Tracy Kendler

- Born 8/4/1918; deceased
- Spouse – Howard Kendler
- B.A. (1940) Brooklyn College, M.A. (1942) and Ph.D (1943) both from State University of Iowa

Major Employment:

- University of California, Santa Barbara – 1966-2001, Professor
- University of California, Santa Barbara – 1990-2001, Professor Emerita

Major Areas of Work:

- Cognitive Development
- Learning
- Problem Solving

SRCD ORAL HISTORY INTERVIEW

Tracy Kendler

February 2, 1995
(Self-Interview)

Could you first state your name and your position?

Kendler: I'm Tracy Kendler and I am Professor Emeritus in the Psychology Department at the University of California, Santa Barbara.

Could you start by describing your family background with any childhood or teenage experiences that may be of interest?

Kendler: Well perhaps I really should start with where I was born which I think did make a difference. I was born in New York City when it was a vibrant exciting city and a safe one. I grew up in that city when it was an intellectual and cultural center and I think that had quite a bit of influence on my life. From my family background from at the time I was born you probably would never have predicted what actually happened to me over the course of events and that's largely because the world had changed quite a bit. So I grew up in New York City and New York City was a very exciting, cultural intellectual center and that was very important in the beginning but it's pertinent that my parents had very little education. My mother went to work when she was fourteen, I think she may have graduated from elementary school and never went to college. My father died when I was only eight or nine years of age and I don't think he had any more and perhaps even less education. But by the time I was born it was more customary for children to go to school but they were public schools. However, the public schools at the time were very good. Teaching was a respected profession. The teachers were involved with the children and they did a good job of opening up vistas that were not available in the homes at the time.

You said your father died when you were quite young, did your mother then support you and how many siblings do you have?

Kendler: I have no siblings, I was the only child and my mother remarried about three years after. My step-father turned out to be a kind man. He never did usurp the place of my father but he was kind a helpful and did what he could emotionally. Financially there were all kinds of problems that came up later largely because I grew up in the

midst of a depression. One of the consequences of that depression was that when I finished high school I had to go to work to help support the family.

So you didn't go straight to college from high school?

Kendler: It was probably mid year I did start, it was anywhere from six months and a year that I was out, that's right and the only school I could afford to go to was a public college. That too no doubt had considerable influence. In the public school all the students lived at home and being educated was not something you took for granted, it was something you earned. The only way I could go to school, by the way after I graduated from I had to go find a job and I found a job at Macy's. R.H. Macy which was the biggest department store in the country and my mother didn't want me to go on to college. She thought that that was not the sort of thing a young woman should do. That's why I think of myself as an antediluvian feminist. But I was determined to go and I simply decided that I would and I worked at Macy's on Saturdays and Thursday nights and I earned the magnificent sum of $4.50 a week for that but of course money could buy more at the time and I worked in the summers. In the summers I had odd jobs like I was a hostess at a restaurant in the World's Fair. I was a receptionist at the AAA one summer and the next year I graduated to be a travel advisor. I had never been out of New York but I became a travel advisor under their tutelage.

Where did you go to college?

Kendler: Well, it was Brooklyn College and Brooklyn College was part of the system that New York's City College where you have a number of really renown scholars graduating from.

Did you know when you started college what you wanted to do?

Kendler: No, I didn't. I didn't know what I wanted to do until I went to a meeting sponsored by the Psychology Department that talked about what it would mean to be a psychology major. That meeting was conducted by Abraham Maslow. Abraham Maslow later became a very popular psychologist that is a public psychologist not really a scientist. He told us to come, anyone who wanted to major in psychology was to come and be interviewed by him and I did and it was typical of him, he was by the way quite young at the time and it was before he had become famous. In many ways much of the experience I had with mentors came at just the right time, when they were young and had a lot of time, a lot of motivation and where interested in students. Well anyhow Maslow said to me, "Well you are not bad looking, your figures okay and you don't talk too much like a New Yorker, yes you can major in psychology" and I took the first psychology course with him. It was typical of him to give a course at that time in what he called eagle level. We didn't really have an introductory text and we didn't really learn any general psychology. We learned what he thought about eagle level. That is eagle level was an important concept that meant you want to keep up your eagle level and not be dominated by other people's needs or interpretations. When the final was coming up he said to us a few days before, by the way Girten is writing the final and it's on the textbook. Now I couldn't afford a textbook. I never bought one because well we didn't need it for his course. The only way I could get a textbook was to go and visit with a friend of mine who lived out in Farrock away and spent the evening before that trying to read it. She had a lot of interesting stories to tell me and I didn't get very far and once more she didn't get me on the bus in time to get back to the exam. When I came the exam door was closed and I didn't know there was such a thing, they wouldn't let me in. I didn't know what I was going to do and I wondered around the hall. I ran into my logic professor who said "What's your problem" and I told him and he called Maslow and he said oh, no problem, I'll tell you three essays, put her in a room and let her write it and I did. He was very encouraging.

And did you do well on the exam?

Kendler: Oh, yes I got very good grades with Maslow. Now as for New York it was just exciting because there were so many wonderful museums. I remember being taken for instance to a museum by a friend of mine whose parents, my parents didn't know about things like that, were a little bit more sophisticated. Seeing the first exhibit of Van Gogh, my eyes were opened, it was a marvelous experience. Being in a city that had exhibits like that. The Metropolitan Museum opened vistas that were well beyond what I had before I had those opportunities and there was the theater that was very exciting. Much better theater than now, the plays were all serious plays. New York wasn't a tourist center per say it was more a business center and which there were quite a good many foreigners who had

come for a better life and their children were looking for a better life and were better enterprising and so they created an atmosphere that was quite exhilarating I should say. But when it comes to my intellectual development per say that really took place at the college and later in the graduate school.

