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CREATIVITY : PROCESS AND PERSONALITY

SIX CASE-STUDIES OF EMINENT PSYCHOLOGISTS

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VII. Jerome S. Bruner : Thinking, Learning, Knowing

Jerome Bruner, one of the youngest subjects, also had one of the quickest rises into a position of recognized standing in his field. Currently Director of the Center for Cognitive Studies at Harvard University and member of the faculties of the Department of Social Relations and the Graduate School of Public Administration, he was one of the youngest men to attain the rank of professor of Psychology. His considerable productivity has been in the areas of propaganda analysis, opinion analysis, perception, thinking and concept attainment, learning and the process of education. In his case, as in McClelland's, there is no immediately identifiable central, paradigmatic question unifying his research; and this is one of the problems we shall be taking up in the following study. He has written many articles, and, alone or in collaboration, four books. Also, like McClelland, he has been a more frequent participant than the other subjects, in administrative and advisory activities. He is currently President of the New England Psychological Association, and President-Elect of the American Psychological Association.

The interviewing for this study was in two parts. The first, on August 13th, 1963, lasting for an hour, was unrecorded and largely unstructured, taking place at lunch. The second, formal part, took place under the crowded schedule of the academic year, on October 29th, 1963, and was unfortunately limited to one hour. The material, therefore, is both limited and less structured according to the outline than the previous chapters. The presentation of the case-study will, therefore, suffer from the same limitations of scope and structure

Growing Up : The Process of Education

Jerome S. Bruner was born in New York and grew up in a Long Island suburb. He had a half-brother 14 years older than himself, and a younger sister. His father, an intellectual, professional man, was also a deeply liberal person, and this im-

pressed young Bruner very much. A conscious realization of intellectuality, however, was a slowly evolving aspect of his identity.

"Very early in life, I had no particular self-consciousness, about goals or such, wanting to be an intellectual. It never occurred to me that there was such a thing, or that there wasn't such a thing. I came out of a liberal Jewish background, with a lot of professional people, and there was no discontinuity between the world of using your mind and the world of anything else. So that in a kind of inchoate way I sort of took intellectuality for granted.

"Yes, I see now that there were certain kinds of things that were inducements to observe and think. I come from a curious split-level family, I have a half-brother who is 14 years older than me, so he could do lots of things with me. I remember my brother and I frequently went into New York, to the Museum of Natural History. And, as early as he could get me to do it, we used to have games. When we got home he would ask me to write up things, usually things like, 'Why the Dinosaurs disappeared.' The nice thing about him was that he seemed to get pleasure, not so much from my getting things right, but just in the excercise of the process. There and in other aspects of life, I think the use of knowledge, the use of mind, that kind of thing, were never anything terribly strange. Nor was there any great separation between what we now call the two cultures, the world of science and the world of literature and art. I think this is one of the benefits of being a Jew, among many. There is a kind of pleasure in process, the process of doing things was always more important than the product we ever produced. And this was true of the games and activities that I and my friends pursued as children.

"I had a dream as a child, that I remember very well, that I think is quite indicative of my state of mind then. Part of this I know from analysis. The dream was that everybody in the world had died, disappeared somehow, they

weren't there. But there were a lot of other people there. And I was somehow in a position of having to know, having to tell -- they had never seen anything in the world -- having to tell them about the things that had been there before; and it was a terrifying dream. I think it must have to do with the fact that I was born blind; and living my first two years blind made, possibly, some kind of compensation in the opposite direction, of wanting to know. Knowledge somehow is what gives you control of the world, knowing what was there."

Having this kind of intellectual curiosity and the need to figure things out by himself, it is easily seen that Bruner might have had a difficult time in public schools as they are usually constituted and staffed. This is what happened.

"My first school years were rather trying, I just couldn't understand what in the world they were after. It wasn't that I couldn't do the stuff, but that I couldn't for the life of me understand why anybody should want me to do these things. I remember being left back in the first grade -- until I managed to start learning in the way they expected." After that he never had any real difficulty in school, but was always dissatisfied with the form and content of the education he was receiving. He always did well scholastically, but his real interests were not those dealt with in his studies, up to and into college. "What you were doing in class was never as interesting as what you were reading on your own; and what you were reading on your own, then, were novels and so forth." But still no consciousness of an intellectual separateness.

