

Michael I. Posner

- Born September 19, 1936 in Cincinnati, Ohio
- B.S. in Physics (1957) and M.S. in Psychology (1959) at University of Washington, Ph.D. in Psychology (1962) University of Michigan

Major Employment

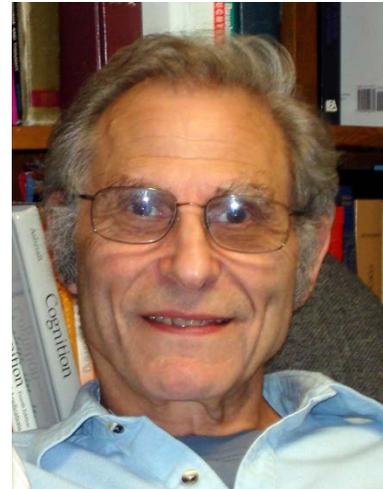
- Professor of Psychology, University of Oregon: 1968-Present
- Director of the Institute of Cognitive and Decision Sciences, University of Oregon: 1989-95
- Director of the Neuropsychology Laboratory, Good Samaritan Hospital: 1979-85

Major Areas of Work

- Neural mechanisms, selective attention

SRCD Affiliation

- Member since late 1980s



SRCD Oral History Interview

Michael I. Posner
University of Oregon

Interviewed by Mary K. Rothbart
At the University of Oregon
February 27, 2009

Rothbart: This is an interview of Michael I. Posner of the University of Oregon. My name is Mary K. Rothbart and I'm a colleague, a coworker, of Dr. Posner. And the date of the interview is Friday, February 27th at the University of Oregon. And this is for the Oral History Project of the Society for Research in Child Development.

To start, Dr. Posner, Mike, could you describe your family background including educational and occupational characteristics of your parents, where you were born, where you grew up and so on?

Posner: My father was a lawyer practicing law in Cincinnati, Ohio, when I was born, but when I was two months old we moved to California for health reasons and I grew up in California. And my father changed from his work in law to the area of social work and did social work for most of the time when I was growing up. My mother was a housewife, sometimes working in shoe stores, but mostly home with the children. And perhaps most influential on my life was my rather remarkable older brother. He's almost five years older. He decided to become a physician when he was less than two years old and realized it quite young and was always a kind of role model for me growing up.

Rothbart: What was your schooling like?

Posner: I went to school in California mostly and in many different schools. I think I was in around 14 schools by the time I reached high school, and I found California schools at that time very pleasant. They had a strong progressive influence. We spent a lot of time learning about peoples of various parts of the world. And it wasn't until I moved to Seattle, where we were told the schools were much more difficult, that I took a more serious view towards schooling and had a very good experience both in junior high school and high school in Seattle, and then at the University of Washington, which is also in Seattle.

Rothbart: Any military experience?

Posner: Well, I had some military experiences. At the time I was a student it was required that land grant schools, of which the University of Washington was one, required everyone, all males at least, to take two years of reserve officer's training. And then I continued on, mostly for the money, to take the remaining two years and then was commissioned as a Second Lieutenant. At that time we all thought we were going to serve in the Korean War, but by the time I graduated they really didn't need anyone. The Korean War was over, and so I only had six months of training and then was assigned to a reserve unit and stayed in the reserves. But when the Berlin Wall was built in 1961 I was a graduate student at the University of Michigan studying for my Ph.D., and I was called back in just at the time I was supposed to be working on my dissertation. Fortunately I had some experiments already done and I could take the results of those experiments and the literature, and I actually wrote my dissertation while I was serving in the military in Alabama. And then I remained as a reserve officer until I could get a discharge, which required, I think, six years of additional service before I reached the time when I could get a discharge.

Rothbart: Could you comment on your early adult intellectual development and collegiate experiences?

Posner: Well, I suppose the two most influential things on me were my brother, who was, of course, a biological scientist going into medicine, and then in high school I took a course in physics which I found to be a very romantic field, and so I decided I would major in physics at the University of Washington, which I did and got my bachelor's degree in four years. I wasn't a very strong student but I loved the physics. And my brother said maybe I could be more successful with a biological science, so I took my first psychology course while I was in the Army, a correspondence course which happened to be graded by a professor who was at the University of Washington. And so when I got out of the Army and went back to Seattle, I got a job at Boeing Airplane Company and they allowed me to work toward my master's degree in psychology, working for a human factor's group and they thought an advanced degree would be useful, so they paid my way to go and take some of the advanced courses in psychology. And I finally got my master's degree and then went on to the University of Michigan for my doctorate.

Rothbart: What are the origins of your interests in child development and what individuals were important to your intellectual development?