When you were studying at Brooklyn College, when did you first become interested in Child Development, or did that happen then?

Kendler: No, it didn't. Actually, I became interested in development which is somewhat broader than just child development. Half way through me career perhaps chronologically but it was brought on by some research findings which I think I will get to after I describe my mentors because it forms a better story. So the first person who really influenced me once I became a psychologist was Salamon Asche. Asche later became a distinguished Gestalt psychologist. Gestalt psychology was born in Germany and had the sort of profound and sort of relatively obscure quality than German philosophy has. That will be important because later I will get to the American versions. There were two kinds of principles that operated in Gestalt psychology, I will have to over simplify these things in order to tell them briefly. The two principles were that whole is greater than the sum or its parts. That is that by putting two things together you can't always tell what they will look like. That character of these things can change quite markedly. That's relatively mysterious because they don't always tell you how they will change and you have to go find out. The other one was something that has become very popular today in psychology and in everyday language namely our influence, one is influenced by one. I mean not only people but animals and young children and old children and so on. Not by what is actually there but your perception of what's there. Now that word today is in very common use, you hear people say that all the time. One reason I think that obscures matters came to think is that it's not clear what you mean by perception. Does it mean what you actually see or does it mean what you conceive about what you say. I think people usually use that to mean your conception you see as oppose to what you actually see. But anyhow I became ardent disciple of Asche and of Gestalt psychology and went to graduate school to study with Cort Leuen who was very, very distinguished Gestalt psychologist at the University of Iowa. When I got to Iowa for a number of reasons that there won't be much time to talk about I encountered a young man named Kenneth Spence who was a behaviorist. Now those were two opposed kinds of fields. Behaviorism began in America with someone named Watson and at the time became very popular and what this said was that if psychology was going to be a science it has to deal with publicly observable events like of other sciences. You can't examine your consciousness and the joke when the gestaltists wanted to make fun of the behaviorists what they would say are things like, well, "What does one behaviorist say to another when they meet?" and the answer is, "your fine how and I!" Now Watson was mostly a polemicist, he talked a lot and that was a very important contribution. It was important to me because I really have become devoted in the course of my career to making psychology a science that can take it's place with other scientists. Not intuitive clinicians you see but science based on experimental knowledge and when you are dealing with experiments it has to deal with publicly observable events. Like everybody has to agree this is a black thing you see and everybody has to agree the rat turned right for instance. While you can't all agree about how somebody is thinking about say, in today's issues the color of somebody's skin. You can only see what they say and what they do. Another thing that because associated with behaviorism was trial and error learning. That is learning became an automatic process that was the result of practice, Rote, what we call Rote memory. Now Spence represented a much more sophisticated version of behaviorism. One that allowed for empirical constructs that had to be defined by observable events but like the genes say that in Mendel's theory that was never itself directly observable was defined in terms of what he did with plants and what happened that everybody could see. Spence had a rather complex mathematical theory of a certain kind of learning called discrimination learning. Discrimination learning entailed learning to choose between we'll say how a rat would learn to choose between a black and a white door where one lead to food and the other didn't. Now if that seems obvious say most people, well do you see it makes sense, it would just choose the correct door. Well, that doesn't really tell you how it learned as a matter of fact if could take rats lots and lots of time depending on the stimuli. Now this theory also was one of the first to apply this mathematical method to a kind of simulation. Before there were computers, long before there were computers it was tantamount to saying you see how could I get a computer to learn like the rat learns and I became quite enchanted with this theory and I did my thesis in that. Now that was important and maybe we can come to that later because I am talking for too long a time now about how that lead me to development. Perhaps it would be well to pause now to talk about political and social events.

Although if it seems more to you that since the next question is, what were your primary interest in child development at the beginning of your career, the answer is really you weren't interested in development at the beginning of your career, is that true?

Kendler: Didn't I say that, I thought I did.

Yea you did so I think we need to skip that. It seems to me we've taken quite a jump here.

Kendler: If we can take this kind of thing out I thought we would take about all the things I did, the reason I don't want to go directly into it is that after I got my degree I did a lot of things were a function of the political and social climate at the time and that it's only when I came back many years later to the research that the child development thing came out.

After graduate school did you go right to work at a university or what did you do?

Kendler: No, maybe I should go back to one of the questions that asked, who were the significant colleagues and I should get that in, when I was in college. The most significant colleague at that time was Howard Kendler. We met when I think we were juniors, we started to go together and we went out to Iowa together and we were married in the second year of graduate school. Both of us studied with Kenneth Spence. Now when we finished our degree which was within six months of each other, by the way at that time people got degrees in much less time than they spent now. I took only three and a half years to get a degree, a Ph.D. degree and I had to have a Master's too, in fact Kurt Levine was my Master's thesis director and Kenneth Spence was the Ph.D. It was customary for people to do both which is not true at least in psychology any more and they take five or six years now to finish their degrees. Well, when we finish our degree, let me be more precise actually very shortly after we were married which was in the second year the United States, we entered World War II. Needless to say that had a vast effect on everybody and everything. One of the effects was that one didn't pursue ones' career directly, may of our friends went into service. Howard had actually volunteered and was turned down because of his eyes and he went to Chicago to take a job working for the Office of Naval Research on Code Learning because we were experts presumably in learning. Now the other social event that is pertinent was that there were some rumbles of feminism and I called myself an antediluvian feminist because it was really before the flood. Now my determination to get an education and an advanced education however indicated that I was a feminist and it was not easy in those times. I was for instance Kenneth Spences' first woman candidate and he actually told me that I ought to go home and be a good wife to my husband, it was very difficult. Later he became, well maybe we'll get to what happened later where he wasn't really so supportive. The rationale for much of that at that time and quite a long time after for not encouraging women students was that while they were going to get married and this would waste all the time, effort and expense put into their professional education. Well, you see what actually happened then was that Howard went to Chicago and we had deliberately made the decision that I would follow him and I did for a number of years I simply followed where ever he went and I did what I could.

