PG 8510: CONTEXT AND CONSEQUENCES OF BEHAVIOR.

COURSE SYLLABUS

Christopher Newland, Ph.D.

(Spring, 2004)

Course:	PG 8510. Context and Consequences of Behavior.
Prerequisites:	Conditioning and Learning.
Meeting Times:	Room 202 Thach Hall Monday, Wednesday. 3:15-4:30
Text:	Readings from the primary and secondary literature. Available in mail room.
Instructor:	Christopher Newland, Ph.D.
Office Hours:	M, W, 1:00-3:00 or by appointment.
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Overview and Course Objectives. We will examine the roles that the consequences of behavior, and the context in which behavior occurs, play in the acquisition, maintenance, and structure of behavior. As befits a graduate seminar we will work on the assumption that you have some background knowledge of the principles of operant and respondent conditioning. We will spend much time on methods, measurement, and quantification, all of which lie behind the phenomena covered in more elementary courses. We will also examine some of the integrative theories, including the matching relation. Topics will include response differentiation and induction, the generation of complex response units, contextual control, stimulus equivalence, respondent conditioning, choice, molecular determinants of behavior, mathematical models of behavior, and the dynamics of behavior during transition states.

We will examine some approaches to linking the analysis of behavior to neural function. This will occur in several places through the course, where topics that we cover at the level of behavior will be extended to some aspect of nervous system function. Toward the end of the course will spend a week or so on neural mechanisms of choice, an area that might provide an interesting nexus of two bodies of literature.

Course Structure. The course will be structured as a seminar based upon the primary literature and focused literature reviews. Through the course of the term we will review the topics and papers listed on the syllabus. For some topics, a review has been identified that covers the literature and current thinking on a topic. The instructor will cover these, unless someone is interested in doing so (it's a great way to learn the background). These reviews are thematic, generally have a theoretical position to advance, and are grounded in data. Indeed, many of them present experiments in some detail. Therefore, we will let the review summarize a topic and provide a perspective on it. Some papers from the primary literature will also be covered during a section. These will be papers representing the experimental approach to a topic, or they will be recent papers on a topic.

Where it is helpful, I will introduce an area by leading a discussion of a review in class. All other papers will be presented by students. Come to class prepared to discuss the literature reviews and papers. Primary papers (reports of experiments) will be presented by students. In most cases we will devote 40 minutes to each paper. Presenters must organize the presentation carefully in order to present the key points, promote and leave time for discussion. By this I mean that you should be able to present the authors' rationale, the methods, results, and conclusions with skeletal notes. *Do not read highlighted sections directly from the paper.* Powerpoint is available if you find it helpful.

In your discussion of a topic be thorough, concise, and clear. Try the *"tell'em*" strategy: "tell 'em what your going to tell 'em, tell 'em, and tell 'em what you told 'em." Set up each paper by summarizing what question is being addressed, why it is an important question, and the methods used to address it, what was found, and what it says about structure and mechanism of behavior. *It is the presenter's responsibility to provide the background material required to understand the paper*. This usually means consulting a good conditioning text or, sometimes, going to the library to read papers referred to prominently. Keep all discussion focused on what was done, what happened, and how this was interpreted. Describe all procedures carefully: say what was done and what happened. *Always* place all behavior in the context of the environmental events such as three-term contingency of reinforcement or the contingencies of respondent conditioning. This may be difficult at first, but it is worth the effort. **We will not tolerate folksy descriptions of behavior**, but instead, will respect the spirit of Lloyd Morgan's canon:

> *In no case may we interpret an action as the outcome of the exercise of a higher psychical faculty, if it can be interpreted as the outcome of the exercise of one which stands lower in the psychological scale.* (From Morgan, C.L. (1894), An Introduction to Comparative Psychology. London: Walter Scott.)

Everybody not presenting a paper or review should submit at least one question, comment, extension, or interpretation of the papers to be covered. These should be submitted by 11:00 A.M. on the day of class. These can be submitted on the WebCT page I set up for this course. If something is confusing or needs clarification then ask it. Presenters should review these items before class. Questions questions/observations may be read to the class to promote discussion. Good questions will be those that generate discussion.

