18); Spring, 1979 (7); Spring, 1980 (10); Spring, 1981 (18); Spring, 1982 (18); Spring, 1983 (25); Fall, 1983 (28); Spring, 1985 (21); Spring, 1986 (24); Fall, 1990 (32); Spring, 1995 (71); Spring, 2000 (13);
- 31:135 Principles of Behavioral Analysis: Spring, 1974 (2); Spring, 1975 (11) with Grisham; Spring, 1976 (10) with Grisham; Spring, 1977 (19) with Grisham; Fall, 1977 (12) with Grisham; Fall, 1979 (10); Fall, 1980 (10); Fall, 1981 (8); Fall, 1982 (5); Fall, 1984 (27); Fall, 1985 (29); Fall, 1986 (33); Fall, 1988 (26); Fall, 1991 (49); Spring, 1993 (36); Fall, 1993 (19); Fall, 1994 (26); Spring, 1996 (54); Fall, 1996 (39); Fall, 1998 (16); Spring, 2002 (18);
- 31:138 Animal Behavior: Spring, 1973 (17); Fall, 1973 (15);
- 31:174 Mind and Behavior: Natural science and cognition after Darwin (with Ringen): Spring, 1994 (14); Spring, 1996 (5); Spring, 1997 (11); Spring, 1998 (13); Spring, 1999 (18); Spring, 2002 (17); Spring, 2004 (20); Fall, 2006 (21); Fall, 2007 (19); Fall, 2008 (26 including 18 freshman in Honors Seminar in Social Sciences);
- 31:180 Current Topics in Psychology: Human, Animal, and Artificial Intelligence: Spring, 1991 (10) with Oden; Cognition in Animals and Infants: Fall, 1998 (10) with Oakes;
- 31:185 Research Practicum in Psychology: Spring, 1984 (1); Spring, 1987 (1); Fall, 1992 (1); Spring, 1993 (1); Spring, 1994 (1); Summer, 1994 (1); Spring, 1995 (1); Spring, 1996 (2); Spring, 1997 (1); Fall, 1997 (1); Spring, 1998 (3); Fall, 1998 (2); Fall, 1999 (1); Spring, 2000 (1); Spring, 2004 (1); Summer, 2004 (1); Fall, 2006 (1); Spring, 2007 (1); Fall, 2007 (1); Spring, 2008 (1); Fall, 2008 (1);
- 31:190 Psychology Seminar: Fall, 2000 (9); Spring, 2003 (17); Fall, 2004 (13); Spring, 2008 (16);
- 31:191 Special Readings and Projects: Fall, 1972 (1); Spring, 1973 (1); Summer, 1973 (1); Fall, 1973 (2); Spring, 1974 (1); Summer, 1974 (3); Fall, 1974 (2); Spring, 1975 (3); Spring, 1976 (1); Summer, 1977 (2); Fall, 1977 (2); Spring, 1978 (2); Spring, 1979 (1); Summer, 1982 (1); Spring, 1983 (1); Spring, 1984 (1); Fall, 1984 (1); Spring, 1985 (1); Fall, 1985 (1); Spring, 1986 (1); Spring, 1988 (1); Spring, 1990 (1); Fall, 1990 (1); Spring, 1991 (1); Fall, 1991 (2); Spring, 1992 (1); Fall, 1993 (2); Spring, 1994 (1); Fall, 1995 (1); Fall, 1996 (1); Summer, 2002 (1); Fall, 2002 (1); Spring, 2003 (1); Fall, 2007 (1);
- 31:195 Honors Seminar: Spring, 1988 (21);
- 31:199 Honors Thesis Research: Spring, 1973 (1); Spring, 1978 (2); Fall, 1979 (1); Summer, 1981 (1); Spring, 1982 (1); Fall, 1982 (1); Summer, 1983 (1); Fall, 1983 (1); Spring, 1984 (1);