Which meant what?

Kendler: Well, the first job I had was at the Chicago State Hospital. They ask for dates on that and I brought along my vita so I could give them dates if they wanted. I should actually mention by the way that even when I was at Iowa an expression of the anti-feminism was that I never got a research appointment. I couldn't have gone on without getting some assistantship so I did get an assistantship at the State University of Iowa Hospital where I did intelligence testing and I had taken a course and it didn't hurt me any to know how to do that. I must say that even though I left Kort Luen he was the one who opened up this possibility for me and I kept it until I got my degree. But when we went to Chicago the only job I could find was as chief clinical psychologist at the Chicago State Hospital which I had very little training and no special interest. That was in some ways a very formidable social experience because this was a vast place with it seemed to me thousands, certainly many hundreds of patients and a very small, very neurotic staff who themselves seemed to need the support. They lived within the community and it was very difficult to do anything constructive in that time. The therapy, the major kind of therapy was shock therapy in which they sort of did that on an assembly line but that didn't last very long because Howard got drafted into the army. Well, you see he had applied for an officership and they didn't take him for that, he did eventually become an officer and I will get to that in a moment but while he was in basic training I worked as a research assistant at the college

entrance board which I guess they do they SAT's now, at Princeton. I was a statistician working on naval research. Then Howard eventually became an officer and he was stationed of all things at Walter Reed in Washington DC and I got an appointment then at the United States Air Force as a statistician working in the Pentagon at the other end of Washington in the Air Force Selection Program which was itself a very interesting experience. By now by the way we're in 1946 which was three years after I had finished my degree. When Howard got out of the army he got out after the war ended by being requested by the University of Colorado to join their faculty and I simply went along for the ride and I say ride because we had our first car. You couldn't get cars before and neither of us knew how to drive and learned how to drive going cross country. When we arrived in Colorado the chairman of the department came back with Howard to meet for lunch and said, why didn't you tell us you were a trained psychologist. They apparently had hired someone who just had a Master's degree, they were so rare at the time and before I knew it I had a full program, but there was a hitch. Because there was a nepotism rule I couldn't have a ladder, it was sort of like an adjunct appointment. Both of us taught there for a couple of years, during this time my first son was born. I didn't really have much time for research I was learning how to teach, filling in developing curriculum for these courses but they were fun, I enjoyed it. It was a small town and it wasn't difficult to both be teaching because we were so close to the school and there were students who would gladly be baby-sitters but after two years Howard got an offer to join the faculty of the Psychology Department at New York University. I went along and there I spent the longest time away from anything that I really wanted to do. I did get a job in New York for a while as research associate for the Commission for Community Interrelations, which was a branch for the American Jewish Congress and they worked, they also had a legal department that worked in cooperation with the NAACP for instance on social issues and in reviewing for this interview I went back to look at what I think was the most interesting thing I did in that time. I was assigned among other things to get some literature that the legal departments could use for pursuing some of the social issues that they pursued and one of them I wrote and article entitled, Contributions of the Psychologist; A Constitutional Law, which was published in the American Psychologist and I'll read just the last paragraph because it turned out to be so pertinent I had really not thought about that for a long time. It says, On the basis of the type of arguments I sketch the brief concluded that it was neither reasonable nor right that colored citizens of the United States should be subjected to the humiliation of being segregated by law on the pretense that they are being treated as equals. That was at the time that they were combating the separate but equal conception of education and lead eventually to the Brown/Plesse decision. Now I left that job because we were living in the city and my son who was only seven months when we moved him from Colorado began to look quite unhappy and my second son was conceived and the sequence of those events, I think I quit before he was conceived but managed to have an accident that brought on the second son and we left New York and moved out to the suburbs. Now New York was now changing its character. That is there were no suburbs before that, people lived in boroughs but boroughs and suburbs were really a different kind of conception. There I didn't do anything for a while but Howard said I was so difficult that he went out and got a contract with the army to develop methods for improving training films and I worked part time on that and I could do much of that at home. There were two other people who did the field work and I would meet with them and do writing and so on. I did that for a number of years just to keep me occupied.

How many years?

Kendler: Well, all tolled you see between the time I got my degree and they what happened next was eleven years. And what happened next that I got a call in September that asked whether I would be willing to teach an experimental psychology course at Barnard College.

What year was this?

Kendler: That was 1954. My youngest son by that time was four years old and this was just a part-time, just one course and I had a baby-sitter who came in, however that was when lady luck started to shine on me because after I was there for a year the person who taught the Child and Adolescent course left and there I was. Now I wasn't trained as a child psychologist but another thing that happened about that time was that Howard said, look why don't we try to do some research together and we had begun to do the research that lead me into developmental psychology presently. That was one that adapted discrimination learning procedures to children. The idea then was to, let me go back just a bit and say, Spences' theory was designed to describe rat behavior. The theme being that if we could understand simple behavior in animals we could then make accumulative science out of this and go on to more complex behavior with humans but he never really got very involved with humans. He always dealt with

