Julian Hochberg died on May 22, 2022; just short of 99 years since his birth on July 10, 1923. I was a graduate student in Julie's lab (1978-1983). During my later years in the PhD program and my first years as a faculty member at Stony Brook, I spent many hours working on data and papers with Julie at his family's apartment at 460 Riverside Drive, drinking countless cups of the hazelnut-flavored coffee he favored. As a graduate advisor, Julie challenged me to think deeply and constantly. As Julie's student, one had to be prepared to continue conversations where they left off the day before in phone calls that began with questions like, "But *why*?", challenging me on a point I made sometime during our discussions on the preceding day. These calls came in as early as 7AM. At the beginning of my graduate career, I wasn't regularly up at that hour much less prepared to jump back into a theoretical discussion mid-stream!

Hochberg studied the perception of pictures, 3-D objects, and films. In the years I studied with him, we used carefully drawn pictures, real objects, and animated films before moving on to computer-programmed stimuli. His laboratory in Room 416 Schermerhorn Hall at Columbia University was a cornucopia of stuff that could be assembled to make stimuli. In addition to learning about science, I learned to solder and to shoot, develop, and cut 16mm animated films. Filming took place in a loft in Room 416 which was two stories high; soldering and cutting using a Moviola took place in other jam-packed rooms on the 3rd floor.

Hochberg was interested in how we integrate successive glances at an object or scene. His "killer cube", introduced in his influential 1978 book, "Perception", is a version of a drawing of a Necker cube that is biased at one point, (say "A") to favor the perception that the cube is facing in one of the two possible directions, but is unbiased at another point (say "B"). Hochberg showed that the stimulus information present at A does not constrain what is perceived when fixation shifts to point B; the cube can reverse apparent facing direction there, even when both points fall on the fovea. (In 1991 Bradley Gibson and I extended this phenomenon to attentional location with fixation held constant.) The killer cube demonstrated that an object's structure is not simply and immutably assembled across glances. Instead, perception is piecemeal rather than holistic, isn't fully determined by stimulus features, and can't be explained by simplicity principles. Rather, an object's structure emerges as a joint function of a viewer's fixation point, the perceptual inquiry they are pursuing (presaging predictive theories), and the best fitting object schema (a Helmholtzian or Bayesian view). Hochberg and I showed that piecemeal perception can also occur for a 3-D version of the killer cube and further, that when a 3-D cube rotates while it is perceived in a reversed orientation, it is also perceived to be rotating in the opposite direction. The perceived rotation direction is "perceptually coupled" to perceived facing direction, although observers are unaware of this coupling. Beginning in 1956, Hochberg advocated for the measurement of perceptually coupled variables as converging evidence of results obtained with measures of variables more obviously linked to participants' task set. This was essential to rule out responses to the demand character of experiments. In our experiments, using responses to perceptually-coupled variables was particularly important because our experiments demonstrated high-level influences on visual perception when such influences were incompatible with current theories.

With Virginia (Ginny) Brooks, Hochberg investigated the cognitive systems involved in the perception and appreciation of film. They showed that the motion viewers perceive in films can be very different from what would be expected from the displacements on the retina, and hence,

that low-level motion detection circuits are insufficient to explain the perception of motion in film. Instead, the context and viewers' expectations based on an actors' behavior and gaze direction determine the direction of perceived motion and bridge across cuts. Hochberg and Brooks made these points both in experiments and by reference to classic films; accordingly, their work is appreciated by both filmmakers and scientists. Brooks' work on filmed dance was critical to this line of research.

This piece touches on only a portion of the theoretical ideas Hochberg promulgated and the creative demonstrations he employed to support his theoretical points. Julie was a true scholar and a font of information about science, history, and art. He taught me to know the history and credit those who came before. He read the literature voraciously and broadly, striving to integrate it with both historical and contemporary theories, discussing incompatibilities that required theory change and proposing some initial steps toward that end. He was a generous supporter of the young scientists whose work he encountered.

I last saw Julie Hochberg and Ginny Brooks in 2007 at a party held at Columbia to celebrate the publication of a book in Julie's honor that Barbara Gillam, Hal Sedgwick and I co-edited (*In the Mind's Eye: Julian Hochberg on the Perception of Pictures, Films and the World*.). Most of Hochberg's major theories were published in chapters that were out of print by then. Those chapters are wide-ranging explorations of the nature of perception containing novel insights that others later developed into substantial research programs. Twenty of them were re-published in our book; they remain stimulating and thought-provoking today. Twenty contemporary scientists wrote commentaries on Julie's work and discussed how Julie had inspired them. Hochberg also wrote a new chapter for the collection.

A brief professional biography follows:
Julian Hochberg attended the College of the City of New York (City College), majoring in Physics. He was a graduate student at Berkeley in the latter days of Tolman and the time of Brunswik. On completion of his Ph.D., he took up his first academic appointment in 1949 as an Instructor at Cornell where he became Professor in 1960. He moved back to New York City in 1965 as Professor at New York University. In 1969 he became Professor at Columbia University. He remained there until he had to retire at age 70, a member of the last cohort that was subject to mandatory retirement at Columbia. After retirement, he was named the Centennial Professor Emeritus of Psychology. Retirement didn't stop Hochberg's scholarly activities: He continued to publish chapters and articles, one appearing as recently as 2019.

Hochberg received many honors including election to the National Academy of Sciences, the American Academy of Arts and Sciences, and the Society of Experimental Psychologists and awards such as the APA Award for Distinguished Scientific Contributions to Psychology, the Howard Crosby Warren Medal of the Society of Experimental Psychologists, a Guggenheim Fellowship, and an Honorary Degree from Columbia University. The APA Award cited "his insightful recognition that the central problem of human perception is to explain how perception is organized, and for highly significant theoretical contributions toward greater understanding of this central problem."

Hochberg also assumed many responsibilities, including Presidencies of the Eastern Psychological Association and of two divisions of the American Psychological Association (Division 3; Experimental Psychology and Division 10; Psychology and the Arts); Chair of Section J (Experimental Psychology) of the American Association for the Advancement of Science, appointments to National Academy of Sciences and National Research Council committees in sensory processes and human factors, and two terms as Chair of the Psychology Department at Columbia University. In addition, he served on the boards of major journals including *Psychological Review*, *American Journal of Psychology*, *Journal of Experimental Psychology*: *General* and *Journal of Experimental Psychology*: *Human Perception and Performance*.

--Mary A. Peterson