- Spring, 1985 (1); Fall, 1985 (1); Fall, 1986 (2); Spring, 1987 (2); Fall, 1987 (2); Spring, 1988 (1); Fall, 1989 (1); Summer, 1990 (1); Fall, 1990 (1); Spring, 1991 (1); Fall, 1992 (1); Spring, 1993 (1); Summer, 1993 (1); Fall, 1993 (2); Spring, 1994 (1); Spring, 1995 (1); Fall, 1995 (1); Fall, 1996 (1); Spring, 1997 (1); Spring, 2004 (1); Fall, 2004 (1); Spring, 2005 (1); Spring, 2006 (1); Spring, 2009 (1);
- 31:221 Motivation and Emotion: Spring, 1979 (3 lectures);
- 31:236 Laboratory Techniques: Summer, 1983 (4);
- 31:237 Experimental Analysis of Behavior: Spring, 1976 (11) with Grisham; Spring, 1977 (16) with Grisham; Spring, 1978 (9) with Grisham; Spring, 1979 (9); Spring, 1980 (2); Spring, 1981 (5); Spring, 1982 (7); Spring, 1983 (6); Spring, 1985 (7); Spring, 1986 (5); Spring, 1987 (1); Spring, 1988 (6); Spring, 1989 (5); Spring, 1990 (7); Spring, 1991 (3); Spring, 1992 (7); Fall, 1992 (3); Spring, 1994 (4); Spring, 1995 (2);
- 31:241 Behavioral and Cognitive Neuroscience I (team taught): Fall, 1996 (10);
- 31:242 Behavioral and Cognitive Neuroscience II (team taught): Spring, 1997 (9); Spring, 2005 (10); Spring, 2007 (5); Spring, 2009 (5);
- 31:244 Behavioral Neuroscience: Spring, 1992 (4) (8 lectures); Spring, 1993 (4) (8 lectures); Spring, 1994 (7) (8 lectures); Spring, 1996 (8) (8 lectures);
- 31:291 Problems in Psychology: Spring, 1975 (1); Spring, 1976 (4) with Randall; Fall, 1976 (1); Spring, 1977 (2); Spring, 1978 (4); Spring, 1983 (2); Summer, 1983 (2); Fall, 1983 (1); Spring, 1984 (2); Spring, 1985 (1);
- 31:295 M.A. Thesis Research in Psychology: Summer, 1975 (1); Spring, 1976 (1); Summer, 1976 (1); Fall, 1976(2); Spring, 1977 (1); Summer, 1977 (1); Fall, 1977 (2); Spring, 1978 (1); Fall, 1982 (1); Spring, 1983 (1); Summer, 1984 (1); Fall, 1984 (1); Spring, 1985 (1); Fall, 1986 (1); Spring, 1987 (1); Summer, 1989 (1); Fall, 1989 (2); Spring, 1990 (2); Fall, 1990 (2); Spring, 1991 (2); Summer, 1991 (1); Fall, 1991 (1); Spring, 1992 (1); Spring, 1993 (2); Spring, 1994 (1); Summer, 1997 (1); Fall, 1997 (1);
- 31:296 Ph.D. Dissertation Research: Spring, 1978 (1); Summer, 1978 (3); Fall, 1978 (3); Spring, 1979 (3); Summer, 1979 (3); Fall, 1979 (2); Spring, 1980 (3); Summer, 1980 (2); Fall, 1980 (2); Spring, 1983 (1); Summer, 1983 (1); Summer, 1984 (1); Fall, 1984 (1); Spring, 1985 (1); Fall, 1985 (1); Spring, 1986 (3); Summer, 1986 (3); Fall, 1986 (2); Spring, 1987 (2); Summer, 1987 (1); Fall, 1987 (1); Fall, 1990 (2); Spring, 1991 (2); Summer, 1991 (1); Fall, 1991 (4); Spring, 1992 (4); Summer, 1992 (1); Fall, 1992 (4); Spring, 1993 (4); Summer, 1993 (3); Fall, 1993 (4); Spring, 1994 (2); Fall, 1994 (1); Spring, 1995 (1); Summer, 1995 (1); Fall, 1995 (2); Fall, 2000 (1); Spring, 2001 (1); Summer, 2001 (1); Fall, 2001 (1); Fall, 2004 (1); Spring, 2005 (1); Summer, 2005 (1); Fall, 2005 (1); Spring, 2006 (1); Summer, 2006 (1); Fall, 2006 (1); Spring, 2009 (1);
- 31:297 Research Projects: Fall, 1972 (2); Spring, 1973 (1); Fall, 1973 (1); Spring, 1974 (1); Summer, 1974 (1); Fall, 1974 (1); Spring, 1975 (1); Fall, 1975 (2); Spring, 1976 (1); Summer, 1976 (1); Fall, 1976 (1); Spring, 1977 (1); Fall, 1980 (1); Fall, 1981 (2); Spring, 1982 (2); Summer, 1982 (2); Fall, 1982 (1); Fall, 1983 (1); Spring, 1984 (1); Fall, 1985 (1); Spring, 1986 (2); Summer, 1986 (1); Fall, 1986 (1); Fall, 1987 (1); Fall, 1988 (2); Spring, 1989 (2); Fall, 1989 (2); Spring, 1990 (2); Summer, 1990 (2); Fall, 1990 (1); Spring, 1991 (1); Summer, 1991 (1); Fall, 1991 (1); Spring, 1992 (1); Summer, 1992 (1); Fall, 1992 (1); Summer, 1994 (1); Fall, 1994 (1); Fall, 1995 (1); Spring, 1996 (1); Summer, 1996 (1); Fall, 1996 (2); Spring, 1997 (1); Fall, 1997 (1); Spring, 1998 (2); Summer, 1998 (1); Fall, 1998 (2); Spring, 1999 (1); Summer, 1999 (1); Fall, 1999 (3); Spring, 2000 (2); Summer, 2000 (2); Fall, 2000 (3); Spring, 2001 (2); Summer, 2001 (1); Fall, 2001 (1); Spring, 2002 (1); Summer, 2002 (1); Fall, 2002 (1); Spring, 2003 (1); Fall, 2005 (1); Spring, 2006 (1); Fall, 2006 (1); Spring, 2007 (2); Fall, 2007 (2); Spring, 2008 (1); Fall, 2008 (2); Spring, 2009 (1);

