Ann Roth Pytkowicz Streissguth

- Born 12/13/1932 in South Pasadena, CA
- Spouse – Daniel Michener Streissguth
- Ph.D. from University of Washington (1964); M.S. from the University of California, Berkeley (1959); B.S. from Oregon State University (1954)

Major Employment:

- Fetal Alcohol Drug Unit – Founder/Director
- Seattle Study on Alcohol and Pregnancy – Principal Investigator (1974)
- University of Washington – 1963-2005, School of Medicine

Major Areas of Work:

- Fetal Alcohol Syndrome (FAS), Fetal Alcohol Effects (FAE)

SRCD Affiliation:

- Member

SRCD ORAL HISTORY INTERVIEW

Ann Streissguth

Interviewed by Heather Olsen
At Dr. Streissguth's home
February 16, 1994

Olsen: The oral history recording for the Society of Research in Child Development of Dr. Ann Streissguth and today is February 16, 1994. The interviewer is Heather Carmichael-Olson and I am a junior faculty member working with Ann. And we're ensconced in her living room comfortably ready for the interview. And the first question I had was simply, tell me how you first became interested in the field developmental psychology.

Streissguth: I became interested in developmental psychology when I was teaching high school, in a school that was, had a lot of children, most of the children in the high school went on to college. There were a few children who didn't, and seemed to have a lot of problems with their lives. And they tended to congregate in my room after school. And I talked with them and I got really interested in how they could be so disturbed by the time they were just young people leaving high school. And after teaching high school for two years, I decided that I was really most interested in solving the problem of how children could be already this disturbed in life, by the time they were sixteen years old, seventeen years old. And what, if anything, society could do about this. And at that point I enrolled in a new program in child development at University of California, Berkeley.

Olsen: So when was this? What year?

Streissguth: I guess--it's so long ago--I guess it was 1956 when I started at Berkeley, and I enrolled in a new master's program in child development that was run by Paul Mussen. It was kind of an experimental program and it seemed just perfect for my needs. I hadn't been particularly interested in getting a Ph.D. and never really had thought about it. I just wanted to solve this problem and really

wanted to start working with young children. I figured the answer to this would obviously be working with pre-school children. So I thought that would be where to start working, rather than with high school students as I had been.

Olsen: When you say it was perfect, how do you mean that? How was it perfect for your needs?

Streissguth: Well at Berkeley there was this age old tradition of longitudinal research and following groups of normal children throughout 30, 40 years of their lives. There was a wonderful developmental pre-school run by the psychology department. So I was able to be a teaching assistant at the pre-school. And just come in contact with this wealth of longitudinal data. And of course some of my important mentors were there, like Nancy Bayley and Jean McFarlane and Hannah Tiow ran the pre-school and they'd all been there for many years. And it was a..... Marjorie Honzik, and it was really wonderful, Katherine Landreth was another one, and it was wonderful to be there with all of these older women, even older in those days, that had spent their lives in developmental psychology research. It was really thrilling.

Olsen: Actually one of my questions is to ask you, I guess, at each point in your career, not only who would you consider your mentors but why they mentored you, how they influenced you? So perhaps you want to start back in Berkeley and choose one or two or three or however many you feel were significant. And just tell me a little bit about that, about the mentoring that you received.

Streissguth: Well I guess the other mentor was Paul Mussen, himself, who was the director of the program. And not having been in psychology as an undergraduate, it was just exciting to me to work with people who had spent their whole life studying child development in a longitudinal context. So I really grew up thinking about the life span approach to psychology and development by working with these people, by taking their classes and working on research with them and getting to know them, going to parties with them.

Olsen: And being involved, as I know already, in the standardization of the first Bayley.

Streissguth: Oh yes, that was years later. I continued to keep in touch with them over the years, but I think that finding myself in this longitudinal context was something that truly influenced all the work that I have done all my life in psychology.

Olsen: So there you were in Berkeley and you were moving through this experimental studies program, it was a master's level program, what happened next?

Streissguth: Well I moved to Boston and found it; I had been looking for some kind of an interesting job in Boston to do. And I just because of my experience working with Nancy Bayley and being an experienced infant examiner at a time in history where it was not very popular for people to be examining babies. I was able to get on, in the very early stages, of the big collaborative perinatal study that was ongoing at twelve sites across the United States. And Boston was one of the sites. And this was a study that began in, actually data collection and piloting began earlier, but around 1959-60. And it was going to be the study to end all studies on child development. This was going to show what were the early influences, the adverse impacts on children that contributed to neurological impairment. And Nancy Bayley was one of the consultants and they used the Bayley Scales for this very early experimental form of the Bayley Scales. So I examined hundreds and hundreds of eight month old infants in Boston. And it was a very interesting job to be involved in this. Richmond Paine was the Boston neurologist that was the principle director, principle investigator of our component. And we had frequent meetings with Doctor Paine and we learned all about how it really is out there in the research world doing longitudinal work. And being a small piece in a very important long-term project. So that was very interesting to me and at the same time I was doing that, I did some volunteer work out at the State Hospital. And began working with some children who were thought to be Autistic. And this was, I guess, '58, '59, something like that. You know when childhood autism was really just beginning to be

talked about. And it was very interesting to me to see these young children that were so severely disturbed. And I had the same reaction that I'd had when I was teaching high school. And I thought, "How can children this young be already so disturbed in life?" You know, what could have happened to them and what could be done to help them? So I was just kind of overwhelmed with the same sense of urgency to go back to school and learn how to solve this new problem. And it was at that point then that I decided to get a Ph.D. in psychology.

Olsen: Oh and just for my own interest, where were you teaching high school?

Streissguth: In Morin County, right outside of, down in the bay area.

Olsen: OK. So you'd actually moved from California now to the East Coast. Out of curiosity, why the East Coast, why Boston?

Streissguth: Well I was married at the time, and my husband was a young Ph.D. from Berkeley and he had a great job in Boston. So I followed him.

Olsen: But you now have both the West Coast influence or ethos in psychology, and you also have the East Coast kind of perspective. So then you decided to go back for your Ph.D. and went where?

Streissguth: I was quite naive, and I decided that I'd like to return to the West Coast to get my Ph.D. because I really felt most like a westerner and wanted to settle on the West Coast. Hadn't really entered my mind that it wasn't clever to get a Ph.D. at where you wanted to end up working. But I hadn't really realized all that. And I was interested in the University of Washington because Doctor Charles Struther was there and was publishing a lot on early brain damage in children. And so I thought I'd like to study with him. So that's why I came out here to the University of Washington.

Olsen: And did in fact study with him?

Streissguth: Yes. I can't remember. He was gone for quite a bit of the time, so he didn't turn out to be my major professor or anything. But I took some classes from him. And I was glad I'd come out here. It was stimulating and interesting.

Olsen: And what was psychology like at the University of Washington at the time? Did you feel a particular environment, behaviorist environment? Or were you able to explore what you wanted to explore?

Streissguth: Well while I was in graduate school here, and I started here in 1960. I guess the peri-natal collaborative study must have started earlier than that, it must have been '58, '59, when I was working on that. At any rate I started here, at the University of Washington, in the psychology department the Ph.D. program in 1960. And during the next couple of years I had my first; I enrolled in the clinical psychology department, and immediately began clinical work at the VA hospital. I had an internship to work at the VA hospital, which is exactly what I wanted to do. So I was immediately thrown into an environment of working with people with serious mental illnesses. And that was fine. I was interested to discover though that the developmental psychology program, here at the University of Washington, at that time, was very behavioristic with Sid Bijou, was the head of the department, and Don Bayer and Lovas and people that are now luminaries in the field, were here when they were younger. Of course, some of their courses were required so it was quite interesting to me, to take these child development courses that talked only about modifying the behavioral manifestations. As a clinical psychologist I was really much more interested in the psyche and the motivations for people and their backgrounds and how these related to their current development. The idea that you would just want to deal on the surface level with using operant techniques to modify their behavior seemed strange to me as a clinical psychologist. And I'm sorry to confess that I didn't really see the wonderful value of the behaviorism in terms of modifying. Particularly disruptive behaviors in young children. I sort of escaped me at the time. But there were certainly luminaries here in that field. My interests more were in disabled

children, childhood autism, and things like that, rather than using operant techniques to modify the behavior of disturbed children.