"It wasn't until freshman year in college that I realized that some kids didn't understand things that seemed so simple to me." His roommate was an athlete who was very bright scholastically and helped out other athletes in their work, and Bruner joined in and started tutoring some of the athletes. "They were very nice and unassuming, humble, and anxious to learn, but they just were not as bright as I was." And it was here that it occurred to him that what was clear to him, and

obvious, need not be generally so. This was an important recognition.

Bruner went to Duke University, then undergoing a great efflorescence, without knowing what he wanted to study. He toyed with economics, but a course on insurance finished that quickly. It was after that that he got on the ultimate path of his intellectual development, and here, too, the process was indirect.

"I acquired an intesest in biology, took courses, did lab work and so on. During the summer I read a lot of anthropology. The next summer I took a course in experimental psychology at Bar Harbor, Maine. And it looked like a career in biology. But, along the way something funny happened. I had developed some strong convictions about compulsion and freedom and that sort of thing. What it all came to center on was compulsory chapel. I just didn't show up for compulsory chapel, whereupon I was expelled from Duke. There was a certain amount of furor about this. Partly because the Deans were a left-over from the old regime, conservative, while the faculty was new and more liberal. And a little earlier I had made some trouble. Some of the students were going to establish sort of a voluntary society, an honor society, and they were to be a secret group who would report on other students. I thought this was simply ghastly, and I wrote a piece for the student newspaper about it. This got the deans made, because they were for it; it was to be some kind of administration secret police Horrible thing. So when I didn't show up for chapel, they expelled me. When I was dismissed, word got around. And MacDougall, who was there then, went to the dean and pleaded my case. He said I could come and work in his laboratory during the compulsory chapel hour. And they agreed. This got me into psychology, and from there on in, that was it.

"For me, interest tends to go where your competence is. As you build up competence, and the technique to make good on the competence, you find yourself going

in that general direction.

"After graduating I came to Harvard to work with Leshley. And while it was not a great department at that time, it had a brilliant collection of graduate students, and we gave ourselves a pro-seminar. And it's a group that has remained very close friends over the years, and all of them have done interesting things in the field."

It was at Harvard that Bruner began to work on the first of the problem areas that have been important in his professional career, and we shall be concerned with these in a further section.

We have seen the development of an inquiring, intellectually curious mind, that was influenced by teachers and courses, but not really molded by them. The fundamental traits had been formed early, in the family situation, and the contentual developments occurred around, but not modifying this essentially independent structure.

Personality

"Achievement motivation? I'd like to make a difference I suppose, in my generation; that there be a difference because I lived. I suppose it is the kind of thing you get in people who are willing to get into a profession in which the main thing that you do in this odd profession is after you finish one thing in which you become master, is purposely put yourself in another situation where you are dumb. This is the great challenge and the glory, but it is terribly exhausting. I enjoy the iconoclast role. I don't feel particularly prophetic or messianic I guess." We might be able to identify some element of a sense of destiny in the dream he recalls from his childhood, of having to tell the world about all previous knowledge. I think this is expressed, if unconsciously, in his current work on education, starting with The Process of Education (1962), in which there is a definite aim to improve society by improving the quality of education in our schools.

"Self-actualization, creativity? Do I feel as though I am using my furnace? Yes, very much so. I sometimes feel that my great problem is that I over-extend myself, over-actualize myself by making more committments than I can fill. And I am struck by the fact that there are so many happy accidents, and unhappy ones, along the way.

"Peak experiences. I have them in research, when I feel I really understand something, and can share it with some people; this is a marvelous experience, it really buoys you up. You've got there finally, and you understand it. When you think you have a simple model that is going to render things that were terribly complicated, suddenly simpler, it really has, itself, tremendous energizing properties to it.

"Teaching is a curious peak experience for me. I had a year without teaching, at the Institute for Advanced Study, and that's too much to give up. First of all, you can't be productive that much during the day. And you can't be productive outside some sort of a dialogue, and I find the dialogue with students makes me tremendously happy, makes me the chief beneficiary, by making things clear to myself. I get tremendous sustaining feeling out of teaching. I really wouldn't do without it.