- 31:331 Behavior Theory Seminar: Fall, 1972 (4); Spring, 1974 (4) with Hinrichs; Spring, 1975 (1 + 2 audit); Fall, 1975 (2) with Randall; Fall, 1976 (9 + 2 audit) with Rosenbaum; Fall, 1977 (8) with Randall; Fall, 1979 (3) with Hinrichs; Fall, 1984 (3) with Randall;
- 31:338 Seminar: Advanced Topics in Behavioral and Cognitive Neuroscience: Summer, 1985 (6); Summer, 1986 (7); Summer, 1987 (8); Summer, 1988 (5); Summer, 1989 (4); Spring, 1990 (5); Summer, 1990 (5); Summer, 1991 (9); Fall, 1991 (9); Summer, 1992 (9); Spring, 1993 (10); Summer, 1993 (11); Summer, 1994 (7); Fall, 1994 with Robinson (8); Summer, 1995 (8); Fall, 1997 (5); Fall, 2000 (8); Spring, 2004 (11); Spring, 2007 (5);
- 33:191 Independent Study for Honors: Spring, 1991 (1);
- 132:305 Neuroscience Research: Fall, 1989 (1); Spring, 1997 (1); Summer, 1997 (1); Fall, 1998 (1);
- 143:040 Honors Studies: Spring, 2007 (1);
- 143:100 Honors Research Practicum: Fall, 2006 (1); Spring, 2009 (1);

Courses Taught at Keio University, Tokyo, Japan:

- Advanced Study of Comparative Psychology II: Summer, 2001 (10)
- Special Topics in Comparative Psychology II: Summer, 2001 (10)

Honors Theses Supervised:

- Craig Waters. Autoshaped nose-poking in rats. 1973.
- Jane Deitchler. Trial grouping effects on second-order autoshaping of the chick's key peck. 1979.
- Mark Larew. Discrimination and retention of stimulus order by pigeons. 1979.
- Kent Cox. The acquisition of two-peck sequences under discriminative control in pigeons. 1980.
- David Slack. Measuring bursts and pauses in the pigeon's pecking response on variable interval schedules. 1981.
- Lucretia Hughes. Effects of diazepam on pigeon discrimination learning. 1982 (with Hinrichs).
- Roxanne Schlapkohl. Persistence of responding on an increasing ratio schedule contrasted with different fixed ratio schedules. 1983.
- Kevin Gregg. Observing behavior by humans. 1983.
- Steven Baldwin. Testing the trace theory of animal short-term memory. 1984.
- Diane Franson. Effects of un signaled changes in response-outcome contingency on human operant behavior. 1985.
- DeAnn Lobmeyer. Preliminaries to foul shooting: Superstitious behavior? 1985.
- John Becker. Human judgments of response-outcome contingency with two active responses. 1986.
- William Reynolds. Categorization of familiar and novel pictorial stimuli by pigeons. 1987.
- John Wallace. Increased punishment responses under counterproductive contingencies. 1987.
- William Sauer. Is there an oddity preference in infants? 1988. (with Quinn).
- Lynne Sebille. The role of good continuation in the perceptual organization of human infants. 1988 (with Quinn).
- David Marchant. Instance-to-category generalization as a critical test of equivalence set formation in pigeons. 1988.
- William Dorner. The influence of preconceptions on judging interevent contingencies. 1988.
- Betsy Carlson. The effects of contour deletion on the discrimination of line drawings by pigeons. 1990.
- Russ Christian. Discrimination of mirror images by pigeons. 1991.
- Sonya Ulrich. Discrimination and generalization along the temporal dimension using the peak procedure in pigeons. 1993.
- Cathy Betti. Temporal discrimination and the peak procedure. 1994.
- Brigette Cook. Stimulus generalization of depth-rotated drawings. 1994.
- Stuart Miller. Temporal control under the peak procedure. 1995.
- Heather Kingery. Depth invariance in pigeon perception. 1997.
- Ingrid Gronstal. Categorical generalization in pigeons. 2005.
- Haley Kemp. Same and different learning in pigeons and humans. 2007.
- John Doyle. Categorical perception in pigeons. 2007.
- Philip Kennedy. Same-different discrimination learning by pigeons. 2008.
- Matthew Manning. Vocabulary learning by pigeons. (Fall, 2009-)

Students Supervised in the Graduate College's Research Opportunities Programs:

Kimberly Knauss. Categorization of trial-unique stimuli in pigeons. Summer, 1986.
 Felicia Hall. Human and animal cognition. Summer, 1994.
 Michelle Marion. Pigeons' recognition of complex object drawings. Summer, 1995.
 Grace Muhammad. Pigeons' recognition of differently sized drawings of objects. Summer, 1995.
 Rhonda Dalrymple. Successive same-different discrimination learning. Summer, 1996.
 Kelvin Garner. Simultaneous same-different discrimination learning. Summer, 1996.
 Rhonda Dalrymple. Successive same-different discrimination learning. Summer, 1997.
 Tamara Barclay. Visual recognition of depth-rotated objects. Summer, 1997.
 Neil Torbert. Visual memory in pigeons and people. Summer, 1999.
 Farrasha Jones. Positive and negative patterning in college students. Summer, 1999.
 Grisselle Betancourt. Same-different discrimination learning by pigeons. Summer, 1999.
 Denise Alexander. Object-based attention in pigeons. Summer, 2003.
 Cristal Martinez. Auditory categorization by pigeons. Summer, 2007.

Students supervised in the Undergraduate Scholars Assistantship Program:

Jane Auh. Causal perception. (Fall, 1986-Spring, 1987)
 Andrew Baker. Fetal alcohol and learning. (Fall, 1987-Spring, 1988; with J. R. West)
 William Dorner. Contingency perception. (Fall, 1987-Fall, 1988)
 Leandro Torres. Fetal alcohol and learning. (Fall, 1989-Spring, 1990; with J. R. West)
 Brad Tucker. Visual perception in pigeons. (Fall, 1990-Spring, 1991)
 Janelle Johnson. Causal perception. (Fall, 1995-Fall, 1998)
 B. J. Terrones. Visual perception in pigeons. (Fall, 1995-Spring, 1999)
 Brigette Robinson. Visual perception in pigeons. (Fall, 1995-Spring, 1995)
 Nicole Hill. Learning and perception in college students. (Fall, 1996-Spring, 1998)
 Raquel Unser. Learning and perception in college students. (Fall, 1999)
 Philip Kennedy. Same-different discrimination learning by pigeons. (Fall, 2007-)

Students supervised from other Graduate Institutions:

Leyre Castro, University of Deusto, Spain (2001)

M.A. Theses Supervised:

- Brian Y. Cooper. Interpolation of the UCS in a one trial per day procedure. 1976 (with Grisham).
- James D. Deich. The acquisition and maintenance of observing responses in pigeons. 1977.
- Keith R. Nelson. Successive matching-to-sample in the pigeon: Proactive and retroactive effects on associative memory. 1978.
- Frederick F. Taylor. The effect of the CS-US interval and the percentage of reinforced trials upon the autoshaped key peck response in pigeons. 1979.
- Danny J. Neunaber. Judgment of contingency and operant responding in depressed and nondepressed college students. 1983 (with O'Hara).
- Gary W. Schroeder. Collateral and operant performance of depressed and nondepressed college students on DRL schedules of reinforcement. 1983 (with O'Hara).
- Veronika T. Guttenberger. Effects of sample duration, retention interval, and time in the test on pigeons' matching-to-sample performance. 1983.
- Ramesh S. Bhatt. Choice behavior of pigeons on progressive and multiple schedules: A test of optimal foraging theory. 1986.
- Shu-Fang Kao. Contingency judgment: The nature of the noncontingency relation and a reexamination of strategy analysis. 1990.
- Carol L. DeVolder. Strategic shift in the prospective and retrospective processing of visual forms. 1990.
- Linda J. Van Hamme. Recognition by components: A comparative analysis of object recognition. 1991.
- Jennifer D. Thomas. Long-term behavioral effects of alcohol exposure during the brain growth spurt in rats: A dose-response study. 1992.
- Joseph L. Gagliardi. Pigeons' perception of stimuli rotated in depth. 1994.

Ph.D. Theses Supervised:

- James D. Deich. Analysis of first- and second-order autoshaping of the chick's keypeck with heat as the unconditioned reinforcer. 1982.
- Lynn Holmes. An experimental analysis of habitat selection in *Tegenaria domestica* (Araneida: Agelenidae). 1982 (with Bovbjerg).
- Keith R. Nelson. A signal detection analysis of successive matching performance in pigeons. 1983.
- Robert E. DeLong. Control of responding by stimulus duration. 1983.
- Danny J. Neunaber. Behavioral and judgmental sensitivity to changes in response-outcome contingencies in depressed and non-depressed individuals. 1986 (with O'Hara).
- Diane L. Chatlosh. Discriminative control by three dimensions of compound stimuli in pigeons: Is the blocking effect confined to redundant relevant cues? 1988. [Winner of the 1986 Don Lewis Dissertation Year Award.]
- Ramesh S. Bhatt. Effects of category size, congruity of training categories with human language categories, and selective attention on multiple-category classification in pigeons. 1988. [Winner of the 1987 Don Lewis Dissertation Year Award.]
- Susan M. Elek. Response to and report of response-outcome contingencies: A developmental study. 1990.
- Shu-Fang Kao. Information integration and associative learning as accounts of contingency judgment. 1993. [Winner of the 1993 Don Lewis Dissertation Year Award.]
- Carol L. DeVolder. Retrospective and prospective memory processes depend on differently distributed neural systems. 1993 (with Tranel).
- Linda J. Van Hamme. Associative and statistical accounts of cue competition in causality judgments. 1994. [Winner of the 1994 Don Lewis Dissertation Year Award and winner of the Outstanding Dissertation Award on Basic Learning Processes from Division 25 of the American Psychological Association.]
- Kimberly K. Kirkpatrick-Steger. The role of object components and their spatial organization in the pigeon's visual recognition of complex line drawings. 1995. [Co-winner of the 1994 K. W. Spence Award and winner of the 1995 Don Lewis Dissertation Year Award. 1997 winner of the Young Investigator Award for papers published in the *Journal of Experimental Psychology: Animal Behavior Processes* from Division 3 of the American Psychological Association. Co-winner of the 1999 Outstanding Dissertation Award on Basic Learning Processes from Division 25 of the American Psychological Association.]
- Jennifer D. Thomas. Behavioral and neuroanatomical effects of brief episodes of alcohol exposure during the brain growth spurt in rats: The importance of time of exposure. 1995. [Co-winner of the 1994 K. W. Spence Award.]
- Jessie J. Peissig. A study of object representation in the pigeon. 2001. [2004 Brenda A. Milner Award winning author of an outstanding paper in the field of behavioral neuroscience or comparative psychology that is written by a member of Division 6 of the American Psychological Association.]
- Andrea J. Frank. 2006. [Co-winner of 2006 Don Lewis Dissertation Year Award; co-winner of 2006 Gormezano Research Award; 2007 Experimental Analysis of Behavior Dissertation Award from Division 25 of the American Psychological Association.]