Olsen: And so that takes us into your Ph.D. program and you are in Seattle and you have an interest in brain damage, and different kinds of childhood disabilities. And I'm tempted to leap to my question of what inspired you to enter the field of fetal alcohol effects, but I'm not sure we're there yet?

Streissguth: Oh we can get there in a hurry.

Olsen: I'm wondering, is there a step in between?

Streissguth: Sure. Sure. After I got my Ph.D. I was hired at the medical school in the psychiatry department, in the division of child psychiatry. And I spent a number of years after that teaching residents, teaching psychology interns, and doing the kind of standard things. Working with families of disabled children, working with disabled children. Doing psychological examinations and so forth. We had an inpatient unit, and an outpatient unit. And then Doctor Struther was involved in developing the Child Development Mental Retardation Center at about that time. So that was built here. And we had this very interesting multidisciplinary MRCD center. So there were many opportunities. And in the beginning it was quite stimulating. And after a number of years of this, I took some time out and I had a baby. And I spent nearly--well I spent almost a year with my husband starting when our baby was 17 months-old. And we were traveling in a Volkswagen camper in Asia and Europe and living at various places in the interim. And I took the total time off from being a psychologist. I wrote children's stories and did a lot of photography and played with the baby. And studied people in other cultures as we lived in these very exciting places in Turkey, and Iran and so forth. And it was all, in terms of my husband's sabbatical. So I was just along as a mother and watching our own baby grow up. And it was so interesting and I had felt really kind of burned out on being a psychologist in a child psychiatry program before I left. Feeling that we weren't really doing enough to help people. We didn't really know how to modify people's behavior. That a lot of these children we could see them, but it didn't seem like we were making a very big impact on their lives. So I was feeling a little disillusioned about this time. It was good to take time off and think about where I was going. And I had such a good time, being gone. And I decided anything I came back to had to be very, very significant and very important in a social sense. Or it wasn't worth getting that involved again. I hadn't really thought particularly about an academic, I mean I wasn't interested in being a full professor, or working my way up in the ranks, that wasn't something that really ever was a motivation for me. I was simply interested always in doing socially significant work, and helping children. Helping children be happy and normal and healthy. So after we got back, and before I really decided really to get my, I had my leave extended and some colleagues of mine, asked me if I would examine some children that they were doing some research on. And it happened to be Dave Smith and Ken Jones in the pediatrics department. They asked me, well they knew me, but also because of my work with Nancy Bayley. I was experienced in examining people of any age, from babies on up. And they had a small group of children that ranged from a couple months of age to maybe four years of age. So they asked me if I'd see these children. And I said, "Well, what's the problem? What are you researching?" And they said, "Well their mothers were all alcoholics, and we think that the alcohol has really impacted these children and that they are really disabled because of the mother's drinking. And so we want someone to do some psychological examinations." So I said, "Fine." But I said, "Alcohol, you mean like alcohol that women drink when they're pregnant?" This was 1973; actually I probably started seeing them maybe the end of '72, the beginning of '73, right about that time. I agreed to do it, but frankly I was stunned that the question hadn't been asked before. Dave and Ken said, as far as we know, no one has ever really looked at this problem before. But we think that's what the problem is. Well I went to the library and I spent a week in the library, and back in those days, nothing was computerized. You had to do searches by sticking a pin through cards that had a certain hole in them.

Olsen: Oh really?

Streissguth: Yes. When you wanted to get into the international files. So I spent all of this time in the library sticking these long knitting needles through these cards to pull up alcoholism and studies of alcoholism in Hungary and Russia, and so forth. And to see if there were any English abstracts. And I was very satisfied by the time I had done this that there was really no research on this area, on the impact of maternal alcoholism during pregnancy, on the development of the child. Well then I was totally intrigued. And I had done some work; I'd already been interested in prenatal influences. I had collaborated with Tom Shepard on an early study of children with Rubella Syndrome, during the big Rubella epidemic here. And that had been one of the most interesting research projects that I had ever worked on. And again we did longitudinal follow-up studies of children born during the Rubella epidemic, whose mother's had been exposed to the Rubella virus. And it was a devastating experience to see these children. They had very significant sensory impairments and some of them were very mentally retarded, many of them were blind and deaf. And there was a whole spectrum of disabilities in these children. It was really about the most interesting piece of research that I'd done, we got to meet families. So I was already using what I'd learned at Berkeley, you know the longitudinal context which I'd followed through on in Boston, with a perinatal collaborative project. And so working with these Rubella families over time, was the first chance that I'd had to do longitudinal research on a prenatal cause of childhood disability. So I was already primed. So when I convinced myself that people really had never looked at alcohol in pregnancy. It was with great interest then that I saw these first children—these first seven children. And sometimes we drove around to the homes to see the families. And sometimes the children were brought in to us. And it was an absolutely devastating experience to see these children that were born to these alcoholic mothers and to see how impaired they were. And because of the kinds of experiences that I'd had in my own lifetime. I'd worked with so many different kinds of disabled children. And not just children that had straight mental retardation, but children that had been brain damaged from different causes, including Rubella. So it was truly clear to me when I saw these first children, that they were brain damaged and not just children of poverty. And I forgot to mention to you that I was also involved in a very large study of children in poverty. And you know back in the war on poverty, I helped fight the war on poverty, long before I was fighting the war on drugs.

Olsen: Here in....?

Streissguth: Here in Seattle. Irwin Sarason had been my mentor when I was in, as a graduate student here. And he and I, and Helen Bee and some other psychologists put together an application to look at the impact of poverty on child development. And we did a big preschool study, in which we looked at early mother infant interactions. And we interviewed mothers and we studied lots of different kinds of cognitive problems in children. So I already had a lot of experience working with children who were just from impoverished backgrounds. Plus I had myself, done volunteer work with the Quakers in the slums of Washington DC, when I was young. And I'd had experience working with children who just grew up in poverty. So it was clear to me, then when I saw these children, these first seven children born to alcoholic mothers, that these were not just standard children that had grown up in poverty environments. And in fact not all the women were poverty women. But they were clearly brain damaged. So I was very intrigued at that point, and so stunned by the realization that drinking during pregnancy could so devastate the potential for children's development, that I just thought that this is the moment, this is the truly socially significant thing that I've been gearing up for, this is it. And I decided to spend ten years of my life doing research on this topic, you know, is it really true that alcohol does this to babies, and how does it happen, and what's the long term impact? As soon as we published the first, these first seven patients, then Ken Jones and Dave Smith published a paper naming Fetal Alcohol Syndrome. And showing a picture of a child that was diagnosed at birth. So the implications seemed incredible, I mean, here you could diagnose at birth, someone who had been impacted by maternal alcoholism. And the opportunities for prevention and intervention just seemed amazing. It seemed like it was a really made to order situation. So I thought, well in ten years we'll be able to establish alcohol does this to children. And develop a plan for prevention and intervention so that no more children will have to be born so disabled from alcohol. So that was my goal, for ten years. And we were, Ken and Dave and I, were able to get access to the records from the perinatal collaborative study. So after those first two little clinical studies, the next study we did was going back to Washington DC, to where the records from the perinatal collaborative study were housed. And we