"I lead a life filled up with things, I do a lot of things, and in consequence, perhaps, over-commit my energies. So I have to get away. First of all, I have to be alone by myself for at least a short while during every day, otherwise I can't stand it. And then, I have to get away in summers, say, for a period of time. Fortunately, my wife and I both enjoy sailing, and we get into our sailboat and just drift off-shore for days. This is important.

"I enjoy painting, but don't get enough time for it. We work so much with words, that I don't get enough of a chance to do that, work with my hands, so that I don't feel requited fully. I don't get enough chance to use my "left hand" (cf.1963),

the world seems too much with us. But I suspect this may have to do with the age I am at, the late 40's. I am committed and asked to do so many things. And even those I feel I really should do are too many. I have a feeling that if I wait a few years some of the irrelevant things will probably drop off. I find that the work you are committed to you return to, you go on with.

"I work all the time. I find even when I go off and am entirely on my own, I come back and what has happened is that the thing is farther along than it was. So my unconscious must have been working at it. There are moments when I have a big insight only to find that I'd said the same thing in some previous memo, only hadn't understood it. So that it is a little bit like a seamless web. I also work at experiments in writing. I care about the English language, I wish I could write it better. I suppose I go through more drafts than anybody else.

"Friends are very important to me. I have been very fortunate in having many close friends you might say that I am given to close friendships. And this has always been an important part of my creative processes." At one point Bruner worked with a group of other thinkers on a project for the State Department, under Acheson. That group became very friendly, and formed a dinner-club. "We have dined together every Friday night during the year for the last 15 years. It's an interesting group: Wassily Leontief, the economist; Edward Purcell, the physicist; Finland; Peter Wulf, the Byzantinist; Myron Gilmore; George Homans; Kingman Brewster, now President of Yale; McGeorge Bundy; Jay Stratton, President of MIT. It has been an interesting kind of thing, in that the group has never had more than informal dinner and conversation. We have brought in outsiders, various people when they were around -- Robert Oppenheimer, Ernst Gombrich, and others. But it has been essentially the same core, it hasn't changed much. It has always been an occasion in which people were talking about the areas in which they found most novelty, within their own fields. And I can't begin to tell you what an important thing this

colloquy was. Oh, a lot of times we start talking politics, and a lot of things get done within the conclave; but, in general, it was talk about ideas. And I think it has formed all of us in quite an important way."

The Evolution of Concepts

During the years before and just after the start of the Second World War, Brumer, a graduate student at Harvard, became interested in the question of propaganda analysis. He went to Yale and worked with a group of people, under Leonard Doob, who were investigating this area. After this work he wrote his doctoral thesis on a problem in propaganda analysis, and this brought him into his first sphere of public service activity. After the thesis, he went to Washington and worked with the Intelligence Services on propaganda analysis, eventually going to Europe on intelligence work.

After the war he returned to Harvard and took up his researches again. "I think the post-war period tends to be more systematic. I came back struck by the fact that human beings don't form attitudes and opinions on the basis of looking at reality, and then forming a view. But rather, what has a tragic cast about opinions and views, is that they determine the way that you look at reality, at the world. And so there is selectivity, the world comes to conform to your expectations. So we worked, first Bob White, Brewster Smith and I, on a study on the roots of opinion in personality. We wrote a book called Opinions and Personality.

"We finished that and I found myself still dissatisfied. I found myself wanting to look more closely at the process, the function that opinion serves in a personality, to keep the world on an even keel. And started studying perception, dusting off an old technique, using a tachistoscope. Being very impressed with the extent to which needs, what the French call professional deformations, affect the manner in which a person looks at his world. I published a whole series of

articles on that, many together with Leo Postman. But as I went along it was also very clear and apparent that this wasn't telling the whole story.

"I was watching my own children grow up. Psychologists don't often write about this, but it was terribly suggestive. It is an extraordinary thing to see. As children grow, they begin to get these models of the world. And that makes it possible for them to spin the model a little bit faster than the world goes, and do some predicting. And there is an extraordinary rationality in it as well. The first thing that struck me was that they go beyond the information given, they are not just stuck there. They have enormous powers for interpolating, extrapolating and predicting.