relatively simple behavior. But psychology was moving on to try a little discouraged with the slowness with the progress and as an aside now let me just say a few words that psychology had and still is gone through a number of changes of paradigm and this was the beginning of the latest movement in psychology which is extend today's' called cognitive psychology and that dealt with much more complex behaviors. Our idea at the time was that we might be able to use, let's say we thought we could use the principles that emerged from simple rat learning to account for a more complex behavior by assuming that the human being at any rate makes what we call mediating representational responses and as an example, a simple example of that idea is the pneumonic that you might use to remember something. Like I have problems remembering names all the time and I couldn't remember the name of the comedian called Mel Brooks and Howard loves comedy and we had a lot of occasion to talk about comedy and the way I finally worked out of remembering him was to use a pneumonic and I thought of a babbling brook because he was babbling all the time and now whenever I want to remember I can I remember babbling brooks and there we are. I guess a lot of people actually made a profession out of teaching memory using these kinds of ideas. Well we were going to adapt such a set of ideas for learning for more complex behavior like abstraction and concept formation and at the same time when it came to laboratory work Howard had found that the predictions that one would make from a theory like Spences' applied to rats but human adults did the opposite of what you would expect. Not that it didn't apply but literally the opposite and the idea here was we would start to research children to see how they learned to make these representation responses. So here I was you see beginning some child research and they opportunity that opened up was one in which I was to teach the experimental course and a course in child and adolescent psychology.

Okay, when this question as phrased, what continuities in your work are most significant, I don't want to just drop that question in somewhere, that's what I think you are talking about now, am I correct?
Kendler: Yes.

Okay, I think this chronology is really good. Now you started at Barnard and your husband, where is he?

Kendler: That is actually very important, I'm glad you remember because I did what to say something. I got an appointment as an assistant professor you see and this was now twelve years after my degree. My youngest son was five, he was in kindergarten and my husband was already a full professor and chairman of the department at his place. Now to give you a feeling about the status of feminism just to break into this and we'll come back to the continuity notion. When I applied, the way I applied is the chairman of the department came around and asked me if I would do the same thing that I was doing, teaching this years course in experimental psychology for which I was paid the magnificent sum of $700.00 which was ordinarily given to a graduate student but they couldn't find an appropriate one which is why they asked me and I said no I wouldn't but I had met the president of the college who was a woman and I was very surprised when I had gotten a note from her asking if I would come a visit her and here I was a lowly essentially a research assistant and I thought she didn't mean it when I had mentioned it to the chairman, he said well of course she means it do go. I went to see her and we had a very nice chat. I use to have lunch with some of the faculty members in the university, they had a very nice lunchroom and a small one because Barnard College, while Columbia University was very large, Barnard College was small and you could have intimate talks with people and one of them was the dean of the school and some of the more established professors who I would sit with because someone I knew in the psychology department was with them so I gathered that the president of the college seemed to know something about me and then asked me a little bit more and I was surprised to find when I left that she said I hope you will be spending more time with us. I was very encouraged by that and when this chairman asked me about continuing this I already knew that people were leaving and I said no but I would like to apply for this job and I mentioned what the president had said. That was the wrong thing to do because he immediately got huffy and he said, she's not going to tell me who to hire. Well, at any rate towards the end of his search he did come and tell me that he had an application from a man who has taught at Vassar and if he took the job he would give it to him, not because he was any better than I but because he was a man and I didn't even raise my voice. I understood what he meant, and what he meant was I had two children at home and if anything happened to those children they would come first and it was true. A number of things did happen to my youngest son, things like he fell on his head and cracked his skull. He was born neo-incompatibility, he developed a sickness when he was four years old that took him to the hospital, they never figured it out. But he was a very good child, it never happened during the teaching year and I didn't miss a day. At any rate I guess the man didn't accept the job or the president prevailed. I don't know which and I did get the appointment. All right then, here I was actually on a ladder scale research was encouraged and much of the preliminary research entailed working with neighborhood

children, my own children, working out techniques because there weren't any techniques available for adapting the procedures that were applicable to animals to children and the point was to make it fun games and they did turn out to be fun games. Course my children behaved much less well than the other children in these games but the kids would come knocking at the door and say could I play games with you today and we did.

It seems to me just from listening to you that even though you didn't enter your field really till late that everything you learned, you seemed to have picked up a lot of things that seemed to help you in your work. Is that true, I mean some of the things that you did that added maybe more dimension to what you know, if I may say it that way.

Kendler: No, to be really direct about it with respect to the research being the clinical psychologist for instance at Chicago State Hospital might have enlarged my personal understanding, my experience with the word but had no barring of the research. I actually had to pickup where I left off at graduate school and in that sense you see it was quite continuous but continuous over a big hump.

Well, what continuities in your work have been most significant?

Kendler: Well eventually, let me add one more concept before I get go the research which is what I want to talk about most. The courses I had to teach were child and adolescent psychology along with experimental psychology. Well the experimental psychology fitted quite well into what I was trained to do and was a very interesting course, a small group and could have, for a whole years lots of papers and lots of things to talk about. Oh, yes I did discover one difference between boys and girls that might be interesting when I came to that. Each student had a great many papers to write to describe the research results and I would talk with them about the papers and when I wanted to suggest to the girls that this wasn't a very good idea I would say, I don't really understand what you mean by this, would be ways that would give them an opportunity to express themselves more clearly and the girls always seemed to understand if you were more direct with a girl sometimes they would cry. Now towards the end of my career there some of the boys from Columbia College started to come over and if I used the same technique with them it came to amuse me they would explain to me what they meant and I had to practically say, look stupid this is wrong before I could get across to them. Now as to continuities in my work, now in doing this research with the children and with using the theory of the mediating response we really expected that the same principles that operated with the simple learning in rats would operate with respect to this mediating response and I suppose the shift that occurred most was the recognition that this would not work. The eventual theory that I developed which is now in press, I've written a book and it will be very difficult for me to describe very succinctly the ideas behind that theory.

You are speaking now of a new book.