Posner: Well, you, Mary, were probably the main reason that I went into child development. You had strong interests in child development, and I really had never done any developmental work. But there was a second impetus and that was the kind of work I had done. I had been working on neuro-imaging, and we began to see these neuro-networks that underlay very important functions, one of which was one that I was very involved with, namely attention. If you have networks of neuro areas that are carrying out functions like attention, you automatically want to know where they come from. And so I was very interested in trying to see what we could learn about the development of these networks by studying infants and young children. But, of course, I had no background, so you helped educate me and together we designed experiments that allowed us to work in this area. So I would say both the neuro-imaging work and then your own influence were the main reasons I got into child development.

Rothbart: What political and social events have influenced your research, writing, teaching or other professional activities?

Posner: I was a professor at the University of Oregon at the time of the Vietnam War and, of course, that was very, very important influence on teaching. We really more or less gave up the standard psychology curriculum at that time and tried to teach courses that should be of greater social relevance. I know I used Daniel Cohn-Bendit's book *Communism: A Left Wing Alternative* during that time, and it really stretched the field of psychology quite a bit in order to accommodate the interests

of students. I don't think it had a great deal of influence on the research work that I did. Mostly it had an influence on teaching.

Rothbart: Would you characterize the development of your ideas in child development as evolving in a straightforward way or in a way that involved sharp turns in theoretical views or research style?

Posner: I never did any work in child development until 1980. That was really mostly your influence. I had an invitation to speak at the Nebraska Symposium, and I wanted to talk not about the standard material that I worked on, but something that would be relevant to development and motivation and so on and we worked together on that paper. And then later on in the late '80s and '90s we started to delve into how these neuro-networks that underlie aspects of attention developed in infants and young children. And of course, that was a very big turn for me. I did join SRCD, but prior to that I had no real involvement in development at all.

Rothbart: What were your primary interests in child development at the beginning of your career?

Posner: Well, none at all except for raising children. We had two children, both boys, and of course, I was involved with raising them and was interested in what they did. Like your two children, they were very different one from another, but I never thought about that in a professional way as something to study psychologically until this issue came up following the work on neuro-imaging.

Rothbart: And feel free on this one to go back to include your career before the work in child development. And the question is, what continuities in your work are most significant? What shifts occurred and what events were responsible?

Posner: To me, my work has always followed a pretty straight line, that is, following out the opportunities and methods that became available and following out the findings that we made. But to an outsider I know people think I've shifted quite a bit from one thing to another. For example, during my career I've been called an experimental psychologist, a cognitive psychologist, a developmental psychologist, a neuroscientist, and probably some less flattering terms as well. But for me I started off wanting to know how the brain worked in a functional way. There was no real way for a person working with human beings to really understand the inner workings of the brain, although early on I did record EEG. They were mostly as an adjunct to getting time course information, which I used to work out in the way that Donald Broadbent first outlined, the functional ideas about the nervous system from what we could observe by the speed at which people processed information. And I summarized that work in a book in 1978 called *Chronometric Explorations of Mind*. And then the opportunity came to see if there were connections between these time course of mental events and underlying brain activity and that really came in the field of attention, because Vernon Mountcastle and Bob Wurtz had been recording from cells in the parietal lobe that they called attention cells and which carried out the functions of shifting attention and giving priority to certain kinds of information. And I had the idea that I would like to see if time course information that we were recording from normal people shifting attention from location to location, which I reported on in a paper in 1980, if that was really the result of these cells. And so I worked with patients with lesions of the parietal lobe and also frontal lobe and superior colliculus and many other places with a number of people, mainly in Portland, because Oscar Marin, a very powerful neurologist, set up a neurology department at Good Samaritan Hospital and he asked me to develop a laboratory there to experiment with patients. We found that, although all of these patients would be said to neglect the side of space opposite the lesion, that depending on exactly where the lesion was, the details of what mental operation might be affected were different. To me that was a very big event, and it seemed to me that that could be a solution to the problem of localization in the brain, because, as you probably know, Lashley said there was no localization for higher mental processes; the brain as a whole was involved. And I thought, well, it seems like the brain as a whole is involved, because these mental operations are carried out by disparate neuro areas. And then a new method came along, positron emission tomography, and it became possible to test this idea by looking at the areas of the brain that might be active in real time in normal people, which I

did. We went to Saint Louis, Missouri, and at Washington University I worked with Marcus Raichle and a group that had developed positron emission tomography (PET) technology and we tested this idea. To me it was successful. We were able to show that particular areas of the brain, very disparate areas or what we now call networks of neural areas, were active during even very simple tasks, mostly language tasks that we were studying then. And from then on I wanted to trace out those networks in real time, so I worked with electroencephalography (EEG) now in a different way, because now we knew where the computations were going on, and we wanted to know how fast they went and in what order and so on. And with a lot of other people I worked on that question and I think got quite successful results.