Evaluation. Course grade will be a simple average of all the "exams." An initial draft of take-home exams will be posted on the WebCT site by 21 Jan. These may be modified depending on class discussions. These will comprise questions about the readings. Since the exams will be distributed early in the class, you can work on them as we cover the materials. The other "exams" will be based on class participation as indicated below:

- Exam 1. Response differentiation. Due 9 Feb
- Exam 2. Contextual control. Due 13 March.
- Exam 3. Aversive control and respondent conditioning. Due 17 March
- Exam 4. Choice. Due 24 April.
- Exam 5. Other developments. Due 6 May

- Exam 6. The grade on exam 6 will depend on the quantity and quality of questions/comments that you turn in. If you turn in something for 90% of the readings then your grade on this exam will be an A. If you turn in something for 80% then the grade will be a B, and so forth.
- Exam 7. Presentations. The grade for this exam will be based your presentations.
- Subjective factor, based on your classroom participation. Up to three points on the final grade.

Following are some of the criteria used to evaluate the presentations:

-- Clear and succinct description of the research question and coverage of the points listed above.

-- Clear description of the methods. (include *important* details, not all details).

-- Graphical presentation of the results. Whether you use the board, powerpoint, or the overhead projector is up to you. If you use powerpoint, avoid floral, distracting slides. Keep in simple, clear, and clean. Data matter. *Fleur de lis* don't.

-- Presentation of the author's conclusions.

-- The extent to which you go beyond the paper and incorporate what you know, or what you are learning in this course. This can be in the form of critical comment on weaknesses, unanswered questions raised, further research prompted by this experiment, or extensions to understanding human behavior or application.

Following are some of the criteria for evaluating participation of those not presenting:

-- Clear evidence that you have read the paper.

-- Questions asked and points of discussion raised.

-- Insights about how two or more of the papers tie together (especially relevant for those with no responsibilities to present during a class).

-- Participation in discussion.

Students with Disabilities. Students with a disability documented by Auburn's Program for Students with Disabilities should schedule a meeting with me early in the term. I will work with the student to meet the accommodations recommended by the Program for Students with Disabilities.

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Daily Schedule (Spring 2004)

Class Date	Class Number	Topic	Readings	Presenter
14-Jan-2004	1	The selectionistic view of voluntary behavior	[1]	
Monday 19 Jan		No class. Martin Luther King holiday.		
Response Differentiation and Induction				
21 Jan	2	The physical properties of the operant	[2] [3]	Mandi John
Monday 26 Jan	3	Characteristics of complex response units.	[4] [5]	Newland Michelle
28 Jan	4	The role of reinforcement contingencies.	[6] [7]	Miranda Tyson
Monday 2 Feb	5	Bouts of behavior Shaping in the face of CNS impairment	[8] [9] [10]	Wendy Donlin Kim
Contextual Control Over Behavior				
4 Feb	6	Control by complex stimuli	[13] [14]	Kent Tyson
Monday 9 Feb	7	*First exam due* Stimulus equivalence	[15] [16]	Kent Trish
11 Feb	8	Control by previously presented stimuli	[17] [18]	Todd Ryan
Monday 16 Feb	9	Complex response units.	[19] [20]	Newland Todd
18 Feb (No Class)				

Class Date	Class Number	Topic	Readings	Presenter
Monday 23 Feb	10	Contextual control and the basal ganglia	[21] [22]	Seth John
Aversive Control				
25 Feb	11	Introductory comments Maintenance by shock-frequency reduction	[23] [24]	Newland (intro) Michelle
Monday 1 Mar	12	Safety signals and other stimuli.	[25] [26]	Trish Todd
Respondent Conditioning				
3 Mar	13	Second order conditioning	[27] [28]	??? Tyson
Monday 8 Mar	14	Operant/Respondent interactions	[29] [30]	Kent Seth
Choice				
10 Mar	15	The strict matching relation and its disconfirmation.	[31] [32]	Newland Mandi
Monday 15 Mar	16	The generalized matching relation	[33] [34] [35]	Newland Miranda Ryan
17 Mar	17	Overflow. Matching is an artifact of the changeover delay?	[36]	Michelle
Monday 22 Mar	18	Hedonic scaling Choice and signal detection.	[37] [38]	Seth John
24 Mar	19	Choice and remembering	[39] [40]	Kim Ryan