Kendler: Yes, yes that book is now in press. It is called the levels of cognitive development and the basic idea is that there is a lower level of development which operates according to the simple learning of principles that do apply to rats and do apply to humans when it comes to making things automatic that it is really very important for us to learn a great many things that come to us automatically. But there is a higher level in which we abstract the relevant from the irrelevant information. Now an important idea is that at the lower level we do not abstract, it comes back to the gestalt notion. In some sense this is continuous with the gestalt theory, what I have perhaps you might say put the two together because I've said both of these things are operative. But in humans, in the adult human you get a hirer level of development in which on the one hand they do abstract the relevant from the irrelevant and they don't learn by trial and error, they learn by rationale hypothesis testing. I have come to believe that that is not a function of learning alone but a function of actual developmental change in the central nervous system. So that the theory that I eventually presented is based upon conceptions of how the brain might be organized, let's put it that way. Now it is more complex than that, there is a mathematical model in it, but that's the basic idea and when I think of it you see it then does represent a continuity on both levels and even Salamon Asche who was a little bit disappointed with us when we left gestalt psychology might not be displeased.

With a question, what shifts occurred? What do they mean?

Kendler: Well, what shifts occurred, I said you see that is the initial idea was that I could explain this complex behavior with the same simple learn principles that were available from human learning and the shift was, no that

can't be done. Now I might mention that the data on which this is based shows that this kind of development begins, the higher level development, begins somewhere around early childhood I'd say about two years of age and goes on until young adulthood at decreasingly accelerating rate. I have a lot of evidence to show that that is the case and if this proves to be true it has implications for education. Which also goes back and forth with respect to do we teach children to think or do we go back to the good old basics and the answer is both you see. But it is more appropriate perhaps in the early stages to do the route where we have to learn, for instance to learn a word that that object that charming thing that moves around is called a cat is totally arbitrary and this is only to be learned by Rote by enough repetition to remember things and it is not to diminish the importance of repetition because as I said before when ever we get into something there is a period of time when we might want to solve problems logically but where we want to know quickly later what the answer is and so sometimes for instance you remember what to do without remembering why you do it and that is just as well because the upper level is probably more limited. We can learn to do a lot of things automatically and clears the brain you might say for doing higher level things.

Were there any particular events that were responsible for this shift in your thinking? Where were you in your career and what was happening?

Kendler: The events came from the data. I feel very strongly about psychology being a science in that what changes I make in theory should be based on the experimental data and the data that produced this was this amazingly long term change. The first study we did for instance was with kindergartners and the reason we did it with kindergartners was because there were relatively large groups available. We went to the schools and did research in the public schools. The games were fun for the kids and it wasn't difficult to get people to cooperate with this and we found that the children didn't behave idol like the rats or like the college students. One could have said, well you see we have a third kind of person or the theory is all wrong and then I got the bright idea that maybe what we were doing was finding that half the children were behaving like the rats and half like the adults and actually broke the data down in terms of how quickly they had learned and was able to actually show that half of them did indeed behave like the rats and half behaved like the adults. Then later it became, what we started to do was to try to get younger children and then test for children at younger different ages and I found a very smooth growth kind of function and I was very impressed with that because I think science needs laws. Laws that can be well confirmed, natural laws and the reason you see I think that this is at least partly determined by physical growth is that it fits that natural law of growth. You know we grow in a gradual way, actually it was so stable that it could be fitted with a mathematical function and logarithmic function and the data was replicable under a variety of circumstances and then I investigated well what would happen if I had the children label things. A lot of experimental tests and it stood up and in the book I tried to apply some of this to other aspects, more complex aspects of behavior. No, I could develop a mathematical model based on Spences' original theory to account for how the younger children behave and by the way the human animals. So may I say parenthetically that this is not a theory of child development, this is a theory of development which I think takes place both antegenetically, that is within the individual and phalagenetically, across evolutionary time and has to do with the changes in our brain. And so in that sense you see there is a lot of continuity of the earlier work of Spence and the idea that the adults behavior tends to be determined not only by what he sees but what is relevant in what he sees is consistent with the gestalt notion that we respond to what we perceive. By the way the gestalt story that corresponds with that behaviorist joke is that, I'm never sure whether they really meant this literally or not but it appears in one of the famous books that a traveler traveled across the great plain in Switzerland, snowy covered plain when he got to the inn he dropped dead because the intern said that was a plain that was Lake Constance you crossed.

In following their model I think we can now address in asking you to reflect on the strengths of your research and theoretical contributions the impact of your work in its current status. You alluded to that now is a brand new book coming out, can you elaborate on your research history a little bit.

Kendler: Yes, much of what appears in the book, the data has been published and the research history to be perfectly honest was that when the early studies were published it was very well received. And I might say when I said lady luck smiled on me I should add one more thing. At the time that I was appointed to assistant professorship at Barnard there was an enormous increasing interest in university science. The government became very involved in that largely because Sputnik had been sent up in space and there was a great deal of interest in supporting research and it was very easy for us to get research support for this. This research received quite a lot of attention and as a matter of fact you see then I got promoted, oh I haven't gotten to UCSB yet but we will come to that presently. But

in the course of time Neobehavioralism lost out again to the changes that took place and cognitive psychology has replaced it and our research tends to be associated more the neobehavioralsim and became considerably less popular shall I say. Now one of the goals I have had in psychology is to see us become a science that does consist of one school replacing another which replaces the next and so on. There is a philosopher of science called Thomas Coon who published a book that argues that scientific development consists of changes paradigms and the paradigms often consist of changes in language and the cognitivists took this up as an indication that this is the way science proceeds but the fact I believe is and I think Coon eventually agreed that while there are changes within a science as it approaches its edges and you do have to look at things differently you don't replace all of the laws and all of the contributions of the previous one which has been characteristic of psychology. I think that one of things that we need to do is to have some laws that we all agree. Our characteristic of psychological change in the case of development for instance and we might have different ways to explain them but at least there ought to be an agreement about some of the laws and so I'm incline to hope you see that people will look at these data and look at it from that perspective and if they want to interpret some of these changes differently well that's fine. Now while I come back I have a pretty good theory about what goes on at the lower level, it's much easier to understand than what goes on at the higher level. I have some suggestions that I offer for instance I think the mechanism that produces the abstraction is a sorting mechanism. That is that we tend not just to see things as they are but we tend to sort them into categories and that we will possibly find is what happens at higher levels. While I am talking there is also an increase interest in neuroscience and there are neuroscientists now who are saying things that are not so far away from what I am trying to say in this book. I suppose the most unique part about it is that I deal with this developmentally and have these rather stable developmental curves to show for it.