were again, stunned to discover that this study to end all studies, which I myself had participated in, in Boston, and which had been conducted at twelve sites across the United States it was the biggest child development study that had been ever carried out in the country, begun in 1958, '59, that this study had never asked a single question about alcohol use during pregnancy. They had asked about smoking, they had asked about medications, they'd asked whether the woman had had contact with farm animals, they'd asked about everything you could imagine. But it was a clear documentation to me that the cleverest people in the country who were planning how to study what was wrong with children, had no conception at all that alcohol could be in any way harmful to children from prenatal exposure. So we did a very nice study then, with the perinatal collaborative records. There were less than a hundred mothers out of the whole, you know the thousands of mothers that had participated in this study of 44,000 something like that, there were less than a hundred who had by some coincidence, been marked on their pre-natal records that they'd either been drunk at the time they came in or someone said they were an alcoholic. So Dave went through the maternal records, and I went through the psychological records, and Ken went through the medical records on these children. And we each gathered our own data, and so we were blind to the other's side of the data. And then we ended up with a small group, oh, and we also had asked them, the peri-natal collaborative people, to pull two very well matched controls for each of the people that were in the exposed group. So they were matched on about twelve different kinds of variables that might be important, like race, and city that they grew up in, and whether they delivered at a hospital that served poverty people and lower middle class people, and maternal and paternal education, and all the kinds of things that as a psychologist you want to be sure you'd looked at. So we had this incredible control group selected from 44,000 people, for this small group that we had. And so we had all of the records mixed up so everything done blind. And we discovered from this study that was published then in Lancet in 1974. That it was clear that the children whose mothers had been alcoholic, were clearly more devastated then those who came from exactly the same kinds of backgrounds where there was no indication of alcoholism. We don't know how much the mothers drank, but even just no indication. So that was a very clear demonstration to me that it wasn't just a poverty environment. That there was something about the maternal alcoholism that was really devastating these children. Well by that time there had been a lot of media attention to the papers that were published in Lancet in '73 and we just started getting lots of phone calls from people who was say, "Well I'm not an alcoholic, but I was drinking during my pregnancy, and can drinking during your pregnancy hurt your child if you're not an alcoholic?" And we said, we don't have any idea, I mean, no one has ever studied that before. So rather than start out just to follow these children with Fetal Alcohol Syndrome, it seemed to me that the most socially significant thing, because it seemed to me already by 1974, we had enough evidence to say that women should not be alcoholic during pregnancy. I mean, this study was really, it was only one, but it was a very powerful study. So with two of my colleagues at the University of Washington Medical School and School of Public Health, Doctors' Joan and Donald Martin, we put together a design for a longitudinal prospective study to look at the impact of maternal alcohol use during pregnancy in a population of Seattle women. And that study then was immediately funded by NIAAA. And we began it in 1974, and it's still ongoing, it's still received funding for 19 years now from NIAAA. And we've been extremely fortunate to have been able to follow it up for so long. And it seemed to me that a study like this was the way to go because millions of women all over the world were blithely drinking alcohol during pregnancy, knowing they were an alcoholic, but not having any idea whether or not alcohol use could be damaging to their children. So that was the motivation for beginning that major longitudinal prospective study, which we're still continuing.

Olsen: So just for a moment, if you could reflect on what you've seen happening in the field of alcohol research, the different parts of the field that you've been involved in? Just for a moment reflect on where the state of alcohol research was at that time, where the interests were?

Streissguth: Well alcohol research was really in its infancy in the early 70's. NIAAA, National Institute of Alcohol Abuse and Alcoholism, was really broken off to fund alcohol related research at around that time. Broken off from the sort of general NIH kinds of research, because of a feeling that this was a very significant health problem in the United States. And the feeling that it needed to have its own institute so that it could be given adequate attention because it didn't fit so neatly into like the heart

institute, or the cancer institute, or something. So the National Institute of Alcoholism and Alcohol Abuse was formed to really foster research in this area. And early on, as soon as the 1973 reports were published, some people in NIAAA were very interested in this research showing the impact of pre-natal alcohol exposure on children. And at this same time the Research Society on Alcoholism was just forming, back in the early 70's. So it was just all getting started. And the institute and the society were both clear that they weren't just going to study alcoholism, but that it was going to be alcohol abuse and alcoholism. So it wasn't just the sort of disease concept of alcohol it was alcoholism that was going to be attacked. So there was a lot of excitement back there at that time, as the Research Society on Alcoholism was forming. And originally the scientific meetings used to be held in conjunction with the National Council on Alcoholism, which was sort of a lot of people from AA, from Alcoholics Anonymous, were involved in the National Council on Alcoholism. It was for education and help about alcohol related problems. So years of having gone to scientific meeting and the child development meeting and APA and so forth, we were invited back to present our work on Fetal Alcohol Syndrome very early on. I think it must have been 1974; they had a big plenary session at one of the earliest RSA-NCA meetings. And it was fascinating to me. I met a lot of people that had, had problems with alcohol in the past and that had a real vested interest in finding the answer to alcoholism. Harold Hughes had a prayer breakfast for people from alcoholics anonymous. And people were just fascinated with our research. And it was like I felt for the first time that there was like a constituency of people that could really see the social significance of this research. It's funny to talk about it now. But it was so completely different than going to a regular APA meeting where it's just all very cool and scientific and you see a few friends, and you give your paper, and that's it. I mean, people were just, there were people there that had spent their life grappling with alcoholism in their families and they were so interested in this. And of course there were people that were very much in disbelief that this could be true. And it was a very exciting time. RSA was just forming. So I was in on the ground floor of the development of the Research Society of Alcoholism. So it seemed very logical that I would submit my first grant to NIAAA, because they were the people at NIH that had really carved out this as a problem to attack. And NIAAA has been very interested in the problem of Fetal Alcohol Syndrome since the beginning, and very supportive of our research, at a time that I think it would have been difficult to get funding from other agencies, because the idea was so new. I think it would have been difficult to convince a study section at NIMH, for example, that this was truly an important thing to study. So that early support for NIAAA was really important. So in addition to funding our longitudinal prospective study NIAAA funded two others at the same time, neither of which is any longer in existence. They were looking primarily at traditional epidemiologic outcomes, like birth weight, still births, miscarriages and so forth. Because of my orientation as a psychologist, I felt that it was really important to really develop a study that would be a longitudinal context. Rather than just look at traditional outcomes like birth weight, and still births, and gestational age, and so forth. So the other thing that NIAAA started doing immediately was funding a lot of animal research on alcohol and pregnancy. And so throughout the entire 19 year period that we have been doing our longitudinal prospective study with this group of children, whose mother, which I can talk about more later. NIAAA was funding animal research, experimental studies that were able to demonstrate that it was the alcohol that was damaging to the fetus, not just the poor nutrition, or not just the vitamin deficiency.

Because of course in the beginning all these things were raised, well alcoholic mothers don't eat very well, and so maybe it's just poor nutrition. But the animal research that went hand in hand with our work throughout all this time was able to demonstrate beyond a shadow of a doubt, that alcohol is teratogenic and can cause many kinds of disabilities in offspring. And then throughout the nineteen year period as our subjects grew older and we began to look at older and older offspring problems, the animal research has grown with it. So they were able, in the beginning they only looked at gross malformations, with very, very heavy doses of alcohol. Gradually over the years they reduced the dose, their techniques got better, they were able to look at smaller and smaller doses of alcohol. That were much more consistent with the kind of work we were doing in our study which most of our women were not alcoholic. So it was very exciting to be funded by an agency that was doing human and animal work simultaneously in the same arena. And gradually the animal studies began to look at behavioral outcomes. And it was really out of this, that the whole field of behavioral teratology became very prominent. Before then it had just been sort of a budding field with a few studies, but there was just a

huge number of new people coming in and new studies coming on behavioral teratology of alcohol. And that fit in nicely with the kind of brain studies that could be done.

Olsen: And lead as well at that time, alcohol and lead.

Streissguth: So that to me was an exciting time to see the field progressing, not just in an epidemiologic study, not just in a clinical sense as we looked at our children with Fetal Alcohol Syndrome as they grew older, but also the clear demonstration of the teratogenicity of alcohol in the animal lab.

Olsen: And actually one thing that you mentioned leads me to my next question which is, you commented that your interests have been in the human side and in the clinical studies that you've been involved in and what I wanted to ask you is, who are some of the most memorable patients that you have interacted with over the years who have fetal alcohol syndrome. Just a few. And what strikes you as important about those particular patients that you might mention.