"I used to take my son to the Peabody Museum at Harvard on Saturday mornings. One time we saw a display-case with a model-scene of some Indians, one of whom had a baby in swaddling clothes on her back. My son asked me what the swaddling clothes were for. I said they were for warmth, and I suspected they had some ritual importance. And he asks me, 'Doesn't it do something to them?' So I told him about the theory Geoffrey Gorer had, that the frustration of the binding clothes tended to make the Indians more aggressive in later life. My son asked me, 'Do you believe that?' And I told him that I didn't know. Later on, that evening, we were discussing why milk froze in in the winter, outside. And I explained why the lid had to be able to come off, if not you'll break the bottle. And I told him how you could check this, by clamping one, and leaving the other open. And then, when I was putting him to bed, he said, having gotten this paradigm for checking: 'Couldn't you find out about the swaddling clothes, if the theory is true, by taking a couple of kids, and binding only some of them on a binding board?' I was impressed with how quickly kids pick up these techniques, for sorting out information and using it.

"I became impressed also with the fact that our perceptual readiness also

reflected some powerful principle whereby human beings and probably organisms in general attempt to maximize gratification but also to minimize surprise in their environment. And it was minimization of surprise in the model building aspects of the thing, that made me very, very receptive when the Shannon and Weaver book on information theory came out; and I got to talking about these things with George Miller and we explored some of these things.

"And then, fortunately, and there have to be breaks when you can rationate and get away from it, they have always been extremely important to me. I have very, very strong introversive tendencies, although I have an extremely misleading social facade. At this point Robert Oppenheimer /whom he had met in Washington and become quite close to/ invited me to the Institue of Advanced Study for a year. And there I had a chance to think a great deal about these things. The extent to which behavior is so beautifully adapted to the environment and to our own capacities. I knew also that the neurotic manifestations of primary process were part of this all. I was in analysis, as a matter of fact, at the time.

"I had a chance during that period to talk to John Von Neumann. He and I set up a supper club down there, like the one up here. I think it has been an important thing in keeping me from getting too much imbedded in my own work, and it has been a diversion, too. Von Neumann, myself, Panofsky, Pies, Plotchek, and various others from time to time. The talk was very much in terms of a kind of epistemological crisis, I suppose, in a sense, the crisis of the intellectuals in the 19th Century had to do with the relationship between values and knowledge. I think in our time the crisis really has to do with understanding the nature of knowledge itself. I became intrigued and gradually found myself attempting to build some kind of model of the way in which human beings adopted strategies for getting information, in order to

form concepts. How these models were built -- concepts which stand for the world.

"I came back, and we worked for several years after that, seeing if we could study the systematic nature in which people picked up information, and that led to A Study of Thinking (1956). These things always have a way of running one thing into the next." In the preface to this book, the problem dealt with is set forth specifically.

> This book is an effort to deal with one of the simplest and most ubiquitous phenomena of cognition: categorizing or conceptualizing. On closer inspection, it is not so simple. The spirit of the inquiry is descriptive. We have not sought "explanation" in terms of learning theory, information theory, or personality theory. We have sought to describe and in a small measure to explain what happens when an intelligent human being seeks to sort out the environment into significant classes of events so that he may be able to end by treating discriminately different things as equivalents. (1956, p.viii).

The next step was one that emerged slowly, from this study of basic cognitive processes. There was first a realization that certain things needed to be fitted in, dealt with. An interesting incident which contributed here occurred at Princeton.

"One day I came by to pick up John Von Neumann for dinner. As I was waiting for him to finish up some work, I noticed that he put something away in a large drawer full of pieces of paper. I asked him what they were. He said, "These are the things which I know but don't bother to prove." This raised a number of questions about knowing and learning that were outside the scope of the book. A few years later, driving his son to boarding-school, they were talking about school in general and it occurred to Burner that if you thought you had a decent theory of learning or concept attainment, it had to imply some kind of theory of education.