Well, I think you have described a little bit perhaps this new book may best represent your thinking about development, would you say that?

Kendler: Oh yes, yes it represents all my thinking about these particular aspects of development. Development is a big concept and there are many other things developing besides what I am talking about but this is referring to the development of abstraction and the development of reasoning and the data that I based this on are very simple problems and the idea behind it is that I have to have simple problems that can be solved by animals in a different way than they are solved by the adult as well as young children so I have the same problems. What I am showing is the different ways that the adult approaches it compared to the child and the gradual increase in this change.

I am assuming by this question they mean a particular single study or which of your studies seem most significant? That's kind of a though question, isn't it?

Kendler: No, I can only answer that you see by saying there is no single study that perhaps ever shows enormous significance. It's the accumulation of data about some phenomenon that can show significance and so no there is no single study, perhaps remember the very first one in which I discovered of all things that children didn't fit either pattern was the germ of the idea that later then developed into a great deal of data all of which points to this. I think that's the theoretical contribution and I don't believe, oh one can't make generalities about science and say there isn't a single study, there was a single idea, the double helix idea for instance was a sort of a single publication but it was based on a huge amount of prior research and I don't know of anybody who has made a break through like that in psychology.

Which contributions the most wrong-headed?

Kendler: Well I did say the most wrong-headed was the one that did try to use the very same set of determinants that determine the lower level, what I now call incremental associative learning in which there is no selection among all the stimuli. That is you're really learning about everything that is impinging on your sensorium. I thought that I could explain that with respect to this learning a mediating representational response. The idea that language for instance could serve such a function and I think that is wrong now, so that was wrong-headed and it took a while to see that change.

Could you reflect on your experiences with research funding apparatus over the years?

Kendler: Well no, as I already mentioned, I didn't. As a matter of fact we were funded by the National Science Foundation from the start. I didn't get around to talking about what happened after I left Barnard and perhaps this is just as good a time to introduce that because Howard began to be unhappy in New York and he was offered a job at the University of California at Santa Barbara. They had an anti-nepotism rule and I gave up a tenured job as an associate professor of psychology to come to California with him. I think of all the things that I did reflect on that was perhaps the one I should not have done. But as it turned out, lady luck shone again. I did manage to get support from at that time was called the Public Health Service which has now become part of the Department of Human Welfare or something like that and I got a five year grant that paid my full time salary. But the anti-nepotism rule here said I had to go and get it reviewed every year even though they were paying me nothing and they were collecting a pretty good amount from the government for this. Now the administration was sympathetic to trying to get me an appointment and did try another of odd ways like marriage in the family which was not at all what I would be interested in and Chancellor Chattel talked to the Sociology Department and proposed that I should become a sociologist, you see this is not social psychology there is an area in psychology called social but that doesn't fit and I can't remember the third one but there was something else that came up. However, while I was here the person teaching developmental psychology didn't get tenure and there was an opening and by this time the research was going very well, well enough for me to get a full time research grant for instance and to make a long story short the department did ask them to wave the nepotism rule and the rumor has it that the university did wave the nepotism rule, the nepotism rule was one only for people in the same department. That is you could not have relatives in the same department, but that was waved, the first one in the whole university system and I was appointed a full professor and I've lived more or less happily ever since.

What year did you come to UC Santa Barbara?

Kendler: 1963. Barnard, I actually became a research psychologist, let me go back now. Barnard was kind enough to give me a terminal sabbatical even though they knew I wasn't coming back because I'd had none before and in 1964 I could then begin, we were doing work under the National Science Foundation grant and that was supporting the research if not me. The appointment with Public Health Service began in 1964 and continued until 1966 at which time I was appointed professor of psychology at the university. Now research funding as cognitive psychology went on began to dry up but I really wasn't terribly interesting in collecting more data, perhaps later we will talk about what happened between my husband and myself on research. So far I have talked about this research only from my own point of view but there is another point of view. I wasn't particularly interested because I had collected a vast amount of data. One of the opportunities that were presented by all this research funding was that I could hire a technician, Doris Berganty was one of them, was the one. She was the young woman who came to me and I decided that despite the fact that she had two young children I was going to give her the opportunity and she became invaluable. We worked together like hand in glove. In fact she actually saved me on one occasion when we both went up to Stanford to go to the Behavioral Research Institute there when the students were rebelling all over the place and among the things they did was to burn down the place that we were working in.

This was I take it in the late 60's or early 70's?

Kendler: Yes. This was I guess in the late 60's, somewhere between the late 60's and early 70's. It was the time they burned the bank here.

That was February 25, 1970 as a matter of fact.

Kendler: Okay well there it was, it was the very same year. And what had happened is that the students were shunted off the campus and this institute was on the grounds and they simply went over there and they were wooden shacks and they burned them down. We happened to be in Europe at the time and got a call while we were in Israel actually saying, I was terrified, why are they calling us. What's happened to my children or what have you. They were grown by that time but they do say that my study had been burned down, now how Doris gets into this is that she wouldn't let me go until she had all copies of everything. Oh, I had lots of data there and it all burned up, because she was so careful it was all saved. Now because I had all that data, you see I never did finish. I still have data that I could go on analyzing so that this book represents some data that had not been presented before. I didn't really need, I needed time to think and time to analyze these data. It was my husband who wanted to go on doing research, perhaps we will get to that.