Streissguth: Well the first one who comes to mind is Wesley. And Wesley was born at the university hospital back in 1973. And to an alcoholic mother, who abandoned him in the hospital. And he was the first baby in the world that was ever diagnosed Fetal Alcohol Syndrome at birth. And I spent many hours playing with Wesley in the nursery; he was hospitalized for about three weeks after birth. So he was readily accessible. And I tried many of my techniques of infant assessment on Wesley. It was really from observing Wesley that I saw the poor habituation in children that we've subsequently observed in many children with Fetal Alcohol Syndrome. And that's where I got many of the ideas that we then used in our longitudinal prospective study, from going up to the nursery and observing Wesley and other children. Ken and Dave would call me if a new patient came in and of course in those days people were very excited about this. If an alcoholic mother delivered, Dave would be called over to do a diagnosis and then they'd call me and I'd go over and look at the baby or talk to the mother. So Wesley has been very important to me because he's been kind of a demonstration that for children with Fetal Alcohol Syndrome, a lot of the damage is done prenatally. It's not to say that their post-natal environment won't have an impact on their development, I mean, of course we can't say that. But Wesley never lived in an alcoholic environment; he never lived in a bad environment. He's lived in the same household all his life, raised by a wonderful foster mother who’s raised many, many disabled children and who is an accurate reporter, nurturing, caring woman with her own biologic children and a caring husband. So he was raised, not only in a good environment, but Wesley had everything that we knew, in those days at the University of Washington at the Medical School at the Child Development Mental Retardation Center, he had everything we knew to do to him to facilitate his development. He had trials on drugs to control his hyperactivity. He had behavior modification techniques used on him at the center. He had surgery as he needed it. He had eye glasses as he needed them. Whatever he needed for his development, he had. And Wes has had an IQ around 45 throughout all of these years. And I'm sure if he'd been raised in a very terrible disruptive environment, he would have many more problems than he has now. But he has not been free of behavioral problems. And by studying Wesley and other children like him that had often been raised in good homes, it was clear to me that these children were often very difficult to manage, even in good homes. Wesley's mother said that, I don't know how many disabled children that she'd raised, and that Wesley was far away the hardest child she'd ever raised. She's very attached to him, he still lives with her now at 20 years of age and she's done her best for him all this time, and got all kinds of appropriate help. But he's just been very, very difficult, he's been extremely hyperactive, he's not a complacent retarded child. He keeps you on your toes every minute. So Wesley and other children like that taught me that they bring a lot of problems with them to the environment. And they made me realize how trying these children are and how much support and help their parent's need. And how unfair it is to blame the parents exclusively for the many kinds of behavioral problems that the children manifest. So that's one thing that he taught us, and that he and other children, but I'll just use him as an example. The second thing that he taught us is that children with Fetal Alcohol Syndrome really are very different from children with Downs Syndrome. And that most of the programs have been developed, you know for disabled children, have been developed for children with Downs Syndrome. And often these patients don't fit in. I can tell you about another young

man, oh, first I should really finish up on Wesley. The other thing that Wesley has taught me is that with perseverance and proper management, that people with Fetal Alcohol Syndrome, can lead productive lives, if they're given appropriate shelter and nurturance at home. And they aren't expected to do what's beyond them in terms of being independent. Now some people can be independent, but Wesley of course, with an IQ of 45, would have no capacity to live independently. But because of the excellent work that's been done by one particular school teacher working with him and using behavior modification techniques, he now works in a group in a sheltered work experience, and is able to do some productive work, which makes him feel good about himself. And so that was a really important thing, to see that in a special environment he could learn, and he could learn to be productive. Now some of our other patients haven't been so lucky and I think of Danny, who I think you remember too.

Olsen: For the first day of my post-doctoral fellowship. Yes I remember Danny.

Streissguth: Danny became my patient when he was already an adolescent and he had been adopted quite early on by again a very loving, nurturing family that had raised children successfully, their own biologic children. And they wanted to help out by adopting a child that didn't have a home. And he had been such a handful for them. They never knew what was wrong with him. They had problems raising him from the start. And finally had to put him in a group home because he was just kind of incorrigible at home. And it was in the group home that he was sent up to Dave Smith for a diagnosis and then Dave referred him to me. And we worked with Danny for a number of years and were very interested because his brother took on Danny as a project. His brother was a very idealistic young man. Sort of Peace Corps type. And he decided to spend six months of his life trying to help Danny. And he took Danny in to live with him and he got jobs for Danny and he tried to go and help Danny work at the different jobs. And he got him a job....

Olsen: Bike repair shop, as I recall?

Streissguth: Right. Right, got a number different jobs and taught him how to ride the bus, and tried really to work with him. And none of these really worked out. Danny would work a little while and something would go wrong. And he'd be mad, or he'd quit, or he'd get fired. And his brother despite his good intentions, despite his brains and his motivation, really couldn't get Danny lined up. But he did get him lined up for a training program at our child development center. And we all knew about the training program because it trained, as you remember, it trained the people who waited on the tables in the cafeteria. And it was a very well-known program. They were very successful training retarded people to behave in a socially acceptable fashion and clear tables in the cafeteria.

Olsen: What I was going to say is that so on the first day of my fellowship I accompanied you to what amounted to the exit interview in staffing for Danny from that program.

Streissguth: Right. As soon as Danny was in, I started consulting with the woman who was in charge of managing Danny and she seemed interested in learning to modify her behavior in terms of the special needs of people with Fetal Alcohol Syndrome. But everyone else in the program had Downs Syndrome, except for Danny. And it was clear when we went to that Staffing that Danny simply did not fit in. It wasn't an IQ problem; his IQ was at the upper end of the people that were in that program. He was absolutely smart enough to do anything that was required. But the kind of behavior problems that he had, made it difficult for people who were managing children with Downs Syndrome to manage Danny. And it was shocking and disappointing to both of us as they informed us, that they had something that worked and they didn't intend to modify their program for the needs of somebody with something like Fetal Alcohol Syndrome. And they were going to stick with people that they could work with. And he was out, and he was out on the street. And we even pleaded with them to take him, because we knew he'd get into trouble without somewhere to go every day and some purpose in his life. By now he was what, 18?

Olsen: He was 18.

Streissguth: Eighteen years old. But even understanding the urgency of him having a placement before he was discharged from this program, they would not accept him. Now it sounds like they were really rigid, but I think looking back on it, it reflects their degree of frustration of trying to deal with Danny in the context. He just didn't shape up the way people expected.

Olsen: And as I recall also, their concerns were that in his inability to shape up, that the program was falling apart for other students who were part of this program.

Streissguth: Right.

Olsen: And they were both concerned that they could not meet his needs and were concerned that they in fact could not meet anyone else's needs either.

Streissguth: Right. And they just weren't used to people like Danny, who would much rather talk and flirt with the managers of the programs, than interact with the other retarded people that he considered quite beneath him and very disinteresting. And they were interested in trying to reward him for how many minutes he could scrub a dirty pot. And he was totally disinterested in scrubbing dirty pots for any number of minutes for any kind of reinforcement. He wanted to be out talking to the people in the cafeteria, and he just wasn't making it. So that taught me a lot. It taught me that we really need to think about the special needs of these kinds of patients. And then I guess the third patient that's really meant a lot to me is Sidney. And Sidney is a young woman with Fetal Alcohol Syndrome who was also diagnosed when she was maybe 12.

Olsen: Thirteen.

Streissguth: Thirteen years old. Her mother had stopped drinking a number of years ago. She came from a very well educated, upper middle class family. She'd had all the advantages, but was having some trouble in school. And it's been very interesting to watch Sidney grow up with the knowledge that she had Fetal Alcohol Syndrome from about the age of twelve-thirteen on. And how she was able to use that knowledge to help form an educational environment for herself at school that would allow her to develop really to her maximal potential. Sidney has an IQ in the average range. And it was very important for us to begin working with people with Fetal Alcohol Syndrome, who were not mentally retarded. And so we've cherished the opportunities to follow children with this diagnosis, with many, many different IQ levels. So Sidney comes to mind as someone who has really used this information well. Her teachers helped her write a letter about herself, which she gave to her junior high teacher. So when she went into high school she could explain through this letter to her teachers that she was motivated, she really wanted to learn, but sometimes it took her longer than other kids to catch on to things, sometimes she needed to have things repeated more than once, and sometimes she would need to come up and get special help after school. But she wanted them to help her make a success of it. So the knowledge that she had Fetal Alcohol Syndrome was really used in an advantageous way both by Sidney and by her mother in counseling her. And now we see Sidney about ready to graduate from High School.

Olsen: With a 3.7 average.