Another important realization grew out of the research on concpt attain-

ment. It was clear that there was a clear pattern of development in the capability of arriving at a concept. There was some kind of optimal pattern of concept development, that would both maximise gratification and minimize surprise, while still allowing, as he had seen with his children, the persons to go beyond the information given.

"I thought maybe we had overshot in the other direction. And I wanted to show where all this systematic stuff came from, and I became interested in children, child development. I started studying children, which I have been involved in ever since."

But this was not yet going beyond the limits of the problems as formulated in the thinking book. It was only a little while later that this new area was restructured around a new problem, namely that of education. And while this was not unheralded, we have seen some seeds of the new departure, the spur that started it was an external, almost accidental one.

In 1959 Bruner was vacationing in Colorado, and planned to spend the summer there, resting, and working out some ideas. But this did not turn out to be the case. "I got asked by the National Academy of Sciences if I would run a summer study of the process of learning, and I said yes: semi-reluctantly, because there were other things that I wanted to do. And from there on, I find myself sort of up to the ears and terribly committed to the business of seeing what can be done by reforming the curriculum."

Bruner's interest in the process of education was motivated not only by its relation to the problems he had been immersed in up till then; it also was personally very relevant in two important ways.

"I think the idea of reforming the curriculum has a lot to do with what I think learning would naturally have been like for me, if it hadn't been interfered with so often by the curious institution of the school." The

troubles he encountered in his own education were ones he could now readily understand in terms of the defects of existing curricula and methods in utilizing the natural learning processes and the natural curiosity of the child. Bruner had in this a rare opportunity for a kind of retrospective compensation for the difficulties he faced as a child.

"My feelings, such as they are, of lack of success as a father, and I feel I could have been much more successful, comes from a failure not to intervene, to hold off your opinions. However much you try, I have the feeling that a great deal of growth consists of children trying out techniques, trying to assimilate things to their own way of thinking and trying them out in practice. I sometimes think it would be an interesting kind of thing, if you take another set of kids through life, and try that again. They are a special kind of product, that's very difficult to define, different from anything else that you do." Bruner has had this opportunity, in a sense, in two ways. In his second marriage he "acquired" five new young children, sort of another chance to bring up children. And, in his work on education, he is doing this on a more detached plane. "You can't help influence your children, I don't know what the right way is. I am not at all clear on the parental role; except insofar as the parent is a figure for identification. And, probably, identification is the most effective technique we have for teaching anything. Because what you do is to provide a set of ways for doing things which then catch the person in it."

> In September, 1959 there gathered at Woods Hole on Cape Cod some thirty-five scientists, scholars, and educators to discuss how education in science might be improved in our primary and secondary schools . . . The intention was . . . to examine the fundamental processes involved in imparting to young students a sense of the substance and method of science. (1962, p.vii)

This was a reflection of a general movement, which, though young, was already wide-spread in America, spurred perhaps by the dramatic impact of the Sputnik in 1957, to effect revolutions in the design and content of scientific curricula. But within this general movement, the Woods Hole conference was a new step, unique in the composition of the group, and in a primary concern for the structure rather than the content of the new curricula. Jerome Bruner was the director of the conference, and chairman of its executive committee.

> Virtually all of the curriculum projects (alluded to) earlier were represented by scientists who had been engaged in the process of writing texts, teaching the new courses, or preparing films or other materials. In addition, there were psychologists who had devoted a major part of their research lives to the examination of intelligence, learning, remembering, and motivation. Strange as it may seem, this was the first time psychologists had been brought together with leading scientists to discuss the problems involved in teaching their various disciplines. The psychologists themselves represented a wide spectrum of points of view -- behavioristic, Gestalt, psychometric, the developmental viewpoint of the Geneva School, and the rest. The differences, however, paled before the issues that were to be faced. The group was leavened by a representation of professional educators -- teachers, deans, experts in audio-visual methods. Two of the Conference members, finally, were historians. (Ibid., p.x.)