Class Date	Class Number	Topic	Readings	Presenter
29, 31 Mar		(spring break)		
Monday 5 Apr	20	Allocation of individuals by groups.	[41] [42]	?? ???
7 Apr NO CLASS				
Monday 12 Apr	21	Choice in a variable environment.	[43]	Mandi
14 Apr	22	Introductory comments Reductionism: Cortical mechanisms of choice.	[44] [45]	Newland (intro) Michelle
Monday 19 Apr	23	Cortical mechanisms of choice.	[46] [47]	???? Kim
Some other developments.				
21 Apr	24	Behavioral momentum Behavioral ecomics	[48]	Miranda Newland
Monday 26 Apr	25	Behavioral economics	[49]	Newland
28 Apr	26	Behavioral economics	[50] [51]	Trish Tod
Monday 3 May	27	An integrated theory of behavior	[52]	Class
8:00 a.m. THURS DAY, 6 MAY	FINAL EXAM DAY.	An integrated theory, con't.		

1. Skinner, B. F. (1981). Selection by consequences. *Science, 213*(4507), 501-504.

2. Eckerman, D. A., Hienz, R. D., , S. S., & Kowlowitz, V. (1980). Shaping the location of pigeon's peck: Effect of rate and size of shaping steps. *Journal of the Experimental Analysis of Behavior, 33*, 299-310.

3. Zeiler, M. D., Davis, E. R., & DeCasper, A. J. (1980). Psychophysics of key-peck duration in pigeons. *Journal of the Experimental Analysis of Behavior, 34*, 23-34.

4. Marr, M. J. (1979). Second-order schedules and the generation of unitary response sequences. In M. D. Zeiler & P. Harzem (Eds.), *Advances in the analysis of behavior. Vol 1. Reinforcement and the organization of behavior.* (pp. 223-260). New York: Wiley.

5. Page, S., & Neuringer, A. (1985). Variability is an operant. *Journal of the Experimental Analysis of Behavior, 11*, 429-452.

6. Kuch, D. O. P., John R. (1976). Reinforcement rate and interresponse time differentiation. *Journal of the Experimental Analysis of Behavior, 26*(3), 471-486.

7. Galbicka, G., & Platt, J. R. (1984). Interresponse-time punishment: A basis of shock-maintained behavior. *Journal of the Experimental Analysis of Behavior, 41*, 291-308.

8. Shull, R. L. G., Scott T; Grimes, Julie A. (2001). Response rate viewed as engagement bouts: Effects of relative reinforcement and schedule type. *Journal of the Experimental Analysis of Behavior, 75*(3), 247-274.

9. Taub, E., & Berman, A. J. (1968). Movement and learning in the absence of sensory feedback., *The neuropsychology of spatially oriented behavior.* (pp. 173-192). Homewood, IL: Dorsey.

10. Taub, E., Miller, N. E., Novack, T. A., Cook, E. W., 3rd, Fleming, W. C., Nepomuceno, C. S., Connell, J. S., & Crago, J. E. (1993). Technique to improve chronic motor deficit after stroke. *Archives of Physical Medicine & Rehabilitation, 74*(4), 347-354.

11. Hearst, E. (1962). Concurrent generalization gradients for food-controlled and shock-controlled behavior. *Journal of the Experimental Analysis of Behavior, 5*, 19-31.

12. Honig, W. K., & Slivka, R. M. (1964). Stimulus generalization of the effects of punishment. *Journal of the Experimental Analysis of Behavior, 7*, 21-25.

13. Herrnstein, R. J. (1979). Acquisition, generalization, and discrimination reversal of a natural concept. *Journal of Experimental Psychology: Animal Behavior Processes, 5*(2), 116-129.