Well, I think this is a good time since I am interested in this now in that you had a great deal of data and were conducting your research. I'm interested in your experiences as a teacher of development research and training of research workers and the kinds of courses that you have taught. If you could just review that a little bit with me now. You have talked about Barnard and what you taught there.

Kendler: Not exactly because the question about teaching began there and has to do with becoming a developmental psychologist, the other side of this and that is I was to teach child psychology as I have mentioned earlier and adolescent psychology and I had never taken a course in either. I had one course at Iowa interestingly enough. This was taught by Beth Wellman, it was a seminar on what's called the wondering IQ and what she was defending at the time was the claim that IQ's could be increased if children go to preschool and she was viscously attacked for that notion by the Stanford people by the way who were producing the IQ test and wanted to think of this as a stable measure. I might add incidentally that it could be a stable measure and still be influenced by education. The two ideas are not in contradiction now so I am not offering a contradiction to that. I didn't really know how I was going to go about this. It was quite a challenge for me partly because I thought to myself, well Howard why do you have to have a course in child psychology if children are indifferent in some ways than adults and how are they different. It was not suppose to be an applied course and I might add that I had become enough of a scientist to think that application really should rest on scientific knowledge. Sometimes you need to talk with someone who is intuitive and sympathetic but when you are teaching a course these are not things that you can convey. So one of the things I did was to make it into a years course and I called it developmental psychology and I never found a text that I really could use. Not through all the years because there really isn't enough in the way of laws in the way of developmental psychology which comes back to saying, you see that's one of my research interests.

So what did you do in lieu of textbooks?

Kendler: Well, I would have readings and they changed, they changed as the field changed and I'd put them together in the best way I could. That's what I did teaching here, I didn't teach a year's course it was a semester's course but I did at the graduate level too. It never was really satisfactory because there never were really enough developmental laws. Now as to research I did have a number of Ph.D. students, all but one did research in developmental psychology and most of them have continued to do this.

Do you know how many students you have under you?

Kendler: Yes, there was one post-doc and seven Ph.D. students. The last one was in 1984 and she did an experiment that used the model that we were using to predict behavior and it predicted beautifully. It was a very pleasant surprise for me.

Was that a very satisfying part of your work was training Ph.D.s?

Kendler: Oh, the most satisfying part of ones' work is talking to graduates and undergraduates. There were undergraduates who came and did research and some of them did very good jobs and sometimes I would have a team of the graduate and the undergraduate students, I don't have any count of the number of undergraduate students. But talking to students individually is the most satisfying and interesting thing one can do I think. It's too bad we have to have big courses where you lecture at people and don't have the opportunity to relate to them on a one to one basis. And it was also true that at Barnard it was easy, there was much more time, the classes were small and the atmosphere was one somehow that made the students come more easily. I found at UCBS that perhaps because it was so much bigger that the students would come to the graduate assistant who usually didn't know much by the way because they were just trying to learn, rather than coming to the professors to talk and I think that was really too bad.

Sometimes we hear the criticism that professors are not available, this sounds like just the opposite of that.

Kendler: Yes.

Teaching and research and the balance between them has always been talked about at a research university. In your field was there any sort of tension between teaching and research?

Kendler: No, none at all. I could teach what I wanted and I could research what I wanted. I must say there was a great deal of freedom with respect to that. There was always pressure to publish of course and pressure to get grants but aside from that no problems.

And grant, again going back to the funding apparatus and your experience with that, you said at one point that some of the money began to dry up in that you had collected a lot of data anyway. Then what happened, if you say there was pressure to pursue getting grants, did you do that and did you find other avenues than you had previously?

Kendler: No, I didn't really care. I got to a Professor VI level in any case, I was getting promotions along the way and I wasn't ambitious anymore. My ambitions could turn to relatively pure scholarship. I was tired of seeing the people in the department each one fighting so viscously for their own little research corner and I could stand aloof from that and mostly did, took advantage to it I suppose you might say.

You earned it, you earned the right don't you think! You've talked a little bit about your feeling about, well your heart-felt belief in your research.

Kendler: You know I might mention that I did get some honors which did accrue you know so that I could satisfy some of the pressures in the course of this. I have them somewhere and they came even when I wasn't getting research support, a little late but…I got a Guggenheim Fellowship in 1974 which I took to study at the Hebrew University in Israel. It was a fascinating experience. I was elected to the Honorary Society of Experimental Psychologists in 1975. I might add that I think a number of these appointments were after the flood gates opened and that if anything the feminism was an advantage at that point. For instance the Society of Experimental Psychologists had practically one or two females at the time. I was elected to be Board of Governors of Psychonomics Society which is a distinguished, not distinguished buy you have to have some research in order to be a member of some significant published research and this was actually part of an organized feminist movement because there were no women on the board and the women got together and decided to find somebody they thought could be elected and I had the honor of being that person and I was selected. Then I got to be President of the Western Psychological Association that was in '77 and '78. Each of these there were executive committees that you functioned on as well and even after I graduated I got a Fulbride Scholarship so that could placate the University with respect to adding to its prestige in any case.

You began to talk about psychology as a science and that has been your life long pursuit it seems, your career pursuit. This question of describing your experiences in so called applied development research…

Kendler: It doesn't apply.

It doesn't apply really.

Kendler: No, I never did any applied. Not that I wouldn't be very pleased you see if anything that I did could be applied, it would be splendid. I think for instance that it might have baring of this education thing that I am talking about where this is this constant conflict between Rote and discovery learning and just indicate that both of them are functional and are required and ones more appropriate at different times than the other and so on.

