

**A Festschrift in Honor of
Alice F. Healy
College Professor of Distinction
June 7-8, 2014
Boulder, Colorado**



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Professor Healy received her Ph.D. in psychology from The Rockefeller University in 1973. She was Assistant Professor and then Associate Professor in the Department of Psychology at Yale University from 1973 to 1981. She joined the faculty of the Department of Psychology at the University of Colorado Boulder in 1981 as Associate Professor, was promoted to Professor in 1984, and was named College Professor of Distinction in 2007.

During her career Dr. Healy has served as a member of the Basic Behavioral Processes Research Review Committee of the National Institute of Mental Health (1979-1981), as a member of the Governing Board (1987-1992) and Publications Committee (1989-1994) of the Psychonomic Society, and as a member of the Executive Committee (1989-1992 and 2001-2004) of Division 3 (Experimental Psychology) of the American Psychological Association (APA). She served as Chair

of the Psychology Section of the American Association for the Advancement of Science (AAAS) (1995-1996), as President of the Rocky Mountain Psychological Association (1994-1995), as President of APA Division 3 (2004-2005), and as Chair of the Society of Experimental Psychologists (SEP) (2008-2009). She also served as Associate Editor of the ***Journal of Experimental Psychology: Learning, Memory, and Cognition*** (1981-1984) and as Editor of ***Memory & Cognition*** (1986-1989). She is a fellow of the APA (1984, Divisions 1 and 3), the American Psychological Society (1989), the AAAS (1989), and the SEP (1997).

Dr. Healy has received grants or contracts from the National Institute of Mental Health, the National Science Foundation (NSF), the Spencer Foundation, the National Aeronautics and Space Administration (NASA), the United States Air Force, the United States Navy, and the United States Army. In addition, she received a James McKeen Cattell Fund Sabbatical Award, faculty fellowships from Yale University and the University of Colorado, and a college scholar award from the University of Colorado. She is currently Principal Investigator of grants from NSF, NASA, and the American Literacy Council.

Dr. Healy has published 250 articles and chapters in professional journals and books and is a co-author of the textbook ***Cognitive Processes*** (2nd ed., 1986) and of the trade book ***Train Your Mind for Peak Performance: A Science-Based Approach for Achieving Your Goals*** (2014). Dr. Healy is also a co-editor of the two-volume series ***Essays in Honor of William K. Estes*** (1992), of ***Learning and Memory of Knowledge and Skills*** (1995), of ***Foreign Language Learning: Psycholinguistic Studies on Training and Retention*** (1995), of ***Training Cognition: Optimizing Efficiency, Durability, and Generalizability*** (2012), and of the ***Experimental Psychology*** volume of the ***Handbook of Psychology*** (2003 and 2013). She is also editor of the volume ***Experimental Cognitive Psychology and its Applications*** (2005).

Dr. Healy is currently the Director of the Center for Research on Training, which is affiliated with the Institute of Cognitive Science and the Department of Psychology and Neuroscience at the University of Colorado. Her research interests include memory and cognitive processes, especially training, long-term retention, reading, short-term memory, psycholinguistics, and political decision-making.

All events will be at the University of Colorado Boulder.
All events take place in the **Gold/MCDB Biosciences A2B70** unless otherwise noted.

CONDENSED AGENDA

Saturday, June 7

- 8:30 – 9:30 **Speaker and Out-of-Town Check-In and Continental Breakfast
in Muenzinger Psychology E214**
- 9:45 – 10:00 **Introductory Remarks**
- 10:00 – 10:25 **Erica Wohldmann**
Associate Professor
Department of Psychology, California State University, Northridge
- 10:30 – 10:55 **Robert A. Bjork**
Distinguished Research Professor
Department of Psychology, University of California Los Angeles
- 11:00 – 11:25 **Robert W. Proctor**
Distinguished Professor
Department of Psychological Sciences, Purdue University
- 11:30 – 1:30 **Group Photo; Lunch**
- 1:30 – 1:55 **Henry L. Roediger III**
James S. McDonnell Distinguished University Professor
Department of Psychology, Washington University
- 2:00 – 2:25 **Immanuel Barshi**
Research Psychologist
Human Systems Integration Division, NASA
- 2:30 – 2:55 **Richard Gerrig**
Professor
Psychology Department, State University of New York, Stony Brook
- 3:00 – 3:30 **Break; Snack in Muenzinger Psychology E214**
- 3:30 – 3:55 **Richard Shiffrin**
Luther Dana Waterman Professor of Cognitive Science
Department of Psychological and Brain Sciences, Indiana University
- 4:00 – 4:25 **Timothy P. McNamara**
Professor and Vice Provost for Faculty and International Affairs
Department of Psychological Sciences, Vanderbilt University
- 4:30 – 4:55 **James Koe**
Assistant Professor
Department of Psychology, University of Northern Colorado
- 6:00 – 9:00 **Dinner in University Memorial Center 235**