Streissguth: Right. And we see her working in a supervised, I won't say, it's not supervised like a sheltered environment but it's an ideal kind of a job for her. It's very structured, it's very regular, and it’s very predictable. It doesn't give her a lot of surprised and things she can't handle. And provides her a lot of satisfaction. So she's working part-time in kind of low stress, but success oriented job. And instead of the threat of having to go to college, which would have been her heritage, coming from this family, go to university and try to hack it try to shape up. We've seen so many children from these backgrounds try to go to college and drop out. No one ever really knew why they couldn't make it, or socially they couldn't make it. Now Sidney is realistically planning for herself a career as a hairdresser. She's going to go to a vocational technical school and get a skill that will allow her to have a successful profession. And I think she's going to make it.

Olsen: And she chose it herself.

Streissguth: She chose it herself, right. With the understanding that she wanted something that she could succeed at.

Olsen: Which bring me to, I think another particularly important question and that is how is it that you've been able to make your important clinical observations? Is it the clinical training you had, is it a passion, is it an intuition, is it the team you worked with, how would you answer that?

Streissguth: Well it's all of those things really; it's not one single thing. I was terribly fortunate to work with these early dismorphologists, at a time when this was just being discovered. So it was thrilling to be part of that, but I find that the multidisciplinary team really sharpens one and enhances the sorts of insights. It gives you a sort of a sounding board to try out your ideas on someone who comes from a different background. You know, a pediatrician, a dismorphologists, something. And I've always worked in a multidisciplinary background, with multidisciplinary colleagues so I like that approach. I think one of the things that made it the easiest for me is that I've always liked working with people. I love working with families and children and I love finding out what makes them tick. I don't feel threatened by them, so I'm comfortable giving them my phone number so they can call me when they get in a crisis and then by helping them solve a crisis, I can learn what a crisis is like for them. So I've tried to make myself available to my patients over the years, so they could call and share with me the times that were difficult. So that I could help them that way, and that's been great. But I'm just passionately interested in this area, and I feel it's very, very socially relevant. And I guess all of those things--plus my clinical training and a lot of intuition--I guess all of those things enter in to the kind of clinical insights that have gone on.

Olsen: What I've seen too, is that you not only have worked with a multidisciplinary team here in Seattle or even nationally, but I've seen you bring together international teams. And I wondered if you could comment on the people you've worked with internationally and what you've gained from those contacts and friends in Sweden and places I don't even know.

Streissguth: Well working here in Seattle, it's a little isolated. And I was fascinated when we received a letter from Doctor Lemwan. Not long after the first Lancet papers were published in 1973, Doctor Smith received a letter and said, hey congratulations that's wonderful that you were able to publish that work in Lancet and you're children sound just like our children in France that we had a really hard time publishing the data, and actually it was published in a small local kind of journal back in 1968. So immediately I realized that there were children in other countries that would be accessible. So one of the things that I planned, was an opportunity to live abroad for a year, so that I could study children with Fetal Alcohol Syndrome, in a different culture. And see if they looked like our children, if they acted like our children. And I had to learn French in order to interact with them and their parents. It was a major project. But I carried on with the help of a friend of mine who spoke French, I carried on a correspondence with two French pediatricians that were the two that were publishing most of the work on children with Fetal Alcohol Syndrome, and asked them if I could come and work with them. And they were both delighted and invited me to come and stay at their houses. And we went around and visited their patients and I saw them in their clinics and they brought in patients for me to see. And it was a remarkable experience to see how another culture handled these things. I learned a lot about things they were doing well, that we might learn. And then I've tried to keep in contact through letters with people all over the world that were working early on with children with Fetal Alcohol Syndrome. And then we were very fortunate back in 1980 to fund the first international conference on Fetal Alcohol Syndrome here at the University of Washington. It was funded by NIAAA. And we were able through some private contributions, to invite a woman from Brazil, from Sao Paulo, who had done some absolutely stunning studies. Genderimous [Sp.?], who had done some stunning studies with her medical students on women from the Favelas [poorest of the poor forced into squatter settlements] where alcoholic and the impact on their children. And again demonstrated that it was not the poverty, but it was the alcohol that was really making the difference. And we invited people from--we invited Oligard

who published some of the first work from Sweden. None of the French were willing to come because they didn't speak English, so they weren't here. And we invited Myefski from Germany. The Germans were some of the earliest ones that started publishing on Fetal Alcohol Syndrome, so Myefski came. When we all put up our slides of children with Fetal Alcohol Syndrome, regardless of what nomenclature we used to describe the disabilities or what kind of a system for diagnosis was used in each country, the children all looked the same. They all, you know, we could recognize them and they could recognize our children. And so we looked at hundreds of pictures of children and it was a very reinforcing experience to see that independently in these countries the same kinds of children were being identified. And then as we discussed their behaviors we could see that they were having some of the same kinds of problems. So really some of the most important studies have been carried out in other countries, particularly Sweden, because they are so much more able to keep track of their children longitudinally than we are here through their public health care because all women get pre-natal care.

Olsen: And I've noted, and I would like to know how many different places, that you've been invited to internationally, not to speak so much, but I've noted that you've been asked to influence public policy in countries over the last four or five years, since I've been associated with you. And I think that people might be interested to know where those places have been.

Streissguth: Well public policy has been very important to me, maybe I could talk a little bit about that first.

Olsen: Sure.

Streissguth: By 1976-7 it was absolutely clear to me that alcohol during pregnancy was bad. And that we knew enough to do something about it. And as long as my main goal was a societal one rather than just doing the research. I felt it was really time that we took some action. So my good colleague Ruth Little, who is an epidemiologist and an alcoholism expert, she and I put together what was the first major program to intervene in female alcohol abuse during pregnancy, and prevent Fetal Alcohol Syndrome. And Ruth was the PI and I was the co-investigator, along with a women obstetrician from the Medical School. The three of us then designed this major study. And we received a million dollars from a special demonstration branch of NIAAA to develop this program. And we had to start immediately with the issue of public policy, because if we were going to have a program, we had to have a statement. And what was the statement going to be? And as a public health person epidemiologist, it was much easier for her to grapple with this than it was for me. As a psychologist and a scientist I'd never thought of myself being in a position to influence public policy, or make public, I'd never thought of this at all. Public policy was always made by someone else. But Ruth rightly said, hey if we're going to run this study we have to have a policy of what we're going to tell people about drinking during pregnancy. And she said, well we ought to tell them that you shouldn't drink during pregnancy. And I said, "Wow, that's really extreme. How can we say that? Can we really demonstrate that one glass of wine during pregnancy is bad?" Well she said, for public policy you just need the best public statement that will apply to the available data. So after several weeks of working over these issues and discussing the pros and cons, we were able to resolve this program policy for our program that we were going to recommend that women not drink during pregnancy. Because we had to have something to say on the posters and the television ads. And no one had really addressed this issue before; there wasn't any policy about it. So we came out with a policy about not drinking during pregnancy. And that was a very interesting multi-disciplinary experience in my first foray into public policy. So that got me very interested in how you do influence behavior because it seemed to me the issue was clear already, that babies would be better off if women didn't drink during pregnancy. So we set up a program of public education. We did PSA's on television, we did radio programs, we did newspaper articles, we had a staff of 35 people that were busy doing all different components of public education, professional training. We had teachers that taught teachers, obstetricians that taught obstetricians, social workers that taught social workers, about alcohol in pregnancy and Fetal Alcohol Syndrome, and not drinking during pregnancy. And then we had a clinical component, where we actually screened women in pre-natal care, to see if we could identify people that were drinking at

a risky level, and help them, and talk to them about the risks and then get help for them if they couldn't stop drinking. We didn't provide pre-natal care, we didn't provide ongoing alcohol treatment, but we were the link that got all these together. So we trained obstetricians about dealing with women with alcohol problems. And then of course we had to train the alcoholism treatment people about dealing with pregnant women. So we did a lot of professional training, and we did a lot of clinical service. And we also ran a psychological clinic for people who had children of any age, that they thought might have been effected by pre-natal alcohol exposure and wanted their children examined. So we had these major components. And then we did research on how people turned out. And we found that our work was the same as what they'd found in Sweden, that women that were able to stop drinking or cut down their alcohol intake during pregnancy, had babies that had a better pregnancy outcome than those that continued to drink all the way through. I mean, it was really clear that you could enhance the development of children by getting women to stop. And you could get women to stop by screening them appropriately and by providing appropriate services for them. We also ran a 24 hour seven day a week crisis line. Where people would call in, it was trained with volunteers. And we reached I think like one out of seven of the pregnant women in the community, called in and asked for information. So we did many, many things for a three year period, and studied the impact and found that we were able to make significant impact on alcohol use during pregnancy.