And then the next question, which is the one that you, Mary, stimulated so much, was the question of where these networks come from, how do they get organized, and then eventually, although we didn't think of this at the beginning, seeing how much of the individual differences that you had measured and reported on were due to different genetic alleles (that is variations in the genes) and how much were due to experience, to the interaction of genes and experience, and then how much could we do something about it by training? So to me it's all very linear one step at a time. It's just that sometimes you crossed boundaries, and then you were called by a different name.

Rothbart: Please reflect on strengths and weaknesses of your research and theoretical contributions, impact of your work and its current status.

Posner: I know that many people have told me that I had a kind of dilettante-ish flavor to my work, because I seemed to skip a lot from area to area, and that probably was a weakness probably compensating for the fact that I really often wasn't able to penetrate very far into the questions that I was able to raise. I just had more of a gift for finding the question than for exactly solving how it was done. So I think there's some weaknesses in that and some strengths, because it does give you maybe a broader approach to the field than you would have if you spent all your time working on one question and unraveling it step by step as we're often told to do. I think I have been extremely fortunate to have lots of great collaborators, and they've influenced me perhaps more than I've influenced them. But I worked with lots of graduate students and postdoctoral people from all over the world and that was a great aspect of the work and, of course, gave it greater influence than perhaps would occur from writing alone.

Rothbart: What published or unpublished manuscripts best represent your thinking about child development? Which of your studies seem most significant? It also asks about wrong-headed contributions, but I don't think there are any of those.

Posner: I've tried generally to summarize the work I did for large periods of time in a book. Now that I'm old and can't remember, that's nice to go back to a book and look at the references and they help tell you what was done. So my early career was summarized in *Chronometric Explorations of Mind* and then both my work on lesions and on imaging really were summarized in a book with Marcus Raichle called *Images of Mind*, and then, of course, our work on development got summarized in this book that you also mentioned called *Educating the Human Brain*. And I've also written quite a few papers, and two of them I think that are the most important from my point of view, although I didn't actually know it at the time. One of them was called "Orienting of Attention." It's probably one of my most cited papers, and it kind of laid out the methods for measuring the fine shifts of attention across the visual field. And then rather recently I published a lecture called the "Arthur Lecture" in a paper called "Evolution and Development of Self-Regulation," which is another effort to describe some of our joint work in the framework of neuro-imaging and genetics.

Rothbart: Please reflect on your experience with research funding over the years and your participation in shaping research funding policy.

Posner: I wouldn't say I've had great experience with research funding over the years. I have had a number of grants; however, usually I had to hide my intention in order to get funding support. For example, there would never be any agency that would have supported neuro-imaging of the type that I

was doing. They were supporting the equipment that Marc Raichle was working with, but there was no one who thought that it was likely enough that we would be able to actually look at parts of the brain that were active during cognitive tasks to fund it, so none of my funding was ever given for that work. Now, of course, there's lots of funding for that area, but by then I had moved on to other areas. Usually I capitalized on your funding, Mary, in the area of development. I wasn't really able to get funding of my own. I was able to get one grant for electrical recordings, though often my proposals in that area were not successful. And so I have had my share of funding, but I do share the view that many have that funding agencies are a bit conservative, that they don't really anticipate the opportunities available for studying psychological questions. I've had absolutely no influence on this. I've complained many times, but as far as I know, no one's paid the slightest attention.

Rothbart: Well, let's turn to your institutional contributions. If you could, talk about the institutions at which you've worked, dates, and your capacities at those places.

Posner: That's fairly simple. I started my career in 1962 at the University of Wisconsin, that is, my postdoctoral career. I was a graduate student at Michigan, and then I had an assistant professorship at the University of Wisconsin and I spent three years there. And then in 1965 I moved to the University of Oregon where I've been for the last 44 years. I did leave a few times. I went on sabbatical a couple of times to various places and I did take a 3-year leave of absence in 1985 to go to Saint Louis and do the work on neuro-imaging. And then in the year 1998 I went to the Cornell Medical School -- not Ithaca, but in New York City, Weill Medical School of Cornell University -- and there set up the Sackler Institute related to the kind of work you and I were doing, particularly pediatric neuro-imaging, imaging the brain of children, and looking also at individual differences among children in relationship to genetic alleles. During my time at the University of Oregon, I worked a lot on development of courses. I developed many of the courses that are in the current curriculum and taught just about every kind of psychology that exists except, perhaps, child development. I never taught child development.

Rothbart: If you could, talk about your experience as a trainer of research workers, again, with respect to child development or generally.