Sunday, June 8

- 8:30 – 9:30 **Continental Breakfast in Muenzinger Psychology E214**
- 9:00 – 10:15 **Poster Session**
- 10:30 – 10:55 **James S. Nairne**
Reece McGee Distinguished Professor
Department of Psychological Sciences, Purdue University
- 11:00 – 11:25 **Elizabeth Ligon Bjork**
Professor
Department of Psychology, University of California Los Angeles
- 11:30 – 11:55 **Danielle S. McNamara**
Professor
Department of Psychology, Learning Sciences Institute, Arizona State University
- 12:00 – 12:15 **Closing Remarks**

FULL AGENDA WITH ABSTRACTS

Saturday, June 7

8:30 – 9:30 **Speaker Check in and Continental Breakfast in Muenzinger**

Psychology E214

9:45 – 10:00 **Introductory Remarks**

Erica Wohldmann (Associate Professor, Department of Psychology, California State University, Northridge)

10:00 – 10:25 Erica Wohldmann (Associate Professor, Department of Psychology, California State University, Northridge)

Planting a Seed: Applications of Cognitive Principles for Improving Food Choices

Dining out poses challenges to healthy eating because ingredients and nutrition information are often unavailable. Unfortunately, estimates of quantitative information are often poor; however, the seeding paradigm improves quantitative estimates in domains such as distances and population (e.g., Brown & Siegler, 1993). Wohldmann (2013) applied seeding to calories and found that it promoted learning of single foods (e.g., apple) and transfer to new single foods (e.g., orange). In addition, seeding promoted learning of whole meals (e.g., spaghetti and meatballs) and transfer to new whole meals (e.g., pizza). The present experiment examined transfer from single foods to other single foods as well as to whole meals. During familiarization, 48 participants estimated the calories in 30 single foods and 30 whole meals. During training, participants were shown 30 different single foods four times each in mixed blocks. Participants in the control condition saw and read aloud only the name of each item; those in the viewing condition saw and read aloud both the name and the calorie content of each item; and those in the seeding condition saw and read aloud the name of each item and estimated the calorie content before being shown actual calorie counts. During testing, participants estimated the calories of both single foods and whole meals, including both old and new items. Participants in the seeding and viewing conditions showed more learning and transfer than those in the control condition. The results will be discussed in the context of practical applications and theoretical implications to learning and transfer.

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- 10:30 – 10:55 Robert A. Bjork (Distinguished Research Professor, Department of Psychology, University of California Los Angeles)
Authors: Robert A. Bjork and Judith F. Kroll
- Desirable Difficulties in Vocabulary Learning***
- Desirable difficulties* (Bjork, 1994) refer to manipulations of the conditions of learning that create challenges for learners and appear to slow the rate of learning, but then enhance long-term retention and transfer. In the domain of foreign-language vocabulary learning, for example, Alice Healy and her collaborators (e.g., Schneider, Healy, & Bourne, 2002) found that when learning involves the more difficult translation direction – that is, having to produce the foreign word rather than having to produce the English word – forgetting across one week was reduced and savings during relearning was enhanced. In this paper we discuss these and related findings in which having learners confront certain difficulties enhances foreign-language learning and we speculate as to why confronting such difficulties triggers processes that support retention and transfer.
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- 11:00 – 11:25 Robert W. Proctor (Distinguished Professor, Department of Psychological Sciences, Purdue University)
Authors: Robert W. Proctor and Jing Chen
- Influence of Action-Effect Feedback on Learning and Performance of a Key-Pressing Task***
- Beginning early in the 21st century, researchers have extensively studied action effects, or events that are produced as a consequence of a response. We noticed that a much earlier study by Morin and Grant (1955), which showed that response times are a decreasing function of the degree of correspondence between stimulus and response locations, also included action effects. For an 8-choice task, when one of the response keys was pressed, a feedback light was lit in a row below the stimulus lights, according to the mapping of stimulus locations to responses. A correct response was thus signaled when the feedback light corresponded with the stimulus location to which the participant was responding. After several practice sessions, the feedback lights were removed in a transfer session, and response times lengthened greatly, indicating reliance on the feedback. We revisited Morin and Grant's paradigm, examining the influence on performance during acquisition and transfer of task difficulty, reliability of the visual feedback, and task instructions. Our results showed: 1) decreased task difficulty resulted in superior performance not only in the practice sessions but also in the transfer session, indicating better learning of the stimulus-response mapping and less reliance on the feedback in the easy task than in the difficult task; 2) unreliable visual feedback reduced