Olsen: And since then if you could just highlight some of the public policy adventures that you've had, since then to now.

Streissguth: Sure. So after having had that experience here, I was called upon to go to other countries and talk with public officials or give lectures, or preside at conferences, or something. To do not just with the scientific aspects of alcohol in pregnancy, but also the public policy issues. One of the early forays we made was to Germany. And both Ruth and I went to Frankfurt and that was very exciting because we met with German researchers all over. There have been hundreds and hundreds of children identified in Germany very early on.

There were major beer drinking in Germany among both women and men. And because of the early work and the many years that they've been diagnosing it, they had a lot of experience working across the life span with these kids as they were growing older. So Germany was one. Another was Iceland, and that was very exciting because they invited me to come to Iceland just at the time that higher alcohol beer was about to be introduced. They'd never had regular alcohol beer available in Iceland before. And there had been much pressure from the industry to market it in Iceland. But they'd always rejected it, but finally it had passed the legislature and it was going to be available. And there is a very high alcohol use and alcoholism rate in Iceland. So they were very concerned about the possibility of women not realizing that this was different and that beer was alcohol and that this was going to be high alcohol beer now, instead of what they were used to which had very little alcohol in it. So they invited me to come and I did this whirlwind trip in Iceland, meeting many public officials and going to several cities, in the middle of winter. It was dark and cold and really very exciting to see how alcoholism fit into the lives of these people. And how isolated many of them were. And the long tradition of alcohol abuse there. And to be able to feel some sense of really contributing. The most recent one was a whirlwind trip to New Zealand, which also has an extremely high alcoholism rate. And where they were trying to get public policy changed for, they were trying to get bottle labeling through. And signs warning about not drinking alcohol at point of purchase. And so this was all part of a big campaign. So I flew around to a number of cities and met with public health officials and policy makers, people in the legislature and gave lots of lectures. Several lectures a day. And did a lot of media interviews and really stirred up the whole concept of not drinking during pregnancy. Sort of from one end of the country to another in a whirlwind week. It was pretty exciting.

Olsen: Tiring.

Streissguth: Tiring, I was exhausted.

Olsen: I think this might be the right time in this interview to have you describe the Seattle 500 study, used to be called the Pregnancy and Health Study. And I think primarily as it reflects how your career has moved and advanced and how has swept you along to this point, which I would then like to discuss, where you are now and what you think the future holds.

Streissguth: Well again I was very fortunate in 1974 when we designed the study to have a couple of colleagues to work with. Again my penchant for collaborative research. I've never felt that I knew enough to do any of these things on my own, that our work would be enhanced. So it seemed very important to me to start out with a group of us. I was the clinical and developmental psychologist, Joan Martin was an experimental psychologist, who had done experimental work on infants studying infant development, and her husband Don Martin was an excellent bio-statistician who taught in the school of public health. So I felt that it was very important to have this kind of a multi-disciplinary background in terms of designing the study. Never in my wildest dreams did I believe the study would go on for 19 years. It has been funded in three year increments. We've never had a five-year grant; in the beginning NIAAA didn't even fund five-year grants. So three was the most we could get. So we planned as much as we could do in a three year period. I'd never run a research project of this magnitude before and in order to do it and to fulfill my promise to myself of working in this area for ten years, I gave up all the other work that I was doing at the university. So I stopped any official teaching, you know, in terms of any regular responsibility for supervising students and so forth, and also stopped doing clinical work. In order to be free to do this research, I funded myself entirely on my own research grant and also funded all the people that worked on it, which seemed a logical way to go at the time. I didn't really realize how difficult it was going to be over the years. I'm not sure it was the right decision, but it was really the only one that seemed logical to me because I'd realized it was going to be a huge job to run a study like this--to systematically interview in their own homes 1500 women in a year's time and then to select, systematically, the right 500 of those women to examine at birth. And the logistics, you know really the computer systems weren't very good in those days, and the logistics of trying to determine who delivered at which hospital and was it a high priority mother, and who should get tested. We had seven people on call because we had Jones experimental program looking at operant learning in the babies and we were doing Braselton's. And then we had the dismorphologist to examine them. And it was just a logistical nightmare. And we saw babies seven days a week for a year. And this was at the same time that we were still interviewing of course, the mothers, the 1500 mothers that were in the, interviewing them all at the 5th month of pregnancy. It was very, very stressful. So I think it was totally the right decision that I not try to be doing other things at the university at the same time. So I threw myself into this. We had a wonderful team of people working together. And I had such a passion for longitudinal research that it seemed a lot of the things about how to run a longitudinal study I'd already learned from all my past experiences with it. So that part of it came really easily. How to run the study, how to hook families into participating, how to intrigue them, how to treat them with respect so that they'd stay in the study, how to have the family share in the excitement of participating in something that would contribute to healthy babies. So I think these were all things that came very naturally and intuitive to me because of my background from Berkeley, and from the perinatal collaborative study, and the work on the Rubella babies and so forth. So that was fine, it was very exciting. It's been very hard though keeping the research funded, we don't always get funded on our first go around. Sometimes we have to re-submit. And I have people that have worked on the project for 18 years. It's been hard to guarantee them salaries over that period when it all comes on soft money. There have been times when we've just had to take donations in order to keep, we've had to develop many innovative ways of getting small grants to help fund the staff to carry over bad times until we could continue another round of investigation. And then it's been a huge problem to work through so much data, you know, 500 subjects that were examined on day 1, day 2, eight months, eighteen months, 4 years, 7 years, 14 years, and so forth. In the beginning we were doing two rounds of examinations at the same time. So it was very hard to figure out the logistics of how much resource to put for data analysis and how much to invest in continuing maintaining the sample. We always had limited funds we never, it seemed like, had enough to run the study, so we had to think of many ways to subsidize it.

Olsen: And you progressed through all those different phases of data collection, which brings us up through adolescence and into young adulthood. If you could just describe briefly sort of where things are now. And then I'd like to ask you questions about the future.

Streissguth: Well we have a five-year grant now under evaluation. So if it gets funded then we will be able to continue the project for five more years, and follow these pregnancies, these children that we interviewed their mothers before they were born, you know, when they were five months pregnant. We'll be able to follow these babies that have been part of our study up through 21 years of age. I feel it's very important. What we found watching our patients with Fetal Alcohol Syndrome grow up is that they've been kind of like a guideline for us, you know, in terms of what kinds of problems they are having and so forth. What we've found is that while kids are still in school, they're really protected, you know, while they're going through school. And if they have families that can keep them in school, and most of our children are still in school, it's kind of difficult to truly evaluate how they are going to function after that protective environment is over. And I feel very strongly that in order to see what is the long-term impact of prenatal alcohol exposure, and exposure to other drugs as well, it's important that a study follow the children until they're in their 20's. So that you can see what happens to them after they are expected to be functioning in a more or less independent fashion. So that's our hope.

Olsen: And it sounds to me as though the passion continues to be there for you, in this field. What do you think is…?

Streissguth: Yes I had to take a second ten year vow, obviously. And this year '93...

Olsen: It does sound like you're working on third... So I guess that brings me to ask the questions about the future. What do you think is the future for work in the whole field of Fetal Alcohol affects from social drinking to following the syndrome.

Streissguth: I think the most important work that needs to be done now, I think there are two areas, one is I think we must devote, well I think there are three areas, one is we must devote more time and energy to understanding the special problems and needs, and deficits, that people with Fetal Alcohol Syndrome and fetal alcohol affects have, so that every child can have the opportunity to develop to it's very best potential. I think that children have really, there's been such an emphasis to prevent Fetal Alcohol Syndrome, which is very important, we don't want any more damaged children, but there's been almost an avoidance of the problems and needs of the children, who have been effected. And that's not fair, that's not right. I mean there are millions of dollars being spent on children with all kinds of disabilities, you know, that can be surgically repaired, that can be medicinally helped. And yet we have really very little idea of what to recommend for children with these disabilities. But I know that many of them can be helped to lead better lives than they are now living. And we are now currently involved in a big study from the Centers for Disease Control, CDC, looking at secondary disabilities and people with Fetal Alcohol Syndrome and Fetal Alcohol Effects. I mean I think it's outrageous that they should end up in jail, that they should end up living on the streets, in shelters, that they should be unable to live and utilize the kind of, live in the kind of sheltered environments that have been developed for disabled people in our society. So this is a big area that needs to be addressed.