Do you see that as happening?

Kendler: No.

And why?

Kendler: Right now I think we are having other kinds of problems in education that are…before these difficult times where we have political correctness and racial discrimination and all of those issues and the issue of how to teach was more important and now it is a question of what to teach and that takes on more social connotations than scientific.

But do you think to the detriment of education?

Kendler: Yes. There was somewhere in this thing a question of how did the social and political events influence your research. Social and political events had an enormous influence on me as a person. I was raised in the great depression and oddly enough it might be helpful to some students to say that what this did was actually to produce a lot of idealism. It's rather strange but it seems to me that my generation was very idealistic. A lot of the social upheaval, for instance some of the Marxism came in from people who were hoping you see that they would find a better way for people to live at that time. So politics has always been a considerable interest and still continues to be for me. The war had enormous impact, the Nazism and Fascism in Europe of course. The Holocaust, I'm Jewish, the Holocaust had enormous impact on my life. By the way we are not at all aware while the war was going on of what was happening. These discoveries that the soldiers made after were not a matter of common knowledge at all but I don't believe that politics should enter into scientific investigation.

Do you still consider yourself an idealist?

Kendler: Yes, I suppose so. I'm still interested in what, I don't think it is as easy as I thought it was when I was young. It seems to me that it was, oh well it'd be perfectly clear what should be done. Exactly how it is going to be done, I've become more weary about predicting.

It's just experience. Do you want to talk about your experiences with SRCD just very briefly?

Kendler: Oh, yes. I don't really remember when I joined SRCD but it was very early in the organization and I can only remember one biannual meeting. It was held in Santa Monica quite a long time ago. I gave a paper and it was very well attended and it was exciting because the questions were challenging and I enjoyed. The other contribution which I did remember after a while was that I did serve as a contributing editor on the journal that was produced, the Journal of Experimental Child Psychology for quite a number of years. They ask my earliest contacts, my earliest contacts was with Sid Bijou who was important I think in organizing the Society and it was at his request that I became a consulting editor. That's as much as I can say.

You've discussed, well to some extent you've discussed the history of the field during the years that you've participated in it and how things have changed and commented on that. Is there anything more that you would like to say, have you views concerning the importance of various issues changed over the years and if so how?

Kendler: No, I think I've expressed those pretty much in what I have had to say. What are my hopes and fears?

For the future of the field. Your hopes I think…

Kendler: My hopes are that it will become a science and stop being tossed on the waves of change. Basic change is where everything is thrown out that preceded it and one starts anew. I think the hope might lie in a merger between experimental psychology, developmental and an experimental psychology, phase of psychology and neuroscience which is developing and perhaps some stability will emerge out of that but that I'm afraid remains to be seen.

And is that, maybe you could say that's you fears for the future of the field as well?

Kendler: My fear is that we'll go through another change at this point for instance cognitive psychology largely, heavily because of the computer and they used a computer model. That is the concepts that go into computer programs and it seems to me at least the original idea that the program itself is a theory has disappeared. The notion was that we could get a computer to actually think and I think most people have given that up. Computers can be programmed to do any awful lot but they don't think like humans and you can see things sort of dissipating but I might be prejudice with respect to that so.

You've talked a bit about your work with your husband and I think this would be a good time to discuss that a little bit more.

Kendler: Yes, I think that would be appropriate. I did get started with the research at his suggestion actually. He would say, well you know you were never interested in my work, maybe we could do something together and this came out. We actually used the Discrimination Learning procedure that was my thesis not his but gradually however we began to see things differently and as Howard says we had an intellectual divorce. We stayed married for over fifty years, we are still married but we did go our separate ways with respect to interpreting the data that we started with. He has gone more into history actually and I've left much of this for me. In other words, it isn't that we publish articles in which we disagree as much as he stopped working in the area and I went on and he doesn't exactly agree with the way I have gone on.

When did you begin to diverge, do you recall that time?

Kendler: Yes, I think it was about in the 70's that far back. I can remember when I got the Guggenheim working in Israel in this cold flat on really what was the germinal notion that is expanded in this book and I don't think he bought much of that. The developmental stuff is not his domain, he is still interested in the mediating representation in some ways and I no longer felt that was operative. That's the way I would describe it but he might describe it quite differently.

But yet he certainly had some influence on your heading in the directions initially into development.

Kendler: Initially, yes but primarily because we both came out of Spences' laboratory and also his own research had shown something which he did by himself about the difference between adults and infrahuman animals, human adults and infrahuman animals that was important in my research.

Is there anything else you'd like to say about your personal interest and your family?

Kendler: I might mention that we have two sons and my husband says we're batting average .5. Our eldest son has never found himself. He is very talented, very handsome, a healthy looking fellow who never found himself and still hasn't. Our younger son is now Banks distinguished professor of Psychiatric Genetics in Psychiatry. I asked him why he doesn't send us some of his articles so he brought down a book of articles and he had, this was about two years ago, about 195 articles and he is only in his forties. He is very productive and he has a nice family. He has three children, his wife is a physician and that's you see what two psychologists can do, bat .5!

Okay if there is anything else you would like to add in closing this interview about how your personal interests may have had some weight on the contributions you've made to your field. Has there been any cross over except for your relationship with Dr. Howard Kendler?

Kendler: No, actually I think I have told a lot more than I ever expected to and much of what I have said are personal interests in the sense that I feel very strongly as I have said before that if psychology is to be of any use we have to have a science which would stop you know all this false memory thing for instance that is going on. It enrages me to see how much harm some people can do because they are not using evidence really basic evidence. Now medicine started really as an applied science based on common sense and gradually became the practitioners of a science and I'd like to see psychology do that. Both from the point of a public value and because it is fascinating. It is an absolutely fascinating topic.

We are through, thank you.