participants' reliance on the feedback but led to better performance in the transfer session; 3) task instructions emphasizing that the mapping was to be learned or that there would be a later test did not affect participants' performance in the transfer session.

11:30 – 1:30 **Group Photo; Lunch**

1:30 – 1:55 Henry L. Roediger III (James S. McDonnell Distinguished University Professor, Department of Psychology, Washington University)
Authors: Henry L. Roediger III and K. Andrew DeSoto

Forgetting the Presidents

One of Alice's all-time favorite experiments is the Roediger and Crowder (1976) report of the serial position curve in recall of U.S. Presidents. They found regular primacy and recency effects in recall of first and last presidents, and they also showed an apparent "isolation" effect for Lincoln (with spread of effect to surrounding presidents). Alice conducted several experiments based on ours, reaching rather different conclusions (e.g., that we were dead wrong in our interpretation). Nearly 40 years after the fact, I will present new analyses from experiments requiring college students to recall the presidents, focusing on the issue of how forgetting occurs in collective memory. How quickly do presidents fade from historical memory in an educated group who recently took a course on American history, i.e. college students? Will other presidents be as well remembered as Lincoln? We explore these questions in several ways and relate the results to issues of collective remembering. Also, we predict that by about 2150 Bill Clinton will be as poorly remembered as Millard Fillmore is now. (Bets are off if Hillary is elected in 2016).

2:00 – 2:25 Immanuel Barshi (Research Psychologist, Human Systems Integration Division, NASA)

The Comprehensive LOFT: Translating Training Principles into Guidelines

The training of pilots at major US air carriers has changed little over the years. These courses often begin in learning each and every subsystem of the particular airplane to be flown. Day 1 might be the hydraulic system, Day 2 the electrical system, Day 3 the fuel system, and so on. The training course culminates in a series of training sessions in a full-motion, full-mission flight simulator where much of the time is dedicated to the practice of particular maneuvers, of trouble shooting problems, and of emergency procedures. Most US airlines now incorporate one final simulator training session known as LOFT, Line Oriented Flight Training, where rather than going through

a series of disconnected, isolated, flight maneuvers, the session is conducted as a flight from a departure airport to a destination airport, including many elements of a normal flight, with some problem solving. Flying for an Air Line, one is a Line Pilot, flying the “line.” And so the LOFT session in the simulator is supposed to represent the reality of line operations and thus prepare the trainee to fly the line. But if the ultimate goal of the training is to produce a pilot who is ready to safely and efficiently fly the line, shouldn’t all training be “line oriented”? This paper describes an approach to structuring airline flight training such that all training is “line oriented.” This approach represents an opportunity to translate many of the training principles offered by Healy and her colleagues into training guidelines.

2:30 – 2:55

Richard Gerrig (Professor, Psychology Department, State University of New York, Stony Brook)

Meaning in Context

Researchers in psycholinguistics have often focused on the question of how context affects people’s understanding of utterances and discourse. I begin a discussion of this topic by reviewing research on people’s understanding of metaphors (e.g., “The night sky was filled with drops of molten silver.”) and lexical innovations (“I aspire to do an Alice Healy.”) I explain how research on these phenomena helped contribute to the demise of the “standard pragmatic model.” I describe how a theoretical perspective that emerged from this work can be applied more broadly to accounts of narrative processing. In particular, I describe the participatory perspective on people’s narrative experiences. This perspective suggests that readers’ participation provides a unique context for their experiences of narrative worlds.