Olsen: And I harken back to what you said was your original reason for entering the field of developmental psychology, you are very true to your determination to work with children and find out what's wrong and do something about it, 20 some odd years later. So that's one direction.

Streissguth: So that's one direction. The second direction is I think there's been a lot of emphasis clinically on children with Fetal Alcohol Syndrome because they can be identified by certain facial features, by a pattern of growth deficiency and by some manifestations of central nervous system damage. So it's a regular diagnosis and children can be examined, and they can say yes or no you have Fetal Alcohol Syndrome. So because you can count it, and examine it, and say yes you have it, it's a regular diagnosis, the tendency is to focus only on these children. Like with Down's syndrome, we can

do a genetic test and say, “Yes, they do,” and we can just focus on them. But with alcohol because it's a teratogen, Fetal Alcohol Syndrome is only the tip of the iceberg. So there are many other children that are affected by pre-natal alcohol exposure, who don't have the full Fetal Alcohol Syndrome. And it's really unfortunate that the needs of these children are not being met at all in our society. So although we think of Fetal Alcohol Syndrome as the tip of the iceberg, in the sense that it's visible, it's not necessarily the most devastating effect. I mean some people that don't have the full syndrome, still may be mentally retarded from prenatal alcohol exposure, or be functioning in that border-line range where they have so many behavior problems. So this is the group of people whose needs are totally being ignored. They often are being denied services because they don't have the medical diagnosis. And yet we can demonstrate clear cognitive deficits in them that are clearly related to the things that we can find in our epidemiologic studies, to be related to pre-natal alcohol exposure. So I think we need to figure out a way to identify these children and see that they also are given adequate intervention programs, because their needs can be just a strong as those with the full Fetal Alcohol Syndrome. So that's two areas. The third area that I think must be addressed is we must continue to work on prevention efforts. There are still many people who don't take this seriously, there are many people who are resistant to the idea that alcohol, which is our drug, our educated people's drug, our national drug, our legal drug, that alcohol which is so much a part of all our lives, could have a devastating effect on children from pre-natal exposure. There are many people who don't want to believe that. And then of course there's the countering force of the industry, which wants to sell alcohol. So there are many countervailing forces that make effective prevention programs difficult. We have a national policy in this country, the Surgeon General said back in 1981, "We recommend as a national policy that women not drink during pregnancy and not drink when they are planning a pregnancy." And despite that, and despite the fact that's been endorsed by many professional organizations, the National Academy of Pediatrics, obstetrics, psychology, and so forth. Despite that there are many professionals who don't take this seriously. There are many children with disabilities whose mothers are never asked about pre-natal alcohol exposure because doctors aren't comfortable talking about drinking with women. And there are many women who acknowledge their alcoholism during pregnancy and their children aren't examined for possible fetal alcohol effects. And they aren't given any kind of special help that would be appropriate to preventing Fetal Alcohol Syndrome. So I think we must continue the prevention efforts. We have a very exciting program under way now out of our unit, our Fetal Alcohol and Drug unit, which is funded by CSAP, the original OSAP, and that is a demonstration program to develop an advocacy program for working with the highest risk women that were abusing alcohol and drugs during pregnancy. We've demonstrated how to pick these women up at delivery because they don't get any pre-natal care, how to work with them on an individual advocacy basis so that they can learn to trust us and we can help them with their problems and gradually get them into treatment and help them deal with birth control issues. I think, ultimately, there have to be programs like this. Women that are chronically alcoholic--abusing alcohol and drugs--are often caught up in lifestyle problems that make it impossible for them to get out of this alcohol and drug lifestyle without special help and intervention. So I think it's important to continue to have a public policy about not drinking during pregnancy. I think it's important to continue to have educational campaigns, to have bottle warning labels about not drinking during pregnancy. Important to have local prevention programs with point of purchase signs about not drinking during pregnancy. But it's also important to have special programs for the highest risk women, some of whom produce numerous children with Fetal Alcohol Syndrome. And now we're starting to see some of our patients with Fetal Alcohol Syndrome having chronically poor judgment, chronic difficulties in adjusting socially, and who are giving birth to children that they are unable to care for.

Olsen: And how do you think you'll be involved in setting and pursuing these three directions over say the next few years.

Streissguth: Well we have research under way in all of these three directions right now. So I guess the answer is simple, I intend to pursue it as I have in the past. I believe that the way to solve these problems is by good research data, and in making that data available for appropriate public policy and information dissemination. And not keeping it kind of close to the chest, as something rarefied, but

always trying to publish and present the data in a way that can be meaningful for appropriate societal interventions, which is to me the real purpose of the research.

Olsen: Again true to your original drive. Well I think we have a choice here, so take it either direction you like. I have a few more questions about how you might visualize the most fruitful kinds of intervention programs or prevention program. Or I have a few questions that move in a completely different direction. I suppose slowly moving away from work and in a direction of other things in your life. So which way would you like to go?

Streissguth: I'll let you ask the questions, whatever you want.

Olsen: All right. Then I think I want to ask one that straddles sort of work and maybe other endeavors and I've had a chance to work with you and observe the kind of work that you've done for several years now and I've observed you working through a creative process. Mostly I've seen this in relation to research, where you're thinking through the next step of a research program, or thinking through a grant proposal. But I think I've also seen this in relation to plans that you've had for dinner parties and creative endeavors in your garden. And I guess I would like, if you can, to reflect on your creative process and how that feels to you, and how you stay in touch with that?

Streissguth: That's a really interesting question. I guess the creative process has always been important to me. I'm really an activist, you know, I'd rather create something than passively listen to it. I'd rather learn to play the cello, and play to the best of my ability, which isn't really well, with some of my friends. I'd rather do that, I'd rather create that experience, than go to a concert and listen to somebody else play. I love to create beautiful spaces in the garden, I love to nurture plants. I'm very interested in growing things. I gather seeds and I take cuttings and I keep records on my successes and failure in disseminating seeds in the garden under what kinds of conditions. And so the whole kind of creative nurturing process has been a really important part of me. I spent some very formative years growing up on a fruit ranch in Southern Oregon. Where we worked very hard, worked on the soil, picked fruit, grew all of our own fruits and vegetables, and lived off of our fruit ranch. So that kind of active creative process has been a really important part of me. And working in the soil and nurturing things has been always, since my childhood, something that was important to me and my parents. So I married a man who also came from a long time gardening tradition. And is very interested in, he's an architect, but he's also very interested in gardens and has had a strong passion for gardening all of his life. So I guess it's all part of the same process that I approach my work with. It's like, the work has been very personal to me and I think about it when I'm working in the garden. But I find that I need those spaces, I need the time to play instruments and to work in the garden and that makes me more creative in the office. Because I work through a lot of the things while I'm doing something with my hands, and suddenly the solution comes easier to me. I can't solve all my problems by sitting in the office; you know all my scientific problems. I have to solve them while I'm doing other things and they sort of fall into place. I don't know if that explains it or not.

Olsen: Well I'll ask one more question and see if anything more comes, because I've also seen you appear to be sort of in a flow, or the solutions come and you sort of pluck them out of the air. It's been a very interesting dimension to observe, of a creative process and operation. I just wonder how it feels.