After the opening sessions, and some demonstrations of various methods and mechanical techniques, the conference split into five study groups. Each group eventually submitted a lengthy report to the conference for debate. The five groups represented a broad spectrum of interest, for our purposes we shall note that three of the topics (1, 4 & 5) are direct manifestations of Bruner's interests in problems of education, and a fourth (no. 3) is closely allied. While not claiming that this is the main reason for the selection, it is proper for us to note the fact. The five areas were:

One concerned with the "Sequence of a Curriculum," a second with "The Apparatus of Teaching," a third with "The Motivation of Learning," a fourth with "The Role of Intuition in Learning and Thinking," and a fifth with "Cognitive Processes in Learning." Bruner was a member of the fifth group, the one most related to his

previous competence.

At the end of the conference it was necessary to arrive at a summarizing and concluding formulation of the accomplishments of the entire group. This fell to Jerome Bruner and resulted in his book The Process of Education (1962), which is generally considered a highly important and creative synthesis of many significant points of view.

> It fell to the Chairman, then, to prepare a Chairman's report -- perforce a selective account of what in his view were the major themes, the principal conjectures, and the most striking tentative conclusions reached. In a proper sense it is the Chairman who is principally responsible for the pages that follow, however much he made every effort to reflect the thought of his colleagues. . . . The final draft was greatly aided by the comments of participants -- though again it was not undertaken in the spirit of trying to find a consensus. Rather, the pages that follow constitute my conception of the "sense of the meeting" and inevitably will reflect the biases and predilections I bring to the task. (Ibid., p.xiif)

This book was, to my thinking, an achievement of creative synthesis, of putting together a lot of ideas in terms of a certain conceptualization of the learning process. And this conceptualization bears the clear stamp of the previous research into problems of thinking that led Bruner into the area of education.

Since that time much of his research interests have been centered around questions of intellectual development and the methods of teaching. Such work may deal with a postulated pattern of "technological advances" in thinking of a child, or with the significance of representation in mathematical instruction.

What can we say now about Jerome Bruner as a creative thinker? Creative products we can easily see. These range from systematic investigation of an important problem, such as concept attainment, to the collection of "Essays for the Left Hand," On Knowing (1963), which represent the more speculative, less rigorous thinking about the problems of knowledge, creativity and education. But does this fit our definition? I think so.

While it is obvious that we don't have the ideal sort of generation of novel belief systems which violate previous ones, I think we have here, as with McClelland for one, the pursuit of one basic question, and its implications, to the point where it begins to take on paradigmatic aspects, although it is not a restructuring of the entire field. The question of how people build their concepts of the world is essentially the question Rokeach is asking in a different way; and in a sense it is more basic. Rokeach is dealing with that set of concepts known as beliefs, and then mainly with beliefs as they reveal basic character structures and the implications of these structures. Bruner is asking a question about all cognition, and it is broader than a concern with the character structure, one area of its implications. In this sense it is paradigmatic, even though it does not build into a systematized concept of human nature.

We also have another creative aspect. In making the leap from the concept attainment of human beings, to the intellectual development of human beings, viewed in terms of concept attainment, Bruner has moved to a major sub-paradigm. And this sub-paradigm has, besides its theoretical significance, also a considerable social significance, and is expressive of a real social interest.

In much the same manner as McClelland, Bruner, starting with a dissatisfaction, a sense of a problem, moved from one aspect of a larger problem to another, from one sense of gap to the next, from preoccupation to preoccupation. And he, too, without any necessary conscious realization, was filling out many of the implications of a paradigmatic question. Reaching a certain stage of completion, having pretty much worked out a major sub-paradigm, he was able to leap to another. And again, like McClelland, this new stage is important not only theoretically but socially, and may also be traced to certain character traits and early influences. Just as the work on inducing achievement motivation is a radical step in that it attempts to produce the phenomena that McClelland is theorizing about, so, too,

is Bruner engaged in creative "change-research;" not only theoretical investigation, but actual work in curriculum reform. There is a double play here of theoretical research and social activity that involves much creative innovation in theory and method. I don't think that we are deforming our definition by including the work of Jerome Bruner in our conception of creative processes. As a child Bruner dreamt that he had to communicate everything that was known to people who knew nothing of what had come before. Whatever else this may mean, I think we might see in it a foreshadowing of his present deep involvement with the process of educating children.