3:00 – 3:30

Break with Snacks in Muenzinger Psychology E214

3:30 – 3:55

Richard Shiffrin (Luther Dana Waterman Professor of Cognitive Science, Department of Psychological and Brain Sciences, Indiana University)

Authors: Joyce Wang, Tyler Solloway, Jerome Busemeyer, and Richard Shiffrin

A Mysterious Finding About Question Order in Surveys and a Quantum Account

When two questions are asked back to back in a national survey the answers often change depending on the order of the questions. Typically half the respondents are asked the questions in one order, and the other half of respondents asked the questions in the other order. This is a form of “context effect” and could be part of almost

any cognitive model. When looking at all surveys over the last ten years that asked two questions back to back, a peculiar regularity seems to hold for all 70 surveys: The change in the probability of saying yes to both questions plus the change in the probability of saying no to both questions adds to zero. If there are at most small context effects then this result is required, but many of the surveys have large context effects. When there are large context effects, this regularity, called the QQ-equality, is not required mathematically; in fact there are surveys that do not show this result (when, for example, extra information is inserted between the two questions). It is hard to come up with any cognitive interpretation or constraints that would require the QQ-equality. In recent years Jerome Busemeyer and his colleagues have proposed a model of decision-making based on the idea that human cognition obeys the laws of quantum probability. The resultant model has been used to explain many findings in the decision-making literature that seem to show decisions that are irrational if they are to obey the laws of probability (such as the conjunction fallacy). Although the new model does a good job when applied to such studies, the applications are parameterized and fit the data by appropriate choice of parameters. The quantum model applied to the QQ-equality has no parameters – it predicts that this finding should hold universally, regardless of parameterization. The fact that the results support the prediction should not only lead cognitive scientists to search for alternative models to explain the finding, but also lead cognitive scientists to give the quantum probability theory serious consideration.

4:00 – 4:25

Timothy P. McNamara (Professor and Vice Provost for Faculty and International Affairs, Department of Psychological Sciences, Vanderbilt University)

Does “Alice” Prime “Neely”?

In this presentation, I will provide a brief personal history of mediated priming – both semantic (e.g., *lion* to *stripes* via *tiger*) and semantic-phonological (e.g., *fourteen* to *carrot* via *karat*) – and discuss its importance in debates about the mechanisms of priming, word recognition, and memory. My involvement in this area of research began with a collaborative project with Alice while I was a graduate student.

4:30 – 4:55

James Kole (Assistant Professor, Department of Psychology,
University of Northern Colorado)

***What's the Problem? Familiarity, Working Memory, and Transfer
in a Problem Solving Task***

The contributions of familiarity and working memory to transfer were examined in the Tower of Hanoi (TOH) task. Participants completed three different versions of the TOH task: a standard three-disk version (sTOH), a Clothing Exchange (CE) task that employed familiar semantic content, and a Tea Ceremony (TC) task that employed unfamiliar semantic content. The constraints on moves were equivalent across tasks, and each could be solved with the same sequence of movements. Working memory demands were manipulated by the provision of a (static or dynamic) visual representation of the problem. Performance was equivalent for the sTOH and CE tasks, but worse for the TC task, and decreased with increasing working memory demands. Further, the sTOH and CE tasks independently, additively, and equivalently transferred to subsequent tasks, whereas the TC task did not. The results suggest that both familiarity and memory load determine overall level of performance, whereas familiarity influences transfer.

6:00 – 9:00

Dinner: University Memorial Center 235

Sunday, June 8

8:30 – 9:30

Continental Breakfast in Muenzinger Psychology E214

9:00 – 10:15

Poster Session

Gold/MCDB Biosciences A2B70

Poster 1:

Title: Specificity and transfer of training in following navigation instructions with different response types

Authors: Vivian L. Schneider (1), Alice F. Healy (1), and Immanuel Barshi (2)

(1) University of Colorado Boulder

(2) NASA Ames Research

Poster 2:

Title: The value of contemplative practice in college courses and its role in learning

Author: Holly Krech Thomas, Bethany College

Poster 3:

Title: The role of metacognition in the deliberate practice of self-paced sports tasks

Authors: Adam Young (1) and Judith Sims-Knight (2)

(1) University of Colorado Boulder

(2) University of Massachusetts, Dartmouth

Poster 4:

Title: Word identification in Chinese and English prose passages by native and nonnative speakers varying in fluency

Authors: Liang Tao (1) and Alice F. Healy (2)

(1) Department of Linguistics, Ohio University

(2) University of Colorado Boulder

Poster 5:

Title: Rhetoric of rapport: Linguistic patterns for emotional alignment in U.S. presidential speeches

Authors: David A. Havas (1) and Christopher B. Chapp (2)

(1) University of Wisconsin-Whitewater

(2) Department of Political Science, University of Wisconsin-Whitewater

Poster 6:

Title: The effects of testing on memory for meaningful and ambiguous visual images

Authors: Shana K. Carpenter and Chad S. Fernandez, Iowa State University

Poster 7:

Title: Comparing recall and recognition in the use of classroom response systems

Authors: Shaw L. Ketels, Alice F. Healy, Matt Jones, Lakshmi Lalchandani, and Diane K. Martichuski, University of Colorado Boulder

Poster 8:

Title: Isolating the effects of different feedback contents on learning

Authors: Lindsay Anderson Tack, Alice F. Healy, and Matt Jones, University of Colorado Boulder

10:30 – 10:55

James S. Nairne (Reece McGee Distinguished Professor, Department of Psychological Sciences, Purdue University)

Learning and Remembering with a Stone-Age Brain

Scholars generally agree that our memory systems are the product of an evolutionary process. More controversial, however, is the notion that nature's criterion – the enhancement of inclusive fitness – has relevance to modern memory functioning. Our lab has now collected evidence from several domains indicating that memory's efficiencies still bear the imprint of ancestral selection pressures. Understanding these natural constraints on remembering has many applications to the real-world, including how to design learning systems that are congruent with memory's natural design.

11:00 – 11:25

Elizabeth Ligon Bjork (Professor, Department of Psychology, University of California Los Angeles)

Authors: Elizabeth Ligon Bjork and Nicholas C. Soderstrom

Can Multiple-Choice Testing Induce Desirable Difficulties? Evidence from the Laboratory and the Classroom

The term *desirable difficulties* (Bjork, 1994) refers to conditions of learning that, while often appearing to cause difficulties for the learner and to slow down the process of acquisition, actually enhance long-term retention and transfer. One known desirable difficulty is testing (as compared to restudy), although, typically, it is tests that clearly involve retrieval – such as free- and cued-recall tests – that are thought to induce these mnemonic benefits and not multiple-choice tests. Nonetheless, multiple-choice testing is ubiquitous in educational settings and many other high-stakes situations. Thus, in this paper, we discuss research – conducted both in the laboratory and the classroom – exploring whether multiple-choice testing can also be fashioned to promote the type of retrieval

processes known to enhance learning, and we speculate about the necessary properties that multiple-choice questions must possess as well as the metacognitive strategy that students need to employ in answering such questions to achieve this goal.

11:30 – 11:55

Danielle S. McNamara (Professor, Department of Psychology, Learning Sciences Institute, Arizona State University)

From Generating in the Lab to Tutoring Systems In Classrooms

My research as a student with Alice Healy focused primarily on benefits of generating, and in particular on extending the generation effect to learning tasks. This research was in the context of the Healy, Ericsson, and Bourne Lab, which examined a variety of phenomena related to long-term learning and retention. This academic training had a profound impact on my own research later in my career, particularly with regards to the development of intelligent tutoring systems that (attempt to) incorporate principles of skill and knowledge acquisition. This paper will describe two tutoring systems, iSTART and the Writing Pal, which provide students with instruction and practice using comprehension and writing strategies. iSTART provides students with training to use effective comprehension strategies while self-explaining complex text. The Writing Pal provides students with instruction and practice to use basic writing strategies when writing persuasive essays. Underlying these systems are the assumptions that students should be provided with initial instruction that breaks down the tasks into component skills, and that deliberate practice should include active generation with meaningful feedback. The implementation of these assumptions is complicated by the ill-defined natures of comprehension and writing, and supported by the use of various natural language processing techniques.

12:00 – 12:15

Closing Remarks

This event was funded by:

The Center for Research on Training, University of Colorado Boulder

The Institute of Cognitive Science, University of Colorado Boulder

The Department of Psychology and Neuroscience, University of Colorado Boulder