Streissguth: Well it's very much like plucking things out of the air. I mean, I feel research and clinical work--kind of the way that we've done the two of them together--I feel it's very creative and very exciting. But I've never been able to solve any of the major kind of creative problems of the research by just like reading or seeing what other people have done. And it's been much more intuitive in terms of, you know, kind of how it felt and what were the right outcome variables to look at. It's more, I might turn to the literature to find exactly how to measure something, but the whole conception of it, it sort of comes to me. I don't know how to explain it. It's like I think about it off and on for a long period of time and I think about it with different faces on it. And I think about it with different aspects. And I talk about it. I work very closely in a pregnancy and health study, the Seattle 500 study,

with three statisticians. They have, you know, their input has been tremendously important. Because their grasp of statistics frees me from having to encase our work in the rudimentary statistics that I, as a psychologist, trained 30 years ago, 40 years ago, would be able to muster. So I've been able to put my creative talents to the research, to the questions, to the best outcomes to measure. To put in the clinical work, into an experimental context. To really, to deal with the psychological aspects of it. And because we have this tight team of statisticians that we've always had as part of the study, then they can be free to develop statistical methods that will also be creative. So we've had creativity on both sides. Instead of, you know, the first time I tried to design a study, Don Martin just looked at me. You know, I sort of saw it as equal little groups of people that had been exposed X, Y, and Z, and blacks and whites, and boys and girls. He said, "You can't design a study like that." He just looked at me in wonder that I would even... So we've hacked out these problems but I've had a lot of confidence in my colleagues for the things that I thought they knew more than I did about. So I could really devote myself to what seemed to me the psychological importance of it.

Olsen: A number of gardening metaphors occurred to me as you talk about your creative process. Cross-fertilization. And the whole notion of raising a garden and nurturing it over a period of time and watching it evolve, also strikes me as very similar to the kind of work that I've seen you do. And the kind of creative process, that things have grown, it's been a very organic kind of process. Just for the interest of the people listening to this history interview, I think that reflections on Ann's creative process are one of the places that we might gain the most in our oral tradition in this field of developmental psychology. So now, I think I will take this in the direction of your life as a woman. And as a doer of work and other aspects of life. And so I guess, I'd like to know how you've, what are some of your other interests, for people that don't know you as well as I do? And then how have you attempted to balance those? Other interests might include Daniel.

Streissguth: Well I've had a lot of interests in my life and a lot of outdoorsy things. When I was young I was an avid mountain climber and skier and on the ski patrol, back in the days when the ski patrol had to side step up and down the hills to flatten them out, because there weren't any snow plow. And we used to haul people off in heavy wooden toboggans. So I've always had an avid interest in outdoor activities and mountain climbing and later in sailing. I've done a lot of sailing and cruising on sailboats. So the interests that I have now are really a reflection of the shared interests that my husband Daniel and I have together. He sailed with me for a number of years but really didn't like the wind. So gradually we gave up sailing and did things that we enjoyed together, and that seemed really important to us. We love traveling, we travel a lot. We love to live abroad in other countries, usually on his sabbaticals or sometimes when I've been able to have a research opportunity abroad. One of our passions is taking camel trips in the Sahara Desert, for two week stints, with native peoples in the Southern Sahara Desert, that we've gone with on several occasions now. So we live these kind of outdoor activities, but we've winnowed them so that they are things that we both enjoy instead of just things that would take us, because the family has been really, really important to us. I was kind of an elderly mother when I had my only child and so I've felt that our own nuclear family has been really important. And I didn't want to; I never felt that my career was like a very important thing. I mean, I never schemed about how to get ahead, or thought about the importance of my career or anything. What was really important was that I did really creative and important things with my time. But it's been hard to find a sort of a happy medium between being passionately involved in the research and the very strenuous commitments that this requires and passionately involved in the family. Being somebody who likes to cook and keep house and play instruments and garden and to find the time to do both of those things. And to not short-change either one of them. So it takes a lot of balancing. I think it takes a real balancing act, but I've been very fortunate to have a very supportive husband who shares the enthusiasm for the work, and feels that it's really important. And has been able to, we share a lot of the activities around the house. We've shared the care of our son. It was always a time when I've traveled a lot, they always made me feel it was OK, because it was a chance for the two of them to be together. The two boys would have special projects that they would do when I was out being a scientist. So they've made me feel that it was OK if I was a scientist passionately involved in my work. And I've tried really hard not to short-change them and work all the time. And I've tried hard not to

work all the time when I'm at home, so that I have time to do things with the family. I don't know; it seems to have worked out OK.

Olsen: What has made you so determined?

Streissguth: Well I suppose it comes out of my background. I'm the child of two immigrants, who came to this country of their own free will as young people to kind of have a better life here, came for a sense of adventure, and chance to have educational opportunities for their child. They didn't come as a married couple, they met here. And I always grew up with a lot of kind of European ideas, I guess. And my father was a socialist and felt very strongly that it was important for each of us to work hard for our fellow man. I mean I was just raised believing that. So it wasn't like any personal decision I had to make, it was just kind of part of the way of life that I had. That each of us had an obligation to try to make the world better. And my family was never very interested in money, so garnering money wasn't an important goal. My family was not professionals; I'm the only person in my family who's ever been to college, in either side of my family, let alone graduate school. So they were not very prestige oriented, but what they were was very, you know, the work ethic was very strong. We worked very hard on the ranch, to make a living. So hard work has been a very strong part of my life. I enjoy hard work, everyone in my family works hard. And the sense of doing something for society and making a better life has been really important to me. It's been just a strong motivation throughout all my work. So I was never academically motivated in the sense that I wanted to get degrees. But I always knew I wanted to go to college. And my parents would say well how are you going to go to college, it's really expensive. And I'd say well I don't know, but I just really want to go to college. And after that I just kind of got more education as I needed it, to kind of answer the questions that I posed myself about children and their problems. So I needed a master's degree, I needed to study young children, I did that. Then I needed a Ph.D., I realized I had to have a Ph.D. and I had to study clinical psychology to really understand how children could be so disturbed. As it turned out that wasn't the clue at all to childhood autism, but I didn't know that at the time. So that's how it went.

Olsen: We could probably sit here for several more hours, because I have other questions that I think would be quite interesting for people interested in Ann's career. I think what I'd like to do is just briefly describe in closing, where we're sitting now and what the setting is like that Ann and Daniel, and Ben have created for themselves. We are in Ann's home which Daniel designed and, as I understand it, built with his own hands. No?

Streissguth: No. He contracted it.

Olsen: Contracted, but was involved. We are surrounded by plants. Outside is a really, quite incredible garden. How big is it?

Streissguth: Almost an acre.

Olsen: An acre of, I'm not even sure I can describe what it is like, it is beautiful. It's beautiful in every part of the year. At the doorstep you'll find gardening shoes all lined up in a row, for members of the family. The teapot sitting in front of me is in the shape of a camel and Ann served tea and rosewater cookies. And it's really very peaceful with a beautiful view as it's now dark out over the city of Seattle and the lights on the lake. So I think I'd like to just close this by asking Ann if there's anything else she'd like to share, and thanking her for the opportunity to hear this. So?

Streissguth: Well thank you, Heather, it's really been a lovely time to sit here and reminisce with you. And I appreciate the thought that's gone into it. And I thank you for your thinking about questions that would take me back. And I hope helped me elucidate for other people if they're interested sort of how the process has been. In closing I would like to say that I've just been tremendously lucky. I've had some wonderful mentors in psychology and in other disciplines. I've had some wonderful men and women. I've had wonderful role models, as women, in the field and not in the field, in person. Women, older women that have been really important to me in my life and helped me keep a balance. You

know, women that weren't professional women. So I've had professional women that have been important and also non-professional women that have really been important to me. And then some wonderful mentors from many different fields. So I'd like to thank all of them and say that I, it's sort of like potpourri, that it all came together in the work that we've done to help prevent children with fetal alcohol damage. And it's been a wonderful opportunity and I can't think of any more exciting wonderful career to have had. And that I had the opportunity to work at this time in history with a problem that was so socially significant. And had the good fortune to work with so many good colleagues, including you. And it's been something that I've discovered really recently, is how wonderful it's been. You were only my second post-doctoral fellow and so I've only had three. And I didn't figure out how to do it very early on, I couldn't figure out how to afford them. So that has been a particular joy to me and I want to thank you for enhancing my life in that way.

Those who inspired and were influenced by Ann Streissguth:

Mentors
Paul Mussen
Nancy Bayley
Jean McFarlane
Hannah Tiow (?)
Marjorie Honzik
Katherine Landreth
Irving Sarason (Seattle)

Colleagues
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