Posner: I have had really a lot of doctoral students, somewhere around 30 to 40 doctoral students over the years, and most of them have been in adult areas, but in recent years I at least participated -- I might not have been the primary person -- but I participated most often with you and students who got their Ph.D.s in development, like Gina Gerardi and Ann Clohessy. And then I have had almost the same number of postdoctoral people that worked with me over the years, many from other countries, and I've been really blessed with a lot of collaborations from areas of the world. When we got into psychology it was pretty much an American discipline, and now it really is truly a worldwide discipline. If you look at the extent of influence of studies, it's very clear that the Europeans and Asians are making very powerful contributions in the field of psychology, maybe not quantitatively as much as the Americans, but really important contributions. And that's been reflected in opportunities to train post-doctoral people, most recently people like Charo Rueda from Spain and Andrea Berger from Israel and others, of course, who we've had opportunity to work with.

Rothbart: Describe your experiences in applied child development research.

Posner: That's going to--

Rothbart: Well, maybe the training study.

Posner: That's going to be kind of quick, because I really never have worked with any direct applications. But as you know, we decided really from your experiences with Duane Rumbaugh to try to adapt the programs that he developed for training monkeys to go into outer space with NASA. We adapted those for children. It really wasn't an applied effort. We really didn't expect anyone to just take this up and apply it, but we wanted to show that it was possible to do this kind of training in the

hopes that eventually, not necessarily our programs, but some type of program would help children before they begin school to achieve a sufficient level of attention so that they would have a better chance of being successful. And that has, I think, moved along so that I believe that this will happen some time.

Rothbart: And now a section on experiences with SRCD, when you joined, the first biannual meeting you attended and so on.

Posner: Well, of course, I didn't belong to SRCD until, well, until you told me to join in the late '80s, and then I did join, and I've gone to about four meetings of SRCD. I like the meetings because they were very kind. People were very kind to one another at these meetings, much more so than other meetings that I've attended, so I enjoyed the SRCD meetings. I actually gave an invited address at one of them and participated in panels at a couple other of the SRCD meetings. But other than going to the meetings and listening to what you were doing on the governing board, I really haven't had much experience with SRCD.

Rothbart: Here's a question that maybe we can adapt. It's about the most important changes to occur in SRCD, but maybe the question could just be important changes to occur in the study of child development.

Posner: Yes. Well, as I say, I'd gotten into child development late but, of course, neuro-imaging has had an influence in child development. There's much more work with children in pediatric neuro-imaging and looking at how the brain changes with development. Together with the efforts to develop appropriate questionnaire material, like you've done, and appropriate experimental material, like we've tried to do together, this allowed changes in the brain to be related to things that are close to real life behavior. In the case of our studies of self-regulation, we have a smooth story that starts with genes and experience and builds in a systematic way so that the questionnaires, which are related to the parts of the brain, which in turn are related to how the genes are building these networks, so these questionnaires can be taken by parents, and they can report on how their children are doing along these various lines. It seems to me that has provided continuity to the field and allows it to fit along with other areas of psychology into a whole field.

Rothbart: So I think you've answered the next question, but what are your hopes and fears for the future of this field?

Posner: Well, I feel very confident that child development will continue to illuminate some of these very important questions of the changes in children's behavior from infancy into adolescence and adulthood. There seems to be progress at every level. You know the progress that has taken place in describing the adolescent's brain and beginning to understand how it is that adolescents become risk-takers. And then your work on individual differences has fit so well with the developing work in genetics, although that work is just really at its very beginning. We're beginning to understand a little bit about the genome and how it generates the basis for the development of neuro-networks, and I'm sure this area is going to expand and help illuminate issues. I hope that the training that we've worked on will continue and we will be able to target appropriate training methods that will help the acquisition of neuro-networks that underlie critical aspects of learning in school, in both cognitive, but also the social relationships among people, and the ability of children to empathize and also to control their own behavior. So I'm optimistic about what the future will bring.

Rothbart: And then finally personal notes; if you could, tell us something about your personal interests, your family and the ways in which they've had a bearing on your scientific interests and contributions and applied contributions.

Posner: As far as family goes my brother, as I said, continues to have a lot of influence on me. He was heavily responsible for me beginning to work with lesioned patients, because he is a well-known neurologist and helped me to get started in that. I also have -- maybe this is the wrong direction --

followed in my son's footsteps. He went into the wood products business and then, when I was beginning to get ready for retirement, I bought a forest. So I have a strong hobby in managing my forest, and planting trees, and keeping them weeded and away from too much competition, and so on. I think my son, Oren, has been very influential in that. I also do enjoy both reading and theatre and my younger son, Aaron, combines that. He adapts literary works for the theatre and I've kind of had a minor hobby of traveling to see many of his plays and productions. So family is a very strong part of what I'm currently doing.

Rothbart: Well, thank you very much, Mike.