The special committee of the General Faculty to prepare a memorial resolution for Abram Amsel, professor emeritus, psychology, has filed with the secretary of the General Faculty the following report.

Sue Alexander Greninger, Secretary
The General Faculty

IN MEMORIAM
ABRAM AMSEL

Abram Amsel, a member of the Department of Psychology since 1969, passed away on August 31, 2006. He was one of the towering figures of modern learning theory and an integral member of the department. He lived a full life that included a 50-year academic career, membership in the National Academy of Sciences, and the love and respect of his family, former students, and colleagues.

Prominent academic careers take many different forms. Some are like the first movement of Beethoven’s Appassionata sonata: turbulent, busy, emotional, and all over the keyboard. Others are more like the first movement of Beethoven’s Moonlight Sonata, constructed of a dominant elegant melody or idea that is examined in great detail and reappears in carefully measured permutations that move the music forward in a highly organized but compelling fashion. Amsel’s scientific career was like the Moonlight Sonata, with one central idea—his theory of frustration—as its basic melody. The theory reappeared in easily-recognized form through various permutations of his research. His life’s work had a compelling and carefully crafted progression that was as beautiful and as satisfying as Beethoven’s composition.

Amsel’s name is synonymous with frustration theory in psychology. At a time when other psychologists were concerned with mechanisms of reward, Amsel focused on what happens when reward is expected but does not occur. As anyone knows who has encountered a vending machine that fails to deliver once it has taken your money, the absence of an expected event can be upsetting. Amsel provided a precise definition of frustration and devoted his career to studying what is learned from frustrating experiences.

Building on Hull and Spence’s expectancy theory, Amsel proposed that repeated frustration in a particular situation results in learning to expect frustration. The natural reaction to the expectancy of frustration is to get angry and give up (kick and swear at the vending machine and walk away). However, if the results are unpredictable (as with a slot machine), walking away may not be the best strategy because that would leave behind all potential winnings. Amsel recognized that success in the face of frustration is a profoundly formative experience. In particular, it teaches you to continue trying in the face of the anticipation of frustration. Such learned persistence in dealing with long odds keeps song writers working in the quest for the next hit, venture capitalists looking for the next breakthrough company, and children working to get the next smile from their busy parents.

The recurrent theme of Amsel’s work was explored in three different stages of Amsel’s long career. The first stage involved developing frustration theory and testing its implications in laboratory rats. During this initial phase, Amsel showed that the unexpected absence of food actually energizes behavior. He and his students then tested numerous implications of frustration theory (Amsel, 1958). In a series of studies, they demonstrated how the size of the reward, the amount of training, and consistency of receiving a reward influenced the rats’ behaviors.

In the second stage of his career, Amsel expanded his research to include rats of younger and younger ages. Developmental psychobiology was a new area of psychology in the 1970s, as investigators turned their attention to the complex behavioral and physiological mechanisms that sustain animals shortly after birth when the
infants are unable to survive without maternal nursing and care. Amsel and his students created downscaled runways (crawlways, if you will) to study how infant rats, or pups, would amble down a runway for food, which was provided by the opportunity to suckle on a lactating female. In inventing a number of imaginative methods to study infant pups, Amsel was the first to systematically define behavioral changes associated with frustration and reward in the developing rat in its first four weeks of life.

Amsel’s developmental studies found that the emotional components of frustration develop fairly late. Basic memory mechanisms appear early in development, but learning to expect reward and becoming frustrated require a more maturely developed brain. Rat pups at birth are roughly comparable in neural development to human embryos at the start of their third trimester. Brain development that occurs at the end of gestation for humans occurs outside the womb for rats. Therefore, post-partum behavioral development in rats is accompanied by post-partum neural development. But, how are the two causally linked? Is behavioral development a result and consequence of neural development or is the relationship more complex? Amsel turned his attention to this critical question in the third and last phase of his career.

One brain region, called the hippocampus, undergoes major changes during the first three weeks post-partum in the rat. Amsel focused on the hippocampus as a possible critical mediator of the behavioral changes that he and his students had documented. In a series of elegant studies, they were able to pinpoint the anatomical changes that occurred in the hippocampus that accounted for the development of expectations of reward and frustration. Indeed, they were able to mimic brain disorders linked to hippocampal damage with fetal alcohol exposure, neurotoxins, and irradiation. Thus, in this last stage of his career, Amsel made important contributions to behavioral neuroscience and behavioral teratology.

Amsel’s work made contact with many of the issues that are central to modern neuroscience. Although contemporary neuroscientists often work at the genetic and molecular level, their basic aim is to understand behavior—which was Amsel’s primary focus. As important as genetic influences are, genetic effects unfold through a complex interaction with experience and learning—as documented in detail by Amsel’s developmental work. Although Amsel was very much a traditionalist when it came to behavior theory, he thought broadly about behavior and its neural bases.