Postdoctoral Supervision:

Dr. G. A. Lucas (1977-1980)
 Dr. R. A. Hancock (1979)
 Dr. M. W. Olson (1980-1982)
 Dr. M. Katagiri (1993)
 Dr. S. L. Astley (1990-1998)
 Dr. M. E. Young (1995-2000). [Received honorable mentions by Divisions 3 (Experimental Psychology) and 6 (Behavioral Neuroscience and Comparative Psychology) of the American Psychological Association for two different papers published in the *Journal of Experimental Psychology: Animal Behavior Processes*.]
 Dr. B. M. Gibson (2001-2003)
 Dr. O. F. Lazareva (2001-2008)
 Dr. L. Castro (2004-)
 Dr. Y. Nagasaka (2004-2006)

Other Research Supervision:

Steven Schectman (URP, 1973)	Julie Backstrom (SSTP, 1973)
Karen Thompson (SSTP, 1973)	Karen Gutowski (SSTP, 1974)
Linda Nagamatsu (SSTP, 1975)	Steven Cohen (SSTP, 1977)
Sarah Scher (SSTP, 1978)	Virginia Whitney (SSTP, 1979)
Steven Manock (SSTP, 1979)	Maria Moraniec (SSTP, 1980)
Julie Boland (SSTP, 1981)	Maribel Valle (SSTP, 1981)
Amy Roskin (SSTP, 1982)	Jacqueline Freedman (SSTP, 1982)
Sylvia Morgan (SSTP, 1983)	Helene Fields (SSTP, 1984)
David Levy (SSTP, 1985)	Lisa Streisfeld (SSTP, 1985)
Mark Valera (SSTP, 1986)	David Shapiro (SSTP, 1987)
Pic Sayasenh (SSTP, 1988)	Tracey Carter (SSTP, 1989)
Cybill Sigler (SSTP, 1990)	Kelley Burgess (SSTP, 1991)
Jennifer Chan (SSTP, 1991)	Jerry Lin (SSTP, 1992)
Steven Shin (SSTP, 1992)	Adam Simon (City High School, 1992-93)
Cristina Garcia (SSTP, 1994)	Raylesha Burton (SSTP, 1995)
Shareena Mundodi (SSTP, 1995)	Rebecca Schiff (SSTP, 1996)
Chinazor Okasi (SSTP, 1997)	Sana Hong (SSTP, 1998)
Lauren Feigenbaum (SSTP, 1999)	Beki Cohen (SSTP, 2000)
Ilana Jerud (SSTP, 2001)	Nicole Ambrosio (SSTP, 2002)
Jonathan Levin (SSTP, 2002; Intel Semifinalist)	Jennifer Zhao (SSTP, 2003)
Morgan Figa (SSTP, 2004)	Jessica Wasserman (SSTP, 2004)
Diane Cai (SSTP, 2005)	Marissa Fox (SSTP, 2006; Intel Semifinalist)
Neel Doshi (SSTP, 2007)	

Honors Committee Service:

M. Gaffey (Bechtoldt, 1974); E. Walker (Grisham, 1975); T. Mueller (Blumberg, 1995);

M.A. and Research Advisory Committee Service:

C. Kelley (Knutson, 1972); R. Swenson (Randall, 1974); J. Elbin (Randall, 1974); K. Simansky (Harvey, 1975); C. Gibbs (Gormezano, 1976); E. Shrager (Johnson, 1976); K. Wahlstrand (Knutson, 1977); DeLong (Grisham, 1978); M. Bensenberg (Gormezano, 1979); E. Anderson (Knutson, Routh, 1980); R. Viken (Knutson, 1981); D. Recher (Hegmann, 1981-Zoology); C. Gundaker (Hegmann, 1981-Zoology); L. Ohman (Johnson, 1982); L. Winsky (Harvey, 1983); T. Cunningham (Randall, 1984); S. Aicher (Randich, 1987); A. Nowak (Gormezano, 1988); D. Meyerson (Knutson, 1988); K. Kirkpatrick-Steger (Gormezano, 1992); M. Cicha (Johnson, 1993); M. Henry (Johnson, 1993); Ed Vogel (Luck); Greta Sokoloff (Blumberg); Dan Nicholson (Freeman);

Ph.D. Committee Service:

C. Poulos (Gormezano, 1974); R. Tait (Gormezano, 1974); M. Trulson (Randall, 1974); E. J. Kehoe (Gormezano, 1976); J. Sorenson (Harvey, 1976); N. Kane (Knutson, 1977); F. Gersh (Weerts, 1978); B. Cooper (Randall, 1978); K. Simansky (Harvey, 1979); E. Edmon (Grisham, 1978); Lucki (Grisham & Harvey, 1979); C. Gibbs (Gormezano, 1978); E. Shrager (Johnson, 1981); F. Gordon (Johnson, 1979); C. Hutz (Cantor, 1980-Ed. Psych. Comps.); K. Perkins (Fowles, 1981); R. Jones (Amada, 1981-Music); W. Lind (Johnson, 1981); D. Tranel (Fowles, 1982); R. Viken (Knutson & Johnson, 1982); B. Schreurs (Gormezano, 1983); L. Ohman (Johnson, 1984); L. Winsky (Harvey, 1984); C. Norton (Hegmann, 1985-Zoology); R. Johnson (Randall, 1985); D. Pierce (West, 1985-Anatomy); C. Kao (Baron, 1986); T. Cunningham (Johnson, 1988); S. Aicher (Randich, 1988); A. Nowak (Gormezano, 1990); B. Hallowell (Hurtig, 1991-Speech Pathology and Audiology); D. Meyerson (Knutson, 1992); Dean Yoshizumi (Levin, 2000);

Service

Departmental Administration:

General Experimental Psychology Committee	1972-1975
Shop Committee	1972-1973
Undergraduate Curriculum Committee	1972-1973
Animal Facilities and Care Committee	1972-1973
Shop and Animal Care Committee, Chair	1974-1976
Animal Care Committee	1976-1978
Animal Welfare	1989-
Chair	1989-2000
Behavioral and Cognitive Neuroscience Training Area	1975-
Coordinator	1977-1978
	1989-1995
Committee on Graduate Studies	1977-1978
	1989-1995
Coordinator of Graduate Studies	1990-1993
Shop and Equipment Committee	1979-1980
Chair	1984-1985
Committee on Undergraduate Studies	1980-1988
Coordinator of Undergraduate Studies	1986-1988
Associate Chair	1988-1989
Faculty Advisory Committee	1989-1990
	2003-2005
Ad Hoc Committee on Joint Appointments	1990
Ad Hoc Committee on Strategic Planning	1995-

Liberal Arts Collegiate Assignments:

Rhetoric Coordinating Committee	1981-1983
Quantitative or Formal Reasoning Coordinating Committee	1987-1990
Computer Science Review Committee	1989
Faculty Assembly (Elected member)	1991-2000
Advisory Committee on Faculty Promotion and Tenure	1991-1993
Scholarship Committee	1995-1997
Chair	1995-1996
Executive Committee	2000-2003
Named Chairs/Professorships Ad Hoc Committee	2003-2008

University Assignments:

Neurobehavioral Sciences Program	1974-1985
Neuroscience Program	1988-
University Animal Care and Use Committee	1978-1982
	1991-1994
Ad Hoc Committee for Per Diem Rates	1994
University Research Council	1980-1983
Human Subjects Review Committee C	1982-1985
Computer Operations Working Committee	1982-1985
Hancher Auditorium Advisory Committee	1992-1995
	1996-1999

FIPSE Planning Committee	1994-1997
Faculty Scholar Review Committee	1996, 2003
Chair, Search Committee for Associate Provost for Faculty Personnel and Development	1998
Presidential Committee on Athletics	2004-2009
Academic Achievement Advisory Subcommittee	2004-2009
Finance and Facilities Subcommittee	2004-2009

Faculty Governance:

Faculty Senate	1996-2002
	2008-2011
Vice President	1996-1997
President	1997-1998
Past President	1998-1999
Faculty Council	1996-1999
Budget Planning Committee	1996-1999
Committee on Committees	1996-1999
Governmental Relations Committee	1996-1999
Post Tenure Effort Allocation Committee	1996-1997
President's Council on Institutional Advancement	1996-1998

Community Service:

Animal Protection League, Johnson County Humane Society	1974-1976
Pals Program	1977-1982
Big Brothers/Big Sisters--Finance and Planning Board	1982-1985
Chair, Finance and Planning Board	1984-1985
Executive Committee	1984-1985
Eastern Iowa Science and Engineering Fair (EISEF): Senior High School Biology Judge	2003