14. Carter, D. E., & Eckerman, D. A. (1975). Symbolic matching by pigeons: Rate of learning complex discriminations predicted from simple discriminations. *Science, 187*(4177), 662-664.

15. Sidman, M., Wynne, C. K., Maguire, R. W., & Barnes, T. (1989). Functional classes and equivalence relations. *Journal of the Experimental Analysis of Behavior, 52*, 261-274.

16. DeGrandpre, R. J., Bickel, W. K., & Higgins, S. T. (1992). Emergent equivalence relations between interoceptive (drug) and exteroceptive (visual) stimuli. *Journal of the Experimental Analysis of Behavior, 58*(1), 9-18.

17. Wenger, G. R., & Wright, D. W. (1990). Disruption of performance under a titrating matching-to-sample schedule of reinforcement by drugs of abuse. *Journal of Pharmacology & Experimental Therapeutics, 254*(1), 258-269.

18. White, K. G., & McKenzie, J. (1982). Delayed stimulus control: Recall for single and relational stimuli. *Journal of the Experimental Analysis of Behavior, 38*(3), 305-312.

19. Newland, M. C., & Marr, M. J. (1985). The effects of chlorpromazine and imipramine on rate and stimulus control of matching to sample. *Journal of the Experimental Analysis of Behavior, 44*, 49-68.

20. Thompson, D. M., & Moerschbaecher, J. M. (1979). An experimental analysis of the effects of d-

amphetamine and cocaine on the acquisition and performance of response chains in monkeys. *Journal of the Experimental Analysis of Behavior, 32*, 433-444.

21. Laties, V. G., & Weiss, B. (1966). Influence of drugs on behavior controlled by internal and external stimuli. *Journal of Pharmacology and Experimental Therapeutics, 152*, 388-396.

22. Flowers, K. (1978). Lack of prediction in the motor behavior of parkinsonism. *Brain, 101*, 35-52.

23. Perone, M., & Galizio, M. (1987). Variable-interval schedules of timeout from avoidance. *Journal of the Experimental Analysis of Behavior, 47*, 97-113.

24. Herrnstein, R. J., & Hineline, P. N. (1966). Negative reinforcement as shock-frequency reduction. *Journal of the Experimental Analysis of Behavior, 9*, 421-430.

25. Badia, P., Harsh, J., Coker, C. C., & Abbott, B. (1976). Choice and the dependability of stimuli that predict shock and safety. *Journal of the Experimental Analysis of Behavior, 26*, 95-111.

26. Mueller, K. L., & Dinsmoor, J. A. (1984). Testing the reinforcing properties of s-: A replication of lieberman's procedure. *Journal of the Experimental Analysis of Behavior, 41*(1), 17-25.

27. Ross, R. T. (1986). Pavlovian second-order conditioned analgesia. *Journal of Experimental Psychology: Animal Behavior Processes, 12*(1), 32-39.

28. Bitterman, M. E., Menzel, R., Fietz, A., & Schafer, S. (1983). Classical conditioning of proboscis extension in honeybees (apis mellifera). *Journal of Comparative Psychology, 97*(2), 107-119.

29. Williams, D. R., & Williams, H. (1969). Automaintenance in the pigeon: Sustained pecking despite contingent nonreinforcement. *Journal of the Experimental Analysis of Behavior, 12*, 511-520.

30. Gibbon, J., & et al. (1977). Trial and intertrial durations in autoshaping. *Journal of Experimental Psychology: Animal Behavior Processes, 3*(3), 264-284.

31. Herrnstein, R. J. (1970). On the law of effect. *Journal of the Experimental Analysis of Behavior, 13*, 243-266.

32. McDowell, J. J., & Dallery, J. (1999). Falsification of matching theory: Changes in the asymptote of herrnstein's hyperbola as a function of water deprivation. *Journal of the Experimental Analysis of Behavior, 72*(2), 251-268.

33. Baum, W. M. (1979). Matching, undermatching, and overmatching in studies of choice. *Journal of the Experimental Analysis of Behavior, 32*(2), 269-281.