Amsel was born in Montreal, Quebec, on December 4, 1922, where he met his wife of 50 years, Tess Amsel. After receiving his B.A. in 1944 from Queens University, he went on to get an M.A. at McGill University (in 1946) and his Ph.D. from the University of Iowa (in 1948). The Iowa years clearly had the most profound effect on his later academic career. His dissertation advisor at Iowa was Kenneth Spence, whose style of behavior theory Amsel adopted in constructing frustration theory. After obtaining his Ph.D. degree, Amsel joined the faculty of Tulane University, where he remained from 1948 to 1960 and progressed through the ranks from assistant to full professor.

By 1960, Amsel was a major figure in behavior theory and was hired on the faculty of the University of Toronto, where he conducted many innovative studies of frustration theory in adult rats and trained some of his most notable Ph.D. students, including Michael Rashotte, who subsequently had an illustrious career at Florida State University. In 1969, Amsel joined the faculty of The University of Texas at Austin, where he finished his career in 1999 as Ashbel Smith Professor. Amsel was invited to Texas to replace Kenneth Spence, who had moved to Texas from Iowa a few years earlier but died unexpectedly of cancer.

During his career, Amsel had several temporary appointments at other institutions, including University College London, England (1966-67), University of Pennsylvania (1974-75), and the Center for the Advanced Study in the Behavioral Sciences (1986-87). His research was supported by the National Science Foundation, National Research Council of Canada, National Institute of Mental Health, National Institute of Child Health and Human Development, National Institute on Alcohol Abuse and Alcoholism, and the Hogg Foundation for Mental Health.

Amsel authored more than 250 research articles and three books. Amsel was elected to membership in the Society of Experimental Psychologists (in 1965), which awarded him the highly coveted Howard Crosby Warren Medal for Outstanding Research in Psychology in 1980. In 1992, he became one of the few members of The University of Texas faculty who were elected to the National Academy of Sciences. He was also a fellow
of the American Association for the Advancement of Science and of the American Psychological Society, and he held memberships in the Society for Neuroscience, the International Society for Developmental Psychology, the International Brain Research Organization, and the Pavlovian Society.

Amsel served on the governing board of the Psychonomic Society (1973-78), an elite organization for the advancement of experimental psychology. In 1992, he was selected as the State University of Iowa’s Distinguished Graduate, and in 1994, as Distinguished Graduate of McGill University’s Department of Psychiatry. In the 1970s, Amsel took on the duty of editor for two journals published by the Psychonomic Society. He was co-editor (with Richard Thompson) of *Psychonomic Science: Section on Animal and Physiological Psychology*, which was published for two years (1971-72). Beginning in 1972, this journal was replaced by several new journals established by the society, and Amsel became the founding editor (1972-76) of *Animal Learning and Behavior*, which remains one of the premiere journals in the area of behavior theory. He also served as consulting editor for the *Journal of Experimental Psychology* (1964-69) and on the editorial board of the *International Journal of Psychophysiology* (1982-88).

In addition to being a dedicated scientist, Amsel was a dedicated teacher. He always had five to six Ph.D. students working in his laboratory. He was demanding of his students but also very loyal to them. In a memorial essay published in the journal *Learning and Behavior*, Michael Rashotte wrote,

> Abe set the highest standards for his laboratory. Experimental plans were proposed and discussed in-group meetings and an air of spontaneous collaboration was pervasive. Key figures in the field visited Abe and his lab, and students at all levels of advancement were involved in scholarly discussions. Such visits often included social events at restaurants or, most enviably, at the Amsel home where he and his gracious wife, Tess, warmly welcomed the students to evenings of memorable cuisine, music and socializing. For many students, these parts of life in the Amsel lab were models for future behavior.

Amsel was also a devoted family man, a lover of art and music, and a romantic. He kept an old Jaguar two-seater in his garage in Austin because the smell of the leather reminded him of his courtship with Tess many years earlier. Tess was an artist and his three children, Steve, Andrew, and Geoff, all had extensive musical training. In addition to Tess, Amsel is survived by his sons; daughters-in-law, Jan, Janice Duff, and Stephanie; grandchildren, Ben, Adam, David Duff-Amsel, Becky, and William; and sister and brother-in-law, Millie and Phemie Ostroff.

This memorial resolution was prepared by a special committee consisting of Professors James W. Pennebaker (chair), Michael Domjan, and John C. Loehlin.

Distributed to the dean of the College of Liberal Arts, the executive vice president and provost, and the president on July 2, 2007. Copies are available on request from the Office of the General Faculty, WMB 2.102, F9500. This resolution is posted under "Memorials" at: [http://www.utexas.edu/faculty/council/](http://www.utexas.edu/faculty/council/).