34. Baum, W. M. (1974). On two types of deviation from the matching law: Bias and undermatching. *Journal of the Experimental Analysis of Behavior, 22*, 231-242.

35. Baum, W. M., & Rachlin, H. C. (1969). Choice as time allocation. *Journal of the Experimental Analysis of Behavior, 12*, 861-874.

36. Todorov, J. C. (1971). Concurrent performances: Effect of punishment contingent on the switching response. *Journal of the Experimental Analysis of Behavior, 16*, 51-62.

37. Miller, H. L. (1976). Match-based hedonic scaling in the pigeon. *Journal of the Experimental Analysis of Behavior, 26*, 335-347.

38. Alsop, B., & Davison, M. (1991). Effects of varying stimulus disparity and the reinforcer ratio in concurrent schedule and signal-detection procedures. *Journal of the Experimental Analysis of Behavior, 56*, 67-80.

39. White, K. G., & Wixted, J. T. (1999). Psychophysics of remembering. *Journal of the Experimental Analysis of Behavior, 71*(1), 91-113.

40. McCarthy, D. C., & Davison, M. D. (1991). The interaction between stimulus and reinforcer control on remembering. *Journal of the Experimental Analysis of Behavior, 86*, 51-66.

41. Baum, W. M., & Kraft, J. R. (1998). Group choice: Competition, travel, and the ideal free distribution.

Journal of the Experimental Analysis of Behavior, 69, 227-245.

42. Kraft, J. R., & Baum, W. M. (2001). Group choice: The ideal free distribution of human social behavior. *Journal of the Experimental Analysis of Behavior, 76*(1), 21-42.

43. Davison, M., & Baum, W. M. (2000). Choice in a variable environment: Every reinforcer counts. *Journal of the Experimental Analysis of Behavior, 74*(1), 1-24.

44. Tremblay, L., & Schultz, W. (1999). Relative reward preference in primate orbitofrontal cortex.[comment]. *Nature, 398*(6729), 704-708.

45. Salamone, J. D., Arizzi, M. N., Sandoval, M. D., Cervone, K. M., & Aberman, J. E. (2002). Dopamine antagonists alter response allocation but do not suppress appetite for food in rats: Contrast between the effects of skf 83566, raclopride, and fenfluramine on a concurrent choice task. *Psychopharmacology, 160*(4), 371-380.

46. Kheramin, S., Body, S., Mobini, S., Ho, M. Y., Velazquez-Martinez, D. N., Bradshaw, C. M., Szabadi, E., Deakin, J. F., & Anderson, I. M. (2002). Effects of quinolinic acid-induced lesions of the orbital prefrontal cortex on inter-temporal choice: A quantitative analysis. *Psychopharmacology, 165*(1), 9-17.

47. Paulus, M. P., Hozack, N., Frank, L., Brown, G. G., & Schuckit, M. A. (2003). Decision making by methamphetamine-dependent subjects is associated with error-rate-independent decrease in prefrontal and parietal activation. *Biological Psychiatry, 53*(1), 65-74.

48. Nevin, J. A., Mandell, C., & Atak, J. R. (1983). The analysis of behavioral momentum. *Journal of the Experimental Analysis of Behavior, 39*, 49-59.

49. Hursh, S. R. (1980). Economic concepts fo the analysis of behaivor. *Journal of the Experimental Analysis of Behavior, 34*, 219-238.

50. Collier, G., Johnson, D. F., & Morgan, C. (1992). The magnitude-of-reinforcement function in closed and open economies. *Journal of the Experimental Analysis of Behavior, 57*, 81-89.

51. Rodefer, J. S., & Carroll, M. E. (1996). Progressive ratio and behavioral economic evaluation of the reinforcing efficacy of orally delivered phencyclidine and ethanol in monkeys: Effects of feeding conditions. *Psychopharmacology, 128*(3), 265-273.

52. Davison, M., & Nevin, J. A. (1999). Stimuli, reinforcers, and behavior: An integration. *Journal of the Experimental Analysis of Behavior, 71*(